RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

Study Area at Solid Waste Management Unit 13
RCRA Facility Investigation Report

FINAL
JULY 2010

PREPARED BY:

URS

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

August 26, 2010

Commander,
Radford Army Ammunition Plant
Attn: SJMRF-OP-EQ (Jim McKenna)
P.O. Box 2
Radford, VA 24141-0099

P.W. Holt
Environmental Manager
Alliant Techsystems, Inc.
Radford Army Ammunition Plant
P.O. Box 1
Radford, VA 24141-0100

Re: Radford Army Ammunition Plant, Va.
Review of Army's Final RCRA Facility Investigation Report for
Solid Waste Management Unit (SWMU) 13

Dear Mr. McKenna and Ms. Holt:

The U.S. Environmental Protection Agency (EPA) and Virginia Department of Environmental Quality (VDEQ) have reviewed the U.S. Army's (Army's) July 2010 Final RCRA Facility Investigation (RFI) Report for SWMU 13, located at the Radford Army Ammunition Plant (RFAAP) in Radford, Virginia. Based upon our review, the report is approved, and in accordance with Part II. (E) (5) of RFAAP's Corrective Action Permit, it can now be considered final.

If you have any questions, please call me at 215-814-3413. Thanks.

Sincerely,

William Geiger
RCRA Project Manager
Office of Remediation (3LC20)

cc: James Cutler, VDEQ

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July 20, 2010

Mr. William Geiger
RCRA General Operations Branch, Mail Code: 3WC23
Waste and Chemicals Management Division
U. S. Environmental Protection Agency, Region III
1650 Arch Street
Philadelphia, PA 19103-2029

Mr. James L. Cutler, Jr.
Virginia Department of Environmental Quality
629 East Main Street
Richmond, VA 23219

Subject: With Certification, Study Area at Solid Waste Management Unit13, RCRA Facility Investigation Report, Final
July 2010
EPA ID# VA1 210020730

Dear Mr. Geiger and Mr. Cutler:

Enclosed is the certification for the subject document that was sent to you on July 15, 2010. Also enclosed is the 15 July 2010 transmittal email.

Please coordinate with and provide any questions or comments to myself at (540) 639-8658, Jerry Redder ATK staff (540) 639-7536 or Jim McKenna, ACO Staff (540) 731-5782.

Sincerely,

P.W. Holt, Environmental Manager
Alliant Techsystems Inc.

c: Karen Sismour
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09-815-105
JMcKenna

Rich Mendoza
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Rob Davie-ACO Staff
P.W. Holt
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Env. File

Coordination: J. McKenna Joe Yeakley for M. A. Miano

09-815-105
JMcKenna

Concerning the following:

Radford Army Ammunition Plant
Study Area at Solid Waste Management Unit13
RCRA Facility Investigation Report
Final July 2010

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE: _____
PRINTED NAME: for Antonio Munera
TITLE: LTC, CM
Commanding

SIGNATURE: _____
PRINTED NAME: Kent Holiday
TITLE: Vice President and General Manager
ATK Energetics Systems

09-815-105
JMcKenna

Greene, Anne

From: McKenna, Jim
Sent: Thursday, July 15, 2010 3:59 PM
To: Greene, Anne; Cutler,Jim; dennis.druck@us.army.mil; diane.wisbeck@arcadis-us.com; Geiger.William@epamail.epa.gov; Redder, Jerome; jim spencer; Llewellyn, Tim; Lohman,Elizabeth; Mendoza, Rich; Meyer, Tom NAB02; Parks, Jeffrey N; Sismour,Karen; Timothy.Leahy@shawgrp.com; Tina_MacGillivray@URSCorp.com
Cc: Holt, Paige; Davie, Robert; Flint, Jeremy
Subject: RE: Study Area at SWMU 13 RFI Final - Fed Ex numbers (UNCLASSIFIED)
Attachments: Response to EPA responses to RTCs SWMU 13 RFI.PDF; RTC USEPA Study Area at SWMU 13 RFI Comments.pdf

Importance: High

Classification: UNCLASSIFIED
Caveats: FOUO

All:

Resending this email as I didn't attach the responses to comments.

Note the contractor will ship the subject document with a copy of this email to the POCs and tracking numbers below. Also attached are the two sets of responses to comments.

Here are the FedEx tracking numbers for the Final Study Area at SWMU 13 RFI Report.

James McKenna 7988 5218 9428 2 Paper copies Will Geiger 7937 2902 6027 1 Paper copy/1 CD Jim Cutler 7988 5220 0058 1 Paper copy/1 CD Tom Meyer
7937 2903 4996 1 Paper copy/1 CD Richard Mendoza 7988 5220 8530 1 Paper
copy/1 CD Dennis Druck 7988 5217 1253 1 CD Elizabeth Lohman 7937 2900 8690 1 CD Susan Ryan
7937 2901 4870 1 CD

Thank you for your support of the Radford Army Ammunition Plant Installation Restoration Program.

Jim McKenna

Classification: UNCLASSIFIED
Caveats: FOUO

April 29, 2010

Response to EPA/DEQ RTCs (Received via e-mail March 29, 2010) to Responses to Comments (Original Responses dated Feb 10, 2010) for Study Area at SWMU 13 RFI Report (July 2009)

1. EPA and VADEQ disagree that no hot spots for lead are present at SWMU 13. Two sample locations show lead concentrations that are substantially higher than lead levels reported in the remaining SWMU 13 samples. Acute risks associated with hot spot exposure should be evaluated, and to this end, EPA performed a risk analysis of these two areas. The Agency concludes that contact with conservatively drawn exposure areas of SWMU 13 is not expected to pose short term risks. However, in consideration of the substantially elevated lead result of 26,500 mg/kg for sample 13SB11B, institutional controls will be required to prevent future digging at this SWMU.

Response: The last sentences of the Executive Summary and Section 8.0 will be revised as follows: "Based on the results of the RFI, HHRA, and SLERA, no further action beyond the implementation of institutional controls to prevent future digging at the RFI study area is recommended.

The following text will also be added to the Executive Summary and Section 8: "Institutional controls are being implemented at the RFI study area at SWMU 13 within the boundaries depicted on Figure 1-2. The objective of the ICs is to prevent future digging at the site. Specifically this site has been incorporated into plant management manual to ensure long-term protection of human health and the environment. The management manual provides for advance notice, assessment and approval of intrusive work that may occur within the plant with a general digging prohibition at sites such as this. In the event the property is transferred or leased, equivalent ICs will be put into terms and conditions of the deed or lease, which are no less restrictive than the IC objectives described above. Furthermore, the transferee or lessee will be responsible for ensuring IC compliance by any future users. However, the Army acknowledges the responsibility for all original liability under CERCLA and its right and responsibility to enforce ICs."

2. The data identified in this comment (1997 study) should be incorporated in the conceptual/mass balance model discussion of soil concentrations left in place and ramifications to river sediment concentrations, etc. How does this lead concentration compare to analyses from other nearby locations?

Response: Prior to the SSP/RFI, historical soil analytical data (1997 study) were considered screening level data and excluded from the risk assessment given the age of the data, the lack of available data validation reports/information, the lack of coordinates to accurately locate the samples, and the availability of sufficient newer validated sediment data to more appropriately characterize conditions. In addition due to the transient nature of the river, the most recent sediment concentrations (SWMU 54 RFI/CMS Report 2008) would be more appropriate to characterize sediment conditions within the river. Per the EPA partnering meeting (February 2010), a mass balance analysis was conducted for the site utilizing annual runoff estimates and estimates of runoff for a 10-year storm event. See calculations in Attachment 1 (Calculations will be provided in an Appendix within the RFI report). The following summary of the results will be added to Section 4.

"Although previous sediment sampling results (Section 2.2.5) did not indicate the site had historically significantly affected the New River based on the detected lead concentrations at the study area, an assessment of the study area as a potential future source of lead loading in the New River was conducted. The site area assessed is limited to the 1.6 acre study area. The presence of

Attachment 1

Soil Loss Calculations

Calculation #2 - Single Event Soil Loss

Modified Universal Soil Loss Equation (MUSLE)

$Y = 95(Q \cdot q)^{0.56}\ K \cdot LS \cdot C \cdot P$
$= 95(0.147 \cdot 4.35)^{0.56}\ 0.24 \cdot 4.4 \cdot 0.004 \cdot 1 = 0.3$ tons of soil

Y = single storm sediment yield in tons

Q = storm runoff volume = $[(P-0.2S)^2/(P+0.8S)]$ (inches)
= 1.1 inches = 0.092 ft = 0.092 ft · 1.6 acres = 0.147 acre-ft
P = Rainfall Depth = 3.63 inches (Virginia Department on Conservation and Recreation - 10 Year Storm 24 Hour for Pulaski County)
S = 1000/CN-10 = 1000/70-10 = 4.3
CN = SCS Curve Number = 70 (Soil Group C – Forest Good Condition)

q = peak flow = C·I·A
= 0.4·6.8·1.6 = 4.35 ft^3/sec
C = Manning's Runoff Coefficient for Sheet Flow = 0.4 (for woods – light underbrush)
I = Rainfall Intensity = 6.8 in/hour (Roanoke County IDF Curve – Duration 5 min due length of overland flow and slope)
A = Drainage Area = 1.6 acres

K = Soil Erodibility Factor = 0.24 (Wheeling Sandy Loam)

LS = factor for horizontal length of slope and slope gradient = 0.77·5.7 = 4.4
L = $(\lambda/72.6)^m$ = 0.77
λ = slope length= 43 feet
m= slope length factor = 0.5 (slope > 5%)
S = $(16.8 \sin(\Theta))-0.5$ = 5.7
Θ= slope angle = 21.8 degrees

C = factor for planned cover = 0.004 (from Table 11 - USDA 1978 – 70-45% cover trees and undergrowth, 85-75% duff coverage)

P = factor for management options = 1 (default)

Lead In Soil = 0.3 tons · 314 mg/kg average lead in surface soil · 2000 lbs/ton · 1kg/2.2 lbs · 1E-06 kg/mg
= 0.09 kg of lead

Attachment 2

Revised Section 5

the less volatile the chemical. Values of Henry's constant for soil COPCs are summarized in Table 5-2.

One VOC (TCE) and one SVOC (naphthalene) with Henry's constants less than 0.1 were identified as COPCs for the soil-to-groundwater migration pathway based on detections in one or more samples above calculated site-specific SLs (Section 5.1.4). Low concentrations of these COPCs have been detected in soil and therefore, volatilization is not expected to be a significant influence on the fate of this compound in soil. Other COPCs at the site are characterized by low Henry's constants (i.e., < 0.01) and are not considered highly volatile, and therefore, volatilization is not expected to be a significant influence on the fate of these compounds at the site.

5.1.2 Erosion Processes in Soil

Erosion processes can substantially affect the distribution of soil-bound particulates in the environment and thus influence the distribution of constituents in soil. High winds can scour fine particles from the soil surface and redistribute these particles downwind. Mass transport from surface water runoff during heavy precipitation events can also scour fine soil particles from surface soil, eventually depositing the particles during sedimentation downstream. As presented in Section 4.4, this potential migration pathway is impeded by the presence of significant vegetation in the RFI study area. Section 4.4 presents a quantitative evaluation of soil erosion in the RFI study area with respect to potential lead transport to the adjacent New River by erosion processes. The results of this evaluation indicated that minimal mass of lead would be potentially transported to the river by erosion processes and the potential soil loss is not considered a significant future risk to the New River.

5.1.3 Degradation of Chemicals in Soil

Many organic chemicals that are found in the environment are subject to naturally occurring biotic (biologically based) and abiotic (non-biologically based) transformation reactions. These reactions result in degradation of the chemical. Biodegradation reactions can occur under aerobic (in the presence of oxygen) and anaerobic (in the absence of oxygen) conditions. During biodegradation, naturally occurring microorganisms in the subsurface transform a chemical to another state as a direct or indirect consequence of their metabolic processes. In many cases, biodegradation reactions break down organic chemicals to less toxic forms.

Several naturally occurring abiotic reactions can significantly affect the fate of chemicals in the environment. Common abiotic reactions include photodegradation and hydrolysis. Photodegradation is the process of decomposition of a chemical upon exposure to radiant energy such as the action of light, and is most significant to chemicals in surface soil that are in direct contact with sunlight. Hydrolysis is the degradation reaction of the chemical with components of water (e.g., hydroxyl and hydronium ions) and is therefore most important in saturated environments.

5.1.3.1 Metals

Metal COPCs, such as antimony, iron, lead, and thallium will not be significantly influenced by degradation processes in soil.

5.1.3.2 VOCs

VOCs were detected low concentrations in soil at the site. The VOC COPC identified for the soil-to-groundwater migration pathway was TCE.

TCE: TCE was detected in 3 of 14 samples at low level concentrations. TCE is resistant to aerobic degradation in soil although biodegradation may proceed co-metabolically. Under anaerobic conditions, TCE is slowly biodegraded through reductive dechlorination, with the

rapid rate of photolysis observed in water. DNT is not expected to undergo hydrolysis in soil due to a lack of functional hydrolyzable functional groups (HSDB 2009).

Nitroglycerin undergoes rapid biodegradation using batch reactors and digestors but its rate of biodegradation in soil is unknown. Hydrolysis of nitroglycerin in soil may be important under alkaline conditions but is not expected to be an operable degradation process at the site due to the neutral pH of the soil (HSDB 2009).

5.1.4 Leaching of Chemicals from Soil to Groundwater

Chemicals in soil have the potential to migrate to greater depths with infiltrating water. As precipitation infiltrates, chemicals may be leached from the soil and carried to greater depths and potentially to groundwater. Table 5-3 summarizes the screening results for soil data including: constituents detected, minimum and maximum concentrations detected, number of detections, number of samples, and number of samples above risk-based soil to groundwater screening levels (SLs) and background (inorganics only) to evaluate the potential migration of chemicals in soil to groundwater. Risk-based SLs were obtained from the April 2009 Regional Screening table (USEPA 2009) and utilize a dilution attenuation factor (DAF) 10. A DAF 10 was used for the site due to the lack of an infinite source, the depth to groundwater, and the attenuation of chemicals due to soil types. The screening identified the following chemicals with detected concentrations above their generic DAF 10 SLs and background point estimates (inorganics only):

Chemical	# Detects/ # Samples	# Detects Above SL
Iron	32/32	2
Thallium	32/32	1
Trichloroethene	3/14	3
Benzo(a)anthracene	25/32	2
Benzo(a)pyrene	29/32	12
Benzo(b)fluoranthene	29/32	1
Naphthalene	10/32	4
2,4,6-Trinitrotoluene	5/32	5
2.6-Dinitrotoluene	1/32	1
Nitroglycerin	6/32	6

Factors affecting leaching are discussed below followed by assessments for soil to groundwater COPCs identified summarized above with concentrations above SLs. The degree to which a chemical is leached is strongly influenced by the chemical's tendency to partition to the solid or aqueous phases, which is largely a function of the chemical's solubility and particle affinity.

Water Solubility

Water solubility of a chemical is the mass of chemical that will dissolve in a unit volume of water at a specific temperature. Chemicals with a high solubility can often be readily dissolved in water and therefore are susceptible to being mobilized from the soil matrix with infiltrating water and migrating downward to groundwater. Chemicals with a low solubility tend to partition to soil.

The solubility of organic chemicals is typically a function of the hydrophobic nature of the chemical. Many organic chemicals are non-polar and therefore do not dissolve readily into water, which is a polar solution. The organic COPCs identified in soil at the site (PAHs and nitroglycerin) have low to moderate water solubility. Water solubility data for COPCs are summarized in Table 5-2.

Parameter	Definition (Units)	Value	Source
θ_w	Water-filled soil porosity, (L_{water}/L_{soil})	0.3	Default (USEPA 2002)
θ_a	Air-filled soil porosity, (L_{air}/L_{soil}), ($\eta - \theta_w$)	0.09	Calculated based on Average of RFI Physical Soil Results
ρ_b	Dry soil bulk density	1.61 kg/L	Average of RFI Physical Soil Test Results (Table 2-1)
H'	Henry's law constant	Chemical-specific	RAIS (2007)

Notes: RAIS = Risk Assessment Information System – Chemical Specific Factors at http://rais.ornl.gov/

Detailed SL calculations are presented in Appendix C.7. The leaching potential of COPCs is evaluated in the following based on the chemical properties of the COPCs, comparisons of the site data to SLs, and an evaluation of groundwater data from the OBG (source of chemicals in the RFI Study Area).

5.1.4.2 Iron

Iron naturally occurs at appreciable levels in soil at RFAAP with a background point estimate of 50,962 mg/kg. Adsorption of iron to soil is dependent on pH and organic matter, with an increase in either of these parameters resulting in increased adsorption. Mobility is also influenced by oxidation reduction potential, with iron becoming more mobile under reducing conditions than oxidizing conditions (HSDB 2009). Soil pH values are in the range of 5 to 7 and will likely reduce the mobility of iron along with the presence of appreciable organic matter in surface and near surface soil (3.5%). Site data indicate that iron concentrations detected above the SL and background point estimate are limited to surface or near surface intervals in 2 of 32 samples collected from the RFI study area. In addition as presented in Section 6.4.2, background statistical evaluations identified iron as consistently below background. Based on the background evaluation, near neutral pH of site soil, and appreciable organic matter in surface and near surface soil, iron is not considered a potential concern for the soil-to-groundwater pathway in the RFI study area.

5.1.4.3 Lead

Although lead does not have a risk-based soil to groundwater SL (USEPA 2009), due to the nature of the RFI study area the migration of lead from soil to groundwater was assessed utilizing the SESOIL model. The SESOIL unsaturated zone fate-and-transport model was used to evaluate the mobility of lead in soil within the RFI study area (Environmental Software Consultants, Inc., 2008). SESOIL is a one-dimensional vertical fate-and-transport screening level model for the unsaturated zone. It simulates chemical fate-and-transport based on diffusion, adsorption, volatilization, biodegradation, and hydrolysis. The model is designed to simultaneously model both chemical and soil water transport in the soil column under natural seasonal climatic variations.

Lead mass loading parameters for this assessment assumed a lead concentration equal to the mean concentration detected in site soil (414 milligram per kilogram) across the entire 1.6 study area for a depth interval of 0 to 5.5 ft. Local climate data for Radford, Virginia and site-specific physical soil data were also incorporated into the assessment.

The results of the SESOIL assessment indicated that over the 30-year period modeled, lead is immobile in site soil, with 99.87 percent of the lead mass remaining adsorbed to soil, with the remaining mass present in the soil air phase. Over the 30-year modeled period, the net change in

COPC	Detected Concentrations (mg/kg)			MDC Above SL	Mean Above SL
	MDC	Mean	Site-Specific SL		
Benzo(a)anthracene	0.480	0.056	0.67	No	No
Benzo(a)pyrene	0.290	0.047	0.23	Yes (1)	No
Benzo(b)fluoranthene	0.630	0.086	2.3	No	No
Naphthalene	0.022	0.0032	0.026	No	No

High molecular weight PAHs identified as COPCs tend to be immobile in soil due to negligible solubility and high K_{oc} values. High molecular weight PAHs have not been identified as COPCs for the soil-to-groundwater migration pathway at the OBG adjacent to the RFI study area and these PAHs have not been detected in groundwater samples collected from the OBG in 2008 (Draper Aden 2009a in Appendix G). Based on the limited detection above site-specific SLs, the immobile nature of the high molecular weight PAHs in soil, and lack of groundwater detections at the OBG, PAHs are not considered a potential concern for the soil-to-groundwater pathway in the RFI study area.

5.1.4.7 Explosives - 2,4,6-TNT, 2,6-DNT, and Nitroglycerin

Explosives detected as COPCs in soil have moderate solubility in water. The K_{oc} values for the explosives range from medium low for nitroglycerin, to moderate for 2,6-DNT, and to moderately high for 2,4,6-TNT. Based on their solubility and K_{oc} values, explosives are expected to have some mobility in soil and potential to leach to groundwater if present at sufficiently high concentrations. As presented in the table below, 2,4,6-TNT and nitroglycerin had detected concentrations in one or more samples above their site-specific SLs (Appendix C.7) and the mean soil concentration of 2,3,6-TNT was below its site-specific SL.

COPC	Detected Concentrations (mg/kg)			MDC Above SL	Mean Above SL
	MDC	Mean	Site-Specific SL		
2,4,6-Trinitrotoluene	3	0.23	0.408	Yes (3)	No
2.6-Dinitrotoluene	0.39	N/A	1.5	No	No
Nitroglycerin	21	1.06	0.056	Yes (6)	Yes

Although low levels of explosives have been detected at concentrations above site-specific SLs, based on the limited number of samples above SLs, the mean concentrations being below the site-specific SL with the exception of nitroglycerin, and the lack of explosives detections in groundwater at the OBG (the source area for chemicals in the RFI study area), explosives are not considered a potential concern for the soil-to-groundwater pathway in the RFI study area.

5.2 FATE AND TRANSPORT SUMMARY

Volatilization was not identified as an important fate and transport process in the RFI study area given the identification of one volatile COPC (TCE) in soil for the soil to groundwater migration pathway only. Degradation processes are not expected to be a significant fate and transport process in soil given that lead is the primary COPC. Erosion processes and mass transport of surface soil are expected to be impeded by the presence of thick vegetative cover across the RFI study area. A quantitative evaluation of soil erosion in the RFI study area indicated that minimal

Table 5-1a
Chemical Properties Affecting Fate and Transport
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Property	Description
Specific Gravity	Specific gravity is the ratio of the density of a chemical to the density of water and its tendency to float (specific gravity <1) or sink (specific gravity >1) in water. Chemicals that are immiscible in water can exist as non-aqueous phase liquids and are referred to as light non-aqueous phase liquid if their specific gravity is less than one, or dense non-aqueous phase liquid if their specific gravity is greater than one.
Water Solubility	Water solubility of a chemical is the mass of chemical that will dissolve in a unit volume of water at a specific temperature. Chemicals with a high solubility tend to remain dissolved in water rather than partition to soil or sediment are less likely to volatilize, and more likely to biodegrade. Chemicals with a low solubility tend to partition to soil or sediment, are more likely to volatilize and less likely to biodegrade.
Vapor Pressure	Vapor pressure of a chemical is how readily it will volatilize to the atmosphere. Volatilization from water is dependent upon vapor pressure and Henry's law constant. Vapor pressures in their pure state range from 0.001 to 760 millimeters mercury (mm Hg) for liquids to less than 1E-10 mm Hg for solids.
Henry's Law Constant	Henry's law constant of a chemical is a measure of how a chemical will partition between air and water at equilibrium. It is the ratio of the vapor pressure to the water solubility (atm-m^3/mole) and can be used to calculate the rate of volatilization of a chemical from water. Chemicals with a high Henry's law constant more readily volatilize from water.
Organic Carbon Partition Coefficient (K_{oc})	K_{oc} is a measure of the tendency for a chemical to be sorbed to the organic fraction of soil and sediment. The lower the K_{oc} values the more leaching potential from soil or sediment to water. Chemicals with a K_{oc} less than 100 milliliters per gram (mL/g) have a high potential to leach from soil or sediment to water, while K_{oc} values in the range of 100 to 500 mL/g indicate a moderate leaching potential.
Octanol-Water Partition Coefficient (Ko_w)	K_{ow} describes the partitioning of an organic chemical between a polar phase (water) and a relatively nonpolar phase (1-octanol). It is equated to the partitioning (sorption) in an aquifer of a chemical between the water and the porous media organic content. A chemical with a high K_{ow} is hydrophobic and may be relatively immobile in an aqueous system but may be mobilized in the presence of an organic solvent.

Table 5-1c
Fate Processes Affecting Organics
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Process	Description
Sorption	Sorption includes the processes of adsorption and absorption. Adsorption is a mass transfer process where a substance is transferred from a phase to the surface of a medium (e.g. soil or sediment) where it is bounded by chemical or physical forces. Absorption is the partitioning between two phases (Knox et al. 1993). Sorption reactions are either sorbent or solvent-motivated. Sorbent-motived reactions occur when there is an attraction between the sorbent and the solute and the chemical accumulates at the surface due to the affinity of the surface for the chemical. Solvent-motivated reactions occur when the chemical is hydrophobic, such as nonionic organics, where the chemical will accumulate at an interface or partition into a nonionic phase (associate with the organic content of the medium). For nonionic organics, the fraction of organic content (foc) of the subsurface material is the dominant soil characteristic affecting sorption (Knox et al. 1993). Primary indicators of the partitioning of a chemical are the organic carbon water partition coefficient (Koc), soil/water distribution coefficient (Kd), the octanol water partitioning coeffient (Kow), and the calculated retardation factor.
Hydrolosis	Hydrolysis is the degradation process via chemical reactions (oxidation, reduction, hydrolysis) without the participation of organisms. Hydrolysis is a chemical decomposition process that uses water to split chemical bonds of substances. There are two types of hydrolysis, acid and enzymatic. Hydrolysis is limited to chemical that contain hydrolyzable groups and is effected by the contaminants hydrolysis half life.
Volatilization	Volatilization is the process by which a contaminant changes from a liquid phase to a gas phase. This process applies to organic comtaminants migrating from the soil or surface water. Volatile organic chemicals are a class of chemicals that easily evaporate or mix with the atmosphere. The potential volatilization of a chemical is affected by the compounds vapor pressure, solubility, organic carbon partitioning coefficient, and the temperature.
Abiotic Degradation	Abiotic degradation includes degradation processes in which organisms do not participate. Photolysis describes the abiotic degradation process via photochemical reactions such as photooxidation, photomineralisation without the participation of organisms. As described above, hydrolysis is an additional process of abiotic degradation.
Biotic Degradation	Biotic degradations the process in which chemical degradation of a contaminant is aided by soil organisms. Biotic degradation can be either aerobic or anaerobic. The rate of metabolism/cometabolism is affected by the contaminant's biochemical oxygen demand, chemical oxygen demand, degree of halogenation, etc. Reactions include but are not limited to oxidation/reduction and hydrolysis, as described above.

Table 5-3
Summary of Soil to Groundwater Risk Screening Results for Total Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

	CAS #	Facility Background [A]	Soil to GW SL DAF 10	Minimum Detected Concentration	Maximum Detected Concentration	# of Samples Above Soil to GW SL [A]	# of Detections	# of Samples
TAL Metals (mg/kg)								
Aluminum	7429-90-5	40,041	550,000	4,250	35,000	0	32	32
Antimony	7440-36-0	--	7	0.089	4.7	0	27	32
Arsenic	7440-38-2	15.8	0.013	0.12	5.6	0	32	32
Barium	7440-39-3	209	3,000	29	290	0	32	32
Beryllium	7440-41-7	1.02	580	0.65	1.3	0	11	32
Cadmium	7440-43-9	0.69	--	0.51	2.8	--	30	32
Calcium	7440-70-2	--	--	1,100	110,000	--	32	32
Chromium	7440-47-3	65.3	--	10	39	--	32	32
Cobalt	7440-48-4	72.3	4.9	3.9	24	0	32	32
Copper	7440-50-8	53.5	510	2.5	260	0	32	32
Iron	7439-89-6	50,962	6,400	5,330	87,000	2	32	32
Lead	7439-92-1	26.8	--	12	26,500	--	183	183
Magnesium	7439-95-4	--	--	1,210	25,000	--	32	32
Manganese	7439-96-5	2,543	570	59	2,200	0	32	32
Mercury	7439-97-6	0.13	0.33	0.0087	0.27	0	30	32
Nickel	7440-02-0	62.8	480	3.8	22	0	32	32
Potassium	7440-09-7	--	--	548	2,900	--	32	32
Selenium	7782-49-2	--	9.5	0.043	1.5	0	32	32
Silver	7440-22-4	--	16	0.023	0.45	0	32	32
Sodium	7440-23-5	--	--	27	100	--	32	32
Thallium	7440-28-0	2.11	1.7	0.047	3.5	1	32	32
Vanadium	7440-62-2	108	2,600	11	59	0	32	32
Zinc	7440-66-6	202	6,800	46	1,600	0	32	32
TCL VOCs (ug/kg)								
1,2,4-Trichlorobenzene	120-82-1	--	130	0.96	0.96	0	1	14
2-Butanone	78-93-3	--	15,000	24	400	0	14	14
Acetone	67-64-1	--	44,000	31	320	0	14	14
Benzene	71-43-2	--	2.3	0.91	1.5	0	3	14
cis-1,2-Dichloroethene	156-59-2	--	1,100	1.9	4.2	0	2	14
Methylene chloride	75-09-2	--	12	4.1	11	0	14	14
Toluene	108-88-3	--	17,000	0.66	3.5	0	7	14
Trichloroethene	79-01-6	--	6.1	9.6	57	3	3	14
TCL SVOCs (ug/kg)								
1,1'-Biphenyl	92-52-4	--	230,000	1.6	8.8	0	5	32
2,4-Dichlorophenol	120-83-2	--	1,800	6.8	6.8	0	1	32
2-Methylnaphthalene	91-57-6	--	9,000	1.1	22	0	16	32
4-Chloro-3-Methylphenol [1]	59-50-7	--	19,000	8	24	0	8	32
Acenaphthene	83-32-9	--	270,000	2.5	19	0	12	32
Acenaphthylene [2]	208-96-8	--	1,500,000	1.5	21	0	19	32
Acetophenone	98-86-2	--	11,000	3.5	4.5	0	8	32
Anthracene	120-12-7	--	4,500,000	6.5	180	0	15	32
Benzo(a)anthracene	56-55-3	--	140	1.8	480	2	25	32
Benzo(a)pyrene	50-32-8	--	46	2.5	290	12	29	32
Benzo(b)fluoranthene	205-99-2	--	470	3.5	630	1	29	32
Benzo(g,h,i)perylene [2]	191-24-2	--	1,500,000	2.5	170	0	27	32
Benzo(k)fluoranthene	207-08-9	--	4,600	2.1	160	0	22	32
Bis(2-ethylhexyl)phthalate	117-81-7	--	16,000	15	540	0	32	32
Butylbenzylphthalate	85-68-7	--	6,700	3.3	40	0	25	32
Carbazole	86-74-8	--	--	2.7375	20.4825	--	15	32
Chrysene	218-01-9	--	14,000	1.3	570	0	29	32
Di-n-butylphthalate	84-74-2	--	110,000	32	6205	0	32	32
Dibenz(a,h)anthracene	53-70-3	--	150	7.1	41	0	14	32
Dibenzofuran	132-64-9	--	--	2	24	--	9	32
Diethylphthalate	84-66-2	--	130,000	1.2	1675	0	32	32
Dimethylphthalate	131-11-3	--	--	1.2	550	--	7	32
Fluoranthene	206-44-0	--	2,100,000	3.9	370	0	28	32
Fluorene	86-73-7	--	330,000	2.5	33	0	13	32
Indeno(1,2,3-cd)pyrene	193-39-5	--	1,600	2.95	130	0	27	32

Attachment 3

SESOIL Output

SESOIL Profile and Load Report

Layer No.	Number of Sub-Layers	Thickness		Intrinsic Permeability	Organic Carbon Content	Adsorption Coefficient	Cation Exchange Capacity	Freundlich Exponent	Solid Phase Degradation Rate	Liquid Phase Degradation Rate	Soil pH
		cm	feet	cm^2	percent	µg/g / µg/mL	mEq / 100 g soil	unitless	1/day	1/day	pH
1	10	168.0	5.51	2.00E-09	1.00	900.00	5.80	1.00	0.00E+00	0.00E+00	6.90
2	1	30.0	0.98	2.00E-09	1.00	900.00	5.80	1.00	0.00E+00	0.00E+00	6.90
3		0.0	0.00	.0	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00
4		0.0	0.00	.0	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00

Soil Parameters

Bulk Density (g/cm^3)	1.86
Effective Porosity (fraction)	0.25
Soil Pore Disconnectedness	8.00

Application Parameters

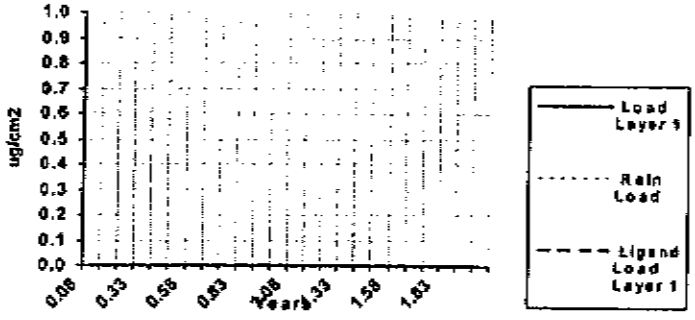
Area	cm^2	6.47E+7
	ft^2	6.96E+4
Latitude	degrees	43.0
Spill Index		1

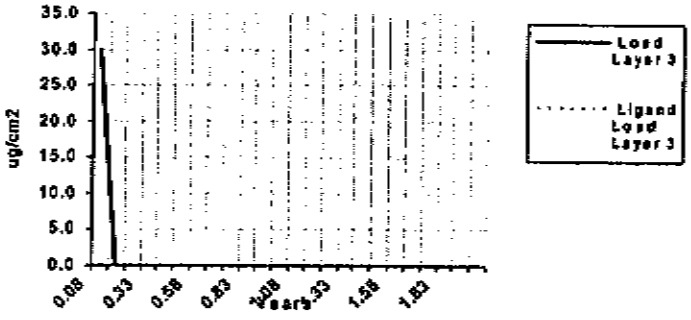
Chemical Parameters

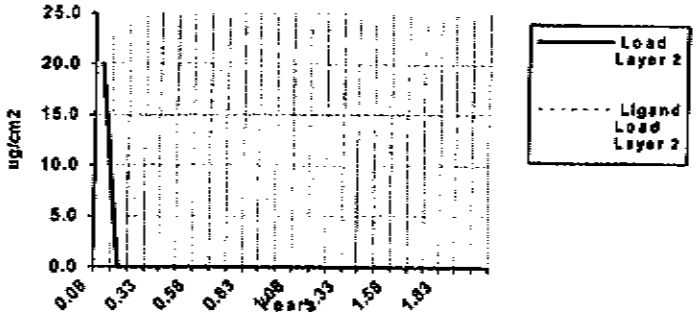
Water Solubility	(µg/mL)	9.58E+3	Moles Ligand / Moles Chemical	0.00
Henry's Law	(M^3atm/mol)	2.44E-2	Ligand Molecular Weight	(g/mol) 0.00
K_{oc}	(µg/g)/(µg/mL)	0.00	Base Hydrolysis Rate	(L/mol/day) 0.00
Valance	(g/mole)	0.00	Ligand Dissociation Constant	0.00
Air Diffusion Coefficient	(cm^2/sec)	.000	Neutral Hydrolysis Rate	(L/mol/day) 0.00
Water Diffusion Coefficient	(cm^2/sec)	.000	Acid Hydrolysis Rate	(L/mol/day) 0.00
Molecular Weight	(g/mol)	207.00		

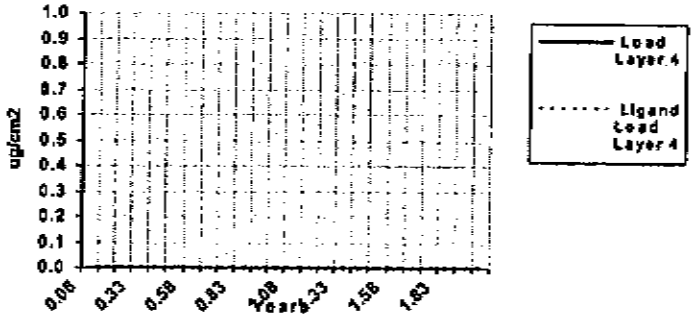
Output File:
C:\SEVIEW63\13PBRN23.OUT
Chemical File: Lead And Compounds (Kd)
C:\SEVIEW63\LEADANDC.CHM
Soil File: Silty Sand, Perm = 1.3-5 cm/sec
C:\SEVIEW63\RAAP13\RAPSM13.SOI
Application File: SEVIEW Default Application Parameters
C:\SEVIEW63\RAAP13\SWMU13V3.APL

Sublayer Loads	1	2	3	4	5	6	7	8	9	10
Layer 1 (ug/g)	4.14E+02	4.14E+02	4.14E+02	4.14E+02	4.14E+02	4.14E+02	4.14E+02	4.14E+02	4.14E+02	4.14E+02
Layer 2 (ug/g)										
Layer 3 (ug/g)										
Layer 4 (ug/g)										









SESOIL Pollutant Cycle Report

Scenario Description:

SESOIL Output File: C:\SEVIEW63\13PBRN23.OUT

SESOIL Process	Pollutant Mass (µg)	Percent of Total
Volatilized	0.000E+00	0.00
In Soil Air	5.967E+08	0.01
Sur. Runoff	0.000E+00	0.00
In Washld	0.000E+00	0.00
Ads On Soil	8.359E+12	99.87
Hydrol Soil	0.000E+00	0.00
Degrad Soil	0.000E+00	0.00
Pure Phase	0.000E+00	0.00
Complexed	0.000E+00	0.00
Immobile CEC	0.000E+00	0.00
Hydrol CEC	0.000E+00	0.00
In Soil Mol	6.536E+08	0.01
Hydrol Mols	0.000E+00	0.00
Degrad Mols	0.000E+00	0.00
Other Trans	0.000E+00	0.00
Other Sinks	0.000E+00	0.00
Gwr. Runoff	0.000E+00	0.00
Total Output	8.360E+12	99.89
Total Input	8.370E+12	
Input - Output	9.349E+09	

Maximum leachate concentration: 0.000E+00 mg/l

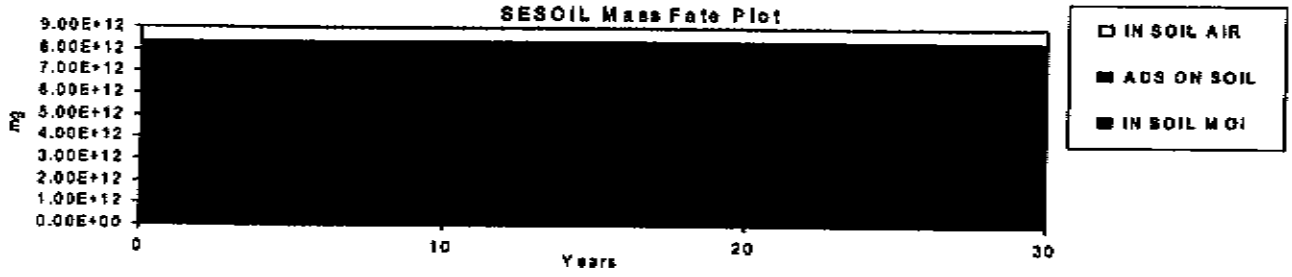
Climate File: RADFORD
C:\SEVIEW63\RADFORD.CLM

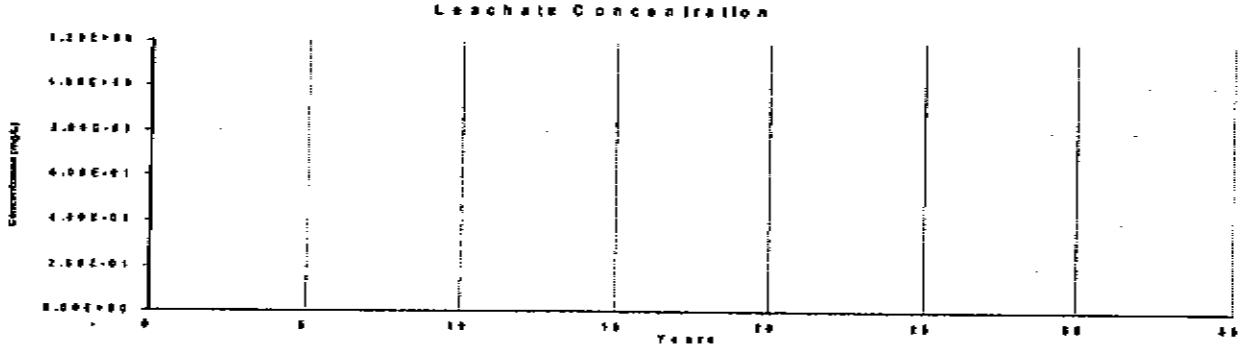
Chemical File: Lead And Compounds (Kd)
C:\SEVIEW63\LEADANDC.CHM

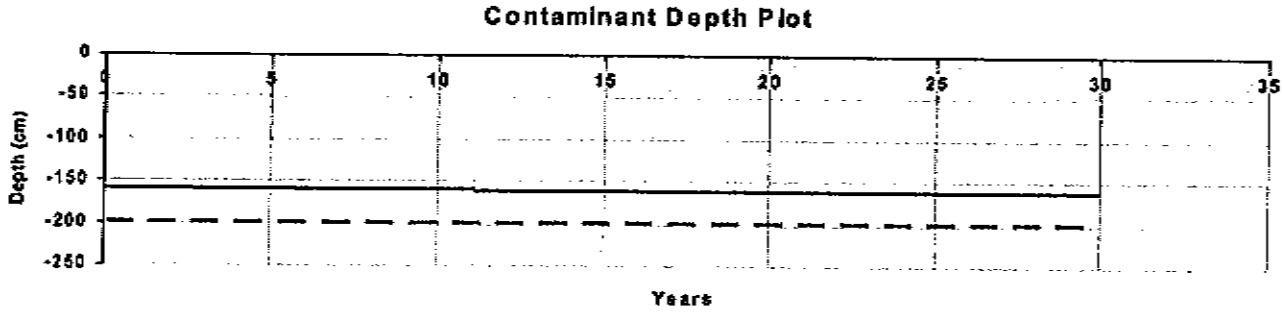
Soil File: Silty Sand, Perm = 1.3-5 cm/sec
C:\SEVIEW63\RAAP13\RAPSM13.SOI

Application File: SEVIEW Default Application Parameters
C:\SEVIEW63\RAAP13\SWMU13V3.APL

Starting Depth: 159.60 cm
Ending Depth: 160.80 cm
Total Depth: 198.00 cm







Site-Specific SL for Benzo(a)anthracene (using C_w = T-RBC)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	2.9E-05	mg/L
C_w =	Target Leachate Conc =	2.9E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.09	--
H' =	Henry's Law Constant =	4.91E-04	--
P_b =	Dry Soil Bulk Density =	1.61	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	2.31E+05	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	2,310	L/kg
	Site-specific SSL =	**6.7E-01**	**mg/kg**

Site-Specific SL for Benzo(b)fluoranthene (using C_w = T-RBC)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	2.9E-05	mg/L
C_w =	Target Leachate Conc =	2.9E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.09	--
H' =	Henry's Law Constant =	2.70E-05	--
P_b =	Dry Soil Bulk Density =	1.61	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	8.03E+05	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	8,030	L/kg
	Site-specific SSL =	**2.3E+00**	**mg/kg**

Site-Specific SL for Trichloroethene (using C_w = T-RBC)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	0.0017	mg/L
C_w =	Target Leachate Conc =	0.017	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.09	--
H' =	Henry's Law Constant =	4E-01	--
P_b =	Dry Soil Bulk Density =	1.61	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	67.7	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	0.677	L/kg
	Site-specific SSL =	**0.015**	**mg/kg**

Site-Specific SL for 2,6-DNT (using C_w = T-RBC)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	0.037	mg/L
C_w =	Target Leachate Conc =	0.37	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.09	--
H' =	Henry's Law Constant =	3.1E-05	--
P_b =	Dry Soil Bulk Density =	1.61	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	371	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	3.714	L/kg
	Site-specific SSL =	**1.5**	**mg/kg**

Response to Comments (February 9, 2010)
Comments on the *Draft Study Area at Solid Waste Management Unit 13 RCRA Facility Investigation Report,* Radford Army Ammunition Plant (RFAAP), Virginia, dated July 2009 (RFI Report). Received November 3, 2009.

GENERAL COMMENTS

1. The RFI Report does not present a "hot spot" evaluation to determine whether there are localized areas of contamination that may require further evaluation or possible remediation. Section 1.5.1.1 of the *Final Work Plan Addendum 023 for RCRA Facility Investigation at Solid Waste Management Unit 13 (Work Plan Addendum 023),* dated July 2008, states that additional soil sampling was required to further assess the nature and extent of lead in soil and to "identify any 'hot spot' areas with concentrations above the industrial [Action Level] AL." Section 4.2.3, Lead, of the RFI Report notes that lead was detected above its industrial Regional Screening Level (RSL) (800 milligrams per kilogram [mg/kg]) in six samples at the site, and above the residential RSL (400 mg/kg) in 21 samples at the site. The maximum concentration of lead in surface soil was reported as 8,620 mg/kg in sample 13SB8A and the maximum concentration of lead in subsurface soil was 26,500 mg/kg in sample 13SB11B, 4.5-5 feet. The RFI Report notes that "the majority of the 17 sample locations with lead concentrations above RSLs occur at discrete locations that are along or proximate to the perimeter berm of the [Open Burn Ground] OBG," however, it is unclear whether this area along the berm could be considered a "hot spot." Additionally, since limited soil data from the OBG were considered in this RFI (i.e., results of soil sampling required by the Subpart X Permit); it is unclear whether the lead contamination identified along the perimeter berm extends into the OBG. Revise the RFI Report to present a "hot spot" evaluation to determine any localized areas of contamination that may require further evaluation or remediation.

   Response: The study area itself is a strip of land approximately 40 feet wide located between the New River and an RCRA permitted unit (OBG). The study area cannot be developed since it is located in the 100-year flood plain and the slope of the terrain.

   The study area is not a typical disposal area. The study area itself was not an active area, but rather adjacent to an active area (OBG) and was potentially impacted by activities at the OBG. The original sampling plan was developed for the 1.6 acre area to provide sufficient data to identify any potential widespread elevated lead levels or "hot spots." The results of the investigation did not indicate widespread elevated lead levels or "hot spots." Since the study area was not an active site, "hot spot" areas would not occur within the study area from previous site activities. The maximum concentrations of lead detected in Samples 13SB8A and 13SB11B were collected during the SSP investigation and these concentrations were not replicated in any of the other SSP or RFI samples (181 samples) collected. These would be isolated elevated levels of lead within maximum approximate areas of 2,000 sq ft based on the grid sampling conducted.

   The lead concentrations detected along the berm were at discrete locations (Figures 4-1a and 4-1b) and do not indicate a "hot spot" due to no pattern or discernable distribution, but rather isolated elevated lead levels primarily above the residential screening level. Although these limited elevated lead levels were located proximate to the berm between

samples were proposed, describe implications of this deviation on achieving the investigation objectives. In particular, sample locations where RSL exceedances were reported in surface soil but deeper samples were not collected (e.g., 13SB63A) should be addressed.

Response: The RFI Report will be revised to provide information on actions taken when refusal was encountered at boring locations at depths substantially shallower than anticipated or planned. In general, a soil-digging bar was used to deepen the boring if possible or the boring was offset slightly in attempt to verify conditions or achieve a greater depth, if possible.

Shallow termination depths resulted in approximately 10 percent of the sample locations not having a subsurface sample where originally planned. The slight bias in the number of surface samples relative to subsurface samples is not considered to represent a significant constraint in achieving investigation objectives, given the likely historical release mechanisms from the adjacent OBG (surface release mechanisms rather than subsurface disposal) and low mobility of lead in soil that would tend to bias higher concentrations in surface soil.

4. According to the conceptual site model (CSM) (Figure 6-2), exposure routes associated with sediment and surface water were evaluated qualitatively. However, the qualitative assessment concerning these exposure media was not included in the HHRA. Revise the HHRA to include a detailed qualitative assessment concerning these exposure media as required by the MWP.

   Response: The following text will be added to Section 6.2.1: "Lead concentrations in New River sediment are below the human health residential SL of 400 mg/kg, with the exception of station NR-SED-16 (500 mg/kg) located downstream of the OBG, SWMU 54, and the RFAAP MMA. The mean concentration of lead for each sub-segment sampled and the entire reach sampled was below 400 mg/kg.

   The SWMU 54 RFI/CMS Report (URS 2008b) concluded that attributing lead and other metals detected in sediment samples to a specific source or sources is not possible for the RFI given the complex transient flow and depositional patterns in the river, and therefore, it is recommended that these data be used holistically as part of any overall evaluations of the facility and potential receptors conducted for the RCRA Corrective Action Permit.

   During the SWMU 54 RFI/CMS investigation, it was established that lead tends to partition to sediment rather than remain in surface water: therefore, the risk to human health receptors is considered minimal with regard to exposure to lead in surface water."

5. Section 6.4, Risk Characterization: This section refers to the default age-dependant adjustment factors that appear in USEPA 2005; however, a specific description of how risks were calculated for carcinogens that act via a mutagenic mode of action (MOA) should be included in the RFI (either in Section 6 or in Appendix E) to ensure that the RFI contains sufficient information to remain a stand-alone document. For the SWMU 13 Study Area, these compounds include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene. It is noted that Appendix E.3 contains

this contamination. Figures 4-2a and 4-2b, Extent of Organic COPCs in Soil, appear to show that the western and southern extents of this contamination have not been defined. No samples west or south of sample 13SB7A, which reported a benzo(a)pyrene exceedance, were analyzed for SVOCs. Please revise Section 4.2.8 to describe the extent of SVOC contamination at the site, and indicate whether the extent of SVOC contamination has been evaluated sufficiently in consideration of the data gap mentioned above.

Response: As stated in the response to comments (dated 6/20/2008) for the work plan (Comment #5), the selected locations reflect the objectives of verifying previous results, providing additional spatial data across the site to characterize site conditions, and providing sufficient data to characterize mean concentrations for risk assessment, while recognizing that lead will be used as the primary indicator to evaluate impacts from historical open burning ground activities and delineate the nature and extent of contamination." The calculated risk associated with the site did not indicate the need for further assessment on the basis of human health. In addition, lead was used as the primary indicator to evaluate impacts from the open burning ground and was sufficiently characterized for the site.

9. **Figure 4-2b, Extent of Organic COPCs in Soil** It does not appear that the extent of nitroglycerin in soil has been evaluated sufficiently. Sample 13SB13C detected nitroglycerin above the industrial RSL, but no samples were analyzed for this constituent east of this location, or at a depth greater than 6 feet below grade. Please revise the RFI Report to address this data gap.

   Response: As stated in the response to comments (dated 6/20/2008) for the work plan (Comment #5), the selected locations reflect the objectives of verifying previous results, providing additional spatial data across the site to characterize site conditions, and providing sufficient data to characterize mean concentrations for risk assessment, while recognizing that lead will be used as the primary indicator to evaluate impacts from historical open burning ground activities and delineate the nature and extent of contamination." The calculated risk associated with the site did not indicate the need for further assessment on the basis of human health. In addition, lead was used as the primary indicator to evaluate impacts from the open burning ground and was sufficiently characterized for the site.

10. **Section 5.1.4, Leaching of Chemicals From Soil to Groundwater, Page 5-3 and Page 5-4:** The individual evaluations for several of the contaminants of potential concern state that many of the contaminants (antimony, lead, thallium, polynuclear aromatic hydrocarbons, nitroglycerin) have not been identified as COPCs for the soil-to-groundwater migration pathway at the OBG adjacent to the RFI study area. However, it does not appear that site-specific data from the current RFI for the study area adjacent to the OBG were evaluated with respect to soil-to-groundwater migration screening levels (SSLs). EPA's Regional Screening Level Table includes Protection of Groundwater SSLs that can be used to evaluate the potential for leaching of chemicals to groundwater. Please revise the RFI Report to screen detected concentrations in soil against the Protection of Groundwater Soil Screening Levels. If exceedances are identified, evaluation of groundwater within the RFI study area may be warranted.

evaluate all metals in surface soil except for manganese. Further, based on the nature of activities conducted at SWMU 13 it is entirely possible that manganese found within the study area is site-related as the study area lies between the perimeter berm of the OBG and the north bank of the New River. While a berm is present to prevent runoff from the OBG into New River, combustion products could have migrated via air over the berm, deposited onto the soil, and subsequently entered New River via runoff; note these transport mechanisms were highlighted in Section 6.2.1 Conceptual Site Model/Receptor Characterization, page 6-4. Manganese is released into the environment from various sources including open burning (e.g.., fossil fuel combustion) (Agency for Toxic Substances & Disease Registry [ATSDR] 2009: http://www.atsdr.cdc.gov/toxprofiles/tp151.html, Toxicological Profile for Manganese). Please revise the HHRA to explain why the background data from SWMU 54 is more relevant to use when assessing manganese in total soil rather than basing conclusions on the facility-wide background data, which was applied to the rest of the metals in surface and total soil. Further, include a qualitative evaluation of manganese in Section 6.6 (Uncertainty Analysis) to explain the impacts of using SWMU 54 data over the facility-wide data for manganese in total soil.

Response: As presented in previous reports (SWMU 54, SWMU 45, SWMU 38, etc.), total manganese concentration in the alluvium tend to be higher than other soil on the plant. The manganese concentrations from SWMU 54 in the area located outside the fence, which was not impacted by previous activities at the site, were used in this comparison since this area is similar to the study area and located slightly downstream the study area. The elevated manganese concentrations are considered to be geologic in nature rather than site related.

13. **Section 6.6.4, Toxicological Data, Pages 6-16 and 6-17:** Section 6.6.4 indicates that provisional toxicity values were used for aluminum, antimony, arsenic, carbazole, cobalt, iron, thallium, vanadium and nitroglycerin. This section further states that some detected constituents (carbazole, dibenzofuran, and dimethylphthalate) do not have Regional RSLs and that provisional/surrogate toxicity values were not available for these COPCs with the exception of carbazole. For completeness, please revise the HHRA to discuss the appropriateness of using the provisional toxicity value for carbazole, provide the value and the source of the value (e.g., Human Health Affects Summary Table [HEAST]).

    Response: A discussion of the appropriateness of using a provisional value is discussed in the third to the last paragraph of Section 6.6.4. The second to the last sentence of the second to the last paragraph will be revised as follows: "Provisional/surrogate toxicity values were not available for these COCPs with the exception of carbazole for which a Human Health Affects Summary Table (HEAST) value from the 1997 table was used."

14. **Appendix E, Human Health Risk Assessment, Tables E.1-2.1 through E.1-2.3:** Please ensure these tables are revised to use the April 2009 RSLs or explain the impact of using an older version in the uncertainty analysis. Also, revise the footnotes of Tables E.1-2.1 and E.1-2.2 to clarify that the screening values for dioxins/furans are based on toxicity relative to 2,3,7,8-TCDD. While this process was described in Section 6.1.1, Data Summary, it would be helpful to provide a footnote in the aforementioned tables to clarify the screening process concerning dioxins/furans.

18. **Section 7.6.2, Dose Rate Modeling Approach, Page 7-8:** The table in this section summarizes the chemicals which either had only NOAEL HQs above 1 or NOAEL and LOAEL HQs above 1 per receptor. One error was identified when the table was compared to Tables F.2-14 through F.2-23. The list of chemicals for the American Robin, which had a NOAEL above 1.0 did not include 2, 4, 6-Trinitroluene. Please revise this table accordingly.

    Response: Table will be revised to include 2,4,6-trinitrotoluene for the American Robin for an HQ above 1 for NOAEL only.

19. **Section 7.7, Risk Management – Scientific Management Decision Point (SMDP), Italicized Conclusion, Page 7-9:** The SMDP states that "Although metal concentrations in plants were above the screening levels, indications of chemical vegetative stress were not observed at the site." The lack of observable chemical vegetative stress is insufficient grounds for concluding no risk to the plant community. For example, it is not known if the local plant community shows a response in terms of lower species diversity, reduced growth, or other more subtle responses that might be observable when compared to an unimpacted reference location. Please discuss in the uncertainty section the limitations of the current conclusion on the lack of risk to the plant community. This additional information will help support risk management decision process.

    Response: The following text will be added to Section 7.8.3: "The qualitative nature of the conclusion of lack of risk to the plant community based on the lack of indicator of chemical vegetative stress and lush vegetation present at the site creates uncertainty since it is not known that if the local plant community shows a response in terms of lower species diversity, reduced growth, or other more subtle responses that might be observable when compared to an unimpacted reference location."

20. **Section 7.8, Exposure and risk uncertainty analysis, Page 7-9 and 7-10:** This section should be expanded to address issues associated with (a) the potential for additive toxic effects of exposure by wildlife receptors to site-related chemicals, (b) the qualitative nature of the evaluation of risk to the plant community, and (c) any concerns associated with listed plant species.

    Response: For part (a): The following text will be added to Section 7.8.6: "An HQ of less than one indicates that the contaminant alone is unlikely to cause adverse ecological effects. The potential for risk increases as the HQ increases above one. However, this result should be considered in the context of other characteristic of the exposure area. In addition, it should be noted that the calculation of chemical specific HQs does not account for multiple chemicals acting through the same exposure mechanism."

    For part (b): See Comment #19.

    For part (c): See Comment #16.

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07/12/10 03:45 PM

To "McKenna, Jim J Mr CIV USA AMC" <jim.mckenna@us.army.mil>
cc "jim spencer" <james_o_spencer@urscorp.com>, jeremy.flint@atk.com, jerome.redder@atk.com, jlcutler@deq.virginia.gov, "Mendoza, Richard R Mr CIV USA
bcc
Subject RE: RTCs - SWMU 13 RFI Comments (UNCLASSIFIED)

Jim, EPA/VDEQ have reviewed these response and they are acceptable. Thank You.

William A. Geiger
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05/17/10 12:14 PM

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cc "jim spencer" <james_o_spencer@urscorp.com>, <jerome.redder@atk.com>, <jlcutler@deq.virginia.gov>, "Mendoza, Richard R Mr CIV USA IMCOM"
bcc
Subject RE: RTCs - SWMU 13 RFI Comments (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: FOUO <<Response to EPA responses to RTCs SWMU 13 RFI.PDF>>

Will and all,

Radford AAP responses to comments on the draft SWMU 13 RFI report.
Please pass on to others in your office.

Thanks,
Jim

Classification: UNCLASSIFIED
Caveats: FOUO

Response to EPA responses to RTCs SWMU 13 RFI.PDF

April 29, 2010

Response to EPA/DEQ RTCs (Received via e-mail March 29, 2010) to Responses to Comments (Original Responses dated Feb 10, 2010) for Study Area at SWMU 13 RFI Report (July 2009)

1. EPA and VADEQ disagree that no hot spots for lead are present at SWMU 13. Two sample locations show lead concentrations that are substantially higher than lead levels reported in the remaining SWMU 13 samples. Acute risks associated with hot spot exposure should be evaluated, and to this end, EPA performed a risk analysis of these two areas. The Agency concludes that contact with conservatively drawn exposure areas of SWMU 13 is not expected to pose short term risks. However, in consideration of the substantially elevated lead result of 26,500 mg/kg for sample 13SB11B, institutional controls will be required to prevent future digging at this SWMU.

> **Response:** The last sentences of the Executive Summary and Section 8.0 will be revised as follows: "Based on the results of the RFI, HHRA, and SLERA, no further action beyond the implementation of institutional controls to prevent future digging at the RFI study area is recommended.
>
> The following text will also be added to the Executive Summary and Section 8: "Institutional controls are being implemented at the RFI study area at SWMU 13 within the boundaries depicted on Figure 1-2. The objective of the ICs is to prevent future digging at the site. Specifically this site has been incorporated into plant management manual to ensure long-term protection of human health and the environment. The management manual provides for advance notice, assessment and approval of intrusive work that may occur within the plant with a general digging prohibition at sites such as this. In the event the property is transferred or leased, equivalent ICs will be put into terms and conditions of the deed or lease, which are no less restrictive than the IC objectives described above. Furthermore, the transferee or lessee will be responsible for ensuring IC compliance by any future users. However, the Army acknowledges the responsibility for all original liability under CERCLA and its right and responsibility to enforce ICs."

2. The data identified in this comment (1997 study) should be incorporated in the conceptual/mass balance model discussion of soil concentrations left in place and ramifications to river sediment concentrations, etc. How does this lead concentration compare to analyses from other nearby locations?

> **Response:** Prior to the SSP/RFI, historical soil analytical data (1997 study) were considered screening level data and excluded from the risk assessment given the age of the data, the lack of available data validation reports/information, the lack of coordinates to accurately locate the samples, and the availability of sufficient newer validated sediment data to more appropriately characterize conditions. In addition due to the transient nature of the river, the most recent sediment concentrations (SWMU 54 RFI/CMS Report 2008) would be more appropriate to characterize sediment conditions within the river. Per the EPA partnering meeting (February 2010), a mass balance analysis was conducted for the site utilizing annual runoff estimates and estimates of runoff for a 10-year storm event. See calculations in Attachment 1 (Calculations will be provided in an Appendix within the RFI report). The following summary of the results will be added to Section 4.
>
> "Although previous sediment sampling results (Section 2.2.5) did not indicate the site had historically significantly affected the New River based on the detected lead concentrations at the study area, an assessment of the study area as a potential future source of lead loading in the New River was conducted. The site area assessed is limited to the 1.6 acre study area. The presence of

the OBG berm along the northern edge of the study area prevents runoff from adjacent areas to the north from entering the study area (Section 2.1.3). Soil losses were calculated as described below.

The Revised Universal Soil Loss Equation (RUSLE) is an erosion model predicting longtime average annual soil loss resulting from raindrop splash and runoff. As presented in Calculation #1, the potential average annual soil loss for the site is 0.9 tons containing a total of 0.26 kg of lead per year. Based on the average flow of the river (3,258 ft^3/sec) and the minimal mass of lead potentially transported to the river over the course of a year, the potential soil loss is not considered to present a significant future risk to the New River.

In addition to calculating potential annual soil loss for the site, soil losses were calculated for an individual storm event using a method called the Modified Universal Soil Loss Equation (MUSLE), which allows for the calculation of sediment yields for individual storm events. As presented in Calculation #2, a potential sediment yield for a 10-year storm was calculated for the site assuming all eroded soil from the site was discharged to the river (i.e., no delivery ratio was used). A 10-year storm resulted in a potential soil loss for the site of 0.3 tons containing a total of 0.09 kg of lead per storm event. Considering mixing of the runoff from the storm event (peak flow of 4.35 ft^3/sec) and the average flow of the New River (3,258 ft^3/sec), as well as, the minimal mass of lead potentially transported to the river via soil loss, the potential soil loss is not considered to present a significant future risk to the New River.

Based on the previous sediment sampling results and the results of the annual and 10-year storm event soil loss assessments, potential RFI study area related releases to the New River are not considered to pose current or future significant risk to the river."

6. The response appears to be adequate and should be included in the report.

Response: The response will be included in Section 6.0 of the report.

8 and 9. Figures 4-1 and 4-2 do not support the initial assumption that lead is the primary indicator for contamination at the study area. 12/15 samples exceeded residential screening levels with 2 above industrial. This is a much higher percentage of hits compared with the lead samples. In addition 8 of the 12 exceedances were at locations where lead was below screening levels.

Response: Per the conference call (4/14/2010), it was agreed that: Although PAHs and nitroglycerin were detected in soil at concentrations above screening levels, PAHs and nitroglycerin were not identified as risk or hazard drivers in the human health and ecological risk assessments. This information will be added to Section 4.

10. Even though groundwater monitoring is being conducted as part of the OBG permit, SSLs are still appropriate for the evaluation of potential soil impact over the subject study area. The soil to groundwater pathway should still be evaluated as part of the overall assessment of the contaminated soils.

Response: Please see revised Section 5 (Attachment 2) and associated attachments (Attachment 3 - SESOIL Output and Attachment 4 - SSL Calculations. Attachments 3 and 4 will be included in appendices within the RFI report.

Attachment 1

Soil Loss Calculations

Calculation #1 - Annual Soil Loss

Revised Universal Soil Loss Equation (RUSLE)

$A = R \cdot K \cdot LS \cdot C \cdot P$
$= 132 \cdot 0.24 \cdot 4.4 \cdot 0.004 \cdot 1 = 0.56$ tons/acre/year

A = Loss per acre per year (tons per acre per year)

R = Rainfall value = 132 (from Figure 2-1 - USDA 1997 – Pulaski County)

K = Soil Erodibility Factor = 0.24 (Wheeling Sandy Loam)

LS = factor for horizontal length of slope and slope gradient = $0.77 \cdot 5.7 = 4.4$

$L = (\lambda/72.6)^m = 0.77$

λ = slope length= 43 feet

m= slope length factor = 0.5 (slope > 5%)

$S = (16.8 \sin(\Theta))-0.5 = 5.7$

Θ= slope angle = 21.8 degrees

C = factor for planned cover = 0.004 (from Table 11 - USDA 1978 – 70-45% cover trees and undergrowth, 85-75% duff coverage)

P = factor for management options = 1 (default)

Site Soil Loss = A·Site Area = 0.56 tons/acre/year·1.6 acres = 0.9 tons/year

Total Lead In Soil = 0.9 tons · 314 mg/kg average lead in surface soil · 2000 lbs/ton · 1kg/2.2 lbs · 1E-06 kg/mg
= 0.26 kg of lead

Calculation #2 - Single Event Soil Loss

Modified Universal Soil Loss Equation (MUSLE)

$Y = 95(Q \cdot q)^{0.56}\ K \cdot LS \cdot C \cdot P$
$= 95(0.147 \cdot 4.35)^{0.56}\ 0.24 \cdot 4.4 \cdot 0.004 \cdot 1 = 0.3$ tons of soil

Y = single storm sediment yield in tons

Q = storm runoff volume = $[(P-0.2S)^2/(P+0.8S)]$ (inches)
= 1.1 inches = 0.092 ft = 0.092 ft · 1.6 acres = 0.147 acre-ft
P = Rainfall Depth = 3.63 inches (Virginia Department on Conservation and Recreation - 10 Year Storm 24 Hour for Pulaski County)
S = 1000/CN-10 = 1000/70-10 = 4.3
CN = SCS Curve Number = 70 (Soil Group C – Forest Good Condition)

q = peak flow = $C \cdot I \cdot A$
$= 0.4 \cdot 6.8 \cdot 1.6 = 4.35\ ft^3/sec$
C = Manning's Runoff Coefficient for Sheet Flow = 0.4 (for woods – light underbrush)
I = Rainfall Intensity = 6.8 in/hour (Roanoke County IDF Curve – Duration 5 min due length of overland flow and slope)
A = Drainage Area = 1.6 acres

K = Soil Erodibility Factor = 0.24 (Wheeling Sandy Loam)

LS = factor for horizontal length of slope and slope gradient = 0.77·5.7 = 4.4
L = $(\lambda/72.6)^m$ = 0.77
λ = slope length= 43 feet
m= slope length factor = 0.5 (slope > 5%)
S = $(16.8 \sin(\Theta))-0.5$ = 5.7
Θ= slope angle = 21.8 degrees

C = factor for planned cover = 0.004 (from Table 11 - USDA 1978 – 70-45% cover trees and undergrowth, 85-75% duff coverage)

P = factor for management options = 1 (default)

Lead In Soil = 0.3 tons · 314 mg/kg average lead in surface soil · 2000 lbs/ton · 1kg/2.2 lbs · 1E-06 kg/mg
= 0.09 kg of lead

References:

USDA 1978 Predicting Rainfall Erosion Losses: A Guide to Conservation Planning. Agriculture Handbook 537. December 1978.

USDA 1997 Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE). Agricultural Handbook 703. January 1997.

Attachment 2

Revised Section 5

5.0 FATE AND TRANSPORT ASSESSMENT

This section discusses the fate and transport of site-related COPCs. Primary fate and transport mechanisms occurring at the site are discussed. The objective of the fate and transport analysis is to identify the primary mechanisms affecting the distribution and migration of COPCs and their ultimate fate. COPCs identified at the site are summarized in the following table.

Site COPCs from Nature and Extent Assessment

Soil – Human Health		Soil to Groundwater SL DAF 10 (Section 5.1.4)	
Antimony	Benzo(a)anthracene	Iron	Benzo(a)pyrene
Iron	Benzo(a)pyrene	Lead*	Benzo(b)fluoranthene
Lead	Benzo(b)fluoranthene	Thallium	2,4,6-Trinitrotoluene (TNT)
Thallium	Dibenz(a,h)anthracene	Trichloroethene (TCE)	2,6-Dinitrotoluene (DNT)
Nitroglycerin		Benzo(a)anthracene	Nitroglycerin

Note: *Although lead does not have a risk based SL it is included in the evaluation due to the nature of the site.

The potential for transport of chemicals in environmental media is largely controlled by the physiochemical properties of the chemicals and the matrix through which they travel or migrate. Table 5-1a describes the physiochemical properties of chemicals that affect their fate in environmental media. Table 5-1b describes the fate processes affecting metals including: ion exchange, chemical speciation, and oxidation-reduction potential. Table 5-1c describes the fate processes affecting organic chemicals including: sorption, volatilization, hydrolysis, and abiotic and biotic degradation. Chemicals can be transported with little attenuation or retardation due to these fate processes or they can be delayed or transformed so that minimal migration occurs. The physical and chemical properties of organic COPCs detected in soil are summarized in Table 5-2.

Primary fate and transport mechanisms for COPCs potentially present at the site include the following:

- Volatilization of chemicals from soil;
- Erosion of particulate-bound chemicals from soil;
- Degradation of chemicals in soil;
- Leaching of chemicals from soil with infiltrating water; and
- Transport of chemicals with groundwater flow.

Fate and transport processes for site media are discussed in the following sections.

5.1 FATE AND TRANSPORT - SOIL

Fate and transport processes for soil are discussed in the following sections including volatilization, erosion and mass transport, and degradation of chemicals in soil, and leaching of chemical from soil with infiltrating water.

5.1.1 Volatilization

Volatilization can significantly affect the distribution of a chemical in the environment. This process will result in the mass and concentration of a chemical in soil as the chemical volatilizes to soil gas and ultimately discharges to the atmosphere. Volatilization reactions are most significant in surface soil that is in direct (or near-direct) contact with the atmosphere. Chemical volatility is typically quantified by a chemical's Henry's constant, which may be calculated from the chemical's vapor pressure, molecular weight, and solubility. The lower the Henry's constant,

the less volatile the chemical. Values of Henry's constant for soil COPCs are summarized in Table 5-2.

One VOC (TCE) and one SVOC (naphthalene) with Henry's constants less than 0.1 were identified as COPCs for the soil-to-groundwater migration pathway based on detections in one or more samples above calculated site-specific SLs (Section 5.1.4). Low concentrations of these COPCs have been detected in soil and therefore, volatilization is not expected to be a significant influence on the fate of this compound in soil. Other COPCs at the site are characterized by low Henry's constants (i.e., < 0.01) and are not considered highly volatile, and therefore, volatilization is not expected to be a significant influence on the fate of these compounds at the site.

5.1.2 Erosion Processes in Soil

Erosion processes can substantially affect the distribution of soil-bound particulates in the environment and thus influence the distribution of constituents in soil. High winds can scour fine particles from the soil surface and redistribute these particles downwind. Mass transport from surface water runoff during heavy precipitation events can also scour fine soil particles from surface soil, eventually depositing the particles during sedimentation downstream. As presented in Section 4.4, this potential migration pathway is impeded by the presence of significant vegetation in the RFI study area. Section 4.4 presents a quantitative evaluation of soil erosion in the RFI study area with respect to potential lead transport to the adjacent New River by erosion processes. The results of this evaluation indicated that minimal mass of lead would be potentially transported to the river by erosion processes and the potential soil loss is not considered a significant future risk to the New River.

5.1.3 Degradation of Chemicals in Soil

Many organic chemicals that are found in the environment are subject to naturally occurring biotic (biologically based) and abiotic (non-biologically based) transformation reactions. These reactions result in degradation of the chemical. Biodegradation reactions can occur under aerobic (in the presence of oxygen) and anaerobic (in the absence of oxygen) conditions. During biodegradation, naturally occurring microorganisms in the subsurface transform a chemical to another state as a direct or indirect consequence of their metabolic processes. In many cases, biodegradation reactions break down organic chemicals to less toxic forms.

Several naturally occurring abiotic reactions can significantly affect the fate of chemicals in the environment. Common abiotic reactions include photodegradation and hydrolysis. Photodegradation is the process of decomposition of a chemical upon exposure to radiant energy such as the action of light, and is most significant to chemicals in surface soil that are in direct contact with sunlight. Hydrolysis is the degradation reaction of the chemical with components of water (e.g., hydroxyl and hydronium ions) and is therefore most important in saturated environments.

5.1.3.1 Metals

Metal COPCs, such as antimony, iron, lead, and thallium will not be significantly influenced by degradation processes in soil.

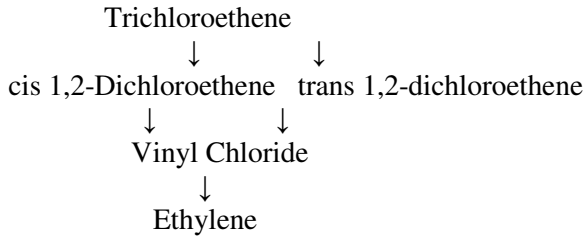
5.1.3.2 VOCs

VOCs were detected low concentrations in soil at the site. The VOC COPC identified for the soil-to-groundwater migration pathway was TCE.

TCE: TCE was detected in 3 of 14 samples at low level concentrations. TCE is resistant to aerobic degradation in soil although biodegradation may proceed co-metabolically. Under anaerobic conditions, TCE is slowly biodegraded through reductive dechlorination, with the

extent and rate of degradation dependant on the degree of the reducing environment. The reductive dechlorination pathway for TCE is shown below. Vinyl chloride is an intermediate degradation by product in this pathway as shown below; this compound has not been detected at the site. Ethylene is an end- product of this degradation process.

TCE Degradation Pathway – Reductive Dechlorination



5.1.3.3 SVOCs

SVOCs identified as COPCs in soil at the site consisted of high molecular weight PAH compounds benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and naphthalene (soil to groundwater). Microbial metabolism is the primary process for degradation of PAHs in soil. Hydrolysis, oxidation reduction, and photodegradation are not considered important processes for the degradation of PAHs in soil. The higher molecular weight PAHs that are COPCs at the site will tend to have lower rates and degrees of degradation than middle to lower molecular weight PAHs. The rate and extent of biodegradation of PAHs in soil is also influenced by soil properties such as organic content, structure, particle size, pH, temperature, and oxygen content, and the characteristics of microbial populations in the soil. The presence of metals in soil that are toxic to microorganisms will impede degradation (ATSDR 1995).

Experimentally reported half-lives for high molecular weight PAHs in soil are typically in the range of 1 to 1.5 years but will vary depending soil and site characteristics. Specific information on the relative degradation rates of PAHs in site soil is not available; it is possible that some degradation of PAHs has occurred at the site given the low concentrations of high molecular weight compounds detected. The presence of lead in soil is not expected to have an adverse impact on PAH degradation given the low-levels or absence of detectable levels of PAHs in soil.

5.1.3.4 Explosives – 2,4,6-TNT, 2,6-DNT, and Nitroglycerin

Explosive compounds identified as COPCs in soil include: 2,4,6-TNT (soil to groundwater only), 2,6-DNT (soil to groundwater only), and nitroglycerin.

2,4,6-TNT transformation generally occurs by sequential reduction of nitro groups to amino groups. 2,4,6-TNT is readily reduced in soil under anaerobic conditions, with sequential microbial transformations producing 4ADNT and 2ADNT and other degradation by products. Recent studies indicate that 2,4,6-TNT can be degraded under aerobic conditions with production of amino DNT and other degradation byproducts. There is some data to suggest that 2,4,6-TNT in uppermost layers of surface soil may be photolyzed to trinitrobenzene and trinitrobenzaldehyde (HSDB 2009). The half lives of 2,4,6-TNT in soil have been reported as ranging from 4 to 10 years, with a microbial oxidative decomposition rate of 0.017 to 0.05 percent per day (Cataldo et al 1989).

2,6-DNT is an impurity of TNT and may undergo some degradation in soil by microorganisms with a reduction of the nitro group to form amino groups including 4-amino-2-nitrotoluene and 2-amino-4-nitrotoluene. DNT may undergo photolysis in uppermost surface soil layers based on a

rapid rate of photolysis observed in water. DNT is not expected to undergo hydrolysis in soil due to a lack of functional hydrolyzable functional groups (HSDB 2009).

Nitroglycerin undergoes rapid biodegradation using batch reactors and digestors but its rate of biodegradation in soil is unknown. Hydrolysis of nitroglycerin in soil may be important under alkaline conditions but is not expected to be an operable degradation process at the site due to the neutral pH of the soil (HSDB 2009).

5.1.4 Leaching of Chemicals from Soil to Groundwater

Chemicals in soil have the potential to migrate to greater depths with infiltrating water. As precipitation infiltrates, chemicals may be leached from the soil and carried to greater depths and potentially to groundwater. Table 5-3 summarizes the screening results for soil data including: constituents detected, minimum and maximum concentrations detected, number of detections, number of samples, and number of samples above risk-based soil to groundwater screening levels (SLs) and background (inorganics only) to evaluate the potential migration of chemicals in soil to groundwater. Risk-based SLs were obtained from the April 2009 Regional Screening table (USEPA 2009) and utilize a dilution attenuation factor (DAF) 10. A DAF 10 was used for the site due to the lack of an infinite source, the depth to groundwater, and the attenuation of chemicals due to soil types. The screening identified the following chemicals with detected concentrations above their generic DAF 10 SLs and background point estimates (inorganics only):

Chemical	# Detects/ # Samples	# Detects Above SL
Iron	32/32	2
Thallium	32/32	1
Trichloroethene	3/14	3
Benzo(a)anthracene	25/32	2
Benzo(a)pyrene	29/32	12
Benzo(b)fluoranthene	29/32	1
Naphthalene	10/32	4
2,4,6-Trinitrotoluene	5/32	5
2.6-Dinitrotoluene	1/32	1
Nitroglycerin	6/32	6

Factors affecting leaching are discussed below followed by assessments for soil to groundwater COPCs identified summarized above with concentrations above SLs. The degree to which a chemical is leached is strongly influenced by the chemical's tendency to partition to the solid or aqueous phases, which is largely a function of the chemical's solubility and particle affinity.

Water Solubility

Water solubility of a chemical is the mass of chemical that will dissolve in a unit volume of water at a specific temperature. Chemicals with a high solubility can often be readily dissolved in water and therefore are susceptible to being mobilized from the soil matrix with infiltrating water and migrating downward to groundwater. Chemicals with a low solubility tend to partition to soil.

The solubility of organic chemicals is typically a function of the hydrophobic nature of the chemical. Many organic chemicals are non-polar and therefore do not dissolve readily into water, which is a polar solution. The organic COPCs identified in soil at the site (PAHs and nitroglycerin) have low to moderate water solubility. Water solubility data for COPCs are summarized in Table 5-2.

Adsorption

The aqueous concentration of chemicals in soil systems can also be substantially influenced by adsorption reaction to the soil matrix. Adsorption is the ability of a substance to bind to the surface of soil particles from reactions that occur between the chemical and the soil particle surface. Organic compounds are frequently non-polar, and therefore, tend to interact with organic matter commonly associated with the soil matrix. The tendency for a chemical to be adsorbed to the organic fraction of soil (or sediment) can be measured by the chemical's organic carbon partition coefficient (K_{oc}). The lower the K_{oc} values the more leaching potential from soil to water as summarized below. Organic compounds with a K_{oc} less than 100 liters per kilogram (L/kg) have a high potential to leach from soil to water such as TCE. Progressively higher values of K_{oc} indicate lower leaching potential. Organic compounds with K_{oc} values in the range of 1E+04 to 1E+06 L/kg, such as the high molecular weight PAHs, are generally immobile or nearly immobile in soil. Values of K_{oc} for COPCs are summarized in Table 5-2.

Site-specific distribution coefficients (K_d) can be estimated for each organic COPC, as the product of the K_{oc} of the chemical and the fraction of the organic carbon (f_{oc}) in the soil matrix. The distribution coefficient is a measure of the ratio of chemical mass that partitions to the solid and liquid phases under equilibrium conditions. The fraction of organic carbon measured in site soil ranged from 0.47 to 1.5% based on physical data collected at the site. Calculated K_d values are presented in Table 5-2. Based on solubility, K_{oc} and K_d values, the high molecular weight PAHs are expected to be immobile in soil while the nitroglycerin is expected to have low to moderate mobility.

5.1.4.1 Development of Site Specific Soil-to-Groundwater SLs

Site-specific soil-to-groundwater SLs have been calculated for organic chemicals to evaluate the potential for leaching of soil to groundwater COPCs to groundwater at concentrations of potential concern. EPA equation B-13 included in Appendix B of the Supplemental Guidance for Developing SSLs for Superfund Site (USEPA 2002) has been modified to incorporate the following site-specific parameter data for each disposal area as summarized in the following table.

$$C_t = C_w\left(K_{oc} * f_{oc} + \frac{\theta_a + \theta_w * H'}{\rho_b}\right) \qquad \text{Equation } 5-1$$

where:

Parameter	Definition (Units)	Value	Source
DAF	Dilution Attenuation Factor (unitless)	10	DAF Value
C_t	Screening level in soil, (mg/kg)	Calculated Using Equation 5-1	USEPA 2002c
C_w	Target leachate concentration (mg/L) x DAF	Chemical Specific T-RSL DAF (10)	USEPA April 2009 RSL Table
K_{oc}	Soil organic carbon-water partition coefficient (L/kg)	Chemical Specific	RAIS (2007)
f_{oc}	Organic carbon content of soil, (kg/kg)	0.01 (1%)	Average Concentration of TOC from Table 2-1

Parameter	Definition (Units)	Value	Source
θ_w	Water-filled soil porosity, (L_{water}/L_{soil})	0.3	Default (USEPA 2002)
θ_a	Air-filled soil porosity, (L_{air}/L_{soil}), (η - θ_w)	0.09	Calculated based on Average of RFI Physical Soil Results
ρ_b	Dry soil bulk density	1.61 kg/L	Average of RFI Physical Soil Test Results (Table 2-1)
H'	Henry's law constant	Chemical-specific	RAIS (2007)

Notes: RAIS = Risk Assessment Information System – Chemical Specific Factors at http://rais.ornl.gov/

Detailed SL calculations are presented in Appendix C.7. The leaching potential of COPCs is evaluated in the following based on the chemical properties of the COPCs, comparisons of the site data to SLs, and an evaluation of groundwater data from the OBG (source of chemicals in the RFI Study Area).

5.1.4.2 Iron

Iron naturally occurs at appreciable levels in soil at RFAAP with a background point estimate of 50,962 mg/kg. Adsorption of iron to soil is dependent on pH and organic matter, with an increase in either of these parameters resulting in increased adsorption. Mobility is also influenced by oxidation reduction potential, with iron becoming more mobile under reducing conditions than oxidizing conditions (HSDB 2009). Soil pH values are in the range of 5 to 7 and will likely reduce the mobility of iron along with the presence of appreciable organic matter in surface and near surface soil (3.5%). Site data indicate that iron concentrations detected above the SL and background point estimate are limited to surface or near surface intervals in 2 of 32 samples collected from the RFI study area. In addition as presented in Section 6.4.2, background statistical evaluations identified iron as consistently below background. Based on the background evaluation, near neutral pH of site soil, and appreciable organic matter in surface and near surface soil, iron is not considered a potential concern for the soil-to-groundwater pathway in the RFI study area.

5.1.4.3 Lead

Although lead does not have a risk-based soil to groundwater SL (USEPA 2009), due to the nature of the RFI study area the migration of lead from soil to groundwater was assessed utilizing the SESOIL model. The SESOIL unsaturated zone fate-and-transport model was used to evaluate the mobility of lead in soil within the RFI study area (Environmental Software Consultants, Inc., 2008). SESOIL is a one-dimensional vertical fate-and-transport screening level model for the unsaturated zone. It simulates chemical fate-and-transport based on diffusion, adsorption, volatilization, biodegradation, and hydrolysis. The model is designed to simultaneously model both chemical and soil water transport in the soil column under natural seasonal climatic variations.

Lead mass loading parameters for this assessment assumed a lead concentration equal to the mean concentration detected in site soil (414 milligram per kilogram) across the entire 1.6 study area for a depth interval of 0 to 5.5 ft. Local climate data for Radford, Virginia and site-specific physical soil data were also incorporated into the assessment.

The results of the SESOIL assessment indicated that over the 30-year period modeled, lead is immobile in site soil, with 99.87 percent of the lead mass remaining adsorbed to soil, with the remaining mass present in the soil air phase. Over the 30-year modeled period, the net change in

lead depth in the soil column is 1.2 centimeters or less than 0.5 inches. It is therefore concluded from the assessment that substantial vertical migration of lead in soil is unlikely within the evaluated study area.

As the model demonstrates, most lead is retained strongly in soil and very little leaches to groundwater. Lead has not been identified as a COPC for the soil-to-groundwater migration pathway at the OBG adjacent to the RFI study area and lead was not detected in groundwater samples collected from the OBG in 2008 (Draper Aden 2009a in Appendix G). Based on the results of the SESOIL model, the immobile nature of lead in soil and lack of groundwater detections at the OBG (the source area for the chemicals at the RFI study area), lead is not considered a potential concern for the soil-to-groundwater pathway in the RFI study area.

5.1.4.4 Thallium

Thallium commonly occurs as salts in soils but can be immobilized by clays and retained in soil by aluminum, and iron oxides, and organic matter, which are present at appreciable levels in site soil (HSDB 2009). Site data indicate the thallium concentration detected above the SL and background point estimate is limited to the surface interval in 1 of 32 samples collected from the RFI study area. Thallium has not been identified as a COPC for the soil-to-groundwater migration pathway at the OBG adjacent to the RFI study area and thallium was not detected in groundwater samples collected from the OBG in 2008 (Draper Aden 2009a in Appendix G). In addition as presented in Section 6.4.2, background statistical evaluations identified thallium as consistently below background. Based on the above information, thallium is not considered a potential concern for the soil-to-groundwater pathway in the RFI study area.

5.1.4.5 VOCs - TCE

TCE was identified as a COPC for the soil-to-groundwater migration pathway. This compound has a high solubility, lower K_{oc} values, and moderate mobility in subsurface (Table 5-2). As presented in the table below, the detected concentrations of TCE in soil above site-specific SLs (Appendix C.7) was limited to two samples above the site-specific SL and the mean soil concentration was below the site-specific SL.

	Detected Concentrations (mg/kg)				
COPC	MDC	Mean	Site-Specific SL	MDC Above SL	Mean Above SL
Trichloroethene	0.057	0.0073	0.015	Yes (2)	No

Based on the limited detections above site-specific SL, the low levels of these detections, and the mean concentrations below the site-specific SL, TCE is not considered a potential concern for the soil-to-groundwater pathway in the RFI study area.

5.1.4.6 PAHs

Several high molecular weight PAH compounds were identified as COPCs for the soil-to-groundwater migration pathway at the RFI study area. As presented in the table below, the detected concentration of PAHs in soil above site-specific SLs (Appendix C.7) was limited to one sample slightly above the site-specific SL for benzo(a)pyrene and the mean soil concentration was below the site-specific SL.

COPC	Detected Concentrations (mg/kg)			MDC Above SL	Mean Above SL
	MDC	Mean	Site-Specific SL		
Benzo(a)anthracene	0.480	0.056	0.67	No	No
Benzo(a)pyrene	0.290	0.047	0.23	Yes (1)	No
Benzo(b)fluoranthene	0.630	0.086	2.3	No	No
Naphthalene	0.022	0.0032	0.026	No	No

High molecular weight PAHs identified as COPCs tend to be immobile in soil due to negligible solubility and high K_{oc} values. High molecular weight PAHs have not been identified as COPCs for the soil-to-groundwater migration pathway at the OBG adjacent to the RFI study area and these PAHs have not been detected in groundwater samples collected from the OBG in 2008 (Draper Aden 2009a in Appendix G). Based on the limited detection above site-specific SLs, the immobile nature of the high molecular weight PAHs in soil, and lack of groundwater detections at the OBG, PAHs are not considered a potential concern for the soil-to-groundwater pathway in the RFI study area.

5.1.4.7 Explosives - 2,4,6-TNT, 2,6-DNT, and Nitroglycerin

Explosives detected as COPCs in soil have moderate solubility in water. The K_{oc} values for the explosives range from medium low for nitroglycerin, to moderate for 2,6-DNT, and to moderately high for 2,4,6-TNT. Based on their solubility and K_{oc} values, explosives are expected to have some mobility in soil and potential to leach to groundwater if present at sufficiently high concentrations. As presented in the table below, 2,4,6-TNT and nitroglycerin had detected concentrations in one or more samples above their site-specific SLs (Appendix C.7) and the mean soil concentration of 2,3,6-TNT was below its site-specific SL.

COPC	Detected Concentrations (mg/kg)			MDC Above SL	Mean Above SL
	MDC	Mean	Site-Specific SL		
2,4,6-Trinitrotoluene	3	0.23	0.408	Yes (3)	No
2.6-Dinitrotoluene	0.39	N/A	1.5	No	No
Nitroglycerin	21	1.06	0.056	Yes (6)	Yes

Although low levels of explosives have been detected at concentrations above site-specific SLs, based on the limited number of samples above SLs, the mean concentrations being below the site-specific SL with the exception of nitroglycerin, and the lack of explosives detections in groundwater at the OBG (the source area for chemicals in the RFI study area), explosives are not considered a potential concern for the soil-to-groundwater pathway in the RFI study area.

5.2 FATE AND TRANSPORT SUMMARY

Volatilization was not identified as an important fate and transport process in the RFI study area given the identification of one volatile COPC (TCE) in soil for the soil to groundwater migration pathway only. Degradation processes are not expected to be a significant fate and transport process in soil given that lead is the primary COPC. Erosion processes and mass transport of surface soil are expected to be impeded by the presence of thick vegetative cover across the RFI study area. A quantitative evaluation of soil erosion in the RFI study area indicated that minimal

mass of lead would be potentially transported to the river by erosion processes and the potential soil loss is not considered a significant future risk to the New River. Leaching from soil is not expected to be a significant fate and transport process given that lead is strongly adsorbed to soil. The latest groundwater data (2008) from monitoring wells located adjacent to the perimeter berm separating the OBG from the RFI study area did not indicate leaching of detectable levels of lead or other site soil COPCs to groundwater.

Table 5-1a
Chemical Properties Affecting Fate and Transport
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, VIrginia

Property	Description
Specific Gravity	Specific gravity is the ratio of the density of a chemical to the density of water and its tendency to float (specific gravity <1) or sink (specific gravity >1) in water. Chemicals that are immiscible in water can exist as non-aqueous phase liquids and are referred to as light non-aqueous phase liquid if their specific gravity is less than one, or dense non-aqueous phase liquid if their specific gravity is greater than one.
Water Solubility	Water solubility of a chemical is the mass of chemical that will dissolve in a unit volume of water at a specific temperature. Chemicals with a high solubility tend to remain dissolved in water rather than partition to soil or sediment are less likely to volatilize, and more likely to biodegrade. Chemicals with a low solubility tend to partition to soil or sediment, are more likely to volatilize and less likely to biodegrade.
Vapor Pressure	Vapor pressure of a chemical is how readily it will volatilize to the atmosphere. Volatilization from water is dependent upon vapor pressure and Henry's law constant. Vapor pressures in their pure state range from 0.001 to 760 millimeters mercury (mm Hg) for liquids to less than 1E-10 mm Hg for solids.
Henry's Law Constant	Henry's law constant of a chemical is a measure of how a chemical will partition between air and water at equilibrium. It is the ratio of the vapor pressure to the water solubility (atm-m^3/mole) and can be used to calculate the rate of volatilization of a chemical from water. Chemicals with a high Henry's law constant more readily volatilize from water.
Organic Carbon Partition Coefficient (K_{oc})	K_{oc} is a measure of the tendency for a chemical to be sorbed to the organic fraction of soil and sediment. The lower the K_{oc} values the more leaching potential from soil or sediment to water. Chemicals with a K_{oc} less than 100 milliliters per gram (mL/g) have a high potential to leach from soil or sediment to water, while K_{oc} values in the range of 100 to 500 mL/g indicate a moderate leaching potential.
Octanol-Water Partition Coefficient (Ko_w)	K_{ow} describes the partitioning of an organic chemical between a polar phase (water) and a relatively nonpolar phase (1-octanol). It is equated to the partitioning (sorption) in an aquifer of a chemical between the water and the porous media organic content. A chemical with a high K_{ow} is hydrophobic and may be relatively immobile in an aqueous system but may be mobilized in the presence of an organic solvent.

Table 5-1b
Fate Processes Affecting Metals
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Process	Description
Ion Exchange	Ion exchange is a specific category of adsorption due to an affinity of the solid surface for the chemical. Ion exchange occurs when the adsorbent charge deficiency can be neutralized more efficiently by ions in solution than by those ions currently adsorbed. As an example, if sodium ions (monovalent) have accumulated at the interface and suddently calcium ions (divalent) appear, the surface excess can be more efficiently neutralized by the calcium ions than by the sodium ions; thus, the sodium ions will desorb and the calcium ions will adsorb and an exchange of ions will occur. Clay minerals are frequently the dominant source of ion exchange in the subsurface. The surface charge of clays and many other mineral surfaces is a function of pH. At low pH (excess hydrogen ions), the surface can exhibit a positive net charge while at higher pH (excess hydroxyl ions) the surface can exhibit a negative charge (Knox et al 1993). The surface area of the exchange site significantly influences the level of adsorption; this parameter is typically discussed in terms of the cation exchange capacity (CEC) of the medium and is expressed in units of milliequivalents of exchanging cations per 100 grams of solids (meq/100 g). CEC values indicate the likely type of clay present; the higher the CEC value the greater the absorption potential.
Chemical Speciation	Most metals occur in more than one ionic form (species) in solid and aqueous media. These species form from hydrolysis, oxidation reduction reactions, and complexation reactions, which may have different valences and mobilities in soil water, groundwater, and surface water due to different affinities for adsorption and different solubilty controls. Simple ionic specifies frequently combine ligands to form ionic or neutral-charge aqueous complexes. Environmental conditions that affect speciation of metals include pH, redox potential, and organic ligands.
Oxidation Reduction Potential (ORP)	Redox refers to the transfer of electrons and resultant specifies change of ions or compounds. Oxidation is the loss of electrons and reduction is the gain of electrons. Redox can cause changes in the mobility of many metals, such as site COPCs iron, manganese, and arsenic. The ability of a redox reaction to occur is a function of the redox potential. Redox potential is typically defined in terms of the negative logarithm of the free-electron activity (pE). The redox potential can also be expressed in terms of volts (Eh). Low values of pE indicate high electron activity and favor electron-rich species (reduced). High values of pE indicate low electron activity and favor electron-poor species (oxidized) (Knox et al 1993).

Table 5-1c
Fate Processes Affecting Organics
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Process	Description
Sorption	Sorption includes the processes of adsorption and absorption. Adsorption is a mass transfer process where a substance is transferred from a phase to the surface of a medium (e.g. soil or sediment) where it is bounded by chemical or physical forces. Absorption is the partitioning between two phases (Knox et al. 1993). Sorption reactions are either sorbent or solvent-motivated. Sorbent-motived reactions occur when there is an attraction between the sorbent and the solute and the chemical accumulates at the surface due to the affinity of the surface for the chemical. Solvent-motivated reactions occur when the chemical is hydrophobic, such as nonionic organics, where the chemical will accumulate at an interface or partition into a nonionic phase (associate with the organic content of the medium). For nonionic organics, the fraction of organic content (foc) of the subsurface material is the dominant soil characteristic affecting sorption (Knox et al. 1993). Primary indicators of the partitioning of a chemical are the organic carbon water partition coefficient (Koc), soil/water distribution coefficient (Kd), the octanol water partitioning coeffient (Kow), and the calculated retardation factor.
Hydrolosis	Hydrolysis is the degradation process via chemical reactions (oxidation, reduction, hydrolysis) without the participation of organisms. Hydrolysis is a chemical decomposition process that uses water to split chemical bonds of substances. There are two types of hydrolysis, acid and enzymatic. Hydrolysis is limited to chemical that contain hydrolyzable groups and is effected by the contaminants hydrolysis half life.
Volatilization	Volatilization is the process by which a contaminant changes from a liquid phase to a gas phase. This process applies to organic comtaminants migrating from the soil or surface water. Volatile organic chemicals are a class of chemicals that easily evaporate or mix with the atmosphere. The potential volatilization of a chemical is affected by the compounds vapor pressure, solubility, organic carbon partitioning coefficient, and the temperature.
Abiotic Degradation	Abiotic degradation includes degradation processes in which organisms do not participate. Photolysis describes the abiotic degradation process via photochemical reactions such as photooxidation, photomineralisation without the participation of organisms. As described above, hydrolysis is an additional process of abiotic degradation.
Biotic Degradation	Biotic degradations the process in which chemical degradation of a contaminant is aided by soil organisms. Biotic degradation can be either aerobic or anaerobic. The rate of metabolism/cometabolism is affected by the contaminant's biochemical oxygen demand, chemical oxygen demand, degree of halogenation, etc. Reactions include but are not limited to oxidation/reduction and hydrolysis, as described above.

Table 5-2
Physical Constants for COPCs
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Molecular Weight (g/mol)	Henry's Law Constant (atm-m^3/mol)	Unitless Henry's Law Constant	Organic Carbon Partition Coef. (Koc) (L/kg)	Site-Specific Soil-Water Partition Coef. (Kd)	Log of Octanol-Water Partition Coef. (log Kow)	Octanol-Water Partition Coef. (Kow) (L/kg)	Water Solubility (mg/L)	Vapor Pressure (mm Hg)
Benz[a]anthracene	56553	228.3	1.20E-05	4.91E-04	2.31E+05	2,310	5.76	5.75E+05	9.40E-03	1.90E-06
Benzo[a]pyrene	50328	252.32	4.63E-07	1.90E-05	7.87E+05	7,870	6.13	1.35E+06	1.62E-03	5.49E-09
Benzo[b]fluoranthene	205992	252.32	6.59E-07	2.70E-05	8.03E+05	8,030	5.78	6.03E+05	1.50E-03	5.00E-07
Dibenz[a,h]anthracene	53703	278.36	1.23E-07	5.03E-06	2.62E+06	26,200	6.54	3.47E+06	1.03E-03	1.39E-11
Dinitrotoluene, 2,6-	606202	182.14	7.56E-07	3.10E-05	3.71E+02	3.7	2.1	1.26E+02	3.52E+02	5.67E-04
Naphthalene	91203	128.18	4.39E-04	1.80E-02	1.84E+03	18.4	3.3	2.00E+03	3.10E+01	8.50E-02
Nitroglycerin	55630	227.09	9.76E-08	4.00E-06	1.31E+02	1.3	1.62	4.17E+01	1.38E+03	4.00E-02
Trichloroethene	79016	131.39	9.76E-03	4.00E-01	6.77E+01	0.7	2.42	2.63E+02	1.28E+03	6.90E+01
Trinitrotoluene, 2,4,6-	118967	227.13	4.63E-07	1.90E-05	1.83E+03	18.3	1.6	3.98E+01	1.30E+02	8.02E-06

Notes:
CAS = Chemical Abstract System
g/mol = Grams per mole
atm-m^3/mol = Cubic meters atmosphere per mole
L/kg = Liters per kilogram
mg/L = Milligrams per liter
mm Hg = Millimeters Mercury

Table 5-3
Summary of Soil to Groundwater Risk Screening Results for Total Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

	CAS #	Facility Background [A]	Soil to GW SL DAF 10	Minimum Detected Concentration	Maximum Detected Concentration	# of Samples Above Soil to GW SL [A]	# of Detections	# of Samples
TAL Metals (mg/kg)								
Aluminum	7429-90-5	40,041	550,000	4,250	35,000	0	32	32
Antimony	7440-36-0	--	7	0.069	4.7	0	27	32
Arsenic	7440-38-2	15.8	0.013	0.12	5.6	0	32	32
Barium	7440-39-3	209	3,000	29	290	0	32	32
Beryllium	7440-41-7	1.02	580	0.65	1.3	0	11	32
Cadmium	7440-43-9	0.69	--	0.51	2.8	--	30	32
Calcium	7440-70-2	--	--	1,100	110,000	--	32	32
Chromium	7440-47-3	65.3	--	10	39	--	32	32
Cobalt	7440-48-4	72.3	4.9	3.9	24	0	32	32
Copper	7440-50-8	53.5	510	2.5	260	0	32	32
Iron	7439-89-6	50,962	6,400	5,330	87,000	**2**	32	32
Lead	7439-92-1	26.8	--	12	26,500	--	183	183
Magnesium	7439-95-4	--	--	1,210	25,000	--	32	32
Manganese	7439-96-5	2,543	570	59	2,200	0	32	32
Mercury	7439-97-6	0.13	0.33	0.0087	0.27	0	30	32
Nickel	7440-02-0	62.8	480	3.8	22	0	32	32
Potassium	7440-09-7	--	--	548	2,900	--	32	32
Selenium	7782-49-2	--	9.5	0.043	1.5	0	32	32
Silver	7440-22-4	--	16	0.023	0.45	0	32	32
Sodium	7440-23-5	--	--	27	100	--	32	32
Thallium	7440-28-0	2.11	1.7	0.047	3.5	**1**	32	32
Vanadium	7440-62-2	108	2,600	11	59	0	32	32
Zinc	7440-66-6	202	6,800	46	1,600	0	32	32
TCL VOCs (ug/kg)								
1,2,4-Trichlorobenzene	120-82-1	--	130	0.96	0.96	0	1	14
2-Butanone	78-93-3	--	15,000	24	400	0	14	14
Acetone	67-64-1	--	44,000	31	320	0	14	14
Benzene	71-43-2	--	2.3	0.91	1.5	0	3	14
cis-1,2-Dichloroethene	156-59-2	--	1,100	1.9	4.2	0	2	14
Methylene chloride	75-09-2	--	12	4.1	11	0	14	14
Toluene	108-88-3	--	17,000	0.66	3.5	0	7	14
Trichloroethene	79-01-6	--	6.1	9.6	57	**3**	3	14
TCL SVOCs (ug/kg)								
1,1'-Biphenyl	92-52-4	--	230,000	1.6	8.8	0	5	32
2,4-Dichlorophenol	120-83-2	--	1,800	6.8	6.8	0	1	32
2-Methylnaphthalene	91-57-6	--	9,000	1.1	22	0	16	32
4-Chloro-3-Methylphenol [1]	59-50-7	--	19,000	8	24	0	8	32
Acenaphthene	83-32-9	--	270,000	2.5	19	0	12	32
Acenaphthylene [2]	208-96-8	--	1,500,000	1.5	21	0	19	32
Acetophenone	98-86-2	--	11,000	3.5	4.5	0	8	32
Anthracene	120-12-7	--	4,500,000	6.5	180	0	15	32
Benzo(a)anthracene	56-55-3	--	140	1.8	480	**2**	25	32
Benzo(a)pyrene	50-32-8	--	46	2.5	290	**12**	29	32
Benzo(b)fluoranthene	205-99-2	--	470	3.5	630	**1**	29	32
Benzo(g,h,i)perylene [2]	191-24-2	--	1,500,000	2.5	170	0	27	32
Benzo(k)fluoranthene	207-08-9	--	4,600	2.1	160	0	22	32
Bis(2-ethylhexyl)phthalate	117-81-7	--	16,000	15	540	0	32	32
Butylbenzylphthalate	85-68-7	--	6,700	3.3	40	0	25	32
Carbazole	86-74-8	--	--	2.7375	20.4825	--	15	32
Chrysene	218-01-9	--	14,000	1.3	570	0	29	32
Di-n-butylphthalate	84-74-2	--	110,000	32	6205	0	32	32
Dibenz(a,h)anthracene	53-70-3	--	150	7.1	41	0	14	32
Dibenzofuran	132-64-9	--	--	2	24	--	9	32
Diethylphthalate	84-66-2	--	130,000	1.2	1675	0	32	32
Dimethylphthalate	131-11-3	--	--	1.2	550	--	7	32
Fluoranthene	206-44-0	--	2,100,000	3.9	370	0	28	32
Fluorene	86-73-7	--	330,000	2.5	33	0	13	32
Indeno(1,2,3-cd)pyrene	193-39-5	--	1,600	2.95	130	0	27	32

Table 5-3
Summary of Soil to Groundwater Risk Screening Results for Total Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

	CAS #	Facility Background [A]	Soil to GW SL DAF 10	Minimum Detected Concentration	Maximum Detected Concentration	# of Samples Above Soil to GW SL [A]	# of Detections	# of Samples
Isophorone	78-59-1	--	220	2.5	5.1	0	17	32
N-Nitrosodiphenylamine	86-30-6	--	1,700	16	950	0	18	32
Naphthalene	91-20-3	--	5.5	2.4	22	**4**	10	32
Phenanthrene [2]	85-01-8	--	1,500,000	3.5	170	0	26	32
Pyrene	129-00-0	--	1,500,000	1.3	260	0	30	32
Explosives (mg/kg)								
1,3,5-Trinitrobenzene	99-35-4	--	26	0.1985	0.1985	0	1	32
2,4,6-Trinitrotoluene	118-96-7	--	0.09	0.23	3	**5**	5	32
2,4-Dinitrotoluene	121-14-2	--	0.68	0.17	0.17	0	1	32
2,6-Dinitrotoluene	606-20-2	--	0.34	0.39	0.39	**1**	1	32
HMX	2691-41-0	--	71	0.1415	0.79	0	3	32
Nitroglycerin/PETN (mg/kg)								
Nitroglycerin	55-63-0	--	0.017	0.45175	21	**6**	6	32
Cyanide (mg/kg)								
Cyanide	57-12-5	--	74	0.07	0.35	0	11	14

Notes:

COPC = Chemical of Potential Concern
mg/kg = Milligram Per Kilogram
ug/kg = microgram per kilogram
CAS = Chemical Abstracts Service
TAL = Target Analyte List
TCL = Target Compound List
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PETN = Pentaerythritol Tetranitrate
SL = Soil to Groundwater Regional Screening Level (RSL) from October 2009 RSL Table
DAF = Dilution Attenuation Factor

[A] = For inorganics, number of samples that exceed background (if available) and screening level

[1] = 3-Methylphenol SL used
[2] = Pyrene SL used

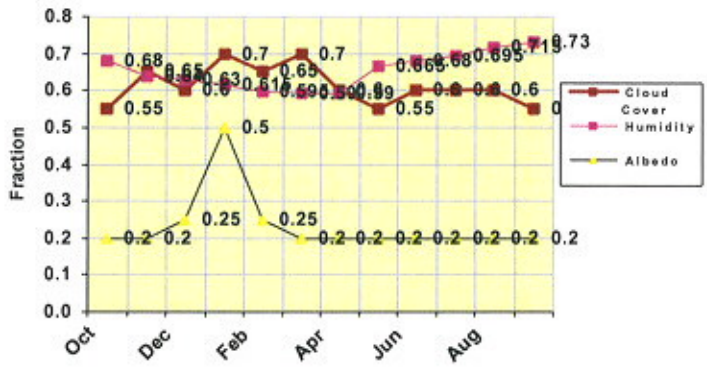
Attachment 3

SESOIL Output

Climate Report

Location Description: RADFORD
Climatic Input File: C:\SEVIEW63\RADFORD.CLM

Month	Temperature		Precipitation		Evapotranspiration Rate		Storms		Cloud Cover	Albedo	Humidity
Units	°C	°F	cm	Inches	cm	Inches	# per Month	Length Days	Fraction	Fraction	Fraction
October	13.61	56.50	8.280	3.26	0.00	0.00	3.97	0.550	0.550	0.200	0.680
November	8.61	47.50	7.137	2.81	0.00	0.00	4.58	0.500	0.650	0.200	0.640
December	3.50	38.30	6.655	2.62	0.00	0.00	4.52	0.550	0.600	0.250	0.630
January	1.39	34.50	6.502	2.56	0.00	0.00	5.11	0.530	0.700	0.500	0.615
February	2.94	37.29	6.833	2.69	0.00	0.00	4.97	0.530	0.650	0.250	0.595
March	8.22	46.80	7.544	2.97	0.00	0.00	5.94	0.560	0.700	0.200	0.590
April	13.11	55.60	7.772	3.06	0.00	0.00	5.05	0.510	0.600	0.200	0.590
May	17.83	64.09	8.509	3.35	0.00	0.00	6.22	0.450	0.550	0.200	0.665
June	21.94	71.49	7.874	3.10	0.00	0.00	5.94	0.380	0.600	0.200	0.680
July	24.22	75.60	9.982	3.93	0.00	0.00	6.82	0.290	0.600	0.200	0.695
August	23.67	74.61	8.458	3.33	0.00	0.00	6.47	0.290	0.600	0.200	0.715
September	19.83	67.69	7.214	2.84	0.00	0.00	4.61	0.490	0.550	0.200	0.730
Total			92.76	36.52	0.00	0.00					



SESOIL Profile and Load Report

Layer No.	Number of Sub-Layers	Thickness		Intrinsic Permeability	Organic Carbon Content	Adsorption Coefficient	Cation Exchange Capacity	Freundlich Exponent	Solid Phase Degradation Rate	Liquid Phase Degradation Rate	Soil pH
		cm	feet	cm^2	percent	$\frac{\mu g/g}{\mu g/mL}$	$\frac{mEq}{100\ g\ soil}$	unitless	1/day	1/day	pH
1	10	168.0	5.51	2.00E-09	1.00	900.00	5.80	1.00	0.00E+00	0.00E+00	6.90
2	1	30.0	0.98	2.00E-09	1.00	900.00	5.80	1.00	0.00E+00	0.00E+00	6.90
3		0.0	0.00	.0	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00
4		0.0	0.00	.0	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00

Soil Parameters

Bulk Density (g/cm^3)	1.86
Effective Porosity (fraction)	0.25
Soil Pore Disconnectedness	8.00

Application Parameters

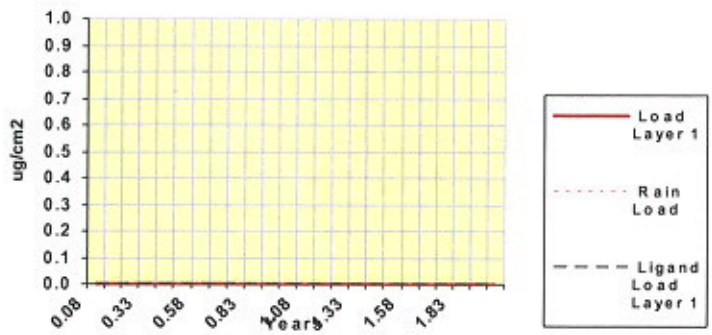
Area	cm^2	6.47E+7
	ft^2	6.96E+4
Latitude	degrees	43.0
Spill Index		1

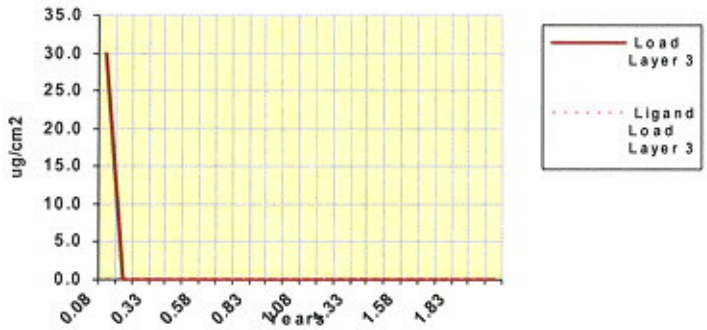
Chemical Parameters

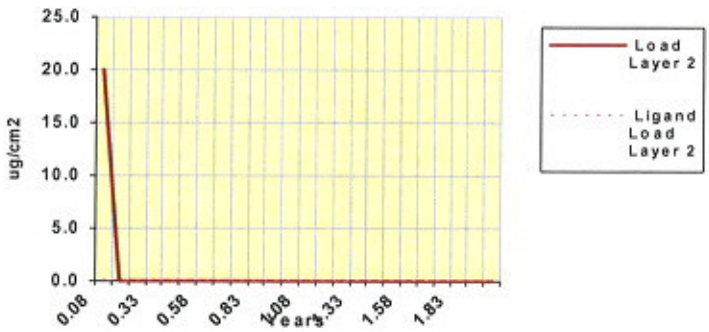
Water Solubility	(µg/mL)	9.58E+3	**Moles Ligand / Moles Chemical**	0.00
Henry's Law	(M^3-atm/mol)	2.44E-2	**Ligand Molecular Weight** (g/mol)	0.00
K_{oc}	(µg/g)/(µg/mL)	0.00	**Base Hydrolysis Rate** (L/mol/day)	0.00
Valance	(g/mole)	0.00	**Ligand Dissociation Constant**	0.00
Air Diffusion Coefficient	(cm^2/sec)	.000	**Neutral Hydrolysis Rate** (L/mol/day)	0.00
Water Diffusion Coefficient	(cm^2/sec)	.000	**Acid Hydrolysis Rate** (L/mol/day)	0.00
Molecular Weight	(g/mol)	207.00		

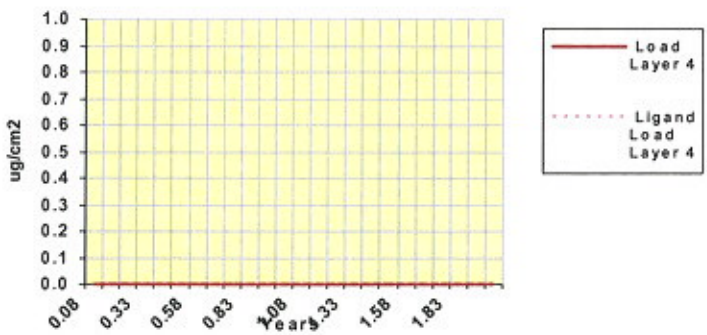
Output File:
C:\SEVIEW63\13PBRN23.OUT
Chemical File: Lead And Compounds (Kd)
C:\SEVIEW63\LEADANDC.CHM
Soil File: Silty Sand, Perm = 1.3-5 cm/sec
C:\SEVIEW63\RAAP13\RAPSM13.SOI
Application File: SEVIEW Default Application Parameters
C:\SEVIEW63\RAAP13\SWMU13V3.APL

Sublayer Loads	1	2	3	4	5	6	7	8	9	10
Layer 1 (ug/g)	4.14E+02	4.14E+02	4.14E+02	4.14E+02	4.14E+02	4.14E+02	4.14E+02	4.14E+02	4.14E+02	4.14E+02
Layer 2 (ug/g)										
Layer 3 (ug/g)										
Layer 4 (ug/g)										





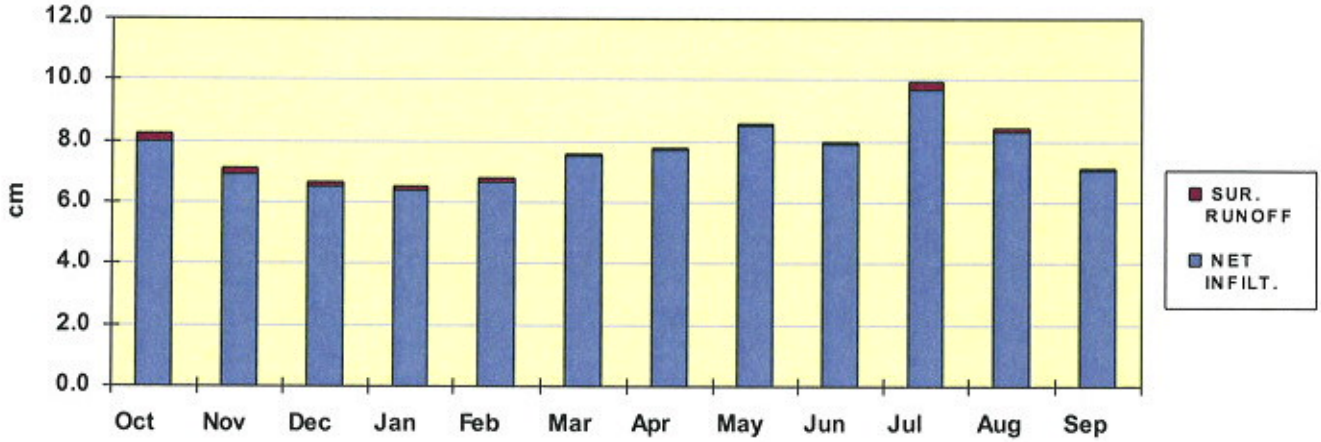


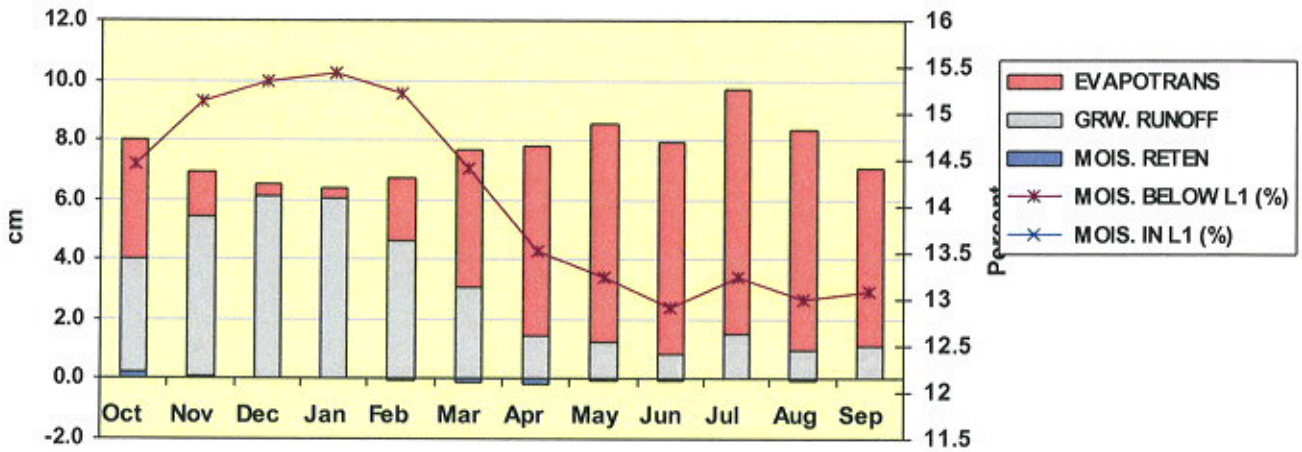


SESOIL Hydrologic Cycle Report

Scenario Description:

SESOIL Output File: C:\SEVIEW63\13PBRN23.OUT





	Surface Water Runoff		Net Infiltration		Evapotranspiration		Soil Moisture Retention		Groundwater Runoff (Recharge)		Soil Moisture	
											Layer 1	Below Layer 1
Units	cm	Inches	cm	Inches	cm	Inches	cm	Inches	cm	Inches	Percent	Percent
October	0.29	0.11	7.98	3.14	3.97	1.56	0.23	0.09	3.79	1.49	14.47	14.47
November	0.18	0.07	6.94	2.73	1.48	0.58	0.11	0.04	5.35	2.11	15.14	15.14
December	0.17	0.07	6.50	2.56	0.39	0.15	0.03	0.01	6.08	2.39	15.34	15.34
January	0.13	0.05	6.37	2.51	0.30	0.12	0.02	0.01	6.05	2.38	15.44	15.44
February	0.16	0.06	6.66	2.62	2.04	0.80	-0.04	-0.02	4.66	1.83	15.22	15.22
March	0.06	0.02	7.53	2.96	4.58	1.80	-0.13	-0.05	3.09	1.22	14.42	14.42
April	0.11	0.04	7.68	3.02	6.35	2.50	-0.15	-0.06	1.48	0.58	13.52	13.52
May	0.07	0.03	8.50	3.35	7.32	2.88	-0.05	-0.02	1.23	0.48	13.24	13.24
June	0.07	0.03	7.88	3.10	7.13	2.81	-0.05	-0.02	0.81	0.32	12.92	12.92
July	0.26	0.10	9.69	3.81	8.16	3.21	0.05	0.02	1.47	0.58	13.24	13.24
August	0.15	0.06	8.32	3.28	7.39	2.91	-0.04	-0.02	0.97	0.38	12.99	12.99
September	0.06	0.02	7.08	2.79	6.00	2.36	0.02	0.01	1.06	0.42	13.09	13.09
Total	1.71	0.67	91.12	35.88	55.09	21.69	0.00	0.00	36.03	14.18		

SESOIL Pollutant Cycle Report

Scenario Description:

SESOIL Output File: C:\SEVIEW63\13PBRN23.OUT

SESOIL Process	Pollutant Mass (µg)	Percent of Total
Volatilized	0.000E+00	0.00
In Soil Air	5.967E+08	0.01
Sur. Runoff	0.000E+00	0.00
In Washld	0.000E+00	0.00
Ads On Soil	8.359E+12	99.87
Hydrol Soil	0.000E+00	0.00
Degrad Soil	0.000E+00	0.00
Pure Phase	0.000E+00	0.00
Complexed	0.000E+00	0.00
Immobile CEC	0.000E+00	0.00
Hydrol CEC	0.000E+00	0.00
In Soil Moi	6.536E+08	0.01
Hydrol Mois	0.000E+00	0.00
Degrad Mois	0.000E+00	0.00
Other Trans	0.000E+00	0.00
Other Sinks	0.000E+00	0.00
Gwr. Runoff	0.000E+00	0.00
Total Output	8.360E+12	99.89
Total Input	8.370E+12	
Input - Output	9.349E+09	

Maximum leachate concentration: 0.000E+00 **mg/l**

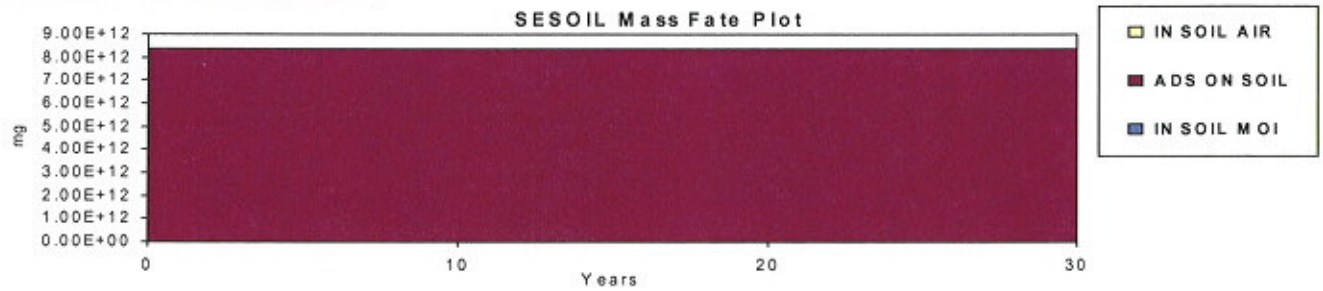
Climate File: RADFORD
C:\SEVIEW63\RADFORD.CLM

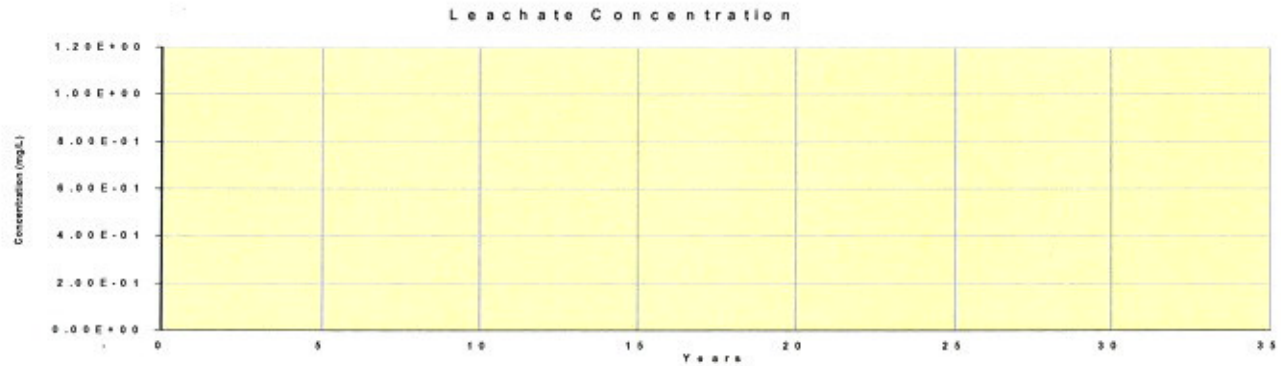
Chemical File: Lead And Compounds (Kd)
C:\SEVIEW63\LEADANDC.CHM

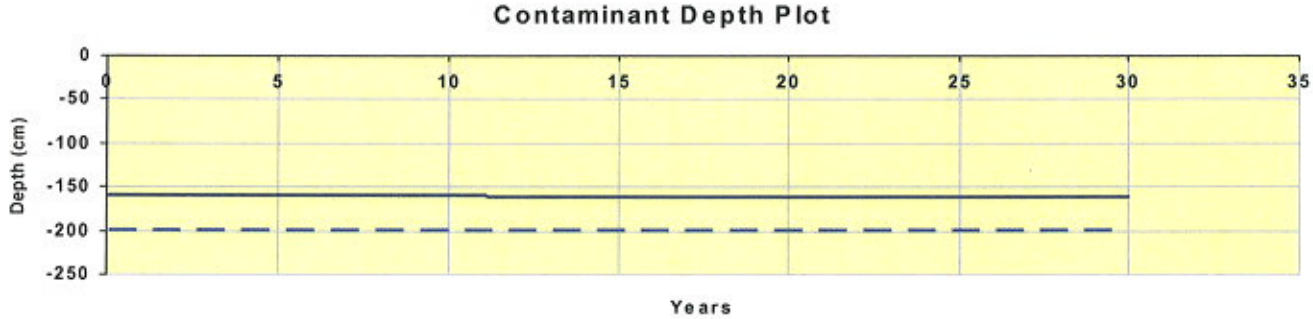
Soil File: Silty Sand, Perm = 1.3-5 cm/sec
C:\SEVIEW63\RAAP13\RAPSM13.SOI

Application File: SEVIEW Default Application Parameters
C:\SEVIEW63\RAAP13\SWMU13V3.APL

Starting Depth: 159.60 **cm**
Ending Depth: 160.80 **cm**
Total Depth: 198.00 **cm**







Attachment 4

SSL Calculations

Site-Specific SL for Benzo(a)anthracene (using C_w = T-RBC)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	2.9E-05	mg/L
C_w =	Target Leachate Conc =	2.9E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.09	--
H' =	Henry's Law Constant =	4.91E-04	--
P_b =	Dry Soil Bulk Density =	1.61	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	2.31E+05	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	2,310	L/kg
	Site-specific SSL =	**6.7E-01**	**mg/kg**

Site-Specific SL for Benzo(a)pyrene (using C_w = T-RBC)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	2.9E-06	mg/L
C_w =	Target Leachate Conc =	2.9E-05	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.09	--
H' =	Henry's Law Constant =	1.9E-05	--
P_b =	Dry Soil Bulk Density =	1.61	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	7.87E+05	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	7,870	L/kg
	Site-specific SSL =	**2.3E-01**	**mg/kg**

Site-Specific SL for Benzo(b)fluoranthene (using C_w = T-RBC)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	2.9E-05	mg/L
C_w =	Target Leachate Conc =	2.9E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.09	--
H' =	Henry's Law Constant =	2.70E-05	--
P_b =	Dry Soil Bulk Density =	1.61	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	8.03E+05	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	8,030	L/kg
	Site-specific SSL =	**2.3E+00**	**mg/kg**

Site-Specific SL for Naphthalene (using C_w = T-RBC)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	1.40E-04	mg/L
C_w =	Target Leachate Conc =	1.40E-03	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.09	--
H' =	Henry's Law Constant =	1.8E-02	--
P_b =	Dry Soil Bulk Density =	1.61	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1.84E+03	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	18.4	L/kg
	Site-specific SSL =	**2.605E-02**	**mg/kg**

Site-Specific SL for Trichloroethene (using C_w = T-RBC)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	0.0017	mg/L
C_w =	Target Leachate Conc =	0.017	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.09	--
H' =	Henry's Law Constant =	4E-01	--
P_b =	Dry Soil Bulk Density =	1.61	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	67.7	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	0.677	L/kg
	Site-specific SSL =	**0.015**	**mg/kg**

Site-Specific SL for 2,4,6-TNT (using C_w = T-RBC)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	0.0022	mg/L
C_w =	Target Leachate Conc =	0.022	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.09	--
H' =	Henry's Law Constant =	1.9E-05	--
P_b =	Dry Soil Bulk Density =	1.61	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1,834	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	18.34	L/kg
	Site-specific SSL =	**0.408**	**mg/kg**

Site-Specific SL for 2,6-DNT (using C_w = T-RBC)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	0.037	mg/L
C_w =	Target Leachate Conc =	0.37	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.09	--
H' =	Henry's Law Constant =	3.1E-05	--
P_b =	Dry Soil Bulk Density =	1.61	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	371	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	3.714	L/kg
	Site-specific SSL =	**1.5**	**mg/kg**

Site-Specific SL for Nitroglycerin (using C_w = T-RBC)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	0.0037	mg/L
C_w =	Target Leachate Conc =	0.037	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.09	--
H' =	Henry's Law Constant =	4.0E-06	--
P_b =	Dry Soil Bulk Density =	1.61	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	131	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	1.31	L/kg
	Site-specific SSL =	**0.056**	**mg/kg**

Geiger.William@epamail.epa.gov
03/29/10 04:03 PM

To "McKenna, Jim J Mr CIV USA AMC" <jim.mckenna@us.army.mil>
cc diane.wisbeck@arcadis-us.com, "jim spencer" <james_o_spencer@urscorp.com>, "Parks, Jeffrey N" <Jeffrey.Parks@shawgrp.com>, jerome.redder@atk.com,
bcc
Subject RTCs - SWMU 13 RFI Comments

Jim, here are EPA/VDEQ responses to Radford's responses to comments (RTCs) (Feb 10, 2010) for the SWMU 13 RFI. Any RTCs not noted below are acceptable.

1. EPA and VADEQ disagree that no hot spots for lead are present at SWMU 13. Two sample locations show lead concentrations that are substantially higher than lead levels reported in the remaining SWMU 13 samples. Acute risks associated with hot spot exposure should be evaluated, and to this end, EPA performed a risk analysis of these two areas. The Agency concludes that contact with conservatively drawn exposure areas of SWMU 13 is not expected to pose short term risks. However, in consideration of the substantially elevated lead result of 26,500 mg/kg for sample 13SB11B, institutional controls will be required to prevent future digging at this SWMU.

2. The data identified in this comment (1997 study) should be incorporated in the conceptual/mass balance model discussion of soil concentrations left in place and ramifications to river sediment concentrations, etc. How does this lead concentration compare to analyses from other nearby locations?

6. The response appears to be adequate and should be included in the report.

8 and 9. Figures 4-1 and 4-2 do not support the initial assumption that lead is the primary indicator for contamination at the study area. 12/15 samples exceeded residential screening levels with 2 above industrial. This is a much higher percentage of hits compared with the lead samples. In addition 8 of the 12 exceedances were at locations where lead was below screening levels.

10. Even though groundwater monitoring is being conducted as part of the OBG permit, SSLs are still appropriate for the evaluation of potential soil impact over the subject study area. The soil to groundwater pathway should still be evaluated as part of the overall assessment of the contaminated soils.

Please call or email me with any questions. Thanks

William A. Geiger
Remedial Project Manager
Office of Remediation (3LC20)
U.S. Environmental Protection Agency
1650 Arch Street
Philadelphia, PA 19103-2029
Phone: 215.814.3413
Geiger.William@epa.gov

Fro

"McKenna, Jim J Mr CIV USA AMC " <jim.mckenna@us.army.mil>
02/10/10 06:50 AM

To <Geiger.William@epamail.epa.gov>
cc <diane.wisbeck@arcadis-us.com>, "jim spencer" <james_o_spencer@urscorp.com>, "Parks, Jeffrey N" <Jeffrey.Parks@shawgrp.com>, <jerome.redder@atk.com>,
bcc
Subject SWMU 13 RFI Comments and Radford AAP responses for same (UNCLASSIFIED)

Classification: UNCLASSIFIED
Caveats: FOUO <<RTC USEPA Study Area at SWMU 13 RFI Comments.doc>>

Will, all,

Attached are RFAAP responses to the subject comments.

Thank you all for your support of the Radford AAP Installation Program.
Jim McKenna

-----Original Message-----
From: Geiger.William@epamail.epa.gov
[mailto:Geiger.William@epamail.epa.gov]
Sent: Tuesday, November 03, 2009 10:10 AM
To: McKenna, Jim J Mr CIV USA AMC
Cc: diane.wisbeck@arcadis-us.com; jim spencer; Parks, Jeffrey N;
jerome.redder@atk.com; jlcutler@deq.virginia.gov; Mendoza, Richard R Mr
CIV USA IMCOM; Timothy.Leahy@shawgrp.com; Tina_MacGillivray@URSCorp.com;
Meyer, Tom NAB02
Subject: SWMU 13 RFI Comments

Attached are EPA/VDEQ comments on the July 2009 SWMU 13 RFI Report.
Please call or email me with any questions. Thanks.

William A. Geiger
Remedial Project Manager
Office of Remediation (3LC20)
U.S. Environmental Protection Agency
1650 Arch Street
Philadelphia, PA 19103-2029
Phone: 215.814.3413
Geiger.William@epa.gov

Classification: UNCLASSIFIED
Caveats: FOUO

RTC USEPA Study Area at SWMU 13 RFI Comments.doc

Response to Comments (February 9, 2010)
Comments on the *Draft Study Area at Solid Waste Management Unit 13 RCRA Facility Investigation Report,* Radford Army Ammunition Plant (RFAAP), Virginia, dated July 2009 (RFI Report). Received November 3, 2009.

GENERAL COMMENTS

1. The RFI Report does not present a "hot spot" evaluation to determine whether there are localized areas of contamination that may require further evaluation or possible remediation. Section 1.5.1.1 of the *Final Work Plan Addendum 023 for RCRA Facility Investigation at Solid Waste Management Unit 13 (Work Plan Addendum 023)*, dated July 2008, states that additional soil sampling was required to further assess the nature and extent of lead in soil and to "identify any 'hot spot' areas with concentrations above the industrial [Action Level] AL." Section 4.2.3, Lead, of the RFI Report notes that lead was detected above its industrial Regional Screening Level (RSL) (800 milligrams per kilogram [mg/kg]) in six samples at the site, and above the residential RSL (400 mg/kg) in 21 samples at the site. The maximum concentration of lead in surface soil was reported as 8,620 mg/kg in sample 13SB8A and the maximum concentration of lead in subsurface soil was 26,500 mg/kg in sample 13SB11B, 4.5-5 feet. The RFI Report notes that "the majority of the 17 sample locations with lead concentrations above RSLs occur at discrete locations that are along or proximate to the perimeter berm of the [Open Burn Ground] OBG," however, it is unclear whether this area along the berm could be considered a "hot spot." Additionally, since limited soil data from the OBG were considered in this RFI (i.e., results of soil sampling required by the Subpart X Permit); it is unclear whether the lead contamination identified along the perimeter berm extends into the OBG. Revise the RFI Report to present a "hot spot" evaluation to determine any localized areas of contamination that may require further evaluation or remediation.

   Response: The study area itself is a strip of land approximately 40 feet wide located between the New River and an RCRA permitted unit (OBG). The study area cannot be developed since it is located in the 100-year flood plain and the slope of the terrain.

   The study area is not a typical disposal area. The study area itself was not an active area, but rather adjacent to an active area (OBG) and was potentially impacted by activities at the OBG. The original sampling plan was developed for the 1.6 acre area to provide sufficient data to identify any potential widespread elevated lead levels or "hot spots." The results of the investigation did not indicate widespread elevated lead levels or "hot spots." Since the study area was not an active site, "hot spot" areas would not occur within the study area from previous site activities. The maximum concentrations of lead detected in Samples 13SB8A and 13SB11B were collected during the SSP investigation and these concentrations were not replicated in any of the other SSP or RFI samples (181 samples) collected. These would be isolated elevated levels of lead within maximum approximate areas of 2,000 sq ft based on the grid sampling conducted.

   The lead concentrations detected along the berm were at discrete locations (Figures 4-1a and 4-1b) and do not indicate a "hot spot" due to no pattern or discernable distribution, but rather isolated elevated lead levels primarily above the residential screening level. Although these limited elevated lead levels were located proximate to the berm between

the study area and the OBG, per WPA 023 the soil within the OBG itself is regulated under the Subpart X permit and is therefore not assessed as part of this RFI.

Based on the results of the RFI, a "hot spot" evaluation for the site is not required due to the lack of identification of significant "hot spots" within the study area.

2. In the figures presented for the nature and extent of contamination evaluation in Section 4, sediment sample locations and results from previous investigations are not presented. However, showing the sediment sample locations (and in particular NRSE4, which reported a lead concentration of 4,415.58 mg/kg) in relation to the soil sample locations may help in understanding potential migration pathways for contaminants. Based on a cursory review of Figure 2-7, New River and Tributaries Study – 1997, which shows the location of sediment sample NRSE4, and Figure 4-1a, Extent of Lead in Soil, it appears that sample NRSE4 may have been located just downslope of some of the sample locations where soil exceedances were reported (e.g., 13SB8A, 13SB62A, etc.). Please revise the Section 4 figures to include the sediment sample locations in relation to the soil sample locations so that a complete evaluation of the nature and extent of contamination can be conducted.

   Response: During site visit conducted with the USEPA and VDEQ on the New River, the sediment sample locations were selected based on depositional areas within the river. Attributing chemicals detected in sediment samples to a specific source (such as the SWMU 13 study area) or sources is not possible for this RFI given the complex transient flow and depositional patterns in the river, and therefore, it is recommended that the sediment data be used holistically as part of any overall evaluations of the facility and potential receptors conducted for the RCRA Corrective Action Permit. Prior to the SSP/RFI, historical soil analytical data (1997) were considered screening level data and excluded from the risk assessment given the age of the data, the lack of available data validation reports/information, and the availability of sufficient newer validated sediment data to more appropriately characterize conditions.

3. The field sampling data sheets, included in Appendix C.3, indicate that refusal was encountered at many of the borings at shallow depths (<2 feet below grade). In several instances, refusal was encountered at 0.5 feet below grade or shallower (e.g., 13SB15, 13SB27, 13SB28, 13SB29, 13SB30, 13SB31, 13SB32, 13SB33, etc.) In these cases, only one surface soil sample was collected and submitted for laboratory analysis. In Work Plan Addendum 023, RAAP had proposed to collect up to two subsurface soil samples at each sample location. RAAP's Response to Comments on Work Plan Addendum 023, dated June 20, 2008, included at the beginning of Work Plan Addendum 023, stated in the response to Specific Comment 7 that "If refusal is encountered at a shallow or unexpected depth, soil digging bars, a slide hammer, or other similar device will be used to deepen the boring or verify refusal on bedrock. As appropriate, soil borings may be slightly offset to verify conditions or reach proposed target depths." The RFI Report does not indicate whether any of these methods were utilized in the field when shallow termination depths were encountered. Please revise the RFI Report to indicate whether any of the methods described in the Response to Comments were utilized in the field when shallow termination depths where encountered. Additionally, since surface soil samples were collected at many locations where subsurface soil

samples were proposed, describe implications of this deviation on achieving the investigation objectives. In particular, sample locations where RSL exceedances were reported in surface soil but deeper samples were not collected (e.g., 13SB63A) should be addressed.

Response: The RFI Report will be revised to provide information on actions taken when refusal was encountered at boring locations at depths substantially shallower than anticipated or planned. In general, a soil-digging bar was used to deepen the boring if possible or the boring was offset slightly in attempt to verify conditions or achieve a greater depth, if possible.

Shallow termination depths resulted in approximately 10 percent of the sample locations not having a subsurface sample where originally planned. The slight bias in the number of surface samples relative to subsurface samples is not considered to represent a significant constraint in achieving investigation objectives, given the likely historical release mechanisms from the adjacent OBG (surface release mechanisms rather than subsurface disposal) and low mobility of lead in soil that would tend to bias higher concentrations in surface soil.

4. According to the conceptual site model (CSM) (Figure 6-2), exposure routes associated with sediment and surface water were evaluated qualitatively. However, the qualitative assessment concerning these exposure media was not included in the HHRA. Revise the HHRA to include a detailed qualitative assessment concerning these exposure media as required by the MWP.

   Response: The following text will be added to Section 6.2.1: "Lead concentrations in New River sediment are below the human health residential SL of 400 mg/kg, with the exception of station NR-SED-16 (500 mg/kg) located downstream of the OBG, SWMU 54, and the RFAAP MMA. The mean concentration of lead for each sub-segment sampled and the entire reach sampled was below 400 mg/kg.

   The SWMU 54 RFI/CMS Report (URS 2008b) concluded that attributing lead and other metals detected in sediment samples to a specific source or sources is not possible for the RFI given the complex transient flow and depositional patterns in the river, and therefore, it is recommended that these data be used holistically as part of any overall evaluations of the facility and potential receptors conducted for the RCRA Corrective Action Permit.

   During the SWMU 54 RFI/CMS investigation, it was established that lead tends to partition to sediment rather than remain in surface water: therefore, the risk to human health receptors is considered minimal with regard to exposure to lead in surface water."

5. Section 6.4, Risk Characterization: This section refers to the default age-dependant adjustment factors that appear in USEPA 2005; however, a specific description of how risks were calculated for carcinogens that act via a mutagenic mode of action (MOA) should be included in the RFI (either in Section 6 or in Appendix E) to ensure that the RFI contains sufficient information to remain a stand-alone document. For the SWMU 13 Study Area, these compounds include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene. It is noted that Appendix E.3 contains

a Region 3 memo providing example calculations of the derivation of Risk Based Concentrations for MOA contaminants; however, this is not an actual site specific risk calculation.

Response: Appendix E.3 will be updated to provide an example site specific risk calculation for benzo(a)pyrene for the child resident, adult resident, and lifetime resident for total soil.

6. Response to comments on the Work Plan Addendum (WPA) 023 indicate that five (5) dioxin samples have been collected at the SWMU 13 Study Area; one sample in 2008 and four samples between 2005 to 2007. Therefore, please clarify in Section 6.0 why only one dioxin sample was used in the risk assessment. Further, Section 6.1.1.1, Surface Soil and Total Soil, indicates that only soil data from 2003 and 2008 were used in the risk assessment; however, it appears that soil samples were also collected between 2005 and 2007 (e.g., dioxin). Please revise Section 6.0 to provide the complete decision rationale for only using one dioxin sample in the risk assessment and, in general, why only data from 2003 and 2008 were used in the risk assessment.

   Response: Per the referenced response to comment (dated 6/20/2008) from the work plan (General Comment), "In addition to the surface soil sample collected as part of the SSP and analyzed for dioxin/furans, soil samples were collected semi-annually (2007) from two locations (SB-1 and SB2) within the study area as shown on Figure 1-10 and analyzed for dioxin/furans as a component of the Subpart X permit for the OBG. As presented in Table 1-4, the detected concentrations of dioxin/furan TEQs for these samples were below both the industrial and residential RBCs. Given that the detected concentrations for dioxin/furans for a total of five samples were below applicable screening levels, no additional sampling for dioxin/furans is necessary."

   The one sample used in the screening is the sample collected during the SSP investigation. The additional four dioxin/furan samples were collected as part of the Subpart X permit for the open burning ground and are screened in Table 2-4 of the RFI. The concentrations were below the applicable screening levels; therefore, would not result in the inclusion of dioxin/furans as a COPC.

SPECIFIC COMMENTS

7. **Table 3-1, Field Sample Identifiers, Depths, and Analytical Methods:** For the SWMU 13 RFI Soil Borings, it appears that only one sample was collected at soil boring location 13SB14 from 0-0.5 feet below grade. The field sampling data sheet for this boring, included in Appendix C.3, does not indicate that refusal was encountered at 0.5 feet, so it is unclear why additional deeper samples were not collected. Please revise the RFI Report to address this concern.

   Response: The refusal depth was inadvertently left off the field data sheet for 13SB14. The field data sheet will be revised to indicate a refusal depth of 0.5 ft bgs.

8. **Section 4.2.8, SVOCs, Page 4-4:** This section identifies the semi-volatile organic compounds (SVOCs) that were detected above RSLs, but it does not address the extent of

this contamination. Figures 4-2a and 4-2b, Extent of Organic COPCs in Soil, appear to show that the western and southern extents of this contamination have not been defined. No samples west or south of sample 13SB7A, which reported a benzo(a)pyrene exceedance, were analyzed for SVOCs. Please revise Section 4.2.8 to describe the extent of SVOC contamination at the site, and indicate whether the extent of SVOC contamination has been evaluated sufficiently in consideration of the data gap mentioned above.

Response: As stated in the response to comments (dated 6/20/2008) for the work plan (Comment #5), the selected locations reflect the objectives of verifying previous results, providing additional spatial data across the site to characterize site conditions, and providing sufficient data to characterize mean concentrations for risk assessment, while recognizing that lead will be used as the primary indicator to evaluate impacts from historical open burning ground activities and delineate the nature and extent of contamination." The calculated risk associated with the site did not indicate the need for further assessment on the basis of human health. In addition, lead was used as the primary indicator to evaluate impacts from the open burning ground and was sufficiently characterized for the site.

9. **Figure 4-2b, Extent of Organic COPCs in Soil** It does not appear that the extent of nitroglycerin in soil has been evaluated sufficiently. Sample 13SB13C detected nitroglycerin above the industrial RSL, but no samples were analyzed for this constituent east of this location, or at a depth greater than 6 feet below grade. Please revise the RFI Report to address this data gap.

   Response: As stated in the response to comments (dated 6/20/2008) for the work plan (Comment #5), the selected locations reflect the objectives of verifying previous results, providing additional spatial data across the site to characterize site conditions, and providing sufficient data to characterize mean concentrations for risk assessment, while recognizing that lead will be used as the primary indicator to evaluate impacts from historical open burning ground activities and delineate the nature and extent of contamination." The calculated risk associated with the site did not indicate the need for further assessment on the basis of human health. In addition, lead was used as the primary indicator to evaluate impacts from the open burning ground and was sufficiently characterized for the site.

10. **Section 5.1.4, Leaching of Chemicals From Soil to Groundwater, Page 5-3 and Page 5-4:** The individual evaluations for several of the contaminants of potential concern state that many of the contaminants (antimony, lead, thallium, polynuclear aromatic hydrocarbons, nitroglycerin) have not been identified as COPCs for the soil-to-groundwater migration pathway at the OBG adjacent to the RFI study area. However, it does not appear that site-specific data from the current RFI for the study area adjacent to the OBG were evaluated with respect to soil-to-groundwater migration screening levels (SSLs). EPA's Regional Screening Level Table includes Protection of Groundwater SSLs that can be used to evaluate the potential for leaching of chemicals to groundwater. Please revise the RFI Report to screen detected concentrations in soil against the Protection of Groundwater Soil Screening Levels. If exceedances are identified, evaluation of groundwater within the RFI study area may be warranted.

Response: As stated in Section 1.5.1.3 of approved WPA 023, "Groundwater in the area of OBG is currently being evaluated under the facility's Subpart X permit issued by the Virginia Department of Environmental Quality (VDEQ) in October 2005. Groundwater monitoring and any required corrective action for groundwater will be addressed under the facility's Subpart X permit; therefore, groundwater will not be further investigated or addressed under this RFI." Soil samples were not assessed with respect to soil-to-groundwater migration screening levels since the constituents present within the study area would have originated from the open burning ground, the study area location immediately downgradient of the OBG, and the groundwater at the OBG is currently being addressed under the Subpart X permit.

Per previous discussions with the USEPA and VDEQ during the work plan development, it was agreed that the results of the Subpart X permit groundwater monitoring would be discussed within this RFI, but that soil with respect to risk to human ecological receptors would be the media of interest with regard to the RFI study area.

11. **Section 6.1.1, Data Summary, Page 6-2:** The third bullet on page 6-1 discusses how duplicate samples were incorporated into the risk assessment. According to Section 6.1.1, data from duplicate sample pairs are averaged and treated as one result, and if an analyte is detected in one of the sample pair, one-half the detection limit of the non-detect is averaged with the detected result. Since there is evidence that the compound is present in these cases, the actual method detection limit (MDL) should be used for averaging purposes, rather than one-half the MDL. Alternatively, the maximum duplicate concentration should be used in the risk analysis to be more protective. Please provide the rationale for not following either of these approaches.

    Response: This methodology has been utilized in past risk assessments. The non-detect result could be as low as zero or up to the MDL for the sample; therefore, it is considered appropriate and reasonably conservative to utilize ½ the MDL in averaging the result. Utilizing the MDL could consistently overestimate the risk. It is important to note that for statistical analysis the use of ½ the MDL for non-detects or in some cases a random number generator, which generates random numbers between 0 and the MDL, is recommended.

12. **Section 6.4.2, Background, Page 6-12:** A background analysis was conducted following the quantitative analysis of total risks. In general, statistical evaluations were conducted by comparing metals concentrations in soil at the study area of SWMU 13 to background concentrations presented in the RFAAP Facility-Wide Background Study Report prepared in 2001, with the exception of manganese. Although manganese in surface soil was demonstrated to be consistently lower than facility-wide background, a statistical evaluation of manganese in total soil was conducted using data from the RFI study area and the background area at SWMU 54. This evaluation concluded that the concentrations of manganese for total soil within the RFI study area were considered to be within background for alluvial soil and not indicative of effects from operational activities at the open burning ground (OBG) on the RFI study area. As presented, this conclusion is not well supported without additional information. The applicability of SWMU 54 background data is in question since the facility wide background data were relevant to

evaluate all metals in surface soil except for manganese. Further, based on the nature of activities conducted at SWMU 13 it is entirely possible that manganese found within the study area is site-related as the study area lies between the perimeter berm of the OBG and the north bank of the New River. While a berm is present to prevent runoff from the OBG into New River, combustion products could have migrated via air over the berm, deposited onto the soil, and subsequently entered New River via runoff; note these transport mechanisms were highlighted in Section 6.2.1 Conceptual Site Model/Receptor Characterization, page 6-4. Manganese is released into the environment from various sources including open burning (e.g.., fossil fuel combustion) (Agency for Toxic Substances & Disease Registry [ATSDR] 2009: http://www.atsdr.cdc.gov/toxprofiles/tp151.html, Toxicological Profile for Manganese). Please revise the HHRA to explain why the background data from SWMU 54 is more relevant to use when assessing manganese in total soil rather than basing conclusions on the facility-wide background data, which was applied to the rest of the metals in surface and total soil. Further, include a qualitative evaluation of manganese in Section 6.6 (Uncertainty Analysis) to explain the impacts of using SWMU 54 data over the facility-wide data for manganese in total soil.

Response: As presented in previous reports (SWMU 54, SWMU 45, SWMU 38, etc.), total manganese concentration in the alluvium tend to be higher than other soil on the plant. The manganese concentrations from SWMU 54 in the area located outside the fence, which was not impacted by previous activities at the site, were used in this comparison since this area is similar to the study area and located slightly downstream the study area. The elevated manganese concentrations are considered to be geologic in nature rather than site related.

13. **Section 6.6.4, Toxicological Data, Pages 6-16 and 6-17:** Section 6.6.4 indicates that provisional toxicity values were used for aluminum, antimony, arsenic, carbazole, cobalt, iron, thallium, vanadium and nitroglycerin. This section further states that some detected constituents (carbazole, dibenzofuran, and dimethylphthalate) do not have Regional RSLs and that provisional/surrogate toxicity values were not available for these COPCs with the exception of carbazole. For completeness, please revise the HHRA to discuss the appropriateness of using the provisional toxicity value for carbazole, provide the value and the source of the value (e.g., Human Health Affects Summary Table [HEAST]).

    Response: A discussion of the appropriateness of using a provisional value is discussed in the third to the last paragraph of Section 6.6.4. The second to the last sentence of the second to the last paragraph will be revised as follows: "Provisional/surrogate toxicity values were not available for these COCPs with the exception of carbazole for which a Human Health Affects Summary Table (HEAST) value from the 1997 table was used."

14. **Appendix E, Human Health Risk Assessment, Tables E.1-2.1 through E.1-2.3:** Please ensure these tables are revised to use the April 2009 RSLs or explain the impact of using an older version in the uncertainty analysis. Also, revise the footnotes of Tables E.1-2.1 and E.1-2.2 to clarify that the screening values for dioxins/furans are based on toxicity relative to 2,3,7,8-TCDD. While this process was described in Section 6.1.1, Data Summary, it would be helpful to provide a footnote in the aforementioned tables to clarify the screening process concerning dioxins/furans.

Response: The risk assessments were completed prior to the release of the April 2009 RSL table in May 2009. If an updated value (April 2009) changed significantly so that it would impact the conclusions for the site, an analysis of the effects of this change will be conducted. A discussion of the use of the September 2008 SLs versus the April 2009 SLs will be added to the uncertainties section of the report.

15. **Appendix E, Human Health Risk Assessment, Tables E.1-4.1a through E.1-4.1c:** It is unclear why an exposure factor (EF) of 50 days is being used for maintenance workers. Please note that the *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* dated December 2002 (SSL Guidance) indicates that an EF of 225 days should be used for outdoor workers in roles including, but not limited to, groundskeepers, gardeners, specified mechanics and repairers, non-specified mechanics and repairers, construction and maintenance workers, and painters. While it appears that maintenance workers at the SWMU 13 Study Area may not encounter the site this frequently, the RFI/CMS Report should include further rationale for reducing the EF of 225 days for maintenance workers to 50 days. At a minimum, an EF of 100 days is recommended as this value would be more protective and would be based on two days per week per year, with two weeks vacation. Please revise the HHRA to further support the professional judgment that 50 days would be more representative for a maintenance worker at this site by describing the anticipated type of maintenance work most likely to occur, or please revise the HHRA to use an EF of 100 days or 225 days for maintenance workers.

    Response: Note 1 on Table E.1-4.1a through E.1-4.1d will be revised as follows: "(1) Best professional judgment. Based on site maintenance conducted 1 day/week with 2 weeks/year vacation. This is considered a conservative exposure frequency based on the nature of maintenance activities likely conducted at the site which would include occasional mowing since the site not active."

16. **Section 7.1.1, Ecological Site Characterization, Page 7-2:** The text states that a Virginia Department of Game and Inland Fisheries survey identified two rare plant species (i.e., Midland Sedge and Shaggy False Gromwell) associated with grassland communities at RFAAP. Please specify if the plant communities at SWMU 13 have been evaluated for the presence of these two species.

    Response: The following text will be added to Section 7.1.1: "No threatened wildlife species or rare plant species were identified at the site."

17. **Section 7.3.1, Data Organization, Page 7-3:** This section did not describe how duplicate samples were handled. The descriptions in the "Location of maximum concentration" column in Table F.2-1 (SLERA Occurrences/Distributions – Surface Soil) suggest that duplicates were averaged together with the original sample. Please briefly describe in this section how duplicates were evaluated in the SLERA.

    Response: The following text will be added to Section 7.3.1: "Data from duplicate sample pairs are averaged and treated as one result. If an analyte is detected in one of the sample pair, one half the detection limit of the non-detect is averaged with the detected result and the result is considered detected."

18. **Section 7.6.2, Dose Rate Modeling Approach, Page 7-8:** The table in this section summarizes the chemicals which either had only NOAEL HQs above 1 or NOAEL and LOAEL HQs above 1 per receptor. One error was identified when the table was compared to Tables F.2-14 through F.2-23. The list of chemicals for the American Robin, which had a NOAEL above 1.0 did not include 2, 4, 6-Trinitroluene. Please revise this table accordingly.

    Response: Table will be revised to include 2,4,6-trinitrotoluene for the American Robin for an HQ above 1 for NOAEL only.

19. **Section 7.7, Risk Management – Scientific Management Decision Point (SMDP), Italicized Conclusion, Page 7-9:** The SMDP states that "Although metal concentrations in plants were above the screening levels, indications of chemical vegetative stress were not observed at the site." The lack of observable chemical vegetative stress is insufficient grounds for concluding no risk to the plant community. For example, it is not known if the local plant community shows a response in terms of lower species diversity, reduced growth, or other more subtle responses that might be observable when compared to an unimpacted reference location. Please discuss in the uncertainty section the limitations of the current conclusion on the lack of risk to the plant community. This additional information will help support risk management decision process.

    Response: The following text will be added to Section 7.8.3: "The qualitative nature of the conclusion of lack of risk to the plant community based on the lack of indicator of chemical vegetative stress and lush vegetation present at the site creates uncertainty since it is not known that if the local plant community shows a response in terms of lower species diversity, reduced growth, or other more subtle responses that might be observable when compared to an unimpacted reference location."

20. **Section 7.8, Exposure and risk uncertainty analysis, Page 7-9 and 7-10:** This section should be expanded to address issues associated with (a) the potential for additive toxic effects of exposure by wildlife receptors to site-related chemicals, (b) the qualitative nature of the evaluation of risk to the plant community, and (c) any concerns associated with listed plant species.

    Response: For part (a): The following text will be added to Section 7.8.6: "An HQ of less than one indicates that the contaminant alone is unlikely to cause adverse ecological effects. The potential for risk increases as the HQ increases above one. However, this result should be considered in the context of other characteristic of the exposure area. In addition, it should be noted that the calculation of chemical specific HQs does not account for multiple chemicals acting through the same exposure mechanism."

    For part (b): See Comment #19.

    For part (c): See Comment #16.

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Subject SWMU 13 RFI Comments

Attached are EPA/VDEQ comments on the July 2009 SWMU 13 RFI Report. Please call or email me with any questions. Thanks.

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SWMU 13 RFI Comments.doc

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GENERAL COMMENTS

1. The RFI Report does not present a "hot spot" evaluation to determine whether there are localized areas of contamination that may require further evaluation or possible remediation. Section 1.5.1.1 of the *Final Work Plan Addendum 023 for RCRA Facility Investigation at Solid Waste Management Unit 13 (Work Plan Addendum 023)*, dated July 2008, states that additional soil sampling was required to further assess the nature and extent of lead in soil and to "identify any 'hot spot' areas with concentrations above the industrial [Action Level] AL." Section 4.2.3, Lead, of the RFI Report notes that lead was detected above its industrial Regional Screening Level (RSL) (800 milligrams per kilogram [mg/kg]) in six samples at the site, and above the residential RSL (400 mg/kg) in 21 samples at the site. The maximum concentration of lead in surface soil was reported as 8,620 mg/kg in sample 13SB8A and the maximum concentration of lead in subsurface soil was 26,500 mg/kg in sample 13SB11B, 4.5-5 feet. The RFI Report notes that "the majority of the 17 sample locations with lead concentrations above RSLs occur at discrete locations that are along or proximate to the perimeter berm of the [Open Burn Ground] OBG," however, it is unclear whether this area along the berm could be considered a "hot spot." Additionally, since limited soil data from the OBG were considered in this RFI (i.e., results of soil sampling required by the Subpart X Permit); it is unclear whether the lead contamination identified along the perimeter berm extends into the OBG. Revise the RFI Report to present a "hot spot" evaluation to determine any localized areas of contamination that may require further evaluation or remediation.

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023, stated in the response to Specific Comment 7 that "If refusal is encountered at a shallow or unexpected depth, soil digging bars, a slide hammer, or other similar device will be used to deepen the boring or verify refusal on bedrock. As appropriate, soil borings may be slightly offset to verify conditions or reach proposed target depths." The RFI Report does not indicate whether any of these methods were utilized in the field when shallow termination depths were encountered. Please revise the RFI Report to indicate whether any of the methods described in the Response to Comments were utilized in the field when shallow termination depths where encountered. Additionally, since surface soil samples were collected at many locations where subsurface soil samples were proposed, describe implications of this deviation on achieving the investigation objectives. In particular, sample locations where RSL exceedances were reported in surface soil but deeper samples were not collected (e.g., 13SB63A) should be addressed.

4. According to the conceptual site model (CSM) (Figure 6-2), exposure routes associated with sediment and surface water were evaluated qualitatively. However, the qualitative assessment concerning these exposure media was not included in the HHRA. Revise the HHRA to include a detailed qualitative assessment concerning these exposure media as required by the MWP.

5. Section 6.4, Risk Characterization: This section refers to the default age-dependant adjustment factors that appear in USEPA 2005; however, a specific description of how risks were calculated for carcinogens that act via a mutagenic mode of action (MOA) should be included in the RFI (either in Section 6 or in Appendix E) to ensure that the RFI contains sufficient information to remain a stand-alone document. For the SWMU 13 Study Area, these compounds include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene. It is noted that Appendix E.3 contains a Region 3 memo providing example calculations of the derivation of Risk Based Concentrations for MOA contaminants; however, this is not an actual site specific risk calculation.

6. Response to comments on the Work Plan Addendum (WPA) 023 indicate that five (5) dioxin samples have been collected at the SWMU 13 Study Area; one sample in 2008 and four samples between 2005 to 2007. Therefore, please clarify in Section 6.0 why only one dioxin sample was used in the risk assessment. Further, Section 6.1.1.1, Surface Soil and Total Soil, indicates that only soil data from 2003 and 2008 were used in the risk assessment; however, it appears that soil samples were also collected between 2005 and 2007 (e.g., dioxin). Please revise Section 6.0 to provide the complete decision rationale for only using one dioxin sample in the risk assessment and, in general, why only data from 2003 and 2008 were used in the risk assessment.

SPECIFIC COMMENTS

7. **Table 3-1, Field Sample Identifiers, Depths, and Analytical Methods:** For the SWMU 13 RFI Soil Borings, it appears that only one sample was collected at soil boring location 13SB14 from 0-0.5 feet below grade. The field sampling data sheet for this boring, included in Appendix C.3, does not indicate that refusal was encountered at 0.5 feet, so it

is unclear why additional deeper samples were not collected. Please revise the RFI Report to address this concern.

8. **Section 4.2.8, SVOCs, Page 4-4:** This section identifies the semi-volatile organic compounds (SVOCs) that were detected above RSLs, but it does not address the extent of this contamination. Figures 4-2a and 4-2b, Extent of Organic COPCs in Soil, appear to show that the western and southern extents of this contamination have not been defined. No samples west or south of sample 13SB7A, which reported a benzo(a)pyrene exceedance, were analyzed for SVOCs. Please revise Section 4.2.8 to describe the extent of SVOC contamination at the site, and indicate whether the extent of SVOC contamination has been evaluated sufficiently in consideration of the data gap mentioned above.

9. **Figure 4-2b, Extent of Organic COPCs in Soil** It does not appear that the extent of nitroglycerin in soil has been evaluated sufficiently. Sample 13SB13C detected nitroglycerin above the industrial RSL, but no samples were analyzed for this constituent east of this location, or at a depth greater than 6 feet below grade. Please revise the RFI Report to address this data gap.

10. **Section 5.1.4, Leaching of Chemicals From Soil to Groundwater, Page 5-3 and Page 5-4:** The individual evaluations for several of the contaminants of potential concern state that many of the contaminants (antimony, lead, thallium, polynuclear aromatic hydrocarbons, nitroglycerin) have not been identified as COPCs for the soil-to-groundwater migration pathway at the OBG adjacent to the RFI study area. However, it does not appear that site-specific data from the current RFI for the study area adjacent to the OBG were evaluated with respect to soil-to-groundwater migration screening levels (SSLs). EPA's Regional Screening Level Table includes Protection of Groundwater SSLs that can be used to evaluate the potential for leaching of chemicals to groundwater. Please revise the RFI Report to screen detected concentrations in soil against the Protection of Groundwater Soil Screening Levels. If exceedances are identified, evaluation of groundwater within the RFI study area may be warranted.

11. **Section 6.1.1, Data Summary, Page 6-2:** The third bullet on page 6-1 discusses how duplicate samples were incorporated into the risk assessment. According to Section 6.1.1, data from duplicate sample pairs are averaged and treated as one result, and if an analyte is detected in one of the sample pair, one-half the detection limit of the non-detect is averaged with the detected result. Since there is evidence that the compound is present in these cases, the actual method detection limit (MDL) should be used for averaging purposes, rather than one-half the MDL. Alternatively, the maximum duplicate concentration should be used in the risk analysis to be more protective. Please provide the rationale for not following either of these approaches.

12. **Section 6.4.2, Background, Page 6-12:** A background analysis was conducted following the quantitative analysis of total risks. In general, statistical evaluations were conducted by comparing metals concentrations in soil at the study area of SWMU 13 to background concentrations presented in the RFAAP Facility-Wide Background Study Report prepared in 2001, with the exception of manganese. Although manganese in surface soil was demonstrated to be consistently lower than facility-wide background, a statistical

evaluation of manganese in total soil was conducted using data from the RFI study area and the background area at SWMU 54. This evaluation concluded that the concentrations of manganese for total soil within the RFI study area were considered to be within background for alluvial soil and not indicative of effects from operational activities at the open burning ground (OBG) on the RFI study area. As presented, this conclusion is not well supported without additional information. The applicability of SWMU 54 background data is in question since the facility wide background data were relevant to evaluate all metals in surface soil except for manganese. Further, based on the nature of activities conducted at SWMU 13 it is entirely possible that manganese found within the study area is site-related as the study area lies between the perimeter berm of the OBG and the north bank of the New River. While a berm is present to prevent runoff from the OBG into New River, combustion products could have migrated via air over the berm, deposited onto the soil, and subsequently entered New River via runoff; note these transport mechanisms were highlighted in Section 6.2.1 Conceptual Site Model/Receptor Characterization**,** page 6-4. Manganese is released into the environment from various sources including open burning (e.g.., fossil fuel combustion) (Agency for Toxic Substances & Disease Registry [ATSDR] 2009: http://www.atsdr.cdc.gov/toxprofiles/tp151.html, Toxicological Profile for Manganese). Please revise the HHRA to explain why the background data from SWMU 54 is more relevant to use when assessing manganese in total soil rather than basing conclusions on the facility-wide background data, which was applied to the rest of the metals in surface and total soil. Further, include a qualitative evaluation of manganese in Section 6.6 (Uncertainty Analysis) to explain the impacts of using SWMU 54 data over the facility-wide data for manganese in total soil.

13. **Section 6.6.4, Toxicological Data, Pages 6-16 and 6-17:** Section 6.6.4 indicates that provisional toxicity values were used for aluminum, antimony, arsenic, carbazole, cobalt, iron, thallium, vanadium and nitroglycerin. This section further states that some detected constituents (carbazole, dibenzofuran, and dimethylphthalate) do not have Regional RSLs and that provisional/surrogate toxicity values were not available for these COPCs with the exception of carbazole. For completeness, please revise the HHRA to discuss the appropriateness of using the provisional toxicity value for carbazole, provide the value and the source of the value (e.g., Human Health Affects Summary Table [HEAST]).

14. **Appendix E, Human Health Risk Assessment, Tables E.1-2.1 through E.1-2.3:** Please ensure these tables are revised to use the April 2009 RSLs or explain the impact of using an older version in the uncertainty analysis. Also, revise the footnotes of Tables E.1-2.1 and E.1-2.2 to clarify that the screening values for dioxins/furans are based on toxicity relative to 2,3,7,8-TCDD. While this process was described in Section 6.1.1, Data Summary, it would be helpful to provide a footnote in the aforementioned tables to clarify the screening process concerning dioxins/furans.

15. **Appendix E, Human Health Risk Assessment, Tables E.1-4.1a through E.1-4.1c:** It is unclear why an exposure factor (EF) of 50 days is being used for maintenance workers. Please note that the *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* dated December 2002 (SSL Guidance) indicates that an EF of 225 days should be used for outdoor workers in roles including, but not limited to, groundskeepers, gardeners, specified mechanics and repairers, non-specified mechanics and repairers,

construction and maintenance workers, and painters. While it appears that maintenance workers at the SWMU 13 Study Area may not encounter the site this frequently, the RFI/CMS Report should include further rationale for reducing the EF of 225 days for maintenance workers to 50 days. At a minimum, an EF of 100 days is recommended as this value would be more protective and would be based on two days per week per year, with two weeks vacation. Please revise the HHRA to further support the professional judgment that 50 days would be more representative for a maintenance worker at this site by describing the anticipated type of maintenance work most likely to occur, or please revise the HHRA to use an EF of 100 days or 225 days for maintenance workers.

16. **Section 7.1.1, Ecological Site Characterization, Page 7-2:** The text states that a Virginia Department of Game and Inland Fisheries survey identified two rare plant species (i.e., Midland Sedge and Shaggy False Gromwell) associated with grassland communities at RFAAP. Please specify if the plant communities at SWMU 13 have been evaluated for the presence of these two species.

17. **Section 7.3.1, Data Organization, Page 7-3:** This section did not describe how duplicate samples were handled. The descriptions in the "Location of maximum concentration" column in Table F.2-1 (SLERA Occurrences/Distributions – Surface Soil) suggest that duplicates were averaged together with the original sample. Please briefly describe in this section how duplicates were evaluated in the SLERA.

18. **Section 7.6.2, Dose Rate Modeling Approach, Page 7-8:** The table in this section summarizes the chemicals which either had only NOAEL HQs above 1 or NOAEL and LOAEL HQs above 1 per receptor. One error was identified when the table was compared to Tables F.2-14 through F.2-23. The list of chemicals for the American Robin, which had a NOAEL above 1.0 did not include 2, 4, 6-Trinitroluene. Please revise this table accordingly.

19. **Section 7.7, Risk Management – Scientific Management Decision Point (SMDP), Italicized Conclusion, Page 7-9:** The SMDP states that "Although metal concentrations in plants were above the screening levels, indications of chemical vegetative stress were not observed at the site." The lack of observable chemical vegetative stress is insufficient grounds for concluding no risk to the plant community. For example, it is not known if the local plant community shows a response in terms of lower species diversity, reduced growth, or other more subtle responses that might be observable when compared to an unimpacted reference location. Please discuss in the uncertainty section the limitations of the current conclusion on the lack of risk to the plant community. This additional information will help support risk management decision process.

20. **Section 7.8, Exposure and risk uncertainty analysis, Page 7-9 and 7-10:** This section should be expanded to address issues associated with (a) the potential for additive toxic effects of exposure by wildlife receptors to site-related chemicals, (b) the qualitative nature of the evaluation of risk to the plant community, and (c) any concerns associated with listed plant species.

DEPARTMENT OF THE ARMY
US ARMY CENTER FOR HEALTH PROMOTION AND PREVENTIVE MEDICINE
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ABERDEEN PROVING GROUND MD 21010-5403

MCHB-TS-REH

31 AUG 2009

MEMORANDUM FOR Office of Environmental Quality, Radford Army Ammunition Plant (SJMRF-OP-EQ/Mr. Jim McKenna), P.O. Box 2, Radford, VA 24143-0002

SUBJECT: Draft RCRA Facility Investigation Report for SWMU 13, Radford Army Ammunition Plant, Virginia, July 2009

1. The US Army Center for Health Promotion and Preventive Medicine reviewed the subject document on behalf of the Office of The Surgeon General pursuant to Army Regulation 200-1 (Environmental Protection and Enhancement). We appreciate the opportunity to review this report.

2. We concur with the recommendation of no further action for this site as being protective of human health and the environment.

3. The document was reviewed by Mr. Dennis Druck, Environmental Health Risk Assessment Program. He can be reached at DSN 584-2953, commercial (410) 436-2953 or electronic mail, dennis.druck@us.army.mil.

FOR THE COMMANDER:

JEFFREY S. KIRKPATRICK
Director, Health Risk Management

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August 17, 2009

Mr. William Geiger
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Waste and Chemicals Management Division
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Philadelphia, PA 19103-2029

Mr. James L. Cutler, Jr.
Virginia Department of Environmental Quality
629 East Main Street
Richmond, VA 24143-0100

Subject: With Certification, Solid Waste Management Unit 13, RCRA Facility Investigation Report Draft July 2009
EPA ID# VA1 210020730

Dear Mr. Geiger and Mr. Cutler:

Enclosed is the certification for the subject document that was sent to you on July 30, 2009. Also enclosed is the 30 July 2009 transmittal email.

Please coordinate with and provide any questions or comments to myself at (540) 639-8658, Jerry Redder ATK staff (540) 639-7536 or Jim McKenna, ACO Staff (540) 731-5782.

Sincerely,

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09-815-136
JMcKenna

Concerning the following:

Radford Army Ammunition Plant

Solid Waste Management Unit 13
RCRA Facility Investigation Report
Draft July 2009

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

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TITLE: LTC, CM
Commanding

SIGNATURE:
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TITLE: Vice President and General Manager
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09-815-136
JMcKenna

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Subject: Fed Ex Number for Study Area at SWMU 13 RFI Report (UNCLASSIFIED)

Importance: High

Classification: UNCLASSIFIED
Caveats: FOUO

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Jim McKenna

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EXECUTIVE SUMMARY

URS Group, Inc. (URS) conducted a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) at the Radford Army Ammunition Plant (RFAAP) for Solid Waste Management Unit (SWMU) 13. SWMU 13 is an approximate 1.6 acre area located outside the current operational area of the RCRA Subpart X permitted open burning ground (OBG) between the OBG perimeter berm and the New River. The RFI was performed in accordance with the U.S. Environmental Protection Agency (USEPA) Region III and Virginia Department of Environmental Quality (VDEQ)-approved Master Work Plan (MWP) Addendum 023 (URS 2008a) and the requirements set forth in the 2000 RCRA permit for RFAAP (USEPA 2000).

The RFI was designed fill data gaps identified during the site screening process (SSP) investigation conducted in the RFI study area in 2003 (URS 2007a) and further evaluate potential releases to soil from historical activities at the adjacent OBG. The RFI assessed the nature and extent of lead in soil, which was identified in the SSP and previous investigations as the primary indicator chemical for evaluating releases to soil. A release and nature and extent assessment was conducted for other chemicals of potential concern (COPCs) identified during the SSP including explosives, nitroglycerin, semi-volatile organic compounds, and metals. Other objectives of the RFI were to assess the fate of detected chemicals, evaluate potential risks to human health and the environment, provide data to support the completion of a Corrective Measures Study (CMS), if required, and if possible, reach a final decision regarding what potential future action is warranted at the RFI study area.

Soil sampling with the RFI study area indicated that lead was the primary COPC based on limited detections of lead above the USEPA residential risk-bases screening level of 400 milligrams per kilogram ([mg/kg] 21 of 183 samples) and the USEPA industrial risk-based screening level of 800 mg/kg (6 of 183 samples). Most of the detections of lead above risk-based screening levels were in samples collected adjacent or proximate to OBG perimeter berm at isolated locations. Approximately 40 percent of these detections were closest to OBG Burning Pad 6. Other COPCs that were identified in soil included antimony, iron, thallium, four high molecular weight polynuclear aromatic hydrocarbons, and nitroglycerin. Groundwater monitoring conducted within the OBG adjacent to the perimeter berm has not indicated leaching of lead or other site COPCs from soil to groundwater at detectable levels. As presented in Section 4.4, based on the limited extent of chemicals in soil within the study area above RSLs, the low lying, lush vegetation present at the site (see photo log in Appendix A), and the percentage of ground cover (90%), the potential for RFI study area related releases from soil to the New River via runoff at levels of concern is not considered significant.

A human health risk assessment (HHRA) was performed to evaluate the potential human health effects associated with releases to soil in the RFI study area. Receptors evaluated included: current/future maintenance worker, current/future adolescent trespasser, hypothetical future construction worker, hypothetical future commercial worker, hypothetical future adult resident, hypothetical future child resident, and hypothetical future lifetime resident. Total carcinogenic risk calculated for each receptor was below or within USEPA's target risk range for Superfund sites (1E-06 to 1E-04, USEPA 1989). The results of the lead modeling predicted the probability of the receptors expected to have blood levels of 10 µg/dL or greater were below the established threshold of 5%. Total non-carcinogenic hazards after target organ segregation and consideration of background for all receptors were equal to or below the USEPA reference HI of 1E+00. The results of the human health risk assessment did not indicate a requirement for further action for soil in the RFI study area.

A screening level ecological risk assessment (SLERA) was performed to evaluate potential ecological risk associated with soil in the RFI study area. Receptors evaluated included soil invertebrates and microbes, plants, and terrestrial wildlife. The results of the screening level ecological risk assessment indicated there is adequate information to conclude that ecological risks were not significant at the RFI study area, and therefore, there was no need for further action for soil at the RFI study area on the basis of ecological risk.

Based on the results of the RFI, HHRA, and SLERA, no further action beyond the implementation of institutional controls to prevent future digging at the RFI study area is recommended. Institutional

controls (ICs) are being implemented at the RFI study area at SWMU 13 within the boundaries depicted on Figure 1-2. The objective of the ICs is to prevent future digging at the site. Specifically this site has been incorporated into plant management manual to ensure long-term protection of human health and the environment. The management manual provides for advance notice, assessment and approval of intrusive work that may occur within the plant with a general digging prohibition at sites such as this. In the event the property is transferred or leased, equivalent ICs will be put into terms and conditions of the deed or lease, which are no less restrictive than the IC objectives described above. Furthermore, the transferee or lessee will be responsible for ensuring IC compliance by any future users. However, the Army acknowledges the responsibility for all original liability under CERCLA and its right and responsibility to enforce ICs.

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RCRA FACILITY INVESTIGATION REPORT
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- G.2 2007-2008 Annual Soil Monitoring Report for the Open Burning Ground - March 2009

Appendix H Analytical Data Evaluation [CD]

- H.1 Data Quality Objectives
- H.2 Data Validation Reports and Laboratory Analytical Data (Form 1s)

LIST OF ABBREVIATIONS AND ACRONYMS

° .....Degree
°C .....Degrees Celsius
% .....Percent
AF .....Area Use Factor
AL .....Action Level
ALM.....Adult Lead Model
AOC .....Area of Concern
ATSDR .....Agency for Toxic Substances and Disease Registry
BAF.....Bioaccumulation Factor
bgs.....Below Ground Surface
BTAG.....Biological Technical Assistance Group
CDCP .....Center for Disease Control and Prevention
CDD .....Chlorinated Dibenzo-p-dioxins
CDF.....Chlorinated Dibenzofurans
CDI.....Chronic Daily Intake
CFR.....Code of Federal Regulations
cfs.....Cubic feet per second
cm/sec .....Centimeters Per Second
CMS .....Corrective Measures Study
CNS.....Central Nervous System
COPC .....Chemical of Potential Concern
COPEC.....Chemical of Potential Ecological Concern
DNT .....Dinitrotoluene
CSF .....Cancer Slope Factor
CSM .....Conceptual Site Model
DAF .....Dilution Attenuation Factor
DQO.....Data Quality Objective
ECSM.....Ecological Conceptual Site Model
EPC .....Exposure Point Concentration
EPIC.....Environmental Photographic Interpretation Center
ERAGS .....Ecological Risk Assessment Guidance for Superfund
ft.....Feet
ft/ft .....Feet per foot
GPS .....Global Positioning System
GI .....Gastrointestinal
HEAST.....Human Health Effects Assessment Summary Table
HHRA .....Human Health Risk Assessment
HHRS.....Human Health Risk Screening
HI .....Hazard Index
HQ.....Hazard Quotient
HSA .....Horseshoe Area
I-RBC.....Industrial Risk-Based Concentration
I-RSL .....Industrial Risk-Based Screening Level
IC .....Institutional Control
IDM.....Investigation-Derived Material
IEUBK .....Integrated Exposure Uptake Biokinetic
IRIS.....Integrated Risk Information System
LOAEL .....Lowest Observable Adverse Effect Level
MDC .....Maximum Detected Concentration
MDL.....Method Detection Limit
µg/dL.....Microgram per Deciliter

LIST OF ABBREVIATIONS AND ACRONYMS (CONTINUED)

mg/kg .....Milligrams Per Kilogram
µg/L.....Microgram Per Liter
mg/L.....Milligrams Per Liter
µg/m^3.....Microgram Per Cubic Meter
mg/m^3.....Milligram Per Cubic Meter
µm.....Micrometer
MMA .....Main Manufacturing Area
MRL.....Minimal Risk Level
MQAP.....Master Quality Assurance Plan
msl.....Mean Sea Level
MWP.....Master Work Plan
NCEA.....National Center for Environmental Assessment
NFA .....No Further Action
NOAEL.....No Observable Adverse Effect Level
NSV .....No Screening Value
OBG.....Open Burning Ground
PAH .....Polynuclear Aromatic Hydrocarbon
PCB.....Polychlorinated Biphenyl
PEF.....Particulate Emission Factor
PETN .....Pentaerythritol Tetranitrate
PPRTV.....Provisional Peer-Reviewed Toxicity Value
QA.....Quality Assurance
QC.....Quality Control
R-RBC .....Residential Risk-Based Concentration
R-RSL .....Residential Risk-Based Screening Level
RAGS.....Risk Assessment Guidance for Superfund
RBC .....Risk-Based Concentration
RCRA.....Resource Conservation and Recovery Act
RDA.....Recommended Daily Allowance
RFA.....RCRA Facility Assessment
RFAAP.....Radford Army Ammunition Plant
RfC.....Reference Concentration
RfD.....Reference Dose
RFI .....RCRA Facility Investigation
RL .....Reporting Limit
RSL .....Risk-Based Screening Level
SLERA.....Screening Level Ecological Risk Assessment
SM.....Silty Sand
SMDP.....Scientific/Management Decision Point
SMP .....Soil Management Program
SOP .....Standard Operating Procedure
SSL.....Soil Screening Level
SSP.....Site Screening Process
SVOC.....Semi-Volatile Organic Compound
SWMU .....Solid Waste Management Unit
TAL.....Target Analyte List
TCL.....Target Compound List
TEF .....Toxicity Equivalency Factor
TNT.....Trinitrotoluene

TRV .....Toxicity Reference Value
T-RBC.....Tap Water Risk-Based Concentration
UCL .....Upper Confidence Limit
URS.....URS Group, Inc.
USACE .....United States Army Corps of Engineers
USEPA.....United States Environmental Protection Agency
UTL.....Upper Tolerance Limit
VDEQ .....Virginia Department of Environmental Quality
VOC.....Volatile Organic Compound
WPA.....Work Plan Addendum

1.0 INTRODUCTION

This Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) report presents the results and findings of the investigations conducted at Solid Waste Management Unit (SWMU) 13, located in the Main Manufacturing Area (MMA) at the Radford Army Ammunition Plant (RFAAP), Radford, Virginia (Figure 1-1). The RFI study area at SWMU 13 is an approximate 1.6 acre area located outside the current operational area of the open burning ground (OBG) between the OBG perimeter berm and the New River (Figure 1-2). Previous investigations have been conducted at the OBG, which has been in operation since 1941 and was first identified as an area of concern in the RCRA Facility Assessment (RFA: USEPA 1987), but since 2005 the OBG has been regulated under a RCRA Subpart X permit issued by the Virginia Department of Environmental Quality (VDEQ). The RFI study area is the area adjacent to the OBG not addressed under the RCRA Subpart X Permit. The SMWU 13 RFI Work Plan is presented as Work Plan Addendum (WPA) 023, and incorporates, by reference, the elements of the RFAAP Master Work Plan (MWP) (URS 2003).

The work was conducted by URS Group, Inc. (URS) to fulfill the requirements set forth in the 2000 RCRA Corrective Action permit as tasked by the United States Army Corps of Engineers (USACE), Baltimore District. URS performed the RFI in accordance with the Master Work Plan (MWP) developed for RFAAP, Work WPA 023 (URS 2008a) to the MWP (URS 2003). These documents, approved by the United States Environmental Protection Agency (USEPA) Region III and the VDEQ, contain the Master Quality Assurance Plan (MQAP), the Master Health and Safety Plan (MHSP), and associated project-specific addenda.

The objective of this RFI is to evaluate potential releases in the RFI study area from historical operations at the adjacent OBG, assess the nature and extent of chemicals in soil located in the RFI study area, and evaluate potential risks to human health and the environment including potential future releases to the New River (Figure 1-2). Investigations will focus on soil conditions in this area and evaluate soil within the RFI study area as a potential source for future releases to the New River. Groundwater in the area of the OBG is currently being evaluated under the facility's Subpart X permit issued by the VDEQ in October 2005. Groundwater monitoring and any required corrective action for groundwater will be addressed under the facility's Subpart X permit; therefore, groundwater will not be further investigated or addressed under this RFI. Soil sampling and any required corrective action within the OBG also will be addressed under the facility's Subpart X permit; therefore, the soil located within the OBG will not be further investigated or addressed under this RFI. The RFI study area is the area adjacent to the OBG not addressed under the RCRA Subpart X Permit.

The additional investigation for this RFI will be to fill data gaps identified during the site screening process (SSP) investigation conducted in 2003 (URS 2007a) as follows:

- Further assessing chemical sources and the nature and extent of chemicals in soil within the RFI study area due to potential effects from the activities at the waste unit (OBG) located adjacent to the RFI study area;
- Assessing the fate of detected chemicals;
- Evaluating potential risks to human health and the environment;
- Provide data to support the completion of a Corrective Measures Study (CMS), if required; and
- If possible, reaching a final decision regarding what potential future action is warranted at the RFI study area.

Section 2.0 of this report presents site background information including: site history, physical setting, and previous investigation results. The RFI field investigation program is described in Section 3.0. Sufficient data was collected for the RFI to complete a Nature and Extent of Chemicals Assessment

(Section 4.0), Fate and Transport Evaluation (Section 5.0), Human Health Risk Assessment (HHRA) (Section 6.0), a Screening Level Ecological Risk Assessment (SLERA) (Section 7.0), and Conclusions and Recommendations (Section 8.0). The results of the risk assessments and fate and transport assessment did not indicate a requirement to complete a CMS for soil at the RFI study area and therefore, a CMS has not been prepared for this report.

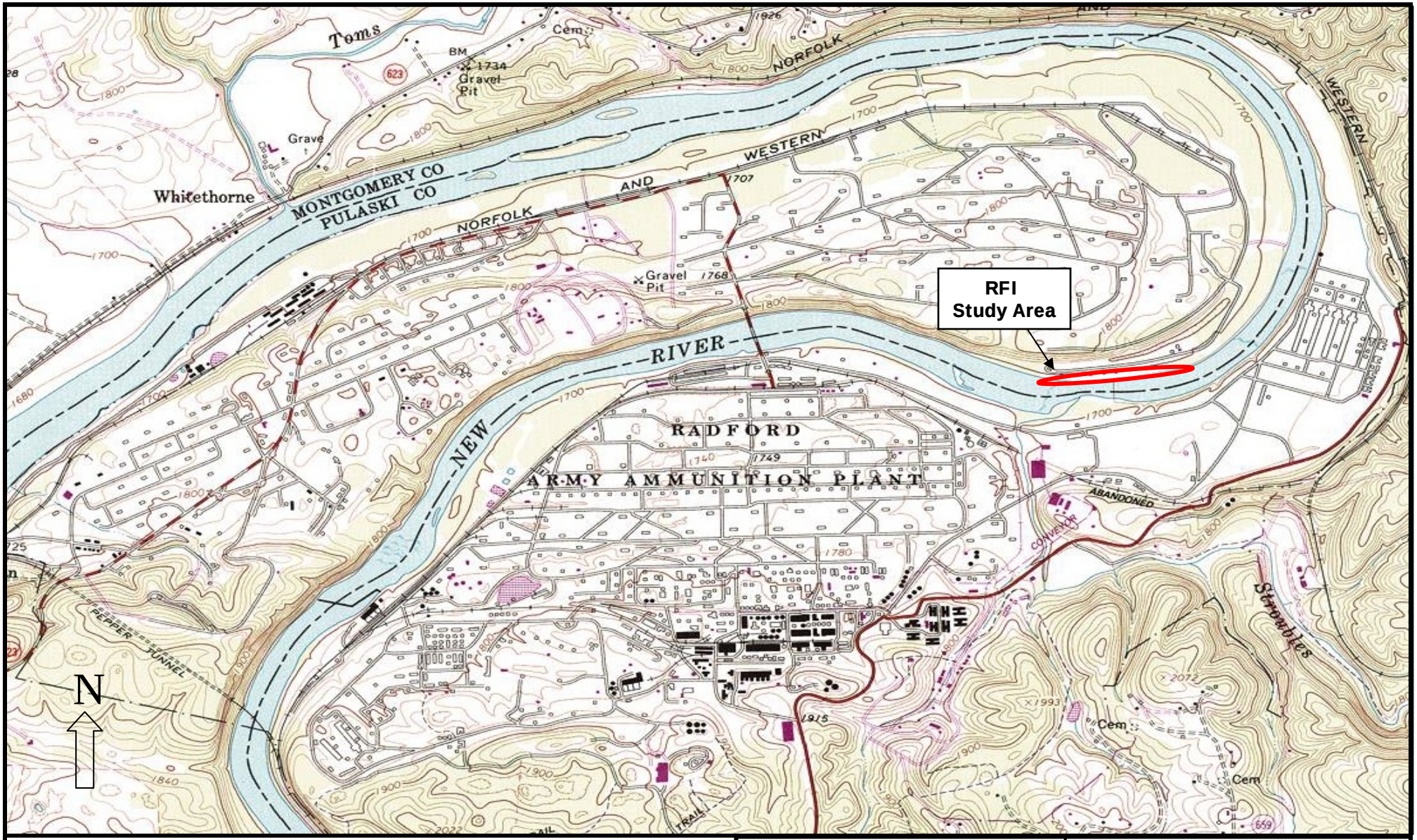

FIGURE 1-1
Site Location Map

Date: *January 2008*	**URS Project#:** *11656367*
Prepared by: *DBC*	**Approved by:** *JOS*
Scale: *1" = 2000'*	**File Name:** *Fig.1-1 SiteLayout*

Study Area at SWMU 13
RFI Report
Radford Army Ammunition Plant
Radford, Virginia

URS
URS Group, Inc.
5540 Falmouth Street,
Suite 201
Richmond, VA 23230

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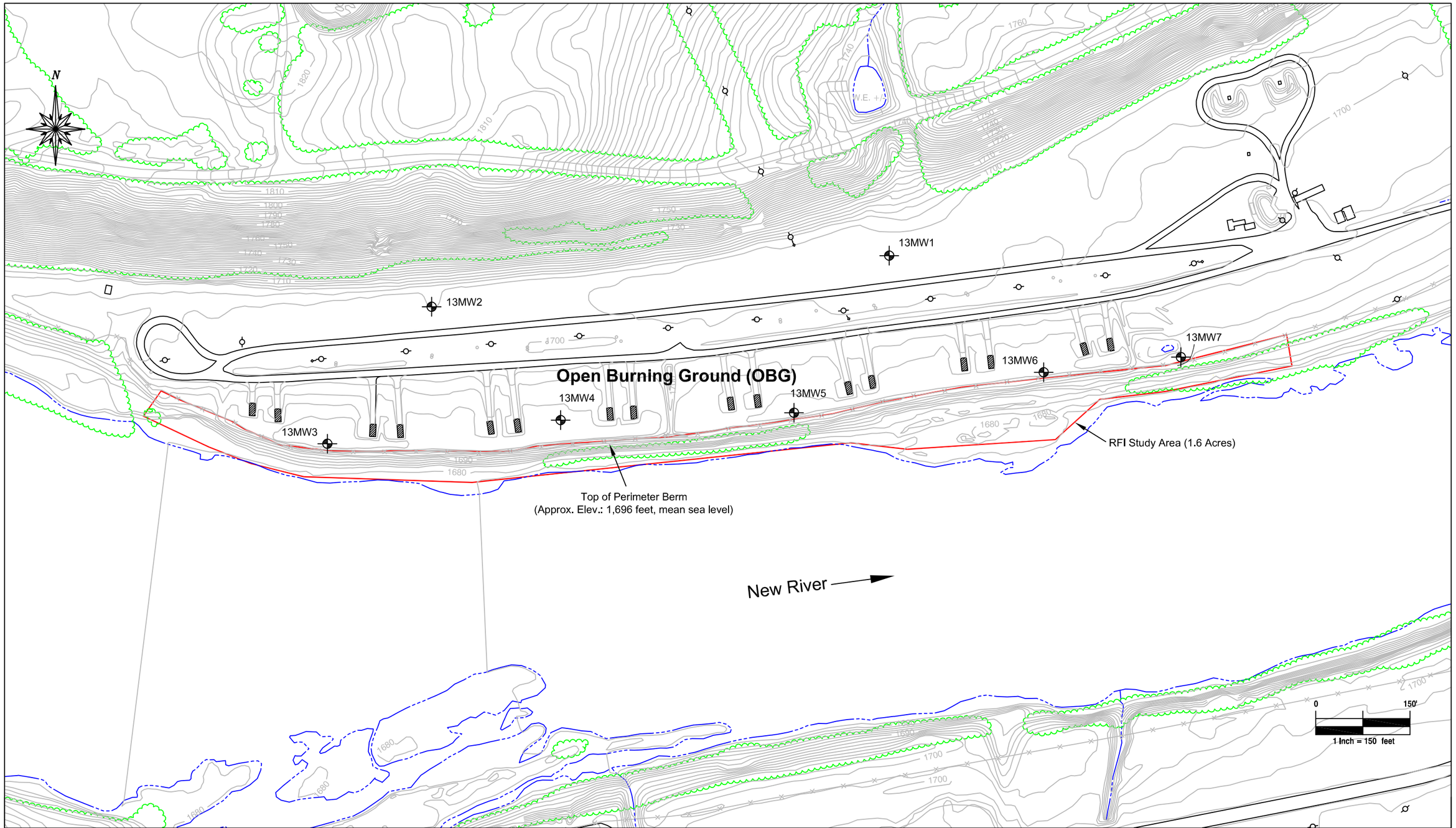

Legend

- Topographic Contour Line (feet, mean sea level)
- Surface Water
- Study Area Boundary
- Monitoring Well Location
- Vegetation
- Burning Pan
- Light/Electric Pole

FIGURE 1-2
Site Topographic Map

Date: January 2008	URS Project #: 11656367
Prepared by: DBC	Approved by: JOS
Scale: 1 inch = 150 feet	File Name: Fig.1-2 Site Topo

Study Area at SWMU 13

RFI Report
Radford Army Ammunition Plant
Radford, Virginia

URS Group, Inc.
5540 Falmouth Street
Suite 201
Richmond, Virginia 23230

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2.0 SITE BACKGROUND

2.1 SITE DESCRIPTION

2.1.1 Physiography

The RFI study area is located in the western section of the Horseshoe Area (HSA) between the perimeter berm of the OBG and the north bank of the New River. This area is approximately 1,700 feet (ft) long and 40 to 60 ft wide or approximately 1.6 acres; it slopes moderately to steeply from an elevation of approximately 1,690 ft above mean sea level (msl) to 1,680 ft msl (Figure 1-2). The RFI study area is vegetated with tall grass and stands of trees, and it is located in the 100-year flood plain of the New River. The study area is located topographically downhill from the OBG and likely received drainage from the OBG prior to the reconfiguration of the OBG to prevent runoff of stormwater outside the unit (see Section 2.1.3). A site photographic log is included in Appendix A.

2.1.2 Tanks/Structures

The RFI study area is undeveloped. A berm and the installation perimeter fence are located between the RFI study area and the OBG to the north. The OBG is equipped with eight pairs of burning pads. Each burning pad contains a metal burning pan, approximately 18 ft long by 6 ft wide by 1 ft deep, and a mobile temporary storage unit (wheeled covers to prevent rainwater accumulation in the pans). Waste material is burned in the pans. An office trailer is located east of the OBG.

2.1.3 Surface Water

The RFI study area is located adjacent to the New River. The OBG has several features to control and prevent runoff of storm water outside of the unit including a perimeter berm, drainage ditches, and a storm water retention basin (Figure 2-1). Other manholes, catch basins, storm drains, or drainageways are not located in the site area. Any storm water runoff from the RFI study area is expected to flow south toward the New River. The heavy vegetative cover within the RFI study area will allow for infiltration of precipitation.

2.1.4 Soil and Geology

The RFI study area is underlain by Wheeling sandy loam soil, which is found on alluvial terraces along the New River. This soil has moderate permeability and medium to strong acidity. Available water capacity of the soil is moderate and surface runoff is slow. This soil does not have a seasonally high water table within 60 inches of the surface (URS 2003).

Five direct push soil borings and eighty hand auger borings were completed within the RFI study area to a maximum depth of 13 ft below ground surface (bgs) to characterize soil and geologic conditions. Alluvial soil encountered in the borings consisted primarily of fine to medium, silty sand (SM), with an approximate one foot layer of clayey gravel encountered in two of the direct push borings immediately above the refusal depth. Nine representative soil samples from the soil borings were submitted to URS' testing laboratory in Totowa, New Jersey, for physical testing and soil classification. Five of these samples also were tested for total organic carbon by Trimatrix Laboratories, Inc. (Trimatrix). Physical test results are summarized in Table 2-1 and complete test results and reports are included in Appendix

C.1. Soil samples were classified as silty sand (SM), with the exception of the clayey gravel (GC) sample collected from the termination depth of 13SB7. Soil samples were slightly below neutral pH (5.9 to 6.9 for measurement with distilled water) with total organic carbon in the range of 0.47 to 1.1 percent (%). One soil collected from a depth of 2 to 3 ft bgs was tested for vertical hydraulic conductivity, with a value of 1.3E-05 centimeters per second (cm/sec) reported by the laboratory.

Carbonate bedrock of the Elbrook Formation underlies alluvium in the RFI study area. The depth to bedrock at monitoring wells 13MW3, 13MW4, 13MW5, and 13MW6 installed within the OBG inside the perimeter berm (adjacent to the RFI study area) ranges from approximately 13 to 17 ft bgs. The slope of the bedrock surface in the OBG area is south toward the New River at an approximate gradient of approximately 1.3% (Dames & Moore 1992). Depth to bedrock in the RFI study area is expected to be progressively shallower toward the New River due to the steeply sloping ground surface from the OBG perimeter berm toward the river.

2.1.5 Groundwater

A detailed discussion of regional and RFAAP hydrogeology is presented in Section 3.8 of the MWP (URS 2003). Within the OBG, an unconfined aquifer occurs within the lower portion of unconsolidated alluvial terrace deposits underlying the site; groundwater is also present within the underlying bedrock. Depth to groundwater ranges from approximately 12 to 20 ft bgs within the operational area of the OBG and becomes progressively shallower toward the New River due to the sloping ground surface. Groundwater was encountered at the completion depths of SSP borings 13SB7 (12 ft bgs) and 13SB8 (3.7 ft bgs).

Groundwater data presented in the 2008 Annual Groundwater Monitoring Report for the OBG (Draper Aden 2009a) indicates that groundwater flow direction in this area is generally southward toward the New River. An estimated groundwater flow velocity of 1.03 feet per year (ft/year) was calculated across the OBG area for 2008 based on average calculated hydraulic conductivity values of 6.56E-06 feet per second (ft/second), an average hydraulic gradient of 0.002 ft/ft, and an effective porosity of 0.40 for carbonate rock and clayey, silty sand, and gravel alluvium.

2.1.6 Site Background – History

Open burning of waste and off-specification energetic products has been performed continuously at the OBG since manufacturing operations began at RFAAP in 1941. Open detonation has not been conducted. A RCRA Subpart X Permit was issued by the VDEQ in October 2005 for open burning at OBG. This unit operated under interim status prior to issuance of the permit.

Material burned at OBG has consisted of waste explosives propellants, and laboratory waste. Three types of propellant wastes have been burned including single base (nitrocellulose), double base (nitrocellulose and nitroglycerin), and triple base (nitrocellulose, nitroglycerin, and nitroguandine), as described in the RFA conducted in 1987 (USEPA 1987). Burning of other energetic materials or burning-rate modifiers, such as lead, dinitrotoluene (DNT), or other organic and inorganic chemicals was not mentioned in the RFA.

Use of the current eight pairs of burning pads and their appurtenances started in 1985 (Dames & Moore 1992). Previously, wastes were burned in earthen pits (i.e., burn pits) at the same locations currently occupied by the burning pads. Burn residue is visually inspected for untreated energetic material. All untreated energetic material is returned to the pans for treatment. Treated burn residue is transferred to an accumulation area for off-site disposal. Composite samples of the burn residue are periodically analyzed for disposal characterization.

The current Subpart X Permit requires the performance of operational and maintenance procedures and actions within the OBG operational area to mitigate releases to the environment (soil) from burning activities. Periodic soil sampling is required under the permit to verify that releases to soil have not occurred above established risk-based levels.

The RFI study area is an approximate 1.6 acre area located outside the current operational area of the OBG between the OBG perimeter berm and the New River (Figure 1-2). The OBG currently operates under a RCRA Subpart X Permit issued by the VDEQ in October 2005. The RFI study area is the area adjacent to the OBG not addressed under the RCRA Subpart X Permit.

2.2 PREVIOUS INVESTIGATIONS

Previous investigations were conducted primarily at the OBG itself, but previous investigations as they relate to the RFI study area (and adjacent New River) are discussed in the following sections. Note that the data provided in the following sections is screened against USEPA Region III October 2007 risk-based concentrations (RBCs) as presented in WPA 023.

2.2.1 Installation Assessment (Aerial Photograph Interpretation) – 1992

The Environmental Photographic Interpretation Center (EPIC), under the direction of the USEPA, performed an assessment of multiple SWMUs at RFAAP using selected aerial photographs from 1937 to 1986 (USEPA 1992). The photogeologic analysis was performed to locate waste management areas, identify the location of sinkholes that existed prior to the construction of the RFAAP, and map fracture traces.

1949 Aerial Photograph (Figure 2-2)

EPIC first noted activity at the burning ground on a 1949 photograph (USEPA 1992). The western portion of the burning ground had been cleared and appeared to be active, with seven burning pits visible. Apparent earth berms were located between each burn pit. A three sided berm was visible between the western portion and the eastern portion of the burning ground; this area may have been used for staging materials or burning. The eastern portion of the burning ground was mostly vegetated with outlines of potential inactive burn areas visible. A single access road was visible along the northern edge of the burning ground area. The RFI study area between the burning ground and the New River was vegetated and undeveloped.

1962 Aerial Photograph (Figure 2-3)

The entire burning ground appears to be active in this photograph. Dark-toned areas were noted within several of the burn pit areas. The three-sided berm shown in the 1949 photograph was still apparent in the same configuration. EPIC noted probable light-tone liquid was present in the burning pit area west of the three-sided berm (USEPA 1992). The access road has been modified to include a loop through the burning ground in the same configuration used currently. The center portion of the RFI study area appeared to have less vegetation than in the 1949 photograph, with more complete vegetative cover still present in other areas.

1971 Aerial Photograph (Figure 2-4)

Eight burning areas were apparent in the photograph with earth berms separating each area. One side of the three-sided center berm observed in the 1962 photograph was still intact. A “light-toned” liquid/material was observed near the remaining berm and “probable liquid” was present along the southern boundary (USEPA 1992). EPIC indicated that the probable liquid was potentially from flooding/precipitation.

1981 Photograph (Figure 2-5)

An interpretation of this photograph was not presented in the EPIC Report. Pit burning was still apparent on this photograph. An earth berm was apparent between the burning ground and the RFI study area. The RFI study area between the burning ground and the New River remained undeveloped and was completely vegetated.

1986 Photograph (Figure 2-6)

The method of burning at the burning ground had been changed from "pit burning" to "pan burning" between the 1981 and 1986 photographs. Western and eastern burning areas were apparent, with a center earth berm separating each area. Each burning area had four burning pads with two pans. Buggy paths were visible for each pan. A perimeter earth berm was apparent along the eastern, southern, and west sides of the burning ground. Two areas of "light-toned" material were visible near the northern edge of the burning ground, and several areas of "staining" were visible along the northwestern and southern boundaries. A lagoon was apparent at the eastern edge of the burning ground (USEPA 1992). The RFI study area between the burning ground and the New River was undeveloped and vegetated.

2.2.2 New River and Tributaries Study – 1997

The objective of the New River and Tributaries Study was to provide data to evaluate migration pathways along the New River and its tributaries at RFAAP to assess potential adverse effects to human health and the environment (Parsons 1997). Two surface water/sediment stations were sampled in the New River near the RFI study area including NRSE4/NRSW4 located adjacent to the site area and NRSE14/NRSW14 located downstream of the site area (Figure 2-7). Surface water and sediment samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), explosives, and target analyte list (TAL) metals. Detected analytical results for sediment and surface water are summarized in Tables 2-2 and 2-3, respectively.

Metals and SVOCs were detected in sediment sample NRSE4 collected adjacent to the RFI study area. Lead was detected in this sample at a concentration (4,415.58 milligrams per kilogram (mg/kg)) above the USEPA Industrial screening level (SL) of 800 mg/kg, USEPA Region III Biological Technical Assistance Group (BTAG) freshwater sediment screening level (35.8 mg/kg), and facility background point estimates (26.8 mg/kg) for soil. Chromium was detected at a concentration (37.53 mg/kg) above its USEPA Region III adjusted residential risk-based concentrations (R-RBC), but below its BTAG freshwater sediment screening level and facility background point estimate for soil. SVOC compounds were detected in sample NRSE4 at concentrations below their adjusted RBCs, but several phthalate compounds were detected at concentrations above their USEPA Region III BTAG freshwater sediment screening values (Table 2-2).

Metals were detected in sediment sample NRSE14 collected downstream of the RFI study area. The lead concentration in this sample (104 mg/kg) was below the USEPA residential SL of 400 mg/kg. Levels of aluminum, iron, manganese, thallium, and vanadium detected in sample NRSE14 were above their R-RBCs but below facility background point estimates for soil (Table 2-2). Arsenic was detected at a concentration above its USEPA Region III adjusted industrial risk-based concentrations (I-RBC), but below its BTAG freshwater sediment screening level and facility background point estimate for soil. Iron, lead, manganese, and zinc were detected at concentrations above their USEPA Region III BTAG freshwater sediment screening levels, but below facility background point estimates for soil with the exception of lead and zinc.

Barium and lead were detected in surface water sample NRSW4 collected adjacent to the RFI study area at concentrations above their BTAG surface water screening levels but below their USEPA Region III human health risk-screening criteria (Table 2-3). Other target analytes were not detected in this sample. Target analytes were not detected in the downstream surface water sample NRSW14.

2.2.3 OBG Soil and Groundwater Monitoring for RCRA Subpart X Permit 2005-2008

Groundwater in the area of OBG is currently being evaluated under the facility's Subpart X permit issued by the VDEQ in October 2005. Groundwater monitoring and any required corrective action for groundwater will be addressed under the facility's Subpart X permit; therefore, groundwater will not be further investigated or addressed under this RFI.

A component of the permit for the OBG is a *Soil Monitoring Program for the Open Burning Ground* (EEE Consulting Inc. 2005), which is intended to monitor the unit for potential impact to surface soil resulting from open burning ground operations. Currently, soil sampling events are conducted semi-annually. In addition to sampling soil within the operational area, the soil monitoring program (SMP) requires collection of surface soil samples (0 to 0.5 ft bgs) from two locations (SB-1 and SB-2) within the RFI study area outside and south of the perimeter berm of the OBG (Figure 2-8). The permit requires comparison of soil sample results to industrial-based action levels (ALs) included in the permit to evaluate whether further actions are required at the site.

As presented in the *2007-2008 Annual Soil Monitoring Report: Open Burning Ground* (Draper Aden 2009b, Appendix G), soil samples collected from locations SB-1 and SB-2 are analyzed for VOCs by SW-846 Method 8260C, SVOCs by SW-846 Method 8270C, RCRA metals by SW-846 Methods 6010B/7471A, dioxin/furans by SW-846 Method 8290, explosives by SW-846 Method 8330, and nitroglycerin by SW-846 Method 8332 (Draper Aden 2009b). Available sample results for locations SB-1 and SB-2 for the 2007 and 2008 soil sampling events are summarized in Table 2-4 for detected compounds. Constituents were not detected in these samples above the ALs specified in the permit and organic constituents were not detected above there adjusted R-RBCs.

One VOC, bromomethane, was detected in 1 of 8 samples at a concentration below its adjusted R-RBC. Explosive compounds 2,4,6-trinitrotoluene (2,4,6-TNT), 2-amino-4,6-dinitrotoluene, and 4-amino-2,6-dinitrotoluene were detected in 1 of 8 samples collected at concentrations below their adjusted R-RBCs. Arsenic was detected in one or more samples at concentrations above its adjusted I-RBC, but below its facility background point estimate. Chromium was detected in one or more samples at concentrations above its adjusted R-RBC, but below facility background point estimate. Barium, cadmium, and selenium were detected in one or more samples at concentrations below their adjusted R-RBCs. Lead was detected in the samples at concentrations below the residential SL of 400 mg/kg. Dioxin/furans were detected in samples SB-1 and SB-2 at concentrations below the adjusted R-RBC for 2,3,7,8-tetrachlorodibenzodioxin (2,3,7,8-TCDD) expressed as toxicity equivalent quotient, when using the current toxicity equivalency factors (WHO 2005).

RFAAP began semiannual detection groundwater monitoring at the OBG after the Permit went into effect in October 2005. During Fourth Quarter 2005, carbon tetrachloride and perchlorate were detected at concentrations above their respective background concentrations, which required development of a Compliance Monitoring Program. As a result, during First Quarter 2006, all wells were sampled for the constituents listed in Appendix IX of 40 CFR Part 264 to determine the Compliance Monitoring List. The hazardous constituents detected during the initial Appendix IX analysis formed the basis for the Compliance Groundwater Monitoring List for the Unit.

As presented in *Calendar Year 2008 Annual Groundwater Monitoring Report: Open Burning Ground* (Draper Aden 2009a, Appendix G), groundwater monitoring activities for calendar year 2008 were conducted in accordance with the proposed *Groundwater Compliance Monitoring Plan* dated February 2007, including the annual monitoring of the point of compliance (POC) wells for the constituents listed in Appendix IX of 40 CFR Part 264. The groundwater analytical data for the calendar year 2008 semiannual monitoring events were evaluated in accordance with the procedures specified in the proposed *Groundwater Compliance Monitoring Plan*, including comparison to the proposed Groundwater Protection Standards. As the proposed *Groundwater Compliance Monitoring Plan* is pending final review for incorporation into the Permit, the groundwater analytical data for calendar year 2008 were also compared to the background concentrations for the OBG previously calculated in the *Constituent Background Values for the Compliance Groundwater Monitoring Program Constituents* dated December 20, 2006.

During the calendar year 2008 semiannual groundwater monitoring events, perchlorate was detected in POC well 13MW4 at concentrations greater than the proposed groundwater protection standard of 26 µg/L. Additionally, carbon tetrachloride was detected in POC well 13MW3 at a concentration greater than the proposed groundwater protection standard of 5 µg/L during Fourth Quarter 2008. As a result,

RFAAP is required to establish a Corrective Action Program for carbon tetrachloride and perchlorate that meets the requirements of 40 CFR Part 264.100. RFAAP has submitted a proposed Corrective Action Program for carbon tetrachloride and perchlorate, which is pending final review for incorporation into the Permit.

As presented in *Calendar Year 2008 Annual Groundwater Monitoring Report: Open Burning Ground* (Draper Aden 2009a), RFAAP will continue to monitoring groundwater at the OBG in accordance with the *Groundwater Compliance Monitoring Plan* until the Corrective Action Program is approved and implemented, at which time groundwater monitoring will be conducted in accordance with the Corrective Action and Groundwater Monitoring Program.

2.2.4 Site Screening Process Investigation Report – 2007

The SSP was designed using specific human health and ecological screening processes to assess: 1) whether releases of hazardous substances, pollutants, hazardous wastes, or hazardous constituents have occurred to the environment at the sites evaluated, and 2) whether further investigation or action (i.e., risk assessment, RFI, interim action), or no further action (NFA) is appropriate at a site.

The SSP investigation was conducted in September-October 2003 and included completion of one soil boring inside the OBG operational area (13SB12) and completion of five soil borings (13SB7 through 13SB11) within the RFI study area outside of the OBG operational area (between the perimeter berm of the OBG and the New River) to evaluate for the presence or absence of chemicals in soil (URS 2007a).

Figure 2-9 shows the five soil boring locations within the RFI study area. Three soil samples were collected from each of these borings (surface sample, intermediate depth, and terminal depth), except at 13SB8 where two samples were collected due to apparent groundwater encountered at a depth of 3.7 ft bgs. Soil samples were analyzed for target compound list (TCL) VOCs, TCL SVOCs, polynuclear aromatic hydrocarbons (PAHs), explosives (including nitroglycerin and pentaerythritol tetranitrate [PETN]), and TAL inorganics. One surface soil sample also was analyzed for TCL pesticides, TCL PCBs, herbicides, and TCL dioxin/furans.

Two pairs of surface water and sediment samples were collected from the New River adjacent to the site (Figure 2-9). Sample pair 13SW2/13SE2 was collected at the western end (upstream) of the site. Sample pair 13SW3/13SE3 was collected at the eastern end (downstream) of the site. Sediment and surface water samples were analyzed for TCL VOCs, TCL SVOCs, PAHs, explosives (including nitroglycerin and PETN), perchlorate (surface water), and TAL inorganics.

Two soil samples were collected for physical testing including: percent moisture, grain size, pH, total organic content, specific gravity, and bulk density. One sample was also tested for Atterberg limits and hydraulic conductivity. Analytical results for these samples are presented in Appendix C.1.

<u>Human Health Risk Screening</u>

The human health risk screening portion of the SSP consisted of the following components:

1. Identification of chemicals of potential concern (COPCs) via comparison of maximum detected concentrations (MDCs) to adjusted R-RBCs and I-RBCs;
2. Cumulative human health risk screening;
3. Chemical specific screening for lead and iron;
4. MDC comparison to soil-to-groundwater site screening levels (SSLs) (dilution attenuation factor [DAF] 20); and
5. Metals MDC comparison to background point estimates.

Ecological Risk Screening

The ecological risk screening portion of the SSP consisted of the following components:

1. Problem formulation including identification of chemicals of potential ecological concern (COPECs);
2. Exposure assessment;
3. Ecological effects assessment; and
4. Risk characterization.

Summary of Results

As presented in WPA 023, the results of the SSP investigation resulted in the identification of lead as the primary COPC and COPEC requiring further investigation and assessment at the site due to detected concentrations in soil that were above the industrial SL and ecological benchmarks. Benzo(a)pyrene was also identified as a COPC in soil due to detected concentrations above its adjusted R-RBC. Zinc was identified as a COPEC due to its detection above its ecological benchmarks and background point estimate. The SSP resulted in the recommendation of a focused RFI for soil within the RFI study area and sediment within the adjacent New River. The RFI was to focus on lead in soil and metals in sediment.

SSP boring 13SB12 was located within the OBG operational area in a retention pond that has been reconfigured since the SSP sampling event under the Subpart X permit. Therefore, due to the location of the boring, as well as, the construction in the area that occurred since the SSP sampling event, this sample was excluded from the RFI assessment. In WPA 023 (URS 2008a) Appendix D.1.2, the SSP screening was revised excluding 13SB12 and utilizing USEPA Region III October 2007 RBCs (current RBCs at the time of workplan development), which resulted in the identification of the following human health COPCs: metals with lead above its facility background point estimate, benzo(a)pyrene, and nitroglycerin. Figure 2-9 shows the sample results for COPCs identified in the revised human health screening and original COPECs above their background point estimates (inorganics only).

2.2.5 New River Investigation and Sampling for SWMU 54 RFI – 2008

Sediment sampling was conducted in the New River in November 2006 concurrent with the RFI conducted at SWMU 54. Sediment samples were collected from 23 stations in the New River along a reach of approximately 5.9 miles; the reach extended from approximately 3.4 miles upstream of SWMU 54 to a location approximately 2.4 miles downstream of SWMU 54, as shown on Figure 2-10. Sample locations were selected based on a desktop assessment of flood plain and hydrologic data (to identify locations where sediment deposition occurs) and a field reconnaissance by boat conducted by representatives of URS, the Army, USEPA, U.S. Fish and Wildlife, and the VDEQ. The purpose of the sediment sampling was to evaluate potential releases to the New River from historical activities at SWMU 54 and to assess overall sediment quality in the RFAAP area.

Sediment samples were analyzed for explosives and TAL metals along with total organic carbon, pH, and grain size analysis. Eight of the 23 samples were collected upstream of the OBG (NR-SED-1 through NR-SED-8). Three samples were collected adjacent to the RFI study area (NR-SED-9 through NR-SED-11), two samples (NR-SED-12 and NR-SED-13) were collected downstream of the OBG and upstream of SWMU 54, and nine samples were collected downstream of the OBG and SWMU 54. Sample results are summarized in Table 2-5. Lead results for the samples are shown on Figure 2-10 and summarized by segment in the following table.

Summary of Lead Sample Results for Sediment

		Lead Concentrations (mg/kg)		
River Segment	**Stations**	**Minimum**	**Maximum**	**Mean**
Upstream of the OBG	NR-SED-1 – NR-SED-8	43	160	87
Adjacent to RFI Study Area	NR-SED-9 – NR-SED-11	120	280	197
Downstream of the OBG and Upstream of SWMU 54	NR-SED-12 – NR-SED-14	86	100	105
Adjacent to SWMU 54	NR-SED-15	190	190	190
Downstream of the OBG, SWMU 54, and MMA	NR-SED-16 – NR-SED-23	82	500	198
Entire Segment Sampled	NR-SED-1 – NR-SED 23	43	500	147

As shown in Figure 2-10 and in the above table, lead concentrations in New River sediment are below the human health residential SL of 400 mg/kg, with the exception of station NR-SED-16 (500 mg/kg) located downstream of the OBG, SWMU 54, and the RFAAP MMA. The mean concentration of lead for each sub-segment sampled and the entire reach sampled was below 400 mg/kg. Detected lead concentrations in each sample were above the BTAG sediment screening value of 35.8 mg/kg.

2,4-Dinitrotoluene (2,4-DNT) was detected in the sediment sample NR-SED-8 collected across the New River (on the opposite river bank) from the western edge of the OBG at a concentration (1.4 mg/kg) above its BTAG sediment screening value but below its adjusted R-RBC. 2,4,6-Trinitrotoluene (2,4,6-TNT) was detected in sediment sample NR-SED-10 collected adjacent to the RFI study area at a concentration (0.24 mg/kg) above its BTAG sediment screening value but below its adjusted R-RBC. Explosives were not detected in the other sediment samples collected from the New River.

The SWMU 54 RFI/CMS Report (URS 2008b) concluded that attributing lead and other metals detected in sediment samples to a specific source or sources is not possible for the RFI given the complex transient flow and depositional patterns in the river, and therefore, it is recommended that these data be used holistically as part of any overall evaluations of the facility and potential receptors conducted for the RCRA Corrective Action Permit.

N

13MW1

13MW2

13MW3

13MW4

13MW5

13MW6

13MW7

Open Burning Ground (OBG)

Stormwater Retention Basin

Top of Perimeter Berm
(Approx. Elev.: 1,696 feet, mean sea level)

RFI Study Area (1.6 Acres)

New River

0 150'

1 Inch = 150 feet

Legend

- Topographic Contour Line (feet, mean sea level)
- Surface Water
- Study Area Boundary
- Stormwater Flow Direction
- Monitoring Well Location
- Vegetation
- Burning Pan
- Light/Electric Pole

FIGURE 2-1

Surface Water Drainage Map

Date: February 2009	URS Project #: 11656367
Prepared by: MRF	Approved by: JOS
Scale: 1 inch = 150 feet	File Name: Fig.2-1 SW Drainage

Study Area at SWMU 13

RFI Report

Radford Army Ammunition Plant
Radford, Virginia

URS Group, Inc.
5540 Falmouth Street
Suite 201
Richmond, Virginia 23230

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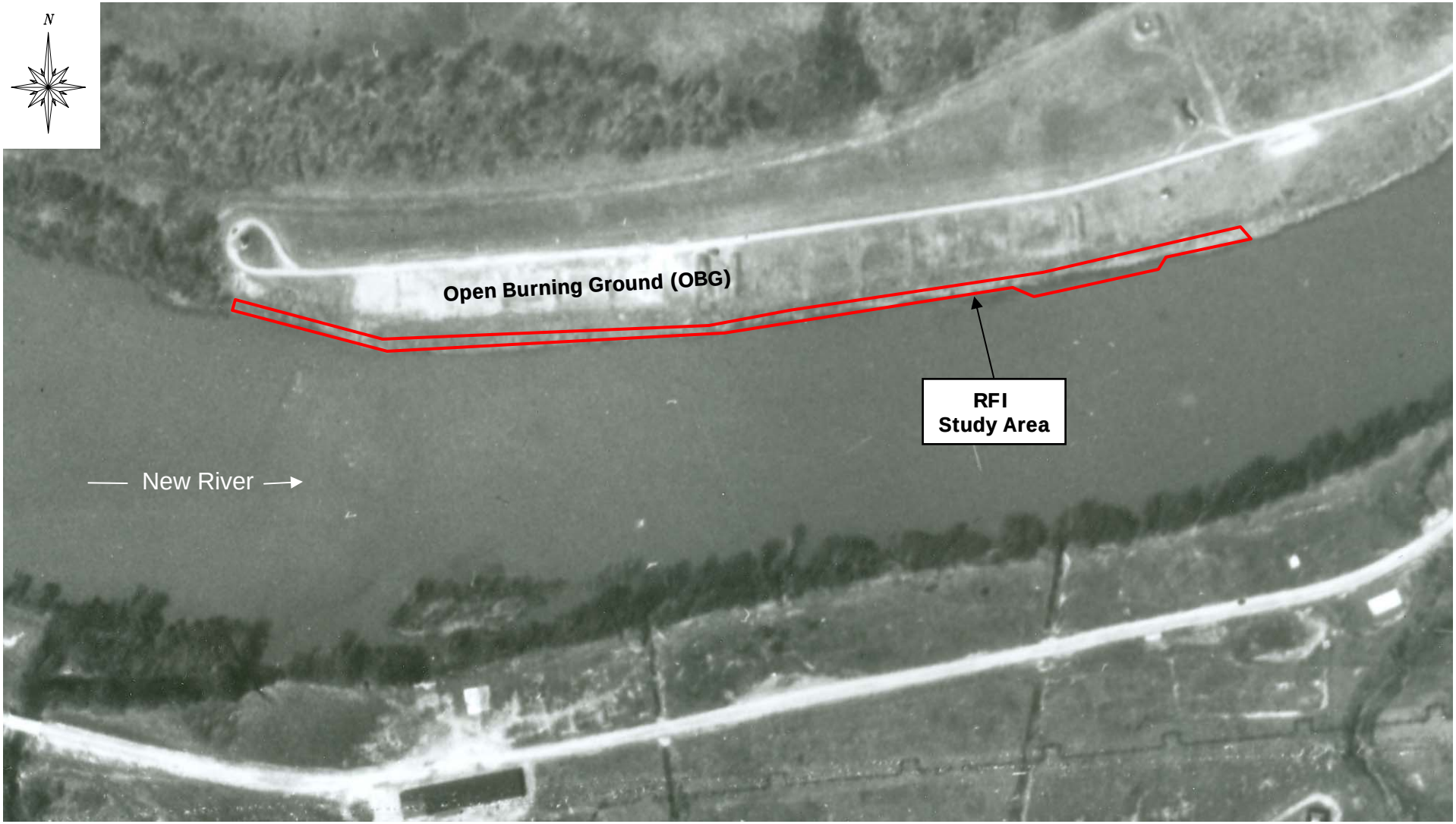

FIGURE 2-2
1949 Aerial

Date: *March 2009*	**URS Project #:** *11656367*
Prepared by: *MRF*	**Approved by:** *JOS*
Scale: *Not to Scale*	**File Name:** *Fig.2-2 1949 Aerial*

Study Area at SWMU 13
RFI Report
Radford Army Ammunition Plant
Radford, Virginia

URS
URS Group, Inc.
5540 Falmouth Street,
Suite 201
Richmond, VA 23230

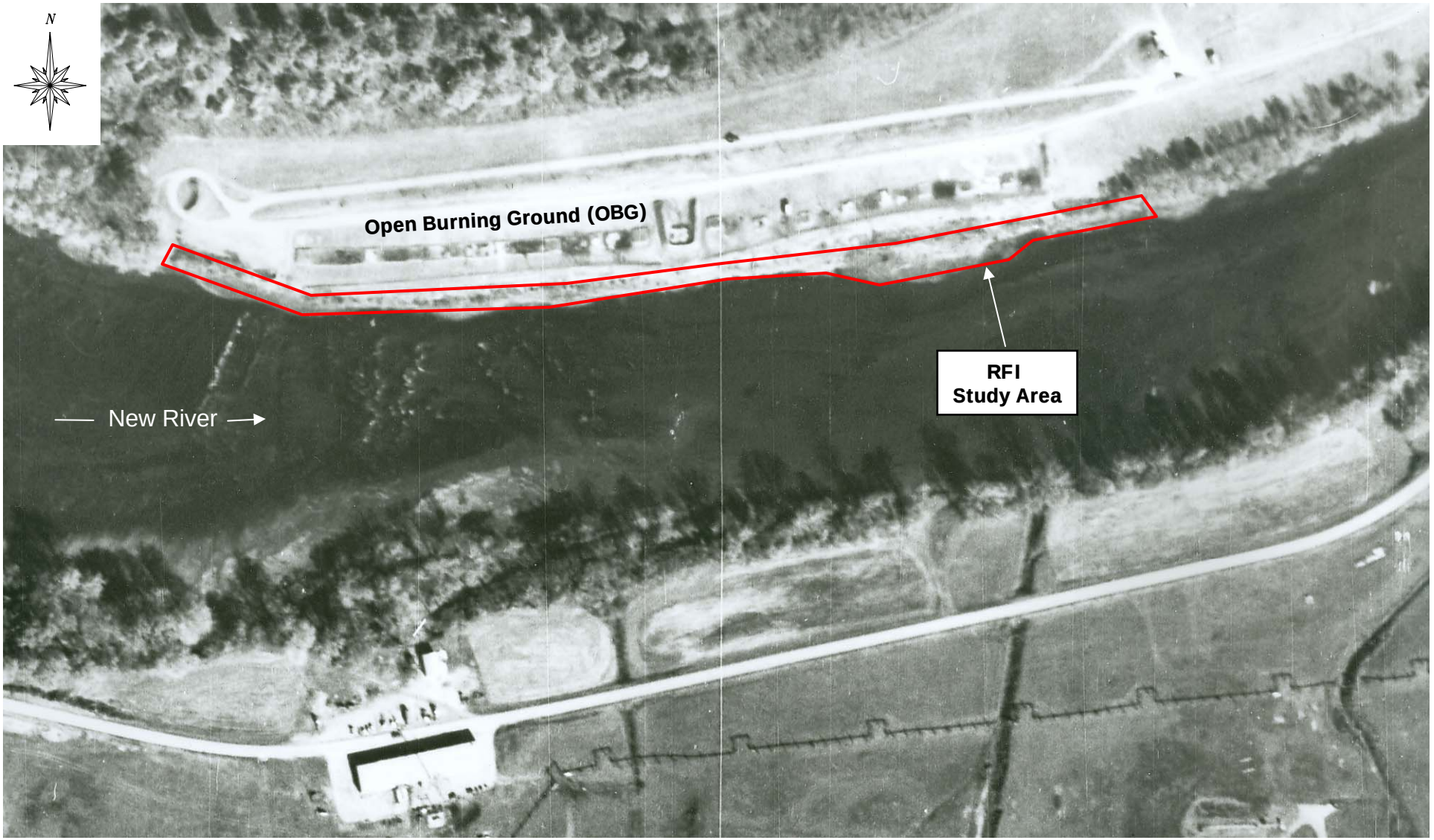

FIGURE 2-3
1962 Aerial

Date: *March 2009*	**URS Project #:** *11656367*
Prepared by: *MRF*	**Approved by:** *JOS*
Scale: *Not to Scale*	**File Name:** *Fig.2-3 1962 Aerial*

Study Area at SWMU 13
RFI Report
Radford Army Ammunition Plant
Radford, Virginia

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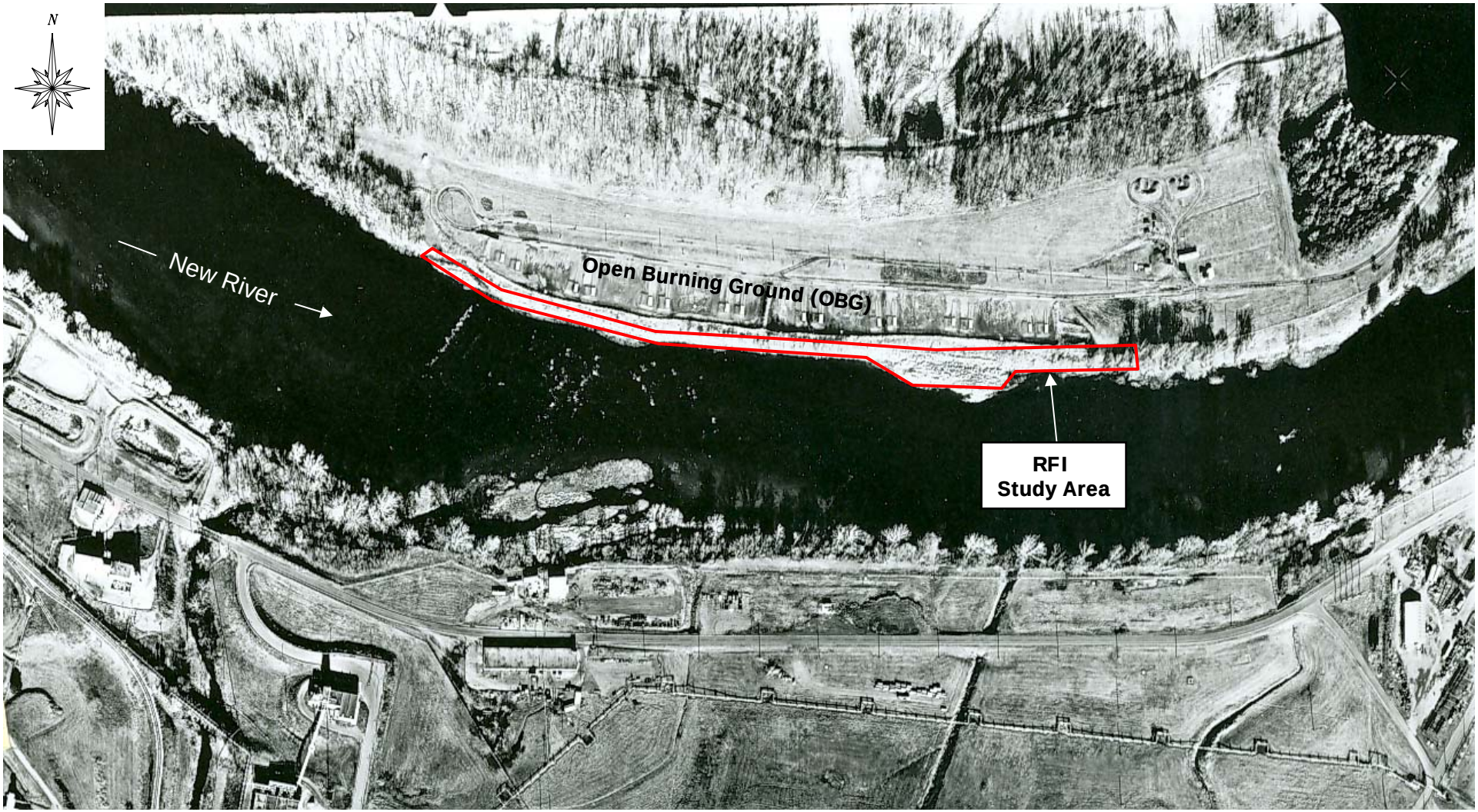

FIGURE 2-4
1971 Aerial

Date: *March 2009*	**URS Project #:** *11656367*
Prepared by: *MRF*	**Approved by:** *JOS*
Scale: *Not to Scale*	**File Name:** *Fig.2-4 1971 Aerial*

Study Area at SWMU 13
RFI Report
Radford Army Ammunition Plant
Radford, Virginia

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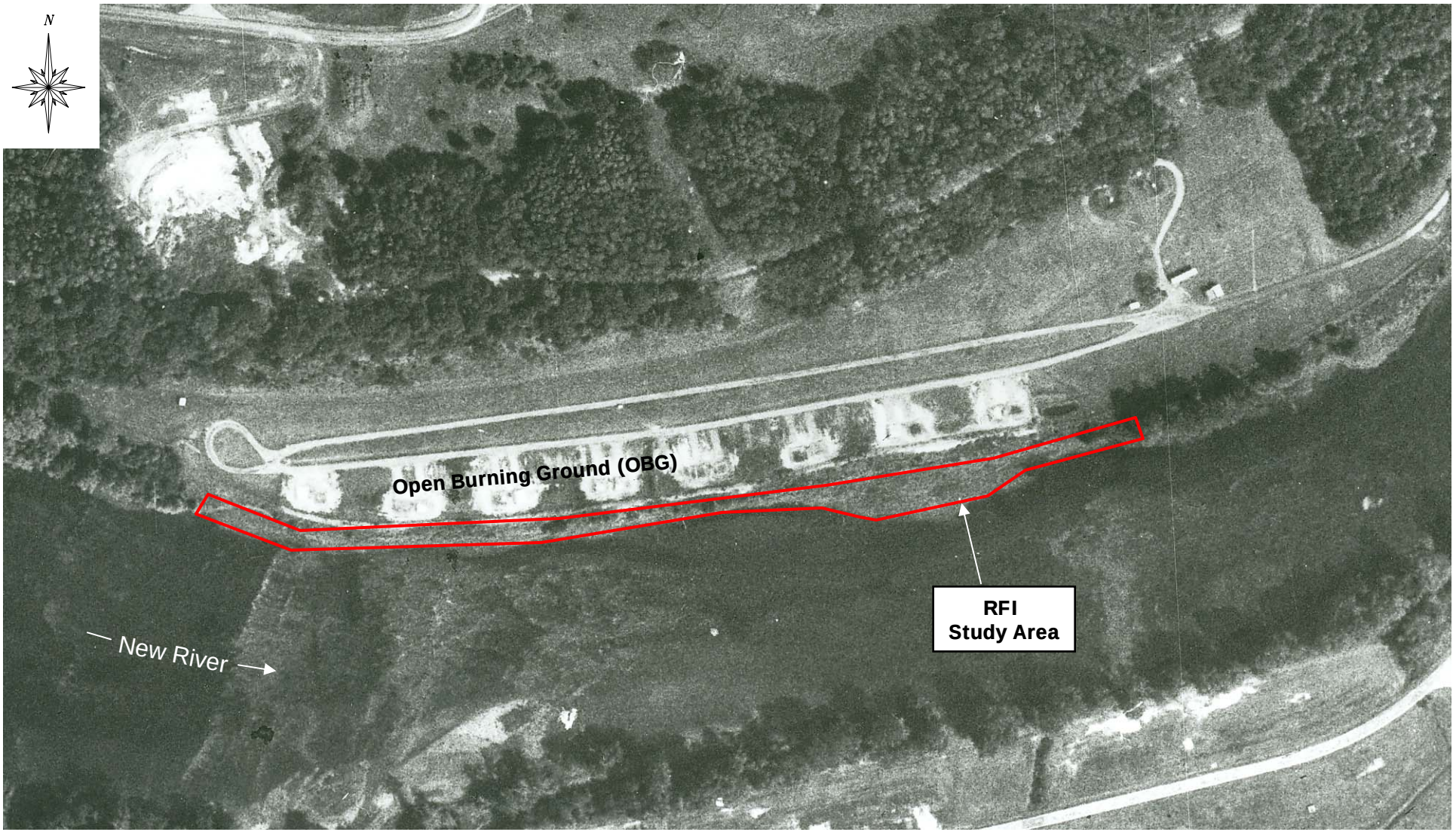

FIGURE 2-5
1981 Aerial

Date: *March 2009*	**URS Project #:** *11656367*
Prepared by: *MRF*	**Approved by:** *JOS*
Scale: *Not to Scale*	**File Name:** *Fig.2-5 1981 Aerial*

Study Area at SWMU 13
RFI Report
Radford Army Ammunition Plant
Radford, Virginia

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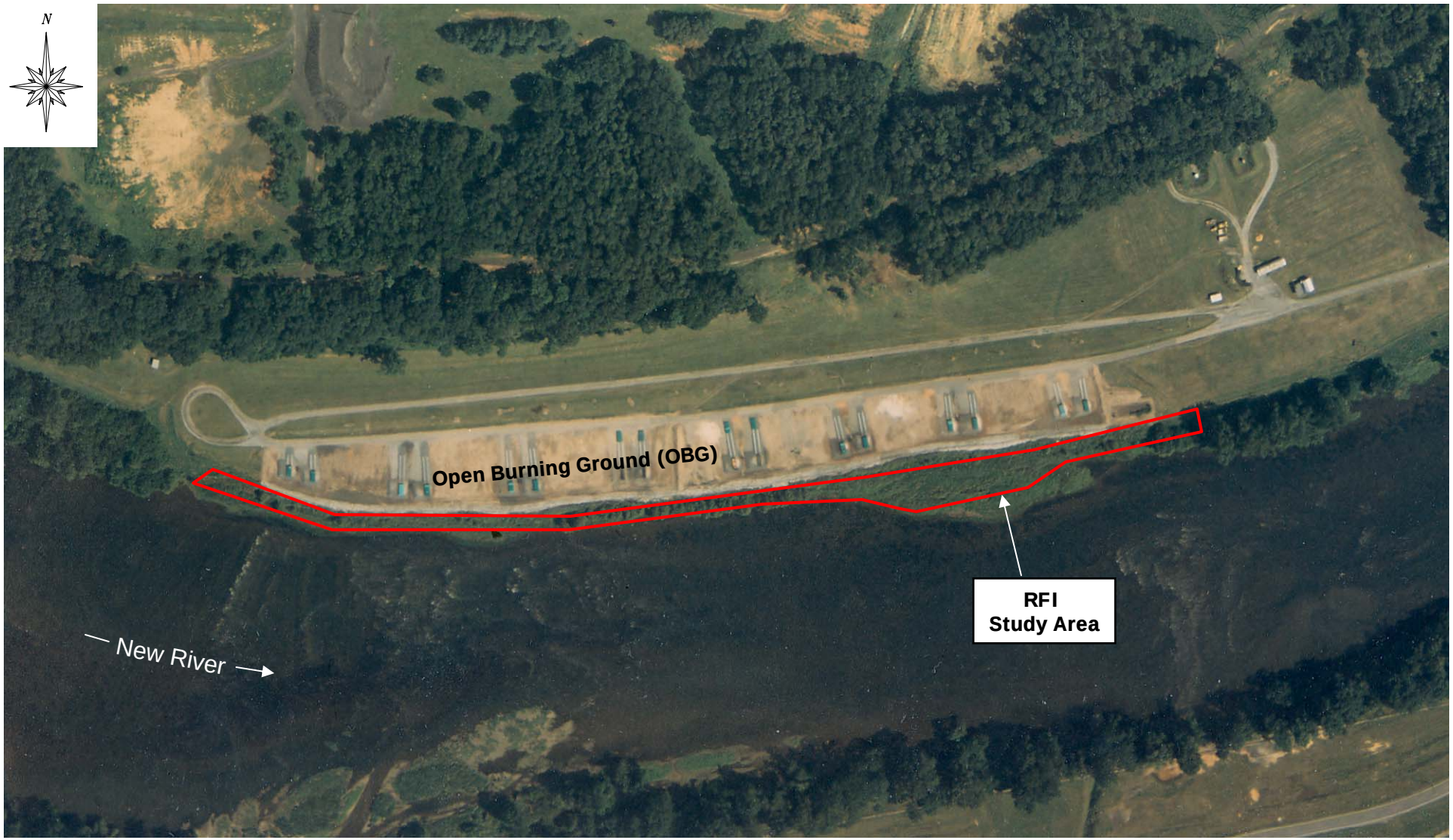

FIGURE 2-6
1986 Aerial

Date: *March 2009*	**URS Project #:** *11656367*
Prepared by: *MRF*	**Approved by:** *JOS*
Scale: *Not to Scale*	**File Name:** *Fig.2-6 1986 Aerial*

Study Area at SWMU 13
RFI Report
Radford Army Ammunition Plant
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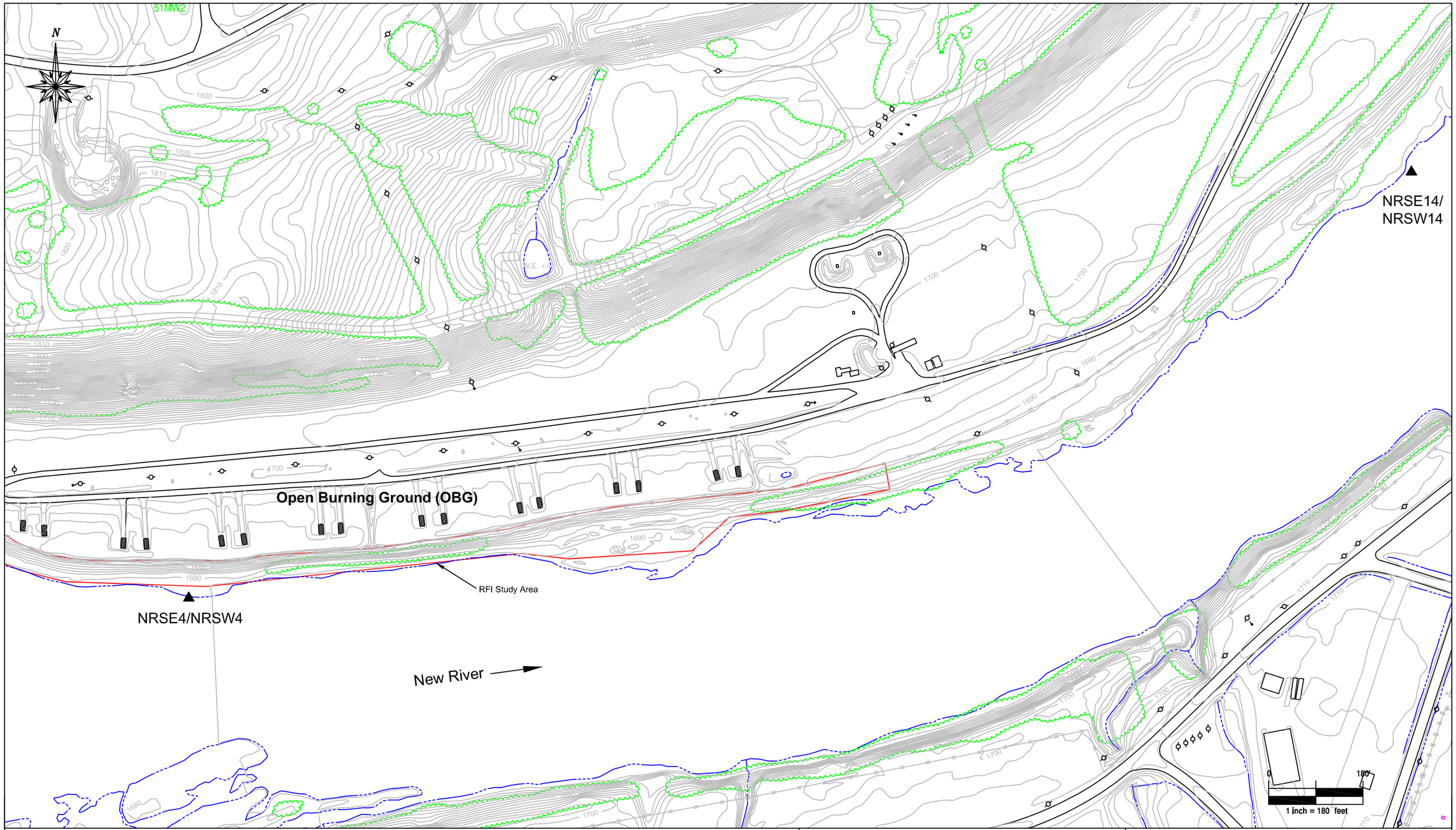

Legend

- Topographic Contour Line (feet, mean sea level)
- Surface Water
- Study Area Boundary
- Vegetation
- Burning Pan
- Light/Electric Pole
- Surface Water/Sediment Sampling Location

FIGURE 2-7

New River and Tributaries Study - 1997
Sample Locations

Date: March 2009	URS Project #: 11656367
Prepared by: MRF	Approved by: JOS
Scale: 1 inch = 180 feet	File Name: Fig.2-7 NR&Trib.Locs

Study Area at SWMU 13
RFI Report
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Radford, Virginia

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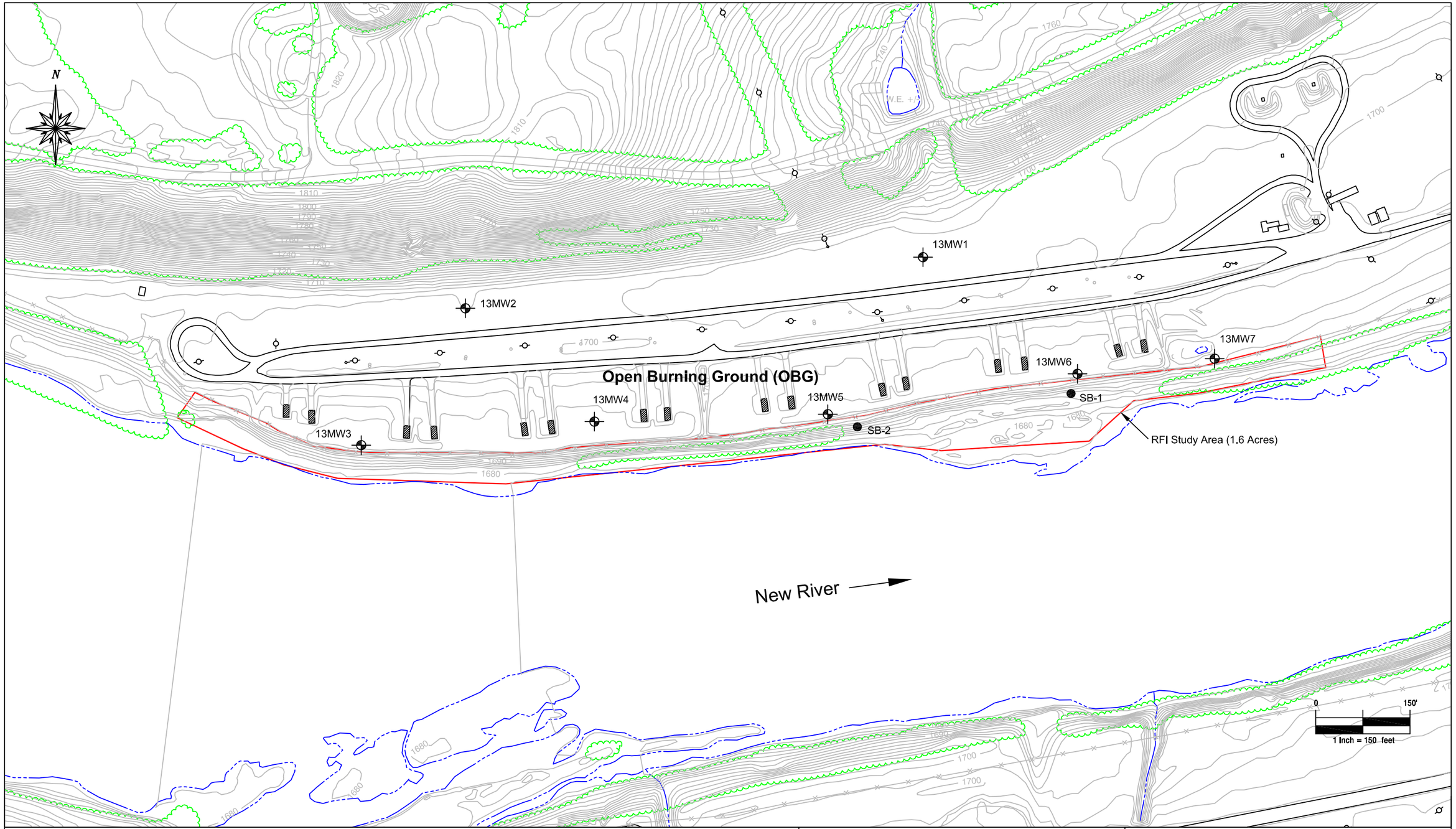

Legend

- Topographic Contour Line (feet, mean sea level)
- Surface Water
- Study Area Boundary
- Burning Pan
- Monitoring Well Location
- Soil Boring Location
- Vegetation
- Light/Electric Pole

FIGURE 2-8

OBG Groundwater and Soil Monitoring Locations - RCRA Subpart X Permit 2005-2007

Date: March 2009	URS Project #: 11656367
Prepared by: MRF	Approved by: JOS
Scale: 1 inch = 150 feet	File Name: Fig.2-8 RCRA Subpart

Study Area at SWMU 13
RFI Report
Radford Army Ammunition Plant
Radford, Virginia

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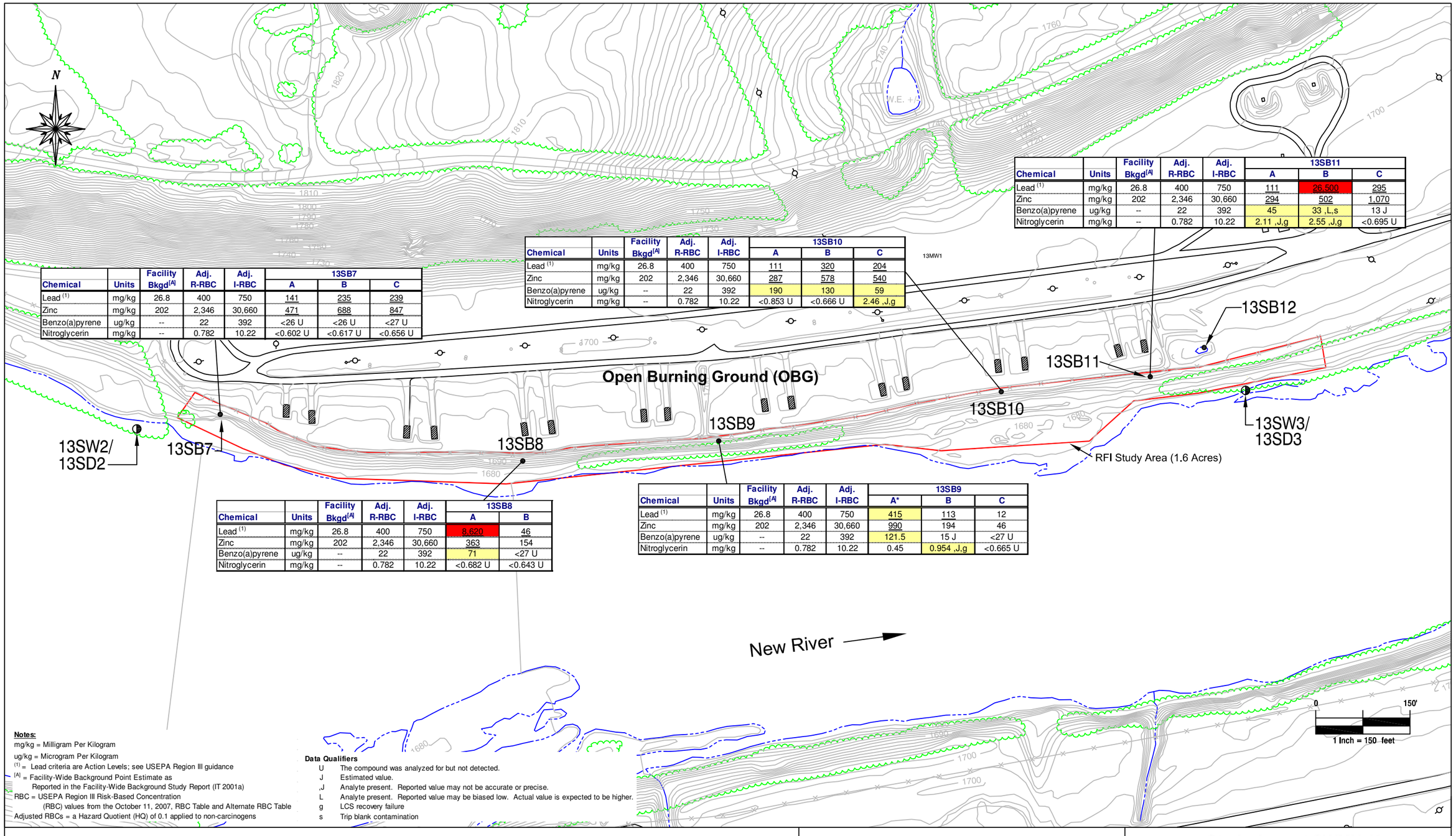

Chemical	Units	Facility Bkgd[A]	Adj. R-RBC	Adj. I-RBC	13SB7 A	13SB7 B	13SB7 C
Lead (1)	mg/kg	26.8	400	750	141	235	239
Zinc	mg/kg	202	2,346	30,660	471	688	847
Benzo(a)pyrene	ug/kg	--	22	392	<26 U	<26 U	<27 U
Nitroglycerin	mg/kg	--	0.782	10.22	<0.602 U	<0.617 U	<0.656 U

Chemical	Units	Facility Bkgd[A]	Adj. R-RBC	Adj. I-RBC	13SB10 A	13SB10 B	13SB10 C
Lead (1)	mg/kg	26.8	400	750	111	320	204
Zinc	mg/kg	202	2,346	30,660	287	578	540
Benzo(a)pyrene	ug/kg	--	22	392	190	130	59
Nitroglycerin	mg/kg	--	0.782	10.22	<0.853 U	<0.666 U	2.46 ,J,g

Chemical	Units	Facility Bkgd[A]	Adj. R-RBC	Adj. I-RBC	13SB11 A	13SB11 B	13SB11 C
Lead (1)	mg/kg	26.8	400	750	111	26,500	295
Zinc	mg/kg	202	2,346	30,660	294	502	1,070
Benzo(a)pyrene	ug/kg	--	22	392	45	33 ,L,s	13 J
Nitroglycerin	mg/kg	--	0.782	10.22	2.11 ,J,g	2.55 ,J,g	<0.695 U

Chemical	Units	Facility Bkgd[A]	Adj. R-RBC	Adj. I-RBC	13SB8 A	13SB8 B
Lead (1)	mg/kg	26.8	400	750	8,620	46
Zinc	mg/kg	202	2,346	30,660	363	154
Benzo(a)pyrene	ug/kg	--	22	392	71	<27 U
Nitroglycerin	mg/kg	--	0.782	10.22	<0.682 U	<0.643 U

Chemical	Units	Facility Bkgd[A]	Adj. R-RBC	Adj. I-RBC	13SB9 A*	13SB9 B	13SB9 C
Lead (1)	mg/kg	26.8	400	750	415	113	12
Zinc	mg/kg	202	2,346	30,660	990	194	46
Benzo(a)pyrene	ug/kg	--	22	392	121.5	15 J	<27 U
Nitroglycerin	mg/kg	--	0.782	10.22	0.45	0.954 ,J,g	<0.665 U

Notes:
mg/kg = Milligram Per Kilogram
ug/kg = Microgram Per Kilogram
(1) = Lead criteria are Action Levels; see USEPA Region III guidance
[A] = Facility-Wide Background Point Estimate as Reported in the Facility-Wide Background Study Report (IT 2001a)
RBC = USEPA Region III Risk-Based Concentration (RBC) values from the October 11, 2007, RBC Table and Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens

Data Qualifiers

U	The compound was analyzed for but not detected.
J	Estimated value.
,J	Analyte present. Reported value may not be accurate or precise.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
g	LCS recovery failure
s	Trip blank contamination

Legend

- Topographic Contour Line (feet, mean sea level)
- Surface Water
- Study Area Boundary
- Soil Boring Location
- Surface Water/Sediment Location
- Vegetation
- Burning Pan
- Light/Electric Pole
- = Concentration Exceeds Adjusted Soil Residential RBC
- = Concentration Exceeds Adjusted Soil Industrial RBC
- underline = Concentration Exceeds Facility-Wide Background Point Estimate

FIGURE 2-9

SSP Investigation Sampling Locations

Date: March 2009	URS Project #: 11656367
Prepared by: MRF	Approved by: JOS
Scale: 1 inch = 150 feet	File Name: Fig.2-9 SSPSamp.Locs

Study Area at SWMU 13
RFI Report
Radford Army Ammunition Plant
Radford, Virginia

URS Group, Inc.
5540 Falmouth Street
Suite 201
Richmond, Virginia 23230

Legend

◇ Sediment Sampling Location

→ Flow Direction

NR-SED-1 Sampling Location ID

91 Concentration of Lead (mg/kg)

N

FIGURE 2-10

New River Sediment Locations and Lead Results

Date: March 2009	URS Project #: 11656367
Prepared by: MRF	Reviewed by: JOS
Scale: Not to Scale	File Name: Fig.2-10 NR-SW&SED Res

Study Area at SWMU 13

RFI Report
Radford Army Ammunition Plant
Radford, Virginia

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Table 2-1
Physical Soil Testing Results
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Soil Sample			Physical Soil Testing Results														
Location	Depth Collected (ft bgs)	USCS Soil Type	Moisture Content (D2216)	Liquid Limit (D4318)	Plastic Limit (D4318)	Plastic Ind. (D4318)	Grain Size Minus No. 200 (D422)	Hydrometer % Minus 2 μ m (D422)	pH Distilled Water (D4972)	pH 0.01 M CaCl Solution (D4972)	Organic Content (D2974)	Specific Gravity (D854)	Total Bulk Density (D4253)	Dry Bulk Density (D4253)	Hydraulic Conductivity (D5084)	Total Organic Carbon (Walkley-Black)	Cation Exchange Capacity
			%	--	--	--	%	%	SU	SU	%	--	pcf	pcf	cm/sec	%	meq/100g
SSP Investigation (2003)																	
13SB10	2-3	SM	29.6	nt	np	nt	28.6	nt	6.9	6.6	3.5	2.688	115.9	89.4	1.3E-05	nt	nt
13SB7	12.7	GC	16.0	nt	nt	nt	13.3	nt	6.3	6.2	1.1	2.711	130	112	nt	nt	nt
RFI Investigation (2008)																	
13SB13A	0-0.5	SM	12.3	np	np	np	34.1	11	6.3	5.6	nt	nt	nt	nt	nt	0.63	5.8
13SB15A	0-0.5	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	1.1	nt
13SB16A	0-0.5	nt	23.9	np	np	np	33.1	11	5.9	5.4	nt	nt	nt	nt	nt	nt	8.8
13SB16C	1.5-2.0	SM	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	1.5	8.2
13SB18A	0-0.5	SM	16.9	np	np	np	25.5	8	6.5	5.6	nt	nt	nt	nt	nt	0.47	2.7
13SB19C	1.5-1.8	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	3.4
13SB20C	4.5-5	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	0.8	nt

Notes:

ft bgs = Feet below ground surface
USCS = Unified Soil Classification System
SU = Standard Units
pcf = Pounds per cubic foot
cm/sec = centimeters per second
meq/100g = milliequivalent per 100 grams
-- = Unitless
(D2216) = ASTM Test Method
np = not plastic
GC = Clayey Gravel
SM = Silty Sand
nt = Not tested

Table 2-2
Detected Analytes for SWMU 13 - Sediment
(Modified from New River and Tributaries Study - Parsons 1997)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID / Sample Date / Sample Depth (ft bgs)	CAS	C/N	Facility-Wide Background Point Estimate	Adjusted Soil RBC (Residential)	Adjusted Soil RBC (Industrial)	BTAG Sediment Screening Level	NRSE4 7/28/1995 0-0.5		NRSE14 11/22/1996 0-0.5	
							Result	LQ, VQ, r	Result	LQ, VQ, r
TAL Metals (mg/kg)										
Aluminum	7429-90-5	N	40,041	7,821	102,200	--	ND		9,910	
Arsenic	7440-38-2	C	15.8	0.426	1.91	9.8	ND		**3.9**	
Barium	7440-39-3	N	209	1,564	20,440	--	97.14		110	
Beryllium	7440-41-7	N	1.02	15.64	204.4	--	0.99		0.71	
Calcium	7440-70-2	N	--	--	--	--	ND		2,190	
Chromium[1]	7440-47-3	C	65.3	23.46	306.6	43.4	37.53		21	
Cobalt	7440-48-4	N	72.3	--	--	50	ND		10	
Copper	7440-50-8	N	53.5	312.9	4,088	31.6	ND		13.4	
Iron	7439-89-6	N	50,962	5,475	71,540	20,000	ND		30,800	
Lead[2]	7439-92-1	--	26.8	400	800	35.8	**4,415.58**		104	
Magnesium	7439-95-4	--	--	--	--	--	ND		2,600	J
Manganese	7439-96-5	N	2,543	156.4	2,044	460	ND		1,210	J
Nickel	7440-02-0	N	62.8	156.4	2,044	22.7	13.25		10.6	
Potassium	7440-09-7	--	--	--	--	--	ND		1,420	
Silver	7440-22-4	N	--	39.11	511	1	0.1		<2	U
Thallium	7440-28-0	N	2.11	0.548	7.15	--	ND		1.6	
Vanadium	7440-62-2	N	108	7.82	102.2	--	ND		24.7	
Zinc	7440-66-6	N	202	2,346	30,660	121	ND		378	
TCL SVOCs (mg/kg)										
Bis(2-ethylhexyl)phthalate	117-81-7	C	--	45.62	204.4	0.18	6.62		<0.33	U
Diethylphthalate	84-66-2	N	--	6,257	81,760	0.603	6.23		<0.33	U
Dimethylphthalate	131-11-3	--	--	--	--	--	8.31		<0.33	U
Di-n-butylphthalate	84-74-2	N	--	782.1	10,220	6.47	12.99		<0.33	U
Fluoranthene	206-44-0	N	--	312.9	4,088	0.423	0.08		<0.33	U
N-Nitrosodiphenylamine	96-30-6	C	--	130.4	584	--	2.6		<0.33	U

Notes:

CAS = Chemical Abstracts Service
ft bgs = Feet Below Ground Surface
mg/kg = Milligram Per Kilogram
µg/kg = Microgram Per Kilogram
TAL = Target Analyte List
SVOC = Semivolatile Organic Compound
RBC = USEPA Region III Risk-Based Concentration (RBC) values from the October 11, 2007, RBC Table and Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
C/N = Carcinogenic/Noncarcinogenic per EPA RBC Table (October 2007)
[1] = Chromium VI RBC value was used
[2] = Lead criteria are Action Levels; see USEPA Region III guidance
BTAG = Biological Technical Assistance Group
Sediment - BTAG Sediment Screening Values (USEPA 2006d)

LQ = Laboratory Qualifier
VQ = Validation Qualifier
r = Reason Code
ND = Not Detected

= Concentration exceeds Adjusted Residential RBC
bold = Concentration exceeds Adjusted Industrial RBC
= Concentration exceeds BTAG Sediment Screening Level
underline = Concentration exceeds Facility-Wide Background Point Estimate

Table 2-3
Detected Analytes for SWMU 13 - Surface Water
(Modified from New River and Tributaries Study - Parsons 1997)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID / Sample Date	CAS #	C/N	Adjusted Tap Water RBC	Drinking Water MCL	BTAG Screening Value	NRSW4 7/28/1995	
						Result	LQ, VQ, r
TAL Metals (µg/L)							
Barium	7440-39-9	N	730	2,000	4	26.3	
Lead[1]	7439-92-1	--	15	--	2.5	9.8	

Notes:

CAS = Chemical Abstracts Service
µg/L = Microgram Per Liter
TAL = Target Analyte List
TCL = Target Compound List
VOC = Volatile Organic Compound
LQ = Laboratory Qualifier
VQ = Validation Qualifier
r = Reason Code
ND = Not Detected
RBC = USEPA Region III Risk-Based Concentration (RBC) values from the October 11, 2007, RBC Table and Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
C/N = Carcinogenic/Noncarcinogenic per EPA RBC Table (October 2007)
BTAG = Biological Technical Assistance Group
Water - BTAG Freshwater Screening Values (USEPA 2006c)
[1] = Lead RBC value is Action Level; see USEPA Region III guidance

= Concentration exceeds MCL

= Concentration exceeds Adjusted Tap Water RBC

= Concentration exceeds BTAG Freshwater Screening Level

Table 2-4
Detected Analytes in Semi-Annual OBG Soil Sampling
(Modified from the 2007-2008 Annual Soil Monitoring Report - March 2009 (Draper Aden 2009b))
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID / Sample Date	CAS #	C/N	Facility-Wide Background Point Estimate	Adjusted Soil RBC (Residential)	Adjusted Soil RBC (Industrial)	Action Level[4]	QL/RL	SB-1				SB-2			
								1/11/2007	6/18/2007	1/8/2008	11/28/2008	1/11/2007	6/18/2007	1/8/2008	11/28/2008
TAL Metals (mg/kg)															
Arsenic	7440-38-2	C	15.8	0.426	1.91	16	1	3.6	3.2	2.4	3.9	4.3	4	4	8.3
Barium	7440-39-3	N	209	1,564	204,400	72,000	20	147	97.2	117	147	149	83.7	141	247
Cadmium	7440-43-9	N	0.69	3.94	51.10	510	0.5	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	<0.5 U	0.76	0.77
Chromium[1]	7440-47-3	C	65.3	23.46	306.6	3,100	1	27.1	19.3	21.1	25.7	25	16.2	24.4	19.5
Lead[2]	7439-92-1	--	26.8	400	750	800	3	68.9	149 J	78.2	93.9	122	164 J	92.2	188
Selenium	7782-49-2	N	--	39.11	5,110	5,100	0.6	<0.6 U	1.2	<0.6 U	<0.6 U	<0.6 U	1.3	<0.6 U	0.69
TCL VOCs (mg/kg)															
Bromomethane	74-83-9	N	--	1.1E+01	1.4E+03	1.5E+01	0.005	<0.005 UJ	0.008	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U	<0.005 U
TCL SVOCs (mg/kg)															
Diethylphthalate	84-66-2	N	--	6.3E+03	8.2E+05	8.2E+05	0.4	<0.4 U	<0.4 UJ	<0.4 U	<0.4 U	<0.4 U	0.58	<0.4 U	<0.4 U
Explosives/Nitroglycerin (mg/kg)															
2,4,6-Trinitrotoluene[3]	118-96-7	N	--	3.9E+00	5.1E+01	9.5E+01	0.25	<0.25 U	1.4	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
2-Amino-4,6-dinitrotoluene	35572-78-2	N	--	1.6E+01	2.0E+03	2.0E+03	0.25	<0.25 U	0.48	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
4-Amino-2,6-dinitrotoluene	19406-51-0	--	--	--	--	2.0E+03	0.25	<0.25 U	0.41	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U	<0.25 U
Dioxin/Furans (ng/kg)															
2,3,7,8-TCDD TEQ[5]	--	--	--	4.3E+00	1.9E+01	1.9E+01	--	2.159	1.237	1.151	0.84	1.977	0.625	1.1678	0.341

Notes:

CAS = Chemical Abstracts Service
mg/kg = Milligram Per Kilogram
TAL = Target Analyte List
TCL = Target Compound List
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
NT = Not Tested
RBC = USEPA Region III Risk-Based Concentration (RBC) values from the October 11, 2007, RBC Table and Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
C/N = Carcinogenic/Noncarcinogenic per EPA RBC Table (October 2007)
SSL DAF1 = Soil Screening Levels at a Dilution Attenuation Factor of 1
[1] = Chromium VI RBC value was used
[2] = Lead criteria are Action Levels; see USEPA Region III guidance
[3] = Noncarcinogenic Residential and Industrial RBC values for 2,4,6-Trinitrotoluene were used for screening
[4] = Action Levels as defined in the Open Burning Ground permit
[6] = 2,3,7,8-TCDD TEQs calculated utilizing revised toxicity equivalency factors (TEFs) (WHO 2005)

QL/RL = Quantitation Limit/Reporting Limit
J = Denotes analyte reported at or above QL/RL and associated result is estimated
U = Denotes analyte not detected at or above QL/RL
UJ = Denotes analyte not detected at or above QL/RL and QL/RL is estimated

= Concentration exceeds Adjusted Residential RBC

= Concentration exceeds Adjusted Industrial RBC

bold italic = Concentration exceeds Action Level

underline = Concentration exceeds Facility-Wide Background Point Estimate

Table 2-5
Summary of Detected Chemicals in Sediment Analytical Samples (from SWMU 54 RFI/CMS Report - September 2008)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID Sample Date Sample Depth (inches)	CAS #	C/N	Facility-Wide Background Point Estimate[A]	Adjusted Soil RBC (Residential)	Adjusted Soil RBC (Industrial)	BTAG Sediment Screening Level	NR-SED-1 11/8/2006 0-4		MDL	RL	NR-SED-2 11/8/2006 0-4		MDL	RL	NR-SED-3 11/8/2006 0-4		MDL	RL	NR-SED-3-DUP(DUP-3) 11/8/2006 0-4		MDL	RL	NR-SED-4 11/8/2006 0-4		MDL	RL	NR-SED-5 11/8/2006 0-4		MDL	RL
							Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r		
TAL Metals (mg/kg)																																
Aluminum	7429-90-5	N	40,041	7,821	102,200	--	9,800		1.6	10	5,300		1.6	10	8,200		1.6	10	11,000		1.6	10	30,000		1.6	10	17,000		790	5,000
Antimony	7440-36-0	N	--	3.13	40.88	2	0.26	,B,p	0.036	0.2	0.2	J,B,p	0.036	0.2	0.37	,B,p	0.036	0.2	0.33	,B,p	0.036	0.2	0.13	J,B,p	0.036	0.2	0.48	,B,p	0.036	0.2
Arsenic	7440-38-2	C	15.8	0.426	1.91	9.8	2.2	,J,s	0.023	0.1	1.6	,J,s	0.023	0.1	2.5	,J,s	0.023	0.1	2.6	,J,s	0.023	0.1	2.2	,J,s	0.023	0.1	6.1	,J,s	0.023	0.1
Barium	7440-39-3	N	209	1,564	20,440	--	94		0.1	1	62		0.1	1	110		0.1	1	130		0.1	1	240		0.1	1	540		1	10
Beryllium	7440-41-7	N	1.02	15.64	204.4	--	0.69	J	0.016	1	0.48	J	0.016	1	0.56	J	0.016	1	0.87	J	0.016	1	1.4		0.016	1	1.3		0.016	1
Cadmium	7440-43-9	N	0.69	3.91	51.1	0.99	1.2	J	0.5	2	0.71	J	0.5	2	1	J	0.5	2	1.5	J	0.5	2	1.4	J	0.5	2	1.3	J	0.5	2
Calcium	7440-70-2	--	--	--	--	--	1,500		10	50	910		10	50	1,100		10	50	1,500		10	50	4,700		10	50	3,100		10	50
Chromium[1]	7440-47-3	N	65.3	23.46	306.6	43.4	23		0.57	5	15		0.57	5	21		0.57	5	24		0.57	5	44		0.57	5	20		0.57	5
Cobalt	7440-48-4	--	72.3	--	--	50	8.6		0.35	2	5.3		0.35	2	7.1		0.35	2	10		0.35	2	18		0.35	2	8.3		0.35	2
Copper	7440-50-8	N	53.5	312.9	4,088	31.6	15	,J,s	0.022	0.1	8.7	,J,s	0.022	0.1	23	,J,s	0.022	0.1	29	,J,s	0.022	0.1	25	,J,s	0.022	0.1	47	,J,s	0.11	0.5
Iron	7439-89-6	N	50,962	5,475	71,540	20,000	32,000	,J,s	4.6	100	28,000	,J,s	4.6	100	39,000	,J,s	4.6	100	39,000	,J,s	4.6	100	41,000	,J,s	4.6	100	39,000	,J,s	230	5,000
Lead[2]	7439-92-1	--	26.8	400	750	35.8	91		0.21	1	77		0.083	0.4	160		0.21	1	160		0.21	1	43		0.041	0.2	88		0.21	1
Magnesium	7439-95-4	--	--	--	--	--	2,300		3.4	50	1,400		3.4	50	1,700		3.4	50	2,400		3.4	50	6,300		3.4	50	2,200		3.4	50
Manganese	7439-96-5	N	2,543	156.43	2,044	460	930		0.14	1	630		0.14	1	1,400		0.14	1	1,600		0.14	1	1,200		0.14	1	420		0.7	5
Mercury[3]	7439-97-6	--	0.13	2.3	30.7	0.18	0.041	J	0.0077	0.05	0.025	J	0.0077	0.05	0.084		0.0077	0.05	0.13		0.0077	0.05	0.068		0.0077	0.05	0.43		0.0077	0.05
Nickel	7440-02-0	N	62.8	156.43	2,044	22.7	11	,J,s	0.027	0.1	7.9	,J,s	0.027	0.1	13	,J,s	0.027	0.1	13	,J,s	0.027	0.1	22	,J,s	0.027	0.1	13	,J,s	0.027	0.1
Potassium	7440-09-7	--	--	--	--	--	1,200		7.5	50	750		7.5	50	820		7.5	50	1,100		7.5	50	3,300		7.5	50	2,600		7.5	50
Selenium	7782-49-2	N	--	39.11	511	2	0.13	J	0.063	0.2	0.12	J	0.063	0.2	0.14	J	0.063	0.2	0.12	J	0.063	0.2	0.084	J	0.063	0.2	0.63	,L,m	0.063	0.2
Silver	7440-22-4	N	--	39.11	511	1	0.12		0.017	0.1	0.097	J	0.017	0.1	0.2		0.017	0.1	0.22		0.017	0.1	0.16		0.017	0.1	0.18		0.017	0.1
Sodium	7440-23-5	--	--	--	--	--	<100	U	19	100	<100	U	19	100	<100	U	19	100	<100	U	19	100	25	J	19	100	260		19	100
Thallium	7440-28-0	N	2.11	0.548	7.154	--	0.28		0.0085	0.1	0.22		0.0085	0.1	0.58		0.0085	0.1	0.68		0.0085	0.1	0.56		0.0085	0.1	0.55		0.0085	0.1
Vanadium	7440-62-2	N	108	7.821	102.2	--	22	,J,s	0.024	0.1	16	,J,s	0.024	0.1	22	,J,s	0.024	0.1	23	,J,s	0.024	0.1	45	,J,s	0.024	0.1	23	,J,s	0.024	0.1
Zinc	7440-66-6	N	202	2,346	30,660	121	400		0.85	5	300		0.85	5	420		0.85	5	590		0.85	5	180		0.85	5	250		4.3	25
Explosives (mg/kg)																														
2,4,6-Trinitrotoluene	118-96-7	N	--	3.9	51	0.092	<2.5	U	0.051	2.5	<2.5	U	0.051	2.5	<2.5	U	0.051	2.5	<2.5	U	0.051	2.5	<2.5	U	0.051	2.5	<2.5	U	0.051	2.5
2,4-Dinitrotoluene	121-14-2	N	--	15.64	204.4	0.0416	<2.5	U	0.073	2.5	<2.5	U	0.073	2.5	<2.5	U	0.073	2.5	<2.5	U	0.073	2.5	<2.5	U	0.073	2.5	<2.5	U	0.073	2.5

Table 2-5
Summary of Detected Chemicals in Sediment Analytical Samples (from SWMU 54 RFI/CMS Report - September 2008)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID / Sample Date / Sample Depth (inches)	CAS #	C/N	Facility-Wide Background Point Estimate[A]	Adjusted Soil RBC (Residential)	Adjusted Soil RBC (Industrial)	BTAG Sediment Screening Level	NR-SED-6 11/8/2006 0-4		MDL	RL	NR-SED-7 11/8/2006 0-4		MDL	RL	NR-SED-8 11/8/2006 0-4		MDL	RL	NR-SED-9 11/8/2006 0-4		MDL	RL	NR-SED-9-DUP(DUP-2) 11/8/2006 0-4		MDL	RL	NR-SED-10 11/8/2006 0-4		MDL	RL
							Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r		
TAL Metals (mg/kg)																														
Aluminum	7429-90-5	N	40,041	7,821	102,200	--	13,000		1.6	10	11,000		1.6	10	6,600		1.6	10	7,900		1.6	10	7,600		1.6	10	22,000		1.6	10
Antimony	7440-36-0	N	--	3.13	40.88	2	0.19	J	0.036	0.2	0.13	J,B,p	0.036	0.2	0.16	J	0.036	0.2	1.1		0.036	0.2	1.7		0.036	0.2	0.66		0.036	0.2
Arsenic	7440-38-2	C	15.8	0.426	1.91	9.8	2.3	,J,s	0.023	0.1	2.1	,J,s	0.023	0.1	2	,J,s	0.023	0.1	1.9	,J,s	0.023	0.1	2.1	,J,s	0.023	0.1	2.5	,J,s	0.023	0.1
Barium	7440-39-3	N	209	1,564	20,440	--	180		0.1	1	120		0.1	1	81		0.1	1	100		0.1	1	110		0.1	1	180		0.1	1
Beryllium	7440-41-7	N	1.02	15.64	204.4	--	0.87	J	0.016	1	0.75	J	0.016	1	0.58	J	0.016	1	0.92	J	0.016	1	0.55	J	0.016	1	1.4		0.016	1
Cadmium	7440-43-9	N	0.69	3.91	51.1	0.99	1.4	J	0.5	2	1.3	J	0.5	2	0.74	J	0.5	2	1.6	J	0.5	2	1.3	J	0.5	2	2.8		0.5	2
Calcium	7440-70-2	--	--	--	--	--	3,000		10	50	3,200		10	50	4,700		10	50	1,600		10	50	1,700		10	50	1,600		10	50
Chromium[1]	7440-47-3	N	65.3	23.46	306.6	43.4	26		0.57	5	23		0.57	5	17		0.57	5	18		0.57	5	16		0.57	5	35		0.57	5
Cobalt	7440-48-4	--	72.3	--	--	50	12		0.35	2	8.7		0.35	2	7.4		0.35	2	8.7		0.35	2	7.8		0.35	2	17		0.35	2
Copper	7440-50-8	N	53.5	312.9	4,088	31.6	20	,J,s	0.022	0.1	12	,J,s	0.022	0.1	13	,J,s	0.022	0.1	16	,J,s	0.022	0.1	21	,J,s	0.022	0.1	24	,J,s	0.022	0.1
Iron	7439-89-6	N	50,962	5,475	71,540	20,000	32,000	,J,s	0.46	10	35,000	,J,s	4.6	100	23,000	,J,s	0.46	10	79,000	,B,p	460	10,000	39,000	,J,s	0.46	10	43,000	,J,s	0.46	10
Lead[2]	7439-92-1	--	26.8	400	750	35.8	90		0.21	1	100		0.21	1	47		0.041	0.2	170		0.21	1	210		0.21	1	280		0.41	2
Magnesium	7439-95-4	--	--	--	--	--	3,500		3.4	50	3,500		3.4	50	3,400		3.4	50	2,000		3.4	50	1,800		3.4	50	3,600		3.4	50
Manganese	7439-96-5	N	2,543	156.43	2,044	460	1,100		0.14	1	1,100		0.14	1	730		0.14	1	800		0.14	1	1,000		0.14	1	1,600		0.14	1
Mercury[3]	7439-97-6	--	0.13	2.3	30.7	0.18	0.44		0.0077	0.05	0.061		0.0077	0.05	0.26		0.0077	0.05	0.041	J	0.0077	0.05	0.058		0.0077	0.05	0.11		0.0077	0.05
Nickel	7440-02-0	N	62.8	156.43	2,044	22.7	13	,J,s	0.027	0.1	12	,J,s	0.027	0.1	10	,J,s	0.027	0.1	10	,J,s	0.027	0.1	8.5	,J,s	0.027	0.1	17	,J,s	0.027	0.1
Potassium	7440-09-7	--	--	--	--	--	1,700		7.5	50	1,500		7.5	50	1,000		7.5	50	850		7.5	50	860		7.5	50	1,800		7.5	50
Selenium	7782-49-2	N	--	39.11	511	2	0.22		0.063	0.2	0.23		0.063	0.2	0.1	J	0.063	0.2	0.15	J	0.063	0.2	0.18	J	0.063	0.2	0.24		0.063	0.2
Silver	7440-22-4	N	--	39.11	511	1	0.16		0.017	0.1	0.13		0.017	0.1	0.098	J	0.017	0.1	0.11		0.017	0.1	0.1		0.017	0.1	0.16		0.017	0.1
Sodium	7440-23-5	--	--	--	--	--	69	J	19	100	<100	U	19	100	<100	U	19	100	<100	U	19	100	<100	U	19	100	<100	U	19	100
Thallium	7440-28-0	N	2.11	0.548	7.154	--	0.4		0.0085	0.1	0.44		0.0085	0.1	0.19		0.0085	0.1	0.46		0.0085	0.1	0.41		0.0085	0.1	0.6		0.0085	0.1
Vanadium	7440-62-2	N	108	7.821	102.2	--	23	,J,s	0.024	0.1	21	,J,s	0.024	0.1	15	,J,s	0.024	0.1	17	,J,s	0.024	0.1	17	,J,s	0.024	0.1	40	,J,s	0.024	0.1
Zinc	7440-66-6	N	202	2,346	30,660	121	350		0.85	5	460		0.85	5	270		0.85	5	550		0.85	5	540		0.85	5	800		0.85	5
Explosives (mg/kg)																														
2,4,6-Trinitrotoluene	118-96-7	N	--	3.9	51	0.092	<2.5	U	0.051	2.5	<2.5	U	0.051	2.5	<2.5	U	0.051	2.5	<2.5	U	0.051	2.5	<2.5	U	0.051	2.5	0.38	J	0.051	2.5
2,4-Dinitrotoluene	121-14-2	N	--	15.64	204.4	0.0416	<2.5	U	0.073	2.5	<2.5	U	0.073	2.5	1.4	J	0.073	2.5	<2.5	U	0.073	2.5	<2.5	U	0.073	2.5	<2.5	U	0.073	2.5

Table 2-5
Summary of Detected Chemicals in Sediment Analytical Samples (from SWMU 54 RFI/CMS Report - September 2008)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID / Sample Date / Sample Depth (inches)	CAS #	C/N	Facility-Wide Background Point Estimate[A]	Adjusted Soil RBC (Residential)	Adjusted Soil RBC (Industrial)	BTAG Sediment Screening Level	NR-SED-11 11/8/2006 0-4		MDL	RL	NR-SED-12 11/8/2006 0-4		MDL	RL	NR-SED-13 11/8/2006 0-4		MDL	RL	NR-SED-14 11/8/2006 0-4		MDL	RL	NR-SED-15 11/8/2006 0-4		MDL	RL	NR-SED-16 11/8/2006 0-4		MDL	RL
							Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r		
TAL Metals (mg/kg)																														
Aluminum	7429-90-5	N	40,041	7,821	102,200	--	11,000		1.6	10	7,200		1.6	10	9,300		1.6	10	7,200		160	1,000	12,000		1.6	10	21,000		1.6	10
Antimony	7440-36-0	N	--	3.13	40.88	2	0.55		0.036	0.2	0.4		0.036	0.2	0.6		0.036	0.2	0.11	J	0.036	0.2	0.2		0.036	0.2	0.32		0.036	0.2
Arsenic	7440-38-2	C	15.8	0.426	1.91	9.8	1.7	,J,s	0.023	0.1	1.6	,J,s	0.023	0.1	2	,J,s	0.023	0.1	1.6	,L,m	0.023	0.1	2.3	,J,s	0.023	0.1	4.3	,J,s	0.023	0.1
Barium	7440-39-3	N	209	1,564	20,440	--	120		0.1	1	72		0.1	1	91		0.1	1	75		0.1	1	140		0.1	1	220		0.1	1
Beryllium	7440-41-7	N	1.02	15.64	204.4	--	0.77	J	0.016	1	0.52	J	0.016	1	0.77	J	0.016	1	0.61	J	0.016	1	0.97	J	0.016	1	2.2		0.016	1
Cadmium	7440-43-9	N	0.69	3.91	51.1	0.99	1.2	J	0.5	2	1	J	0.5	2	1.1	J	0.5	2	0.95	J	0.5	2	1.6	J	0.5	2	3.6		0.5	2
Calcium	7440-70-2	--	--	--	--	--	2,400		10	50	1,600		10	50	2,200		10	50	1,500	,K,m	10	50	2,200		10	50	3,400		10	50
Chromium[1]	7440-47-3	N	65.3	23.46	306.6	43.4	21		0.57	5	15		0.57	5	18		0.57	5	16		0.57	5	18		0.57	5	21		0.57	5
Cobalt	7440-48-4	--	72.3	--	--	50	9.5		0.35	2	6.2		0.35	2	8.4		0.35	2	5.5		0.35	2	10		0.35	2	16		0.35	2
Copper	7440-50-8	N	53.5	312.9	4,088	31.6	19	,J,s	0.022	0.1	12	,J,s	0.022	0.1	17	,J,s	0.022	0.1	8.6	,J,s	0.022	0.1	13	,J,s	0.022	0.1	20	,J,s	0.022	0.1
Iron	7439-89-6	N	50,962	5,475	71,540	20,000	29,000	,J,s	0.46	10	30,000	,J,s	0.46	10	28,000	,J,s	0.46	10	35,000	,B,p	230	5,000	41,000	,J,s	0.46	10	84,000	,B,p	460	10,000
Lead[2]	7439-92-1	--	26.8	400	750	35.8	120		0.21	1	100		0.21	1	130		0.21	1	86	,L,m	0.21	1	190		0.21	1	500		0.83	4
Magnesium	7439-95-4	--	--	--	--	--	3,400		3.4	50	2,200		3.4	50	2,600		3.4	50	1,900	,K,m	3.4	50	3,100		3.4	50	2,900		3.4	50
Manganese	7439-96-5	N	2,543	156.43	2,044	460	900		0.14	1	640		0.14	1	470		0.14	1	330		0.7	5	1,500		0.14	1	4,400		0.14	1
Mercury[3]	7439-97-6	--	0.13	2.3	30.7	0.18	0.065		0.0077	0.05	0.042	J	0.0077	0.05	0.056		0.0077	0.05	0.033	J	0.0077	0.05	0.048	J	0.0077	0.05	0.11		0.0077	0.05
Nickel	7440-02-0	N	62.8	156.43	2,044	22.7	12	,J,s	0.027	0.1	8.2	,J,s	0.027	0.1	11	,J,s	0.027	0.1	7.9	,J,s	0.027	0.1	12	,J,s	0.027	0.1	17	,J,s	0.027	0.1
Potassium	7440-09-7	--	--	--	--	--	1,600		7.5	50	1,000		7.5	50	1,200		7.5	50	870		7.5	50	1,400		7.5	50	1,400		7.5	50
Selenium	7782-49-2	N	--	39.11	511	2	0.25		0.063	0.2	0.18	J	0.063	0.2	0.41		0.063	0.2	0.16	J,L,m	0.063	0.2	0.2	J	0.063	0.2	0.45		0.063	0.2
Silver	7440-22-4	N	--	39.11	511	1	0.13		0.017	0.1	0.088	J	0.017	0.1	0.15		0.017	0.1	0.081	J	0.017	0.1	0.14		0.017	0.1	0.22		0.017	0.1
Sodium	7440-23-5	--	--	--	--	--	<100	U	19	100	<100	U	19	100	<100	U	19	100	<100	U	19	100	<100	U	19	100	<100	U	19	100
Thallium	7440-28-0	N	2.11	0.548	7.154	--	0.38		0.0085	0.1	0.23		0.0085	0.1	0.31		0.0085	0.1	0.27		0.0085	0.1	0.94		0.0085	0.1	2.3		0.0085	0.1
Vanadium	7440-62-2	N	108	7.821	102.2	--	21	,J,s	0.024	0.1	17	,J,s	0.024	0.1	20	,J,s	0.024	0.1	15	,J,s	0.024	0.1	21	,J,s	0.024	0.1	24	,J,s	0.024	0.1
Zinc	7440-66-6	N	202	2,346	30,660	121	390		0.85	5	390		0.85	5	400		0.85	5	340		4.3	25	750		0.85	5	1,700		0.85	5
Explosives (mg/kg)																														
2,4,6-Trinitrotoluene	118-96-7	N	--	3.9	51	0.092	<2.5	U	0.051	2.5	<2.5	U	0.051	2.5	<2.5	U	0.051	2.5	<2.5	U	0.051	2.5	<2.5	U	0.051	2.5	<2.5	U	0.051	2.5
2,4-Dinitrotoluene	121-14-2	N	--	15.64	204.4	0.0416	<2.5	U	0.073	2.5	<2.5	U	0.073	2.5	<2.5	U	0.073	2.5	<2.5	U	0.073	2.5	<2.5	U	0.073	2.5	<2.5	U	0.073	2.5

Table 2-5
Summary of Detected Chemicals in Sediment Analytical Samples (from SWMU 54 RFI/CMS Report - September 2008)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID / Sample Date / Sample Depth (inches)	CAS #	C/N	Facility-Wide Background Point Estimate[A]	Adjusted Soil RBC (Residential)	Adjusted Soil RBC (Industrial)	BTAG Sediment Screening Level	NR-SED-17 11/8/2006 0-4		MDL	RL	NR-SED-17-DUP(DUP-1) 11/8/2006 0-4		MDL	RL	NR-SED-18 11/8/2006 0-4		MDL	RL	NR-SED-19 11/8/2006 0-4		MDL	RL	NR-SED-20 11/8/2006 0-4		MDL	RL	NR-SED-21 11/8/2006 0-4		MDL	RL
							Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r		
TAL Metals (mg/kg)																														
Aluminum	7429-90-5	N	40,041	7,821	102,200	--	11,000		1.6	10	9,400		1.6	10	10,000		1.6	10	4,500		1.6	10	7,300		1.6	10	18,000		1.6	10
Antimony	7440-36-0	N	--	3.13	40.88	2	0.47		0.036	0.2	0.45		0.036	0.2	0.21		0.036	0.2	0.18	J	0.036	0.2	0.19	J	0.036	0.2	0.26		0.036	0.2
Arsenic	7440-38-2	C	15.8	0.426	1.91	9.8	2.5	,J,s	0.023	0.1	2.3	,J,s	0.023	0.1	1.8	,J,s	0.023	0.1	1.7	,J,s	0.023	0.1	1.8	,J,s	0.023	0.1	4.4	,J,s	0.023	0.1
Barium	7440-39-3	N	209	1,564	20,440	--	110		0.1	1	110		0.1	1	110		0.1	1	44		0.1	1	84		0.1	1	180		0.1	1
Beryllium	7440-41-7	N	1.02	15.64	204.4	--	0.76	J	0.016	1	0.73	J	0.016	1	0.71	J	0.016	1	0.52	J	0.016	1	0.56	J	0.016	1	1.6		0.016	1
Cadmium	7440-43-9	N	0.69	3.91	51.1	0.99	1.2	J	0.5	2	1.2	J	0.5	2	1.2	J	0.5	2	0.86	J	0.5	2	1	J	0.5	2	2.5		0.5	2
Calcium	7440-70-2	--	--	--	--	--	2,600		10	50	2,400		10	50	2,900		10	50	1,000		10	50	2,100		10	50	11,000		10	50
Chromium[1]	7440-47-3	N	65.3	23.46	306.6	43.4	17		0.57	5	19		0.57	5	24		0.57	5	13		0.57	5	14		0.57	5	20		0.57	5
Cobalt	7440-48-4	--	72.3	--	--	50	9.2		0.35	2	8.4		0.35	2	9.5		0.35	2	4.6		0.35	2	7.4		0.35	2	15		0.35	2
Copper	7440-50-8	N	53.5	312.9	4,088	31.6	19	,J,s	0.022	0.1	17	,J,s	0.022	0.1	13	,J,s	0.022	0.1	7.3	,J,s	0.022	0.1	11	,J,s	0.022	0.1	17	,J,s	0.022	0.1
Iron	7439-89-6	N	50,962	5,475	71,540	20,000	31,000	,J,s	0.46	10	32,000	,J,s	0.46	10	28,000	,J,s	0.46	10	29,000	,J,s	0.46	10	27,000	,J,s	0.46	10	74,000	,B,p	460	10,000
Lead[2]	7439-92-1	--	26.8	400	750	35.8	110		0.21	1	110		0.21	1	82		0.083	0.4	96		0.21	1	94		0.21	1	320		0.41	2
Magnesium	7439-95-4	--	--	--	--	--	2,800		3.4	50	2,800		3.4	50	3,600		3.4	50	1,400		3.4	50	2,600		3.4	50	7,400		3.4	50
Manganese	7439-96-5	N	2,543	156.43	2,044	460	470		0.14	1	700		0.14	1	550		0.14	1	450		0.14	1	730		0.14	1	2,300		0.14	1
Mercury[3]	7439-97-6	--	0.13	2.3	30.7	0.18	0.078		0.0077	0.05	0.063		0.0077	0.05	0.044	J	0.0077	0.05	0.024	J	0.0077	0.05	0.036	J	0.0077	0.05	0.079		0.0077	0.05
Nickel	7440-02-0	N	62.8	156.43	2,044	22.7	12	,J,s	0.027	0.1	11	,J,s	0.027	0.1	12	,J,s	0.027	0.1	6.7	,J,s	0.027	0.1	9.4	,J,s	0.027	0.1	19	,J,s	0.027	0.1
Potassium	7440-09-7	--	--	--	--	--	1,200		7.5	50	1,100		7.5	50	1,600		7.5	50	620		7.5	50	1,000		7.5	50	1,300		7.5	50
Selenium	7782-49-2	N	--	39.11	511	2	0.31		0.063	0.2	0.18	J	0.063	0.2	0.21		0.063	0.2	0.084	J	0.063	0.2	0.18	J	0.063	0.2	0.33		0.063	0.2
Silver	7440-22-4	N	--	39.11	511	1	0.13		0.017	0.1	0.12		0.017	0.1	0.1		0.017	0.1	0.067	J	0.017	0.1	0.11		0.017	0.1	0.2		0.017	0.1
Sodium	7440-23-5	--	--	--	--	--	<100	U	19	100	<100	U	19	100	<100	U	19	100	<100	U	19	100	<100	U	19	100	<100	U	19	100
Thallium	7440-28-0	N	2.11	0.548	7.154	--	0.37		0.0085	0.1	0.35		0.0085	0.1	0.36		0.0085	0.1	0.16		0.0085	0.1	0.25		0.0085	0.1	1.9		0.0085	0.1
Vanadium	7440-62-2	N	108	7.821	102.2	--	20	,J,s	0.024	0.1	20	,J,s	0.024	0.1	21	,J,s	0.024	0.1	14	,J,s	0.024	0.1	18	,J,s	0.024	0.1	23	,J,s	0.024	0.1
Zinc	7440-66-6	N	202	2,346	30,660	121	450		0.85	5	470		0.85	5	370		0.85	5	370		0.85	5	350		0.85	5	940		0.85	5
Explosives (mg/kg)																														
2,4,6-Trinitrotoluene	118-96-7	N	--	3.9	51	0.092	<2.5	U	0.051	2.5	<2.5	U	0.051	2.5	<2.5	U	0.051	2.5	<2.5	U	0.051	2.5	<2.5	U	0.051	2.5	<2.5	U	0.051	2.5
2,4-Dinitrotoluene	121-14-2	N	--	15.64	204.4	0.0416	<2.5	U	0.073	2.5	<2.5	U	0.073	2.5	<2.5	U	0.073	2.5	<2.5	U	0.073	2.5	<2.5	U	0.073	2.5	<2.5	U	0.073	2.5

Table 2-5
Summary of Detected Chemicals in Sediment Analytical Samples (from SWMU 54 RFI/CMS Report - September 2008)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID / Sample Date / Sample Depth (inches)	CAS #	C/N	Facility-Wide Background Point Estimate[A]	Adjusted Soil RBC (Residential)	Adjusted Soil RBC (Industrial)	BTAG Sediment Screening Level	NR-SED-22 11/8/2006 0-4 Result	LQ, VQ, r	MDL	RL	NR-SED-23 11/8/2006 0-4 Result	LQ, VQ, r	MDL	RL
TAL Metals (mg/kg)														
Aluminum	7429-90-5	N	40,041	7,821	102,200	--	14,000		1.6	10	19,000		1.6	10
Antimony	7440-36-0	N	--	3.13	40.88	2	1.9		0.036	0.2	0.26		0.036	0.2
Arsenic	7440-38-2	C	15.8	0.426	1.91	9.8	3.4	,J,s	0.023	0.1	2.7	,J,s	0.023	0.1
Barium	7440-39-3	N	209	1,564	20,440	--	170		0.1	1	180		0.1	1
Beryllium	7440-41-7	N	1.02	15.64	204.4	--	1		0.016	1	1.2		0.016	1
Cadmium	7440-43-9	N	0.69	3.91	51.1	0.99	1.9	J	0.5	2	2.2		0.5	2
Calcium	7440-70-2	--	--	--	--	--	10,000		10	50	3,700		10	50
Chromium[1]	7440-47-3	N	65.3	23.46	306.6	43.4	24		0.57	5	24		0.57	5
Cobalt	7440-48-4	--	72.3	--	--	50	13		0.35	2	15		0.35	2
Copper	7440-50-8	N	53.5	312.9	4,088	31.6	24	,J,s	0.022	0.1	20	,J,s	0.022	0.1
Iron	7439-89-6	N	50,962	5,475	71,540	20,000	39,000	,J,s	0.46	10	36,000	,J,s	0.46	10
Lead[2]	7439-92-1	--	26.8	400	750	35.8	180		0.21	1	200		0.21	1
Magnesium	7439-95-4	--	--	--	--	--	7,600		3.4	50	4,400		3.4	50
Manganese	7439-96-5	N	2,543	156.43	2,044	460	1,900		0.14	1	1,200		0.14	1
Mercury[3]	7439-97-6	--	0.13	2.3	30.7	0.18	0.16		0.0077	0.05	0.09		0.0077	0.05
Nickel	7440-02-0	N	62.8	156.43	2,044	22.7	16	,J,s	0.027	0.1	17	,J,s	0.027	0.1
Potassium	7440-09-7	--	--	--	--	--	1,400		7.5	50	1,600		7.5	50
Selenium	7782-49-2	N	--	39.11	511	2	0.38		0.063	0.2	0.29		0.063	0.2
Silver	7440-22-4	N	--	39.11	511	1	0.45		0.017	0.1	0.2		0.017	0.1
Sodium	7440-23-5	--	--	--	--	--	21	J	19	100	<100	U	19	100
Thallium	7440-28-0	N	2.11	0.548	7.154	--	0.44		0.0085	0.1	0.47		0.0085	0.1
Vanadium	7440-62-2	N	108	7.821	102.2	--	27	,J,s	0.024	0.1	26	,J,s	0.024	0.1
Zinc	7440-66-6	N	202	2,346	30,660	121	550		0.85	5	660		0.85	5
Explosives (mg/kg)														
2,4,6-Trinitrotoluene	118-96-7	N	--	3.9	51	0.092	<2.5	U	0.051	2.5	<2.5	U	0.051	2.5
2,4-Dinitrotoluene	121-14-2	N	--	15.64	204.4	0.0416	<2.5	U	0.073	2.5	<2.5	U	0.073	2.5

Notes:

CAS = Chemical Abstracts Service
ft bgs = Feet Below Ground Surface
mg/kg = Milligram Per Kilogram
TAL = Target Analyte List
TCL = Target Compound List
MDL = Method Detection Limit
RL = Reporting Limit
LQ = Laboratory Qualifier
VQ = Validation Qualifier
r = Reason Code
(1) = Chromium VI RBC value was used
(2) = Lead criteria are Action Levels; see USEPA Region III guidance
(3) = Mercuric chloride soil RBC value used
[A] = Facility-Wide Background Point Estimate as
Reported in the Facility-Wide Background Study Report (IT 2001a)
RBC = USEPA Region III Risk-Based Concentration
(RBC) values from the April 6, 2007,
RBC Table and April 10, 2007, Alternate RBC Table
Adjusted RBCs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
C/N = Carcinogenic per EPA RBC Table (April 2007)
BTAG = Biological Technical Assistance Group
Sediment - BTAG Sediment Screening Values, 2004

= Concentration Exceeds Adjusted Soil Residential RBC
= Concentration Exceeds Adjusted Soil Industrial RBC
underline = Concentration Exceeds Facility-Wide Background Values
= Concentration Exceeds BTAG Screening Level

Laboratory Qualifiers

U The compound was analyzed for but not detected. The reporting limit will be adjusted to reflect any dilution, and for soil, the percent moisture.
J Estimated value.

Validation Qualifiers

B Not detected substantially above the level reported in laboratory or field blanks.
J Analyte present. Reported value may not be accurate or precise.
K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ Not detected, quantitation limit may be inaccurate or imprecise.

Reason Codes

Inorganics and Conventionals
m MS/MSD recovery failure
p Preparation blank contamination
s Serial dilution failure

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3.0 FIELD INVESTIGATION PROGRAM

The field investigation program for the RFI conducted at the RFI study area included a soil investigation as outlined in the following sections.

3.1 SAMPLING AND ANALYSIS

The RFI and SSP sampling and analysis plan is summarized in Table 3-1; this table identifies the boring locations, chemical and physical sample locations and depths, and analytical methods and parameters. Figures 3-1a and 3-1b show the soil sample locations for the RFI and SSP investigations.

3.1.1 Soil Borings and Soil Sampling

Five direct push borings and 80 hand auger borings were completed to characterize soil conditions at the RFI study area. Soil boring locations are shown on Figures 3-1a and 3-1b, provided in Table 3-1, and summarized below.

Soil Sampling and Analysis

Date/Event	Soil Sample Locations	Analytical Parameters	Comments
October 2003 (SSP)	***Soil Borings:*** 13SB7 through 13SB11	TAL Metals, TCL VOCs, TCL SVOCs, TCL PAHs, TCL PCBs (selected samples), TCL Pesticides and Herbicides (selected samples), Explosives, and Nitroglycerin/PETN.	Assess the nature and extent of COPCs in soil within the RFI study area.
	Physical/Geotechnical Properties: 13SB7 and 13SB10	Moisture content, Atterburg Limits, grain size, pH, organic content, specific gravity, bulk density, and hydraulic conductivity.	Geotechnical and physical property analysis.
November/ December 2008 (RFI)	***Soil Borings:*** 13SB13 through 13SB92	Lead	Assess the nature and extent of lead within the RFI study area and to provide sufficient data for risk assessment.
	Soil Borings: 13SB13 through 13SB22	TAL Metals, TCL SVOCs, Explosives, and Nitroglycerin/PETN.	Assess the nature and extent of chemicals within the RFI study area and to provide sufficient data for risk assessment.
	Physical/Geotechnical Properties: 13SB13, 13SB16, 13SB18, 13SB19, 13SB15 (TOC only), and 13SB20 (TOC only)	Moisture content, Atterburg Limits, grain size, pH, total organic carbon (TOC), and cation exchange capacity.	Geotechnical and physical property analysis.

For the RFI, 80 soil borings (13SB13 through 13SB92) were completed within the RFI study area using hand augers. RFI soil borings were completed within the RFI study area to a maximum depth of 6 ft bgs. One to three soil samples were collected from each boring from various intervals dependant on field conditions (i.e., depth of refusal or depth to groundwater). Soil samples were analyzed for lead. Selected

soil samples were analyzed for TAL Metals, TCL SVOCs, explosives, and nitroglycerin/PETN. Additionally, seven samples were collected from soil borings listed in the table above for physical testing. Three of the samples were analyzed for a full suite of analysis including moisture content, Atterburg Limits, grain size, pH, total organic carbon, and cation exchange capacity. Four other samples were analyzed for total organic carbon and/or cation exchange capacity. Physical test results are summarized in Table 2-1 and the complete results are presented in Appendix C.1.

3.2 QUALITY ASSURANCE

Quality Assurance (QA) planning defined the overall system of activities for assuring the reliability of data produced. The system integrated the quality planning, assessment, and corrective actions of various groups in the organization to provide the independent QA program necessary to establish and maintain an effective system for collection and analysis of environmental samples and related activities. The program encompasses the generation of complete data with its subsequent review, validation, and documentation.

The accuracy and integrity of RFI data were ensured through the implementation of internal quality control (QC) measures consistent with WPA 023 (URS 2008a). QA and QC procedures, including field QC, laboratory QC, data management, and data validation, were integrated into the investigation program to meet data quality objectives (DQOs) established and approved for the RFI. The data were evaluated for each of the DQO indicators and the results of this evaluation are presented in Appendix H.1. DQOs for the RFI were met.

3.3 INVESTIGATION METHODOLOGY

3.3.1 Soil Sampling for Chemical Analysis

A soil sampling grid was established within the RFI study area to assess the spatial distribution of lead in soil following the procedures outline in SOP 30.7 (Appendix B) for systematic grid sampling. Data was collected on a central aligned rectangular grid to provide coverage across the entire RFI study area. A rectangular sample grid was used to cover the elongated rectangular shape of the site, with approximate 50 ft sample spacing in the east to west direction and 20 ft sample spacing in the north to south direction as shown on Figures 3-1a and 3-1b. Eighty sample point locations were located on the grid, with two or three rows of samples between the OBG perimeter berm and the New River depending on the RFI study area width in the north to south direction.

Surface and subsurface soil samples were collected for chemical analysis following the procedures outlined in standard operating procedure (SOP) 30.1 included in Appendix B and as described in Section 5.2 of the MWP (URS 2003). Stainless steel hand augers were used to collect both surface and subsurface soil samples. Hand augers were decontaminated between sampling locations following the procedures outlined in SOP 80.1 (Appendix B) to prevent potential cross-contamination. Soil sampling information was documented in the field logbooks and on sample forms as described in SOPs 10.1 and 10.2 included in Appendix B. Completed soil sample forms are presented in Appendix C.3.

Soil samples were processed following the procedures outlined in SOP 50.1 for labeling, SOP 10.4 for chain of custody, and SOP 50.2 for sampling packing for shipping. Appropriately, label the samples (SOP 50.1), complete the chain-of-custody (SOP 10.4), and package the samples for shipping (SOP 50.2).

3.3.2 Site Surveying

Horizontal coordinates and ground surface elevations for sample locations were obtained using a Trimble Pathfinder Pro XRS® global positioning system (GPS) unit with submeter accuracy for horizontal measurements (+1 part per million) and vertical measurements (+2 parts per million). Surveying was conducted using the U.S. State [Virginia (South Zone)] Plane Coordinate System (measured in U.S. survey ft) using the North American Datum 1983. The sampling grid was surveyed and locations flagged prior to completing soil sampling.

3.3.3 Investigation-Derived Material (IDM) Management

IDM management activities were conducted consistent with the procedures outlined in WPA 023 (URS 2008a) and documented in the field logbook, and conducted as described below.

3.3.3.1 Accumulation

IDM accumulated during soil sampling included the following materials and containers:

- Decontamination water – one 55-gallon drum.

IDM accumulation and labeling was conducted as outlined in MWP SOP 70.1 (Appendix B). The drum was transferred to the Installation's approved container accumulation area at SWMU 17 while this IDM was on hold pending analysis for characterization and disposal.

3.3.3.2 Material Characterization

An IDM characterization sample was collected for the decontamination water generated during the investigation to allow for disposal in the RFAAP Process Water Treatment Plant. The characterization sample was analyzed for pH, chemical oxygen demand, and Toxicity Characteristic Leaching Procedure metals as required by RFAAP. IDM sample results are presented in Appendix C.4.

3.3.3.3 Decontamination Water

Following the waste characterization sample analysis, the Installation and RFAAP Process Water Treatment Plant engineers were provided a copy of the water IDM sample results. After receiving Plant approval, decontamination water was discharged into the collection system of the Process Water Treatment Plant.

3.4 WORK PLAN FIELD CHANGES

The sampling grid consisted of 80 sampling points rather than the 77 sampling points estimated in the work plan based on actual field conditions encountered during layout of the sampling grid. Consistent with WPA 023, two or three samples were collected from each sampling point depending on the conditions encountered (depth to refusal or groundwater). The maximum depth of sampling during the investigation (6 ft bgs) was consistent with the anticipated depth identified in WPA 023. Sample location coordinates are provided in Appendix C.5.

Shallow refusal depths were encountered at several planned boring locations. A soil digging bar was used to deepen hand auger borings if possible or the borings were offset slightly in an attempt to verify conditions or achieve a greater depth if possible. At approximately 10 percent of the total sample locations, the borings could not be extended substantially below the depth of the surface sampling interval to collect planned subsurface soil samples. The slight bias in the number of surface samples relative to subsurface samples is not considered to represent a significant constraint in achieving investigation objectives, given the likely historical release mechanisms from the adjacent OBG (surface release mechanisms rather than subsurface disposal) and low mobility of lead in soil that would tend to bias higher concentrations in surface soil.

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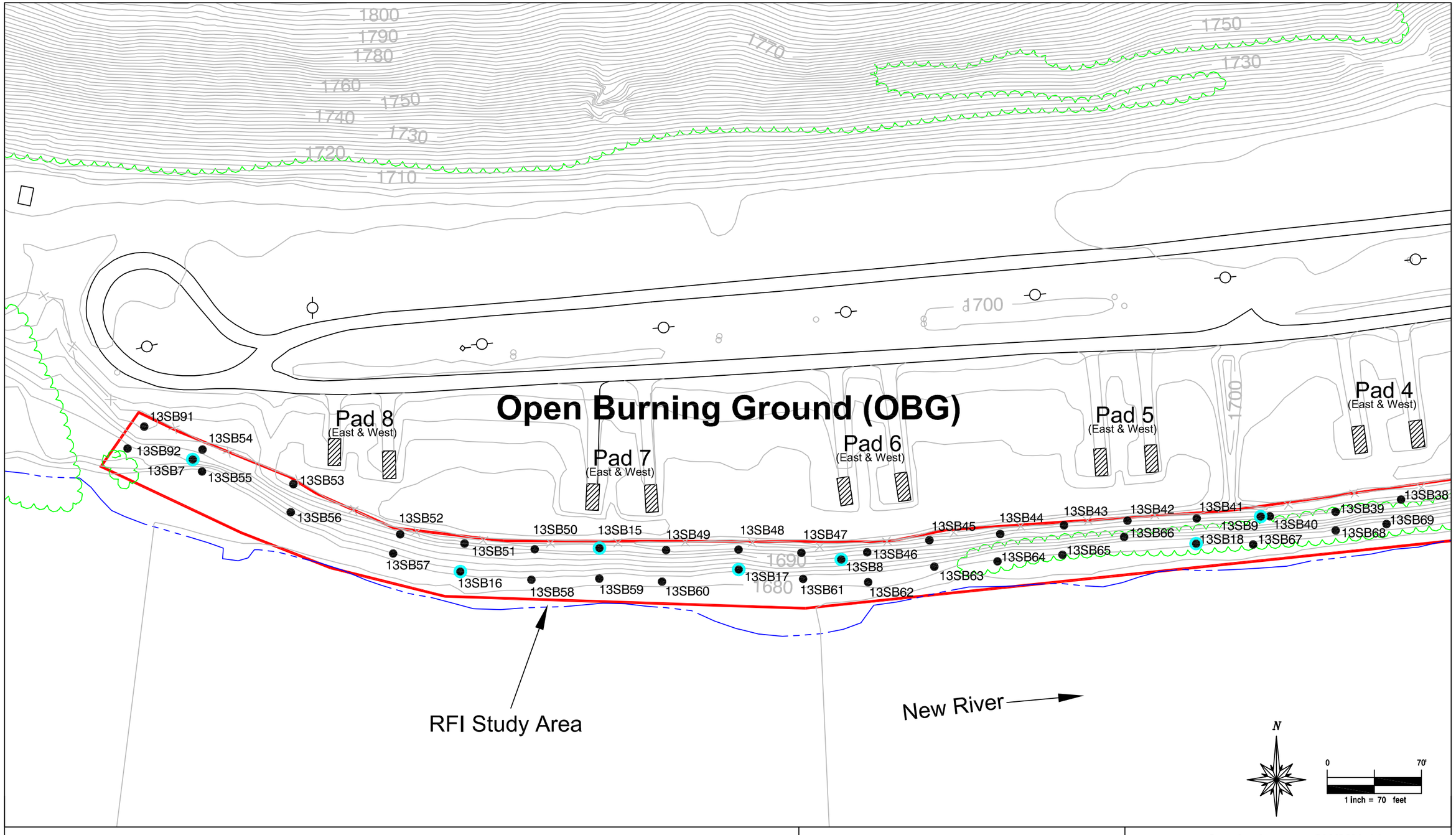


Legend

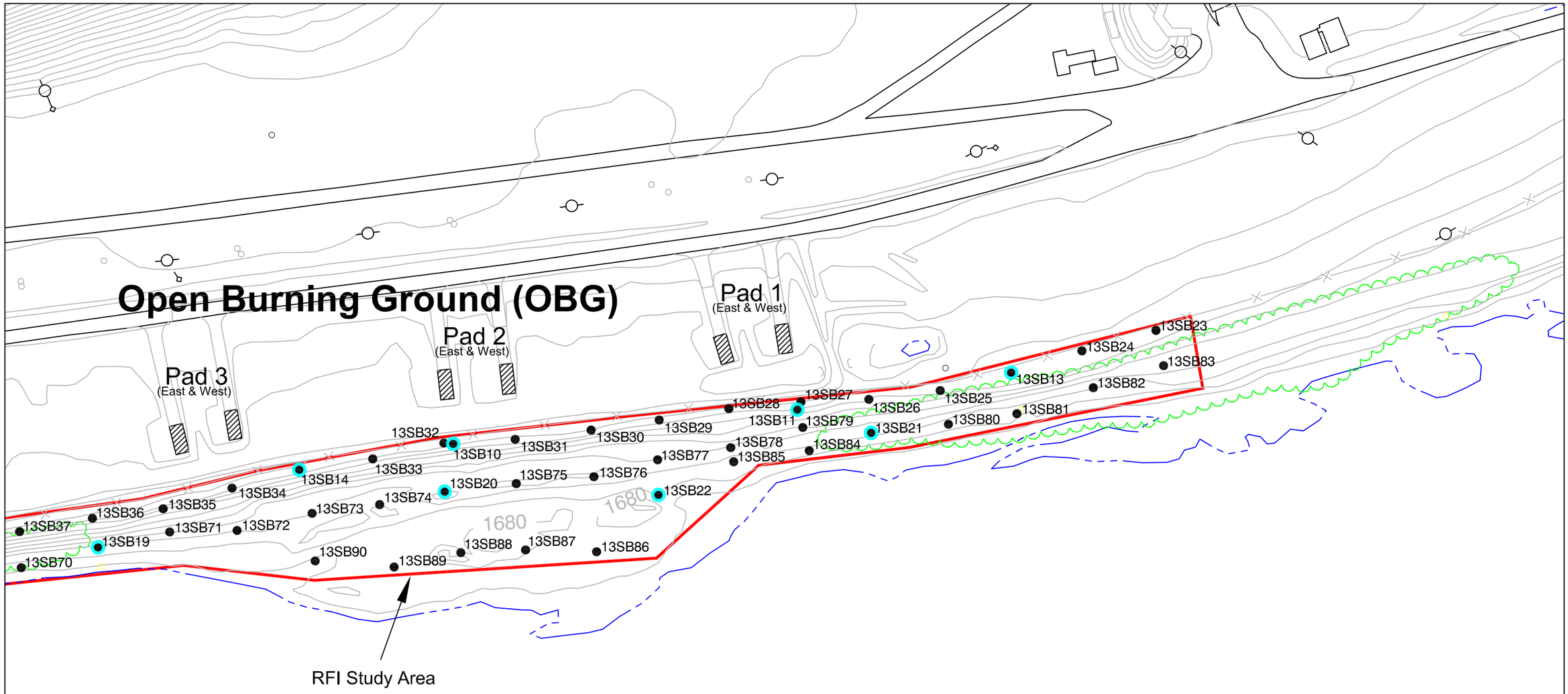
- Topographic Contour Line (feet, mean sea level)
- Surface Water
- Study Area Boundary
- Sample Location (Lead)
- Sample Location (TCL Metals, SVOCs, Explosives, and Nitroglycerin)
- Light/Electric Pole
- Vegetation
- Burning Pan

FIGURE 3-1a
Soil Sampling Locations

Date: March 2009	URS Project #: 11656367
Prepared by: MRF	Approved by: JOS
Scale: 1 inch = 70 feet	File Name: Fig.3-1a Soil Locs

Study Area at SWMU 13
RFI Report
Radford Army Ammunition Plant
Radford, Virginia

URS Group, Inc.
5540 Falmouth Street
Suite 201
Richmond, Virginia 23230



Legend

- Topographic Contour Line (feet, mean sea level)
- Surface Water
- Study Area Boundary
- Sample Location (Lead)
- Sample Location (TCL Metals, SVOCs, Explosives, and Nitroglycerin)
- Light/Electric Pole
- Vegetation
- Burning Pan

FIGURE 3-1b
Soil Sampling Locations

Date: March 2009	URS Project #: 11656367
Prepared by: MRF	Approved by: JOS
Scale: 1 inch = 70 feet	File Name: Fig.3-1b Soil Locs

Study Area at SWMU 13
RFI Report
Radford Army Ammunition Plant
Radford, Virginia

URS Group, Inc.
5540 Falmouth Street
Suite 201
Richmond, Virginia 23230

Table 3-1
Field Sample Identifiers, Depths, and Analytical Methods
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

					Chemical Analysis											Physical Analysis									
Sample ID	Date Sampled	Time	Dup Location	Depth (ft bgs)	TAL Metals/ CV Mercury/ Cyanide (SSP) (Unfiltered) SW-846 Method 6010B/7471A/9012A	TAL Metals/ CV Mercury/ Cyanide (SSP) (Filtered) SW-846 Method 6010B/7471A/9012A	Lead SW-846 Method 6010B	Pesticides/PCBs SW-846 Method 8081A/8082	Herbicides SW-846 Method 8151	VOCs SW-846 Method 8260B	SVOCs SW-846 Method 8270C	PAHs SW-846 Method 8310	Explosives/Nitroglycerin/PETN SW-846 Method 8330m/8332	Dioxin/Furans SW-846 Method 8290	Perchlorate Method E314.0	Moisture Content ASTM D2216	Atterburg Limits ASTM D4318	Grain Size ASTM D422	pH ASTM D4972	Organic Content ASTM D2974-00	Specific Gravity ASTM D854	Soil Bulk Density ASTM D4253	Hydraulic Conductivity ASTM D5084	Total Organic Carbon Walkley-Black Method	Cation Exchange Capacity
SWMU 13 SSP Soil Borings																									
13SB7A	10/9/2003	9:45		0-1	X					X	X	X	X			X	X	X	X	X	X	X	X		
13SB7B	10/9/2003	10:00		5-6	X					X	X	X	X												
13SB7C	10/9/2003	10:15		10-12	X					X	X	X	X												
13SB8A	10/9/2003	15:15		0-1	X					X	X	X	X												
13SB8B	10/9/2003	15:30		3.5-3.7	X					X	X	X	X												
13SB9A	10/9/2003	14:00		0-1	X			X	X	X	X	X	X	X											
13SB9B	10/9/2003	14:15		1.5-2	X					X	X	X	X												
13SB9C	10/9/2003	14:30		3.5-4	X					X	X	X	X												
13SB10A	10/9/2003	13:00		0-1	X					X	X	X	X			X	X	X	X	X	X	X	X		
13SB10B	10/9/2003	13:15		2.5-3	X					X	X	X	X												
13SB10C	10/9/2003	13:30		4.5-4.8	X					X	X	X	X												
13SB11A	10/9/2003	12:15		0-1	X					X	X	X	X												
13SB11B	10/9/2003	12:30		4.5-5	X					X	X	X	X												
13SB11C	10/9/2003	12:45		8-8.5	X					X	X	X	X												
SBD-9	10/9/2003	14:00	13SB9A	0-1	X			X	X	X	X	X	X	X											
SWMU 13 SSP Sediment																									
13SD2	10/10/2003	14:00		0-1	X					X	X	X	X												
13SD3	10/10/2003	13:00		0-1	X					X	X	X	X												
SDD-1	10/10/2003	13:00	13SD3	0-1	X					X	X	X	X												
SWMU 13 SSP Surface Water																									
13SW2	10/10/2003	14:00		--	X	X				X	X	X	X		X										
13SW3	10/10/2003	13:00		--	X	X				X	X	X	X		X										
SWD-1	10/10/2003	13:00	13SW3	--	X	X				X	X	X	X		X										
SWMU 13 RFI Soil Borings																									
13SB13A	11/12/2008	10:00		0-0.5	X						X		X			X	X	X	X					X	X
13SB13C	11/12/2008	10:18		5-6	X						X		X												
13SB14A	11/12/2008	16:00		0-0.5	X						X		X												
13SB15A	11/14/2008	12:53		0-0.5	X						X		X											X	
DUP-13	11/14/2008	12:53	13SB15A	0-0.5	X						X		X											X	
13SB16A	11/14/2008	13:00		0-0.5	X						X		X			X	X	X	X						X
13SB16C	11/14/2008	13:08		1.5-2	X						X		X											X	X
13SB17A	11/14/2008	10:05		0-0.5	X						X		X												
13SB17C	11/14/2008	10:15		2.5-3	X						X		X												
13SB18A	11/13/2008	15:21		0-0.5	X						X		X			X	X	X	X					X	X
13SB18C	11/13/2008	15:29		2-2.5	X						X		X												
13SB19A	11/13/2008	12:22		0-0.5	X						X		X												
13SB19C	11/13/2008	12:27		1.5-1.8	X						X		X												X
13SB20A	11/12/2008	14:39		0-0.5	X						X		X												
13SB20C	11/12/2008	14:49		4.5-5	X						X		X											X	
13SB21A	11/12/2008	12:21		0-0.5	X						X		X												
13SB21C	11/12/2008	12:26		1.5-2	X						X		X												
13SB22A	11/12/2008	13:20		0-0.5	X						X		X												
13SB22C	11/12/2008	13:25		4-5	X						X		X												
13SB23A	11/12/2008	9:12		0-0.5			X																		
13SB23B	11/12/2008	9:18		2-3			X																		
13SB23C	11/12/2008	9:27		5-6			X																		
13SB24A	11/12/2008	9:12		0-0.5			X																		
13SB24B	11/12/2008	9:19		2-3			X																		
13SB24C	11/12/2008	9:25		5-6			X																		
13SB25A	11/12/2008	10:00		0-0.5			X																		
13SB25B	11/12/2008	10:05		2-3			X																		
13SB25C	11/12/2008	10:15		5-6			X																		
13SB26A	11/12/2008	12:14		0-0.5			X																		
13SB26B	11/12/2008	12:28		1-1.5			X																		
DUP-1	11/12/2008	12:28	13SB26B	1-1.5			X																		

Table 3-1
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Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

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Sample ID	Date Sampled	Time	Dup Location	Depth (ft bgs)	TAL Metals/ CV Mercury/ Cyanide (SSP) (Unfiltered) SW-846 Method 6010B/7471A/9012A	TAL Metals/ CV Mercury/ Cyanide (SSP) (Filtered) SW-846 Method 6010B/7471A/9012A	Lead SW-846 Method 6010B	Pesticides/PCBs SW-846 Method 8081A/8082	Herbicides SW-846 Method 8151	VOCs SW-846 Method 8260B	SVOCs SW-846 Method 8270C	PAHs SW-846 Method 8310	Explosives/Nitroglycerin/PETN SW-846 Method 8330m/8332	Dioxin/Furans SW-846 Method 8290	Perchlorate Method E314.0	Moisture Content ASTM D2216	Atterburg Limits ASTM D4318	Grain Size ASTM D422	pH ASTM D4972	Organic Content ASTM D2974-00	Specific Gravity ASTM D854	Soil Bulk Density ASTM D4253	Hydraulic Conductivity ASTM D5084	Total Organic Carbon Walkley-Black Method	Cation Exchange Capacity
13SB27A	11/12/2008	12:36		0-0.5			X																		
13SB28A	11/12/2008	12:45		0-0.5			X																		
13SB29A	11/12/2008	13:35		0-0.3			X																		
13SB30A	11/12/2008	14:24		0-0.5			X																		
13SB31A	11/12/2008	14:28		0-0.5			X																		
13SB32A	11/12/2008	14:50		0-0.25			X																		
13SB33A	11/12/2008	16:08		0-0.25			X																		
DUP-6	11/12/2008	16:08	13SB33A	0-0.25			X																		
13SB34A	11/13/2008	12:00		0-0.5			X																		
13SB34B	11/13/2008	12:04		1.5-2			X																		
13SB35A	11/13/2008	11:56		0-0.5			X																		
13SB35B	11/13/2008	12:05		2-3			X																		
13SB35C	11/13/2008	12:12		5-6			X																		
13SB36A	11/13/2008	12:37		0-0.5			X																		
13SB36B	11/13/2008	12:42		2-3			X																		
DUP-7	11/13/2008	12:42	13SB36B	2-3			X																		
13SB36C	11/13/2008	12:46		5-6			X																		
13SB37A	11/13/2008	13:15		0-0.5			X																		
13SB38A	11/13/2008	14:20		0-0.5			X																		
13SB38B	11/13/2008	14:26		2-3			X																		
DUP-8	11/13/2008	14:26	13SB38B	2-3			X																		
13SB38C	11/13/2008	14:35		5-6			X																		
13SB39A	11/13/2008	14:30		0-0.5			X																		
DUP-9	11/13/2008	14:30	13SB39A	0-0.5			X																		
13SB39B	11/13/2008	14:35		2-3			X																		
13SB39C	11/13/2008	14:40		4-4.5			X																		
13SB40A	11/13/2008	14:50		0-0.5			X																		
13SB40B	11/13/2008	14:56		2-2.25			X																		
13SB41A	11/13/2008	15:02		0-0.5			X																		
13SB41B	11/13/2008	15:08		1.5-2			X																		
13SB42A	11/14/2008	8:40		0-0.5			X																		
13SB42B	11/14/2008	8:45		1-1.5			X																		
13SB43A	11/14/2008	8:58		0-0.5			X																		
13SB43B	11/14/2008	9:01		2-3			X																		
13SB43C	11/14/2008	9:06		5-6			X																		
13SB44A	11/14/2008	9:52		0-0.5			X																		
13SB44B	11/14/2008	9:59		2-3			X																		
13SB44C	11/14/2008	10:01		5-5.5			X																		
13SB45A	11/14/2008	9:23		0-0.5			X																		
13SB45B	11/14/2008	9:30		2-3			X																		
13SB46A	11/14/2008	9:48		0-0.5			X																		
13SB46B	11/14/2008	9:50		2-3			X																		
13SB46C	11/14/2008	9:56		5-6			X																		
13SB47A	11/14/2008	10:17		0-0.5			X																		
13SB47B	11/14/2008	10:21		1.5-2.5			X																		
13SB48A	11/14/2008	12:16		0-0.5			X																		
13SB48B	11/14/2008	12:20		2-3			X																		
13SB48C	11/14/2008	12:25		5-6			X																		
13SB49A	11/14/2008	12:30		0-0.5			X																		
13SB50A	11/14/2008	13:31		0-0.5			X																		
13SB50B	11/14/2008	13:36		2-3			X																		
13SB50C	11/14/2008	13:41		4.5-5			X																		
13SB51A	11/14/2008	12:50		0-0.5			X																		
13SB51B	11/14/2008	12:55		0.5-1			X																		
13SB52A	11/14/2008	13:25		0-0.5			X																		
13SB52B	11/14/2008	13:30		2-2.25			X																		
13SB53A	11/14/2008	14:05		0-0.5			X																		

Table 3-1
Field Sample Identifiers, Depths, and Analytical Methods
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

					Chemical Analysis											Physical Analysis									
Sample ID	Date Sampled	Time	Dup Location	Depth (ft bgs)	TAL Metals/ CV Mercury/ Cyanide (SSP) (Unfiltered) SW-846 Method 6010B/7471A/9012A	TAL Metals/ CV Mercury/ Cyanide (SSP) (Filtered) SW-846 Method 6010B/7471A/9012A	Lead SW-846 Method 6010B	Pesticides/PCBs SW-846 Method 8081A/8082	Herbicides SW-846 Method 8151	VOCs SW-846 Method 8260B	SVOCs SW-846 Method 8270C	PAHs SW-846 Method 8310	Explosives/Nitroglycerin/PETN SW-846 Method 8330m/8332	Dioxin/Furans SW-846 Method 8290	Perchlorate Method E314.0	Moisture Content ASTM D2216	Atterburg Limits ASTM D4318	Grain Size ASTM D422	pH ASTM D4972	Organic Content ASTM D2974-00	Specific Gravity ASTM D854	Soil Bulk Density ASTM D4253	Hydraulic Conductivity ASTM D5084	Total Organic Carbon Walkley-Black Method	Cation Exchange Capacity
13SB53B	11/14/2008	14:09		0.5-1			X																		
13SB54A	11/14/2008	13:50		0-0.5			X																		
13SB54B	11/14/2008	13:55		2-2.75			X																		
13SB55A	11/14/2008	14:05		0-0.5			X																		
13SB56A	11/14/2008	13:35		0-0.5			X																		
13SB56B	11/14/2008	13:40		1-1.25			X																		
DUP-14	11/14/2008	13:40	13SB56B	1-1.25			X																		
13SB57A	11/14/2008	13:48		0-0.5			X																		
13SB57B	11/14/2008	13:52		2-3			X																		
13SB57C	11/14/2008	13:56		3.5-4			X																		
13SB58A	11/14/2008	12:40		0-0.5			X																		
DUP-12	11/14/2008	12:40	13SB58A	0-0.5			X																		
13SB58B	11/14/2008	12:45		2-3			X																		
13SB59A	11/14/2008	13:02		0-0.5			X																		
13SB59B	11/14/2008	13:23		0.5-1			X																		
13SB60A	11/14/2008	12:19		0-0.5			X																		
13SB60B	11/14/2008	12:23		0.5-1			X																		
13SB61A	11/14/2008	10:08		0-0.5			X																		
13SB61B	11/14/2008	10:11		1.5-2.5			X																		
13SB62A	11/14/2008	9:45		0-0.5			X																		
DUP-11	11/14/2008	9:45	13SB62A	0-0.5			X																		
13SB63A	11/14/2008	9:15		0-0.5			X																		
13SB64A	11/14/2008	9:32		0-0.5			X																		
13SB64B	11/14/2008	9:36		0.5-1			X																		
13SB65A	11/14/2008	14:28		0-0.5			X																		
13SB65B	11/14/2008	14:34		0.5-1			X																		
13SB66A	11/13/2008	15:10		0-0.5			X																		
13SB66B	11/13/2008	15:16		2-3			X																		
13SB67A	11/13/2008	14:44		0-0.5			X																		
13SB67B	11/13/2008	14:48		2-3.5			X																		
13SB68A	11/13/2008	14:02		0-0.5			X																		
13SB68B	11/13/2008	14:09		2-2.75			X																		
13SB69A	11/13/2008	13:30		0-0.5			X																		
13SB70A	11/13/2008	12:59		0-0.5			X																		
13SB70B	11/13/2008	13:01		2-2.5			X																		
13SB71A	11/13/2008	12:15		0-0.5			X																		
13SB71B	11/13/2008	12:19		2-3			X																		
13SB71C	11/13/2008	12:23		5-6			X																		
13SB72A	11/13/2008	11:45		0-0.5			X																		
13SB72B	11/13/2008	11:48		2-3			X																		
13SB72C	11/13/2008	11:50		5-6			X																		
13SB73A	11/13/2008	11:30		0-0.5			X																		
13SB73B	11/13/2008	11:40		2-3			X																		
13SB73C	11/13/2008	11:50		5-5.5			X																		
13SB74A	11/12/2008	15:35		0-0.5			X																		
13SB74B	11/12/2008	15:40		2-3			X																		
13SB74	11/12/2008	15:50		3.5-4			X																		
DUP-3	11/12/2008	15:50	13SB74C	3.5-4			X																		
13SB75A	11/12/2008	14:25		0-0.5			X																		
13SB75B	11/12/2008	14:30		2-3			X																		
DUP-4	11/12/2008	14:30	13SB75B	2-3			X																		
13SB75C	11/12/2008	14:40		3.5-4			X																		
13SB76A	11/12/2008	13:50		0-0.5			X																		
13SB76B	11/12/2008	13:55		2-3			X																		
DUP-2	11/12/2008	13:55	13SB76B	2-3			X																		
13SB76C	11/12/2008	14:05		4.5-5			X																		
13SB77A	11/12/2008	13:32		0-0.5			X																		

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Radford Army Ammunition Plant, Radford, Virginia

					Chemical Analysis											Physical Analysis									
Sample ID	Date Sampled	Time	Dup Location	Depth (ft bgs)	TAL Metals/ CV Mercury/ Cyanide (SSP) (Unfiltered) SW-846 Method 6010B/7471A/9012A	TAL Metals/ CV Mercury/ Cyanide (SSP) (Filtered) SW-846 Method 6010B/7471A/9012A	Lead SW-846 Method 6010B	Pesticides/PCBs SW-846 Method 8081A/8082	Herbicides SW-846 Method 8151	VOCs SW-846 Method 8260B	SVOCs SW-846 Method 8270C	PAHs SW-846 Method 8310	Explosives/Nitroglycerin/PETN SW-846 Method 8330m/8332	Dioxin/Furans SW-846 Method 8290	Perchlorate Method E314.0	Moisture Content ASTM D2216	Atterburg Limits ASTM D4318	Grain Size ASTM D422	pH ASTM D4972	Organic Content ASTM D2974-00	Specific Gravity ASTM D854	Soil Bulk Density ASTM D4253	Hydraulic Conductivity ASTM D5084	Total Organic Carbon Walkley-Black Method	Cation Exchange Capacity
13SB77B	11/12/2008	13:35		2-3			X																		
13SB78A	11/12/2008	13:09		0-0.5			X																		
13SB78B	11/12/2008	13:11		2-2.5			X																		
13SB79A	11/12/2008	13:00		0-0.5			X																		
13SB79B	11/12/2008	13:05		0.5-1			X																		
13SB80A	11/12/2008	12:10		0-0.5			X																		
13SB80B	11/12/2008	12:13		2-3			X																		
13SB81A	11/12/2008	9:44		0-0.5			X																		
13SB81B	11/12/2008	9:50		2-3			X																		
13SB82A	11/12/2008	9:34		0-0.5			X																		
13SB82B	11/12/2008	9:41		2-3			X																		
13SB82C	11/12/2008	9:51		5-6			X																		
13SB83A	11/12/2008	9:30		0-0.5			X																		
13SB83B	11/12/2008	9:33		2-3			X																		
13SB84A	11/14/2008	8:50		0-0.5			X																		
DUP-10	11/14/2008	8:50	13SB84A	0-0.5			X																		
13SB84B	11/14/2008	8:55		1.5-2			X																		
13SB85A	11/12/2008	13:10		0-0.5			X																		
13SB85B	11/12/2008	13:14		2-3			X																		
13SB85C	11/12/2008	13:20		4.5-5			X																		
13SB86A	11/12/2008	13:45		0-0.5			X																		
13SB86B	11/12/2008	13:50		2-2.5			X																		
13SB87A	11/12/2008	14:00		0-0.5			X																		
13SB87B	11/12/2008	14:05		2-3			X																		
13SB87C	11/12/2008	14:15		3.5-4			X																		
13SB88A	11/12/2008	15:08		0-0.5			X																		
13SB88B	11/12/2008	15:15		2-2.75			X																		
13SB89A	11/12/2008	15:17		0-0.5			X																		
DUP-5	11/12/2008	15:17	13SB89A	0-0.5			X																		
13SB89B	11/12/2008	15:21		2-3			X																		
13SB90A	11/12/2008	15:42		0-0.5			X																		
13SB90B	11/12/2008	15:48		2-2.5			X																		
13SB91A	12/17/2008	16:30		0-0.5			X																		
13SB91B	12/17/2008	16:35		2-3			X																		
13SB91C	12/17/2008	16:40		5-6			X																		
DUP-15	12/17/2008	16:40	13SB91C	5-6			X																		
13SB92A	12/17/2008	16:50		0-0.5			X																		
13SB92B	12/17/2008	16:55		2-3			X																		
13SB92C	12/17/2008	17:00		5-5.5			X																		

Notes:

ft bgs = Feet Below Ground Surface
EPA = U.S. Environmental Protection Agency
SSP = Soil Sampling Process
RFI = RCRA Facility Investigation
SB = Soil Boring
SBD = Soil Boring Duplicate
SD = Sediment Sample
SDD = Sediment Duplicate
SW = Surface Water Sample
SWD = Surface Water Duplicate
DUP = Duplicate sample

TAL = Target Analyte List
PCB =Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
TCLP = Toxicity Characteristic Leaching Procedure
NA = Not Applicable
ASTM = ASTM International

4.0 NATURE AND EXTENT OF CHEMICALS

The following sections discuss the results of chemical sampling of soil at the site and assess the nature and extent of detected chemicals in site media. Chemical results are evaluated with respect to the following: USEPA Region III residential risk-based screening levels (R-RSLs) and industrial risk-based screening levels (I-RSLs) for soil (USEPA 2008), which are adjusted downward for non-carcinogenic chemicals to an HQ of 0.1 to account for potential additive toxicity effects of multiple chemicals; the most current USEPA Region III ecological soil screening levels (as presented in Section 7.0); and facility-wide background concentrations for metals in soil as provided below (IT 2001).

Facility-Wide Point Estimates for Soil

Chemical	Minimum Concentration (mg/kg)	Maximum Concentration (mg/kg)	95% Upper Tolerance Limit (UTL) of the Mean (mg/kg)
Aluminum	3,620	47,900	40,041
Arsenic	1.2	35.9	15.8
Barium	23.4	174	209
Beryllium	0.61	5.4	1.02
Cadmium	0.62	2.5	0.69
Chromium	6.3	75.8	65.3
Cobalt	5.9	130	72.3
Copper	1.6	38.7	53.5
Iron	7,250	67,700	50,962
Lead	2.1	256	26.8
Manganese	16.7	2,040	2,543
Mercury	0.038	1.2	0.13
Nickel	4.6	94.2	62.8
Thallium	1.3	5	2.11
Vanadium	12.2	114	108
Zinc	4.7	598	202

Note: mg/kg = Milligram per kilogram

With the exception of metals in soil, chemicals detected in one or more samples in a given medium at concentrations above their adjusted RSLs or ecological screening levels are identified in the nature and extent assessment as COPCs. Metals in soil detected at concentrations above their background point estimates and an adjusted RSL or ecological screening value are retained as COPCs in the nature and extent assessment. The facility-wide background concentrations are used in the nature and extent assessment to evaluate the significance of background concentrations in soil and to assist in bounding the lateral and vertical extent of metals concentrations potentially attributable to historical site activities. Additional chemical specific screening information is provided below.

Note that for some explosives (i.e., DNT) with regard to human health, the carcinogenic toxicity data available for DNTs (i.e., 2,4-DNT and 2,6-Dinitrotoluene [2,6 DNT]) applies to the DNT mixture; therefore, the concentrations detected for 2,4-DNT and 2,6-DNT for each sample are summed and this value is screened against the carcinogenic RSL. Non-carcinogenic RSLs are available for both 2,4-DNT

and 2,6-DNT; therefore, they are screened independently against the adjusted non-carcinogenic RSLs. If one compound is detected in the sample and the other compound is not, one half the detection limit of the non-detect is averaged with the detected result.

4.1 ANALYTICAL RESULTS

Ninety-two surface soil samples and 91 subsurface soil samples for a total of 183 samples were collected for chemical analysis from the RFI study area (Figures 3-1a and 3-1b and Table 3-1). Soil samples for chemical analysis were collected from borings from various intervals. Tables 4-1 and 4-2 present analytical results for chemicals detected in soil samples collected at the RFI study area and screens these data with respect to adjusted RSLs and background concentrations. Table 4-3 summarizes the screening results for soil data including: constituents detected, minimum and maximum concentrations detected, number of detections, number of samples, and number of samples above human health screening criteria and background concentrations (inorganics only). COPECs listed below were identified for the site as part of the refined screening level ecological risk assessment presented in Section 7.7 and above background point estimates (inorganics only). The screenings resulted in the identification of the following COPCs and COPECs (note that chemicals which were above industrial screening levels are italicized):

TAL Metals (Methods 6010B, 6020A, 7471A) – 23 TAL metals were detected in soil samples with the following metals detected at concentrations above SLs:

RSL – antimony, *iron*, *lead*, thallium; and
Eco – none.

TCL Pesticides (Method 8081A) – No pesticides were detected in the SSP soil samples tested for pesticides. Additional soil samples collected as part of the RFI investigation were not analyzed for pesticides in accordance with WPA 023.

TCL PCBs (Method 8082) – No PCBs were detected in the SSP soil samples tested for PCBs. Additional soil samples collected as part of the RFI investigation were not analyzed for PCBs in accordance with WPA 023.

TCL VOCs (Method 8260B) – Additional soil samples collected as part of the RFI investigation were not analyzed for VOCs. 8 VOCs were detected in SSP soil samples with the following VOCs detected at concentrations above SLs:

RSL – none; and
Eco – none.

TCL SVOCs (Method 8270C) – 32 SVOCs were detected in soil samples with the following SVOCs detected at concentrations above SLs:

RSL – benzo(a)anthracene, *benzo(a)pyrene*, benzo(b)fluoranthene, dibenz(a,h)anthracene; and
Eco – none.

Explosives (Method 8330) and Nitroglycerin (Method 8332) – 5 explosives and nitroglycerin were detected in soil samples with the following constituents detected at concentrations above SLs:

RSL – *nitroglycerin*; and
Eco – none.

Dioxin/Furans (Method 8290) – Additional soil samples collected as part of the RFI investigation were not analyzed for dioxin/furans. Dioxin/furans were detected in SSP soil samples with the following concentrations above SLs:

RSL –none; and
Eco – none.

4.2 HUMAN HEALTH NATURE AND EXTENT ASSESSMENT

A summary of the human health risk and background screening results for COPCs is presented in the table below.

Summary of COPCs for Soil

Chemical	Total # of Det/# of Samples	Surface Soil Samples (0- 1 ft bgs) Above RSLs		Subsurface Soil Samples (> 1 ft bgs) Above RSLs	
		# Above R-RSL/I-RSL	Sample ID	# Above R-RSL/I-RSL	Sample ID
Antimony	27/32	0/0	NA	1/0	13SB11B
Iron	32/32	1/1	**13SB19A**	1/1	**13SB21C**
Lead	183/183	11/3	**13SB8A**, 13SB9A DUP AVG, 13SB19A, **13SB33A**, 13SB38A, 13SB45A, 13SB56A, 13SB62A DUP AVG, **13SB63A**, 13SB70A, 13SB78A	10/3	**13SB11B**, 13SB25B, **13SB25C**, 13SB38B DUP AVG, 13SB42B, 13SB44C, 13SB48C, 13SB56B DUP AVG, **13SB61B**, 13SB80B
Thallium	32/32	1/0	13SB19A	0/0	NA
Benzo(a)anthracene	25/32	1/0	13SB9A DUP AVG	1/0	13SB22C
Benzo(a)pyrene	29/32	11/0	13SB7A, 13SB8A, 13SB9A DUP AVG, 13SB10A, 13SB11A, 13SB16A, 13SB17A, 13SB18A, 13SB20A, 13SB21A, 13SB22A	8/1	13SB8B, 13SB9B, 13SB10B, 13SB10C, 13SB16C, 13SB17C, 13SB20C, **13SB22C**
Benzo(b)fluoranthene	29/32	5/0	13SB8A, 13SB9A DUP AVG, 13SB17A, 13SB20A, 13SB22A	1/0	13SB22C
Dibenz(a,h)anthracene	14/32	5/0	13SB8A, 13SB9A DUP AVG, 13SB16A, 13SB20A, 13SB22A	2/0	13SB10B, 13SB22C
Nitroglycerin	6/32	1/0	13SB11A	4/1	13SB9B, 13SB10C, 13SB11B, **13SB13C**

Notes: NA=Not Applicable, DUP AVG = Duplicate Average, **Bold**=Sample Above adjusted R-RSL and I-RSL

The nature and extent of COPCs identified in the above table is discussed further in the following sections.

4.2.1 Antimony

Antimony was detected in one sample (13SB11B at 4.5 to 5 ft bgs) at a concentration above its adjusted R-RSL (no background point estimate is available for antimony). Samples collected at surface and terminal depths at boring 13SB11 had antimony concentrations below the adjusted R-RSL. Detected concentrations of antimony were below its adjusted I-RSL.

4.2.2 Iron

Iron was detected in one surface sample (13SB19A) and one subsurface sample (13SB21C) at concentrations above its adjusted R-RSL, I-RSL, and background point estimate. The subsurface sample

collected from 1.5 to 1.8 ft bgs at boring 13SB19 had an iron concentration below the adjusted R-RSL and background point estimate.

4.2.3 Lead

As outlined in the COPC summary table above, lead was detected at concentrations above its R-RSL and background point estimate in 21 of 183 samples and above its I-RSL and background point estimate in six samples. Figures 4-1a and 4-1b show the concentrations of lead detected in soil within the RFI study area and identify sample locations where lead was detected at concentrations above the R-RSL and I-RSL. The majority of the 17 sample locations with lead concentrations above RSLs occur at discrete locations that are along or proximate to the perimeter berm of the OBG. Seven of the 17 sample locations are closest to Burn Pan No. 6. The mean concentration of lead detected in surface soil with the RFI study area was 313.9 mg/kg, with a mean concentration of 414.9 mg/kg for all samples collected from the surface and subsurface intervals (Appendix D).

The highest lead concentrations were identified in surface sample 13SB8A (8,620 mg/kg) and intermediate depth subsurface sample 13SB11B (26,500 mg/kg). The subsurface sample collected at boring 13SB8 from 3.5 to 3.7 ft bgs had a lead concentration (46 mg/kg) below its R-RSL. The surface sample and terminal samples at 13SB11 had lead concentrations below its R-RSL (111 mg/kg and 295 mg/kg, respectively).

4.2.4 Thallium

Thallium was detected in one surface sample (13SB19A) at a concentration above its adjusted R-RSL and background point estimate. The subsurface sample collected from 1.5 to 1.8 ft bgs at boring 13SB19 had a thallium concentration below the adjusted R-RSL and background point estimate. Detected concentrations of thallium were below its adjusted I-RSL.

4.2.5 Pesticides

Pesticides were not detected in SSP soil samples; therefore, no additional samples were analyzed for pesticides as part of the RFI in accordance with WPA 023.

4.2.6 PCBs

PCBs were not detected in SSP soil samples; therefore, no additional samples were analyzed for PCBs as part of the RFI in accordance with WPA 023.

4.2.7 VOCs

VOCs were detected in SSP samples at concentrations below their adjusted RSLs. No additional samples were analyzed for VOCs as part of the RFI in accordance with WPA 023.

4.2.8 SVOCs

As presented on Figures 4-2a and 4-2b and as outlined in the table above, SVOC compounds benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and dibenz(a,h)anthracene (high molecular weight PAH compounds) were detected in one or more of the 32 samples collected at concentrations above their adjusted R-RSLs. Benzo(a)pyrene was detected in one sample (13SB22B) at a concentration (290 µg/kg) above its I-RSL of 210 µg/kg.

4.2.9 Explosives and Nitroglycerin

Explosives analyzed for by Method 8330 were detected in samples at concentrations below their adjusted RSLs. Nitroglycerin was detected in 5 of 32 samples (13SB9B, 13SB10C, 13SB11A, 13SB11B, and

13SB13C) at concentrations above its adjusted R-RSL, as shown on Figures 4-2a and 4-2b. The concentration of nitroglycerin detected in sample 13SB13C (21 mg/kg) was also above its I-RSL.

4.2.10 Dioxins

Additional soil samples collected as part of the RFI investigation were not analyzed for dioxin/furans in accordance with WPA 023. Dioxin/furans were detected in the SSP soil sample at a concentration below its RSLs.

4.3 ECOLOGICAL NATURE AND EXTENT ASSESSMENT

As presented in Section 7.7, after consideration of the results of the SLERA, background concentrations, site conditions, and nature of the material in place at the site, the scientific management decision point (SMDP) is the following:

There is adequate information to conclude that ecological risks are not significant and therefore there is no need for further action at the site on the basis of ecological risk.

4.4 NATURE AND EXTENT SUMMARY

Lead is the primary site-related COPC in soil within the RFI study area and the presence of lead above background levels is likely attributable to historical activities at the adjacent OBG. Other COPCs identified in soil include antimony, iron, thallium, four PAH compounds, and nitroglycerin. Detected concentrations above I-RSLs were limited to 6 of 183 samples for lead and one sample each for iron, nitroglycerin, and benzo(a)pyrene. Although PAHs and nitroglycerin were detected in soil at concentrations above screening levels, PAHs and nitroglycerin were not identified as risk or hazard drivers in the human health and ecological risk assessments (Sections 6.0 and 7.0).

The majority of sample locations with lead concentrations above RSLs occur at discrete locations that are along or proximate to the perimeter berm of the OBG. Approximately 40% of these locations are closest to Burn Pan No. 6 in the western portion of the OBG area (See Figures 3-1a and 3-1b for pad/pan locations). The mean concentration of lead in surface soil with the RFI study area is 313.9 mg/kg, which is below the R-RSL.

Although previous sediment sampling results (Section 2.2.5) did not indicate the site had historically significantly affected the New River based on the detected lead concentrations at the study area, an assessment of the study area as a potential future source of lead loading in the New River was conducted. The site area assessed is limited to the 1.6 acre study area. The presence of the OBG berm along the northern edge of the study area prevents runoff from adjacent areas to the north from entering the study area (Section 2.1.3). Soil losses were calculated as described below.

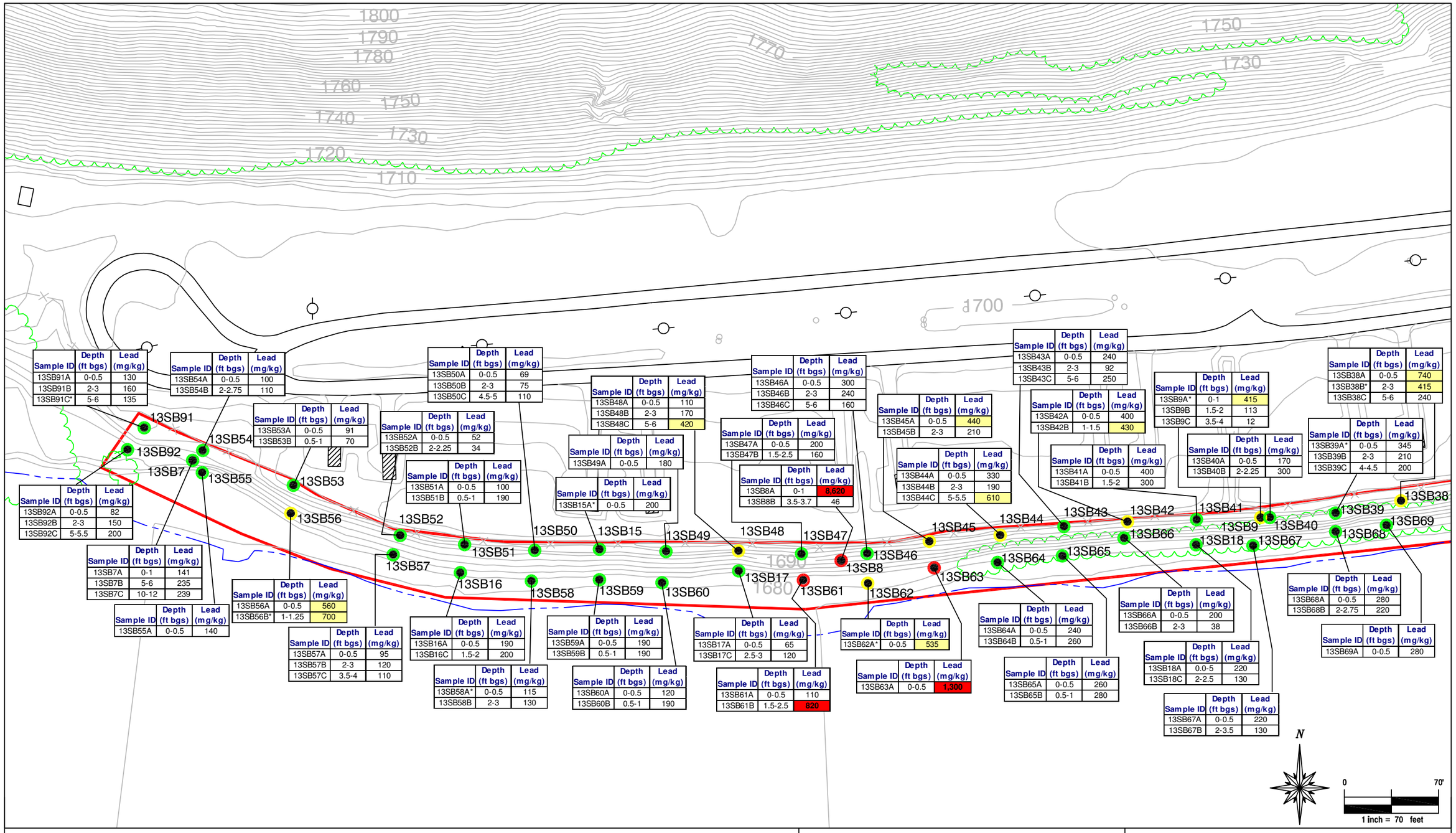
The Revised Universal Soil Loss Equation (RUSLE) is an erosion model predicting longtime average annual soil loss resulting from raindrop splash and runoff. As presented in Calculation #1 in Appendix C.6, the potential average annual soil loss for the site is 0.9 tons containing a total of 0.26 kg of lead per year. Based on the average flow of the river (3,258 ft^3/sec) and the minimal mass of lead potentially transported to the river over the course of a year, the potential soil loss is not considered to present a significant future risk to the New River.

In addition to calculating potential annual soil loss for the site, soil losses were calculated for an individual storm event using a method called the Modified Universal Soil Loss Equation (MUSLE), which allows for the calculation of sediment yields for individual storm events. As presented in Calculation #2 in Appendix C.6, a potential sediment yield for a 10-year storm was calculated for the site assuming all eroded soil from the site was discharged to the river (i.e., no delivery ratio was used). A 10-year storm resulted in a potential soil loss for the site of 0.3 tons containing a total of 0.09 kg of lead per storm event. Considering mixing of the runoff from the storm event (peak flow of 4.35 ft^3/sec) and the

average flow of the New River (3,258 ft^3/sec), as well as, the minimal mass of lead potentially transported to the river via soil loss, the potential soil loss is not considered to present a significant future risk to the New River.

Based on the previous sediment sampling results and the results of the annual and 10-year storm event soil loss assessments, potential RFI study area related releases to the New River are not considered to pose current or future significant risk to the river.

As presented in Sections 6.0 and 7.0, the human health and ecological risks assessments did not identify lead or other COPCs as risk drivers for potential receptors at the site.



Legend

- Topographic Contour Line (feet, mean sea level)
- Surface Water
- Study Area Boundary
- Below Adjusted Residential Regional Screening Level (R-RSL) of 400 mg/kg
- Above Adjusted R-RSL
- Above Adjusted Industrial Regional Screening Level (I-RSL) of 800 mg/kg
- Sample Locations
- *Duplicate Average Result
- mg/kg - milligram per kilogram
- (ft bgs)-feet below ground surface
- Light/Electric Pole
- Vegetation
- Burning Pan

FIGURE 4-1a

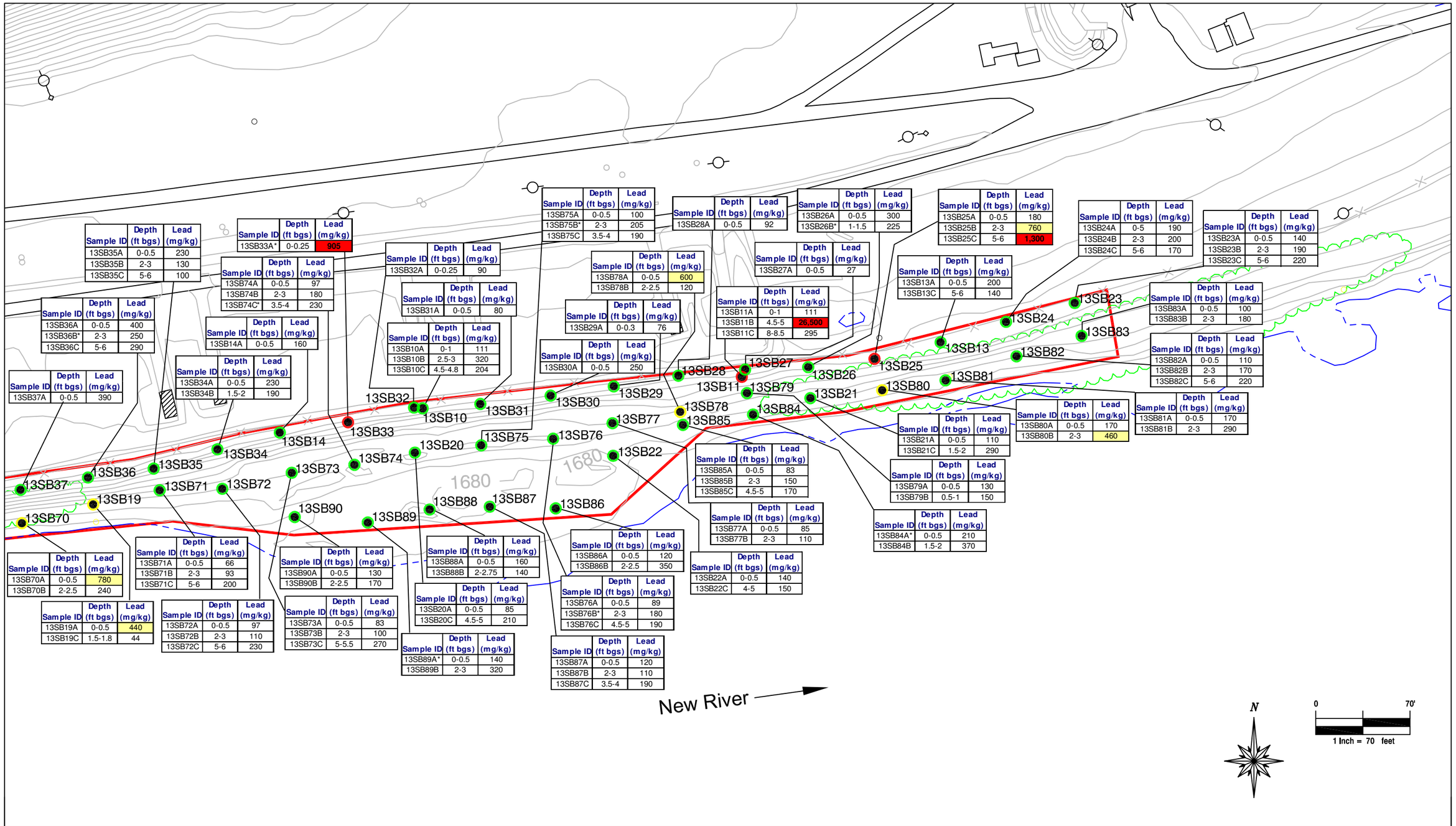
Extent of Lead in Soil

Date: March 2009	URS Project #: 11656367
Prepared by: MRF	Approved by: JOS
Scale: 1 inch = 70 feet	File Name: Fig4-1a lead

Study Area at SWMU 13

RFI Report
Radford Army Ammunition Plant
Radford, Virginia

URS Group, Inc.
5540 Falmouth Street
Suite 201
Richmond, Virginia 23230



Legend

- Topographic Contour Line (feet, mean sea level)
- Surface Water
- Study Area Boundary
- Below Adjusted Residential Regional Screening Level (R-RSL) of 400 mg/kg
- Above Adjusted R-RSL
- Above Adjusted Industrial Regional Screening Level (I-RSL) of 800 mg/kg
- Sample Locations
- *Duplicate Average Result
- mg/kg - milligram per kilogram
- (ft bgs)-feet below ground surface
- Light/Electric Pole
- Vegetation
- Burning Pan

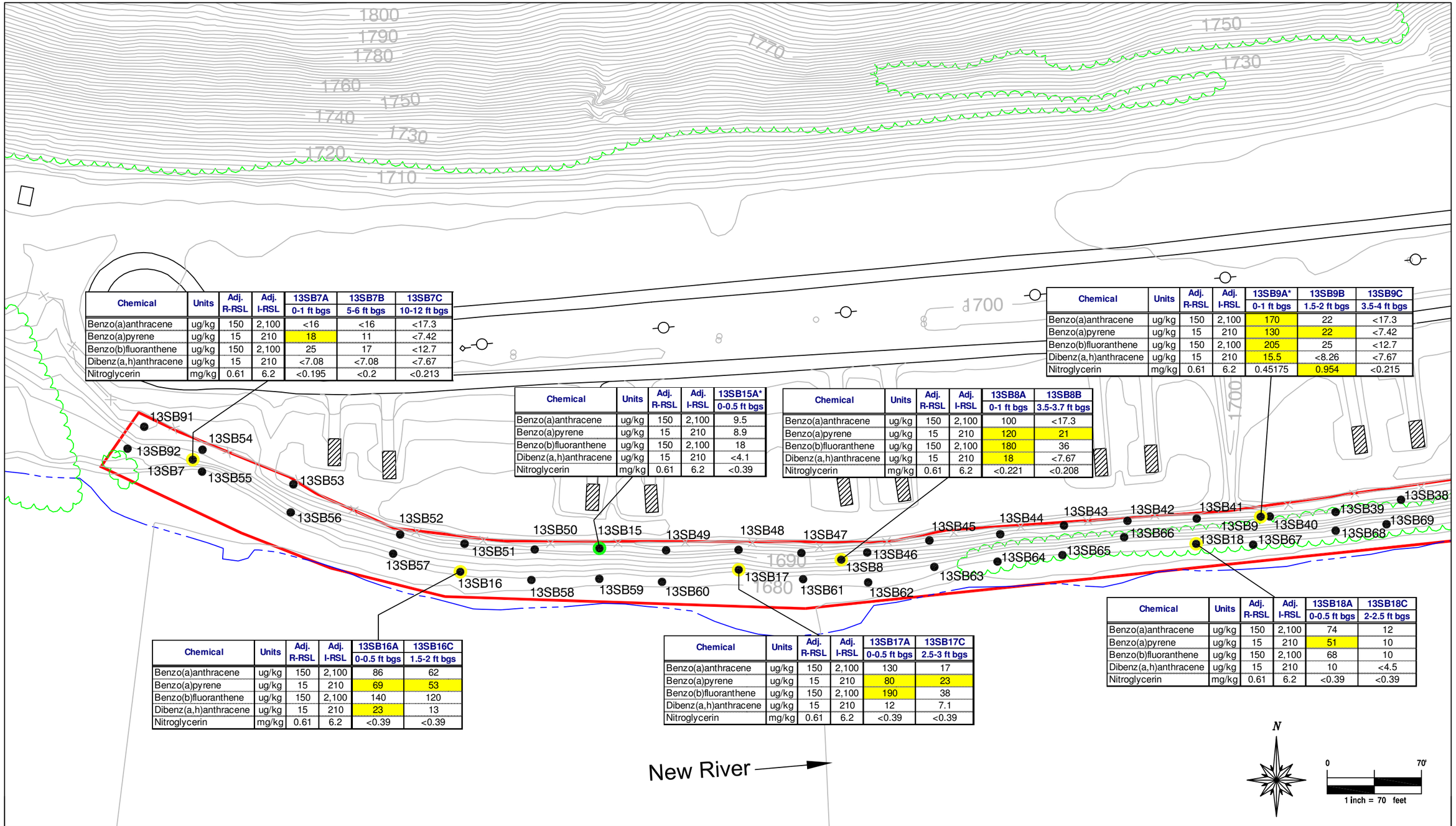
FIGURE 4-1b

Extent of Lead in Soil

Date: March 2009	URS Project #: 11656367
Prepared by: MRF	Approved by: JOS
Scale: 1 inch = 70 feet	File Name: Fig.4-1b lead

Study Area at SWMU 13
RFI Report
Radford Army Ammunition Plant
Radford, Virginia

URS Group, Inc.
5540 Falmouth Street
Suite 201
Richmond, Virginia 23230



Chemical	Units	Adj. R-RSL	Adj. I-RSL	13SB7A 0-1 ft bgs	13SB7B 5-6 ft bgs	13SB7C 10-12 ft bgs
Benzo(a)anthracene	ug/kg	150	2,100	<16	<16	<17.3
Benzo(a)pyrene	ug/kg	15	210	18	11	<7.42
Benzo(b)fluoranthene	ug/kg	150	2,100	25	17	<12.7
Dibenz(a,h)anthracene	ug/kg	15	210	<7.08	<7.08	<7.67
Nitroglycerin	mg/kg	0.61	6.2	<0.195	<0.2	<0.213

Chemical	Units	Adj. R-RSL	Adj. I-RSL	13SB15A* 0-0.5 ft bgs
Benzo(a)anthracene	ug/kg	150	2,100	9.5
Benzo(a)pyrene	ug/kg	15	210	8.9
Benzo(b)fluoranthene	ug/kg	150	2,100	18
Dibenz(a,h)anthracene	ug/kg	15	210	<4.1
Nitroglycerin	mg/kg	0.61	6.2	<0.39

Chemical	Units	Adj. R-RSL	Adj. I-RSL	13SB8A 0-1 ft bgs	13SB8B 3.5-3.7 ft bgs
Benzo(a)anthracene	ug/kg	150	2,100	100	<17.3
Benzo(a)pyrene	ug/kg	15	210	120	21
Benzo(b)fluoranthene	ug/kg	150	2,100	180	36
Dibenz(a,h)anthracene	ug/kg	15	210	18	<7.67
Nitroglycerin	mg/kg	0.61	6.2	<0.221	<0.208

Chemical	Units	Adj. R-RSL	Adj. I-RSL	13SB9A* 0-1 ft bgs	13SB9B 1.5-2 ft bgs	13SB9C 3.5-4 ft bgs
Benzo(a)anthracene	ug/kg	150	2,100	170	22	<17.3
Benzo(a)pyrene	ug/kg	15	210	130	22	<7.42
Benzo(b)fluoranthene	ug/kg	150	2,100	205	25	<12.7
Dibenz(a,h)anthracene	ug/kg	15	210	15.5	<8.26	<7.67
Nitroglycerin	mg/kg	0.61	6.2	0.45175	0.954	<0.215

Chemical	Units	Adj. R-RSL	Adj. I-RSL	13SB16A 0-0.5 ft bgs	13SB16C 1.5-2 ft bgs
Benzo(a)anthracene	ug/kg	150	2,100	86	62
Benzo(a)pyrene	ug/kg	15	210	69	53
Benzo(b)fluoranthene	ug/kg	150	2,100	140	120
Dibenz(a,h)anthracene	ug/kg	15	210	23	13
Nitroglycerin	mg/kg	0.61	6.2	<0.39	<0.39

Chemical	Units	Adj. R-RSL	Adj. I-RSL	13SB17A 0-0.5 ft bgs	13SB17C 2.5-3 ft bgs
Benzo(a)anthracene	ug/kg	150	2,100	130	17
Benzo(a)pyrene	ug/kg	15	210	80	23
Benzo(b)fluoranthene	ug/kg	150	2,100	190	38
Dibenz(a,h)anthracene	ug/kg	15	210	12	7.1
Nitroglycerin	mg/kg	0.61	6.2	<0.39	<0.39

Chemical	Units	Adj. R-RSL	Adj. I-RSL	13SB18A 0-0.5 ft bgs	13SB18C 2-2.5 ft bgs
Benzo(a)anthracene	ug/kg	150	2,100	74	12
Benzo(a)pyrene	ug/kg	15	210	51	10
Benzo(b)fluoranthene	ug/kg	150	2,100	68	10
Dibenz(a,h)anthracene	ug/kg	15	210	10	<4.5
Nitroglycerin	mg/kg	0.61	6.2	<0.39	<0.39

Legend

- Topographic Contour Line (feet, mean sea level)
- Surface Water
- Study Area Boundary
- Below Adjusted Residential Regional Screening Level (R-RSL)
- Above Adjusted R-RSL
- Above Adjusted Industrial Regional Screening Level (I-RSL)
- Sample Locations
- *Duplicate Average Result
- mg/kg - milligram per kilogram
- (ft bgs)-feet below ground surface
- Light/Electric Pole
- Vegetation
- Burning Pan

FIGURE 4-2a

Extent of Organic COPCs in Soil

Date: March 2009	URS Project #: 11656367
Prepared by: MRF	Approved by: JOS
Scale: 1 inch = 70 feet	File Name: Fig4-2a organics

Study Area at SWMU 13

RFI Report
Radford Army Ammunition Plant
Radford, Virginia

URS Group, Inc.
5540 Falmouth Street
Suite 201
Richmond, Virginia 23230

Chemical	Units	Adj. R-RSL	Adj. I-RSL	13SB10A 0-1 ft bgs	13SB10B 2.5-3 ft bgs	13SB10C 4.5-4.8 ft bgs
Benzo(a)anthracene	ug/kg	150	2,100	89	73	50
Benzo(a)pyrene	ug/kg	15	210	72	95	82
Benzo(b)fluoranthene	ug/kg	150	2,100	120	150	140
Dibenz(a,h)anthracene	ug/kg	15	210	<8.26	16	13
Nitroglycerin	mg/kg	0.61	6.2	<0.276	<0.216	2.46

Chemical	Units	Adj. R-RSL	Adj. I-RSL	13SB11A 0-1 ft bgs	13SB11B 4.5-5 ft bgs	13SB11C 8-8.5 ft bgs
Benzo(a)anthracene	ug/kg	150	2,100	51	<14.6	<17.3
Benzo(a)pyrene	ug/kg	15	210	44	7	14
Benzo(b)fluoranthene	ug/kg	150	2,100	78	13	24
Dibenz(a,h)anthracene	ug/kg	15	210	<7.67	<6.49	<7.67
Nitroglycerin	mg/kg	0.61	6.2	2.11	2.55	<0.225

Chemical	Units	Adj. R-RSL	Adj. I-RSL	13SB13A 0-0.5 ft bgs	13SB13C 5-6 ft bgs
Benzo(a)anthracene	ug/kg	150	2,100	14	7.4
Benzo(a)pyrene	ug/kg	15	210	15	9.7
Benzo(b)fluoranthene	ug/kg	150	2,100	20	14
Dibenz(a,h)anthracene	ug/kg	15	210	<4.1	<4.1
Nitroglycerin	mg/kg	0.61	6.2	<0.39	21

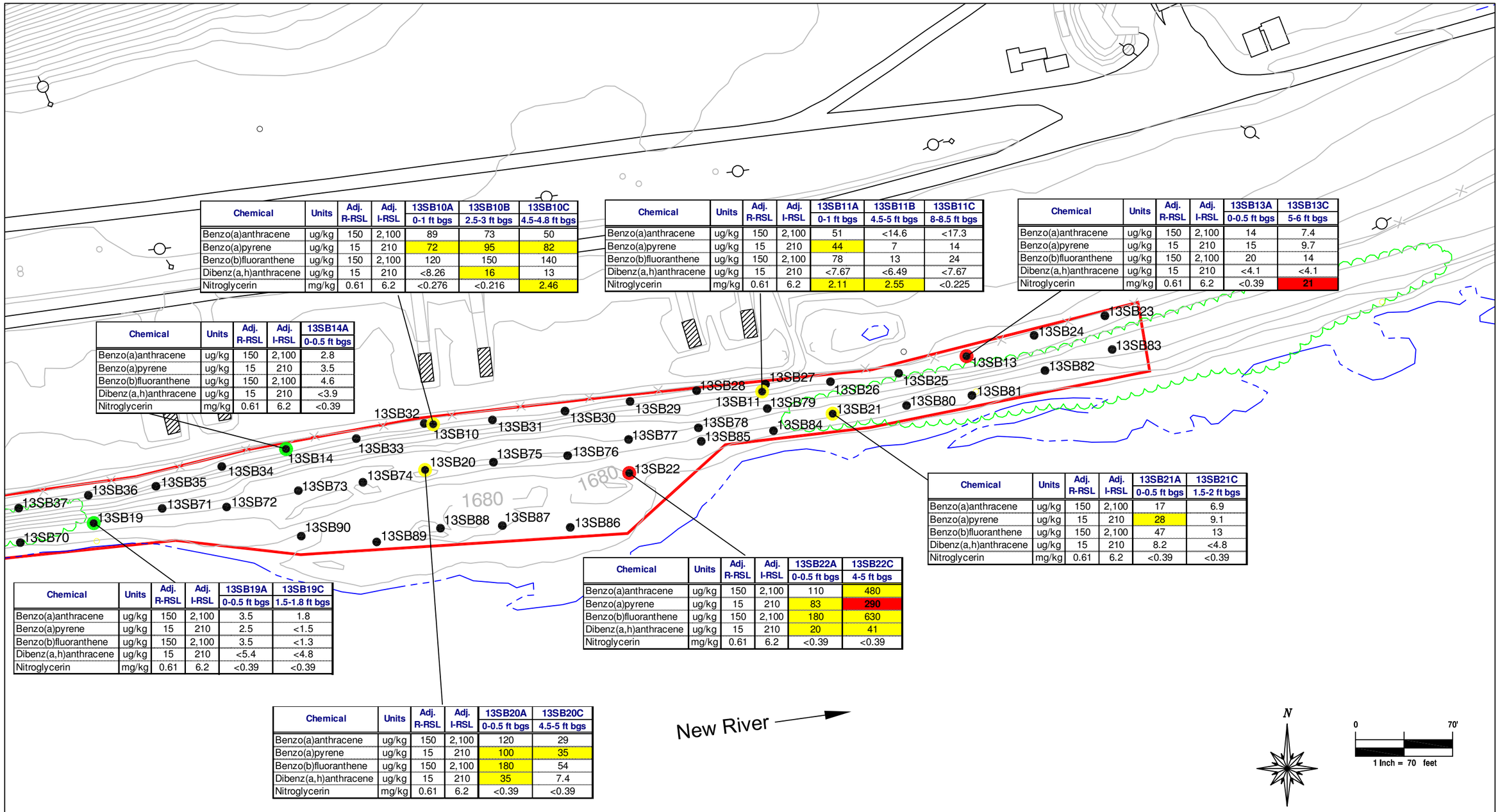
Chemical	Units	Adj. R-RSL	Adj. I-RSL	13SB14A 0-0.5 ft bgs
Benzo(a)anthracene	ug/kg	150	2,100	2.8
Benzo(a)pyrene	ug/kg	15	210	3.5
Benzo(b)fluoranthene	ug/kg	150	2,100	4.6
Dibenz(a,h)anthracene	ug/kg	15	210	<3.9
Nitroglycerin	mg/kg	0.61	6.2	<0.39

Chemical	Units	Adj. R-RSL	Adj. I-RSL	13SB21A 0-0.5 ft bgs	13SB21C 1.5-2 ft bgs
Benzo(a)anthracene	ug/kg	150	2,100	17	6.9
Benzo(a)pyrene	ug/kg	15	210	28	9.1
Benzo(b)fluoranthene	ug/kg	150	2,100	47	13
Dibenz(a,h)anthracene	ug/kg	15	210	8.2	<4.8
Nitroglycerin	mg/kg	0.61	6.2	<0.39	<0.39

Chemical	Units	Adj. R-RSL	Adj. I-RSL	13SB19A 0-0.5 ft bgs	13SB19C 1.5-1.8 ft bgs
Benzo(a)anthracene	ug/kg	150	2,100	3.5	1.8
Benzo(a)pyrene	ug/kg	15	210	2.5	<1.5
Benzo(b)fluoranthene	ug/kg	150	2,100	3.5	<1.3
Dibenz(a,h)anthracene	ug/kg	15	210	<5.4	<4.8
Nitroglycerin	mg/kg	0.61	6.2	<0.39	<0.39

Chemical	Units	Adj. R-RSL	Adj. I-RSL	13SB22A 0-0.5 ft bgs	13SB22C 4-5 ft bgs
Benzo(a)anthracene	ug/kg	150	2,100	110	480
Benzo(a)pyrene	ug/kg	15	210	83	290
Benzo(b)fluoranthene	ug/kg	150	2,100	180	630
Dibenz(a,h)anthracene	ug/kg	15	210	20	41
Nitroglycerin	mg/kg	0.61	6.2	<0.39	<0.39

Chemical	Units	Adj. R-RSL	Adj. I-RSL	13SB20A 0-0.5 ft bgs	13SB20C 4.5-5 ft bgs
Benzo(a)anthracene	ug/kg	150	2,100	120	29
Benzo(a)pyrene	ug/kg	15	210	100	35
Benzo(b)fluoranthene	ug/kg	150	2,100	180	54
Dibenz(a,h)anthracene	ug/kg	15	210	35	7.4
Nitroglycerin	mg/kg	0.61	6.2	<0.39	<0.39



Legend

- Topographic Contour Line (feet, mean sea level)
- Surface Water
- Study Area Boundary
- Below Adjusted Residential Regional Screening Level (R-RSL)
- Above Adjusted R-RSL
- Above Adjusted Industrial Regional Screening Level (I-RSL)
- Sample Locations

*Duplicate Average Result
mg/kg - milligram per kilogram
(ft bgs)-feet below ground surface

- Light/Electric Pole
- Vegetation
- Burning Pan

FIGURE 4-2b

Extent of Organic COPCs in Soil

Date: March 2009	URS Project #: 11656367
Prepared by: MRF	Approved by: JOS
Scale: 1 inch = 70 feet	File Name: Fig.4-2b organics

Study Area at SWMU 13
RFI Report
Radford Army Ammunition Plant
Radford, Virginia

URS Group, Inc.
5540 Falmouth Street
Suite 201
Richmond, Virginia 23230

Table 4-1
Summary of Detected Chemicals in Soil Analytical Samples
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID / Sample Date / Sample Depth (ft bgs)	CAS #	Facility-Wide Background Point Estimate[A]	Adjusted Soil RSL (Residential)	Key	Adjusted Soil RSL (Industrial)	Key	13SB7A 10/9/2003 0-1 Result	LQ, VQ, r	MDL	RL	13SB7B 10/9/2003 5-6 Result	LQ, VQ, r	MDL	RL	13SB7C 10/9/2003 10-12 Result	LQ, VQ, r	MDL	RL	13SB8A 10/9/2003 0-1 Result	LQ, VQ, r	MDL	RL	13SB8B 10/9/2003 3.5-3.7 Result	LQ, VQ, r	MDL	RL	13SB9A 10/9/2003 0-1 Result	LQ, VQ, r	MDL	RL	13SB9A-DUP (SBD9) 10/9/2003 0-1 Result	LQ, VQ, r	MDL	RL
TAL Metals (mg/kg)																																			
Aluminum	7429-90-5	40,041	7,700	n	99,000	nm	14,000		1.83	50	13,900		1.83	50	21,400		1.83	50	12,600		1.83	50	7,650		1.83	50	20,400		1.83	50	18,600		1.83	50
Antimony	7440-36-0	--	3.1	n	41	n	<0.5	U	0.0518	0.5	0.12	J,B,p	0.0518	0.5	0.085	J,B,p	0.0518	0.5	0.069	J,B,p	0.0518	0.5	<0.5	U	0.0518	0.5	0.095	J,B,p	0.0518	0.5	0.1	J,B,p	0.0518	0.5
Arsenic	7440-38-2	15.8	0.39	c*	1.6	c	2.5		0.0232	0.4	3.5		0.0232	0.4	2.4		0.0232	0.4	2.4		0.0232	0.4	0.65		0.0232	0.4	2.7		0.0232	0.4	2.4		0.0232	0.4
Barium	7440-39-3	209	1,500	n	19,000	nm	170		0.106	5	199		0.106	5	208		0.106	5	124		0.106	5	66		0.106	5	175		0.106	5	178		0.106	5
Beryllium	7440-41-7	1.02	16	n	200	n	1		0.167	1	0.98	J	0.167	1	1.3		0.167	1	0.66	J	0.0333	1	<1	U	0.0391	1	1.2		0.167	1	1.1		0.167	1
Cadmium	7440-43-9	0.69	7	n	81	n	1.3		0.182	1	1.5		0.182	1	1.3		0.182	1	0.91	J	0.182	1	0.72	J	0.182	1	2.2		0.182	1	2.4		0.182	1
Calcium	7440-70-2	--	--	--	--	--	2,290	,J,m	16.6	250	2,650	,J,m	16.6	250	2,310	,J,m	16.6	250	3,290	,J,m	16.6	250	1,750	,J,m	16.6	250	1,890	,J,m	16.6	250	2,070	,J,m	16.6	250
Chromium	7440-47-3	65.3	280	c	1,400	c	28	,J,m	0.912	5	30	,J,m	0.912	5	37	,J,m	0.912	5	28	,J,m	0.912	5	19	,J,m	0.912	5	36	,J,m	0.912	5	34	,J,m	0.912	5
Cobalt	7440-48-4	72.3	2.3	n	30	n	9	,J,s	0.208	1	13	,J,s	0.208	1	13	,J,s	0.208	1	10	,J,s	0.208	1	6	,J,s	0.208	1	13	,J,s	0.208	1	13	,J,s	0.208	1
Copper	7440-50-8	53.5	310	n	4,100	n	13	,J,s	0.368	2	16	,J,s	0.368	2	19	,J,s	0.368	2	18	,J,s	0.368	2	8.3	,J,s	0.368	2	25	,J,s	0.368	2	26	,J,s	0.368	2
Iron	7439-89-6	50,962	5,500	n	72,000	nm	31,000		42.4	200	41,600		42.4	200	41,900		42.4	200	29,200		42.4	200	12,400		21.2	100	36,500		42.4	200	35,900		42.4	200
Lead	7439-92-1	26.8	400	n	800	n	141		0.545	25	235		1.09	50	239		1.09	50	8,620		21.8	1,000	46		0.0218	1	434		1.09	50	396		1.09	50
Magnesium	7439-95-4	--	--	--	--	--	3,370	,J,m	3.21	250	3,140	,J,m	3.21	250	3,940	,J,m	3.21	250	3,240	,J,m	3.21	250	2,160	,J,m	3.21	250	3,690	,J,m	3.21	250	3,690	,J,m	3.21	250
Manganese	7439-96-5	2,543	180	n	2,300	n	1,040		1.32	25	1,650		1.32	25	1,380		1.32	25	1,160		1.32	25	270		0.264	5	1,240		1.32	25	1,390		1.32	25
Mercury[1]	7439-97-6	0.13	2.3	n	31	n	0.027	J	0.0077	0.1	0.038	J	0.0077	0.1	0.034	J	0.0077	0.1	0.033	J	0.0077	0.1	0.0087	J	0.0077	0.1	0.043	J	0.0077	0.1	0.043	J	0.0077	0.1
Nickel	7440-02-0	62.8	160	n	2,000	n	14		0.0356	0.5	13		0.0356	0.5	19		0.0356	0.5	14		0.0356	0.5	7.8		0.0356	0.5	19		0.0356	0.5	17		0.0356	0.5
Potassium	7440-09-7	--	--	--	--	--	1,670		5	100	1,320		5	100	1,890		5	100	1,480		5	100	939		5	100	1,980		5	100	1,910		5	100
Selenium	7782-49-2	--	39	n	510	n	0.57	J	0.0502	1	0.7	J	0.0502	1	0.84	J	0.0502	1	0.66	J	0.0502	1	0.35	J	0.0502	1	0.93	J	0.0502	1	0.84	J	0.0502	1
Silver	7440-22-4	--	39	n	510	n	0.084	J	0.0044	3	0.096	J	0.0044	3	0.11	J	0.0044	3	0.14	J	0.0044	3	0.45	J	0.0044	3	0.12	J	0.0044	3	0.12	J	0.0044	3
Sodium	7440-23-5	--	--	--	--	--	58	J	18.1	100	46	J	18.1	100	53	J	18.1	100	40	J	18.1	100	63	J	18.1	100	44	J	18.1	100	45	J	18.1	100
Thallium	7440-28-0	2.11	0.51	n	6.6	n	0.52	,B,x	0.027	0.5	0.69	,B,x	0.027	0.5	0.86	,B,x	0.027	0.5	0.36	J,B,x	0.027	0.5	0.14	J,B,x	0.027	0.5	0.78	,B,x	0.027	0.5	0.95	,B,x	0.027	0.5
Vanadium	7440-62-2	108	55	n	720	n	24		0.207	1	24		0.207	1	36		0.207	1	23		0.207	1	15		0.207	1	37		0.207	1	35		0.207	1
Zinc	7440-66-6	202	2,300	n	31,000	nm	471		5.17	40	688		5.17	40	847		5.17	40	363		2.59	20	154		2.59	20	1,010		12.9	100	969		12.9	100
TCL VOCs (ug/kg)																																			
1,2,4-Trichlorobenzene	120-82-1	--	8.7E+03	n	4.0E+04	ns	<6.1	U	0.492	6.1	<6.2	U	0.492	6.2	<6.3	U,UJ,m	0.517	6.3	<6.5	U	0.533	6.5	<6.5	U	0.533	6.5	<6.4	U	0.533	6.4	<6.2	U	0.492	6.2
2-Butanone	78-93-3	--	2.8E+06	ns	1.9E+07	nms	38		6	24	37		6	25	29	,J,d	6.3	25	30		6.5	26	25	J	6.5	26	41		6.5	26	33		6	25
Acetone	67-64-1	--	6.1E+06	n	6.1E+07	nms	140	,B,z	6	24	130	,B,z	6	25	110	B,B,z	6.3	25	120		6.5	26	77	,B,z	6.5	26	140		6.5	26	130		6	25
Benzene	71-43-2	--	1.1E+03	c*	5.6E+03	c*	<6.1	U	0.632	6.1	<6.2	U	0.632	6.2	<6.3	U,UJ,m	0.664	6.3	<6.5	U	0.685	6.5	<6.5	U	0.685	6.5	<6.4	U	0.685	6.4	<6.2	U	0.632	6.2
cis-1,2-Dichloroethene	156-59-2	--	7.8E+04	n	1.0E+06	ns	<6.1	U	0.852	6.1	<6.2	U	0.852	6.2	<6.3	U	0.895	6.3	<6.5	U	0.923	6.5	<6.5	U	0.923	6.5	<6.4	U	0.923	6.4	<6.2	U	0.852	6.2
Methylene chloride	75-09-2	--	1.1E+04	c	5.4E+04	c	6.4	J,B,z	3.37	24	6.8	J,B,z	3.37	25	7.2	J,B,z	3.54	25	4.1	J	3.65	26	5.6	J	3.65	26	5.7	J	3.65	26	5.7	J	3.37	25
Toluene	108-88-3	--	5.0E+05	ns	4.6E+06	ns	<6.1	U	0.557	6.1	<6.2	U	0.557	6.2	<6.3	U,UJ,m	0.585	6.3	0.66	J	0.603	6.5	<6.5	U	0.603	6.5	2.7	J	0.603	6.4	0.69	J	0.557	6.2
Trichloroethene	79-01-6	--	2.8E+03	c	1.4E+04	c	<6.1	U	0.812	6.1	<6.2	U	0.812	6.2	<6.3	U	0.853	6.3	<6.5	U	0.88	6.5	<6.5	U	0.88	6.5	<6.4	U	0.88	6.4	<6.2	U	0.812	6.2
TCL SVOCs (ug/kg)																																			
1,1'-Biphenyl	92-52-4	--	3.9E+05	ns	5.1E+06	ns	<210	U	2.95	210	<210	U	2.95	210	<220	U	3.2	220	<220	U	3.2	220	<220	U	3.2	220	<220	U	3.2	220	<210	U	2.95	210
2,4-Dichlorophenol	120-83-2	--	1.8E+04	n	1.8E+05	n	<210	U	4.22	210	<210	U	4.22	210	<220	U	4.58	220	<220	U	4.58	220	<220	U	4.58	220	<220	U	4.58	220	<210	U	4.22	210
2,4-Dinitrotoluene	121-14-2	--	1.2E+04	n	1.2E+05	n	<210	U	3.78	210	<210	U	3.78	210	<220	U	4.1	220	<220	U	4.1	220	<220	U	4.1	220	220	J	4.1	220	23	J	3.78	210
2,6-Dinitrotoluene	606-20-2	--	6.1E+03	n	6.2E+04	n	<210	U	33.2	210	<210	U	33.2	210	<220	U	36	220	<220	U	36	220	<220	U	36	220	<220	U	36	220	<210	U	33.2	210
2-Methylnaphthalene	91-57-6	--	3.1E+04	n	4.1E+05	ns	<210	U	3.29	210	<210	U	3.29	210	<220	U	3.56	220	22	J	3.56	220	<220	U	3.56	220	<220	U	3.56	220	<210	U	3.29	210
4-Chloro-3-Methylphenol[2]	59-50-7	--	3.1E+05	n	3.1E+06	n	19	J	6.25	210	16	J	6.25	210	8	J	6.77	220	<220	U	6.77	220	24	J	6.77	220	25	J	6.77	220	8	J	6.25	210
Acenaphthene	83-32-9	--	3.4E+05	n	3.3E+06	n	<210	U	2.06	210	<210	U	2.06	210	<220	U	2.24	220	19	J	2.24	220	<220	U	2.24	220	10	J	2.24	220	7	J	2.06	210
Acenaphthylene[3]	208-96-8	--	1.7E+05	n	1.7E+06	n	<210	U	1.8	210	<210	U	1.8	210	<220	U	1.95	220	2	J	1.95	220	<220	U	1.95	220	7	J	1.95	220	3	J	1.8	210
Acetophenone	98-86-2	--	7.8E+05	ns	1.0E+07	nms	<210	U	2.28	210	<210	U	2.28	210	<220	U	2.47	220	<220	U	2.47	220	<220	U	2.47	220	<220	U	2.47	220	<210	U	2.28	210
Anthracene	120-12-7	--	1.7E+06	n	1.7E+07	nm	<210	U	5.54	210	<210	U	5.54	210	<220	U	6.01	220	37	J	6.01	220	<220	U	6.01	220	25	J	6.01	220	18	J	5.54	210
Benzo(a)anthracene	56-55-3	--	1.5E+02	c	2.1E+03	c	<210	U	16	210	<210	U	16	210	<220	U	17.3	220	100	J	17.3	220	<220	U	17.3	220	200	J	17.3	220	140	J	16	210
Benzo(a)pyrene	50-32-8	--	1.5E+01	c	2.1E+02	c	18	J	6.85	210	11	J	6.85	210	<220	U	7.42	220	120	J	7.42	220	21	J	7.42	220	140	J	7.42	220	120	J	6.85	210
Benzo(b)fluoranthene	205-99-2	--	1.5E+02	c	2.1E+03	c	25	J,J,l	11.7	210	17	J,J,l	11.7	210	<220	U	12.7	220	180	J	12.7	220	36	J	12.7	220	240		12.7	220	170	J	11.7	210
Benzo(g,h,i)perylene[3]	191-24-2	--	1.7E+05	n	1.7E+06	n	11	J,J,l	10.5	210	<210	U	10.5	210	<220	U	11.3	220	72	J	11.3	220	14	J	11.3	220	46	J	11.3	220	58	J	10.5	210
Benzo(k)fluoranthene	207-08-9	--	1.5E+03	c	2.1E+04	c	<210	U	16.1	210	<210	U	16.1	210	<220	U	17.4	220	68	J	17.4	220	<220	U	17.4	220	93	J	17.4	220	85	J	16.1	210
Bis(2-ethylhexyl)phthalate	117-81-7	--	3.5E+04	c*	1.2E+05	c*	19	J,B,z	2.48	210	18	J,B,z	2.48	210	17	J,B,z	2.69	220	35	J	2.69	220	190	J	2.69	220	43	J	2.69	220	33	J	2.48	210
Butylbenzylphthalate	85-68-7	--	2.6E+05	c*	9.1E+05	c	6	J	5.38	210	<210	U	5.38	210	<220	U	5.82	220	<220	U	5.82	220	6	J	5.82	220	<220	U	5.82	220	<210	U	5.38	210
Carbazole	86-74-8	--	--	--	--	--	<210	U	7.32	210	<210	U	7.32	210	<220	U	7.93	220	<220	U	7.93	220	<220	U	7.93	220	<220	U	7.93	220	37	J	7.32	210
Chrysene	218-01-9	--	1.5E+04	c	2.1E+05	c	24	J	12.2	210	16	J	12.2	210	<220	U	13.3	220	140	J	13.3	220	25	J	13.3	220	220		13.3	220	160	J	12.2	210
Di-n-butylphthalate	84-74-2	--	6.1E+05	n	6.2E+06	n	70	J,B,z	4.58	210	85	J,B,z	4.58	210	120	J,B,z	4.97	220	62	J	4.97	220	190	J	4.97	220	580		4.97	220	430		4.58	210
Dibenz(a,h)anthracene	53-70-3	--	1.5E+01	c	2.1E+02	c	<210	U	7.08	210	<210	U	7.08	210	<220	U	7.67	220	18	J	7.67	220	<220	U	7.67	220	13	J	7.67	220	18	J	7.08	210
Dibenzofuran	132-64-9	--	--	--	--	--	<210	U	3.79	210	<210	U	3.79	210	<220	U	4.11	220	13	J	4.11	220	<220	U	4.11	220	<220	U	4.11	220	<210	U	3.79	210
Diethylphthalate	84-66-2	--	4.9E+06	n	4.9E+07	nm	9	J,J,l	2.28	210	8	J,J,l	2.28	210	6	J,J,l	2.47	220	33	J	2.47	220	40	J	2.47	220	230		2.47	220	44	J	2.28	210
Dimethylphthalate	131-11-3	--	--	--	--	--	<210	U	3.97	210	<210	U	3.97	210	<220	U	4.3	220	<220	U	4.3	220	<220	U	4.3	220	18	J	4.3	220	<210	U	3.97	210
Fluoranthene	206-44-0	--	2.3E+05	n	2.2E+06	n	9	J	2.82	210	<210	U	2.82	210	<220	U	3.06	220	370		3.06	220	35	J	3.06	220	260		3.06	220	190	J	2.82	210
Fluorene	86-73-7	--	2.3E+05	n	2.2E+06	n	<210	U	2.02	210	<210	U	2.02	210	<220	U	2.18	220	20	J	2.18	220	<220	U	2.18	220	6	J	2.18	220	4	J	2.02	210
Indeno(1,2,3-cd)pyrene	193-39-5	--	1.5E+02	c	2.1E+03	c	10	J,J,l	4.7	210	<210	U	4.7	210	<220	U	5.1	220	73	J	5.1	220	12	J	5.1	220	43	J	5.1	220	52	J	4.7	210
Isophorone	78-59-1	--	5.1E+05	c*	1.8E+06	c*	<210	U	2.08	210	<210	U	2.08	210	<220	U	2.25	220	<220	U	2.25	220	<220	U	2.25	220	<220	U	2.25	220	<210	U	2.08	210
N-Nitrosodiphenylamine	86-30-6	--	9.9E+04	c	3.5E+05	c	<210	U	5.7	210	<210	U	5.7	210	<220	U	6.18	220	21	J	6.18	220	<220	U	6.18	220	25	J	6.18	220	46	J	5.7	210
Naphthalene	91-20-3	--	3.9E+03	c*	2.0E+04	c*	<210	U	3.3	210	<210	U	3.3	210	<220	U	3.58	220	10	J	3.58	220	<220	U	3.58	220	<220	U	3.58	220	<210	U	3.3	210
Phenanthrene[3]	85-01-8	--	1.7E+05	n	1.7E+06	n	4	J	2.76	210	<210	U	2.76	210	<220	U	2.99	220	130	J	2.99	220	10	J	2.99	220	79	J	2.99	220	60	J	2.76	210
Pyrene	129-00-0	--	1.7E+05	n	1.7E+06	n	6	J	1.78	210	<210	U	1.78	210	<220	U	1.92	220	260		1.92	220	32	J	1.92	220	230		1.92	220	170	J	1.78	210
TCL PAHs (ug/kg)																																			
Acenaphthene	83-32-9	--	3.4E+05	n	3.3E+06	n	<120	U	11.3	120	<130	U	12.2	130	<130	U	12.2	130	<130	U	12.2	130	<130	U	12.2	130	17	J	12.2	130	<130	U	12.2	130
Anthracene	120-12-7	--	1.7E+06	n	1.7E+07	nm	<26	U	0.84	26	1	J	0.91	26	<27	U	0.91	27	12	J	0.91	27	<27	U	0.91	27	38		0.91	27	15	J	0.91	26
Benzo(a)anthracene	56-55-3	--	1.5E+02	c	2.1E+03	c	2.1	J	0.96	26	3.9	J	1.04	26	<27	U	1.04	27	49		1.04	27	3.1	J	1.04	27	130		1.04	27	61		1.04	26
Benzo(a)pyrene	50-32-8	--	1.5E+01	c	2.1E+02	c	<26	U	1.2	26	<26	U	1.3	26	<27	U	1.3	27	71		1.3	27	<27	U	1.3	27	170		1.3	27	73		1.3	26
Benzo(b)fluoranthene	205-99-2	--	1.5E+02	c	2.1E+03	c	<26	U	1.56	26	<26	U	1.69	26	<27	U	1.69	27	54		1.69	27	<27	U	1.69	27	120		1.69	27	56		1.69	26
Benzo(g,h,i)perylene[3]	191-24-2	--	1.7E+05	n	1.7E+06	n	<26	U	15	26	<26	U	16.3	26	<27	U	16.3	27	120		16.3	27	<27	U	16.3	27	540	,J,f	16.3	27	240	,J,f	16.3	26
Benzo(k)fluoranthene	207-08-9	--	1.5E+03	c	2.1E+04	c	<26	U	1.2	26	<26	U	1.3	26	<27	U	1.3	27	32		1.3	27	<27	U	1.3	27	77		1.3	27	36		1.3	26
Chrysene	218-01-9	--	1.5E+04	c	2.1E+05	c	2.6	J	1.44	26	6.5	J	1.56	26	<27	U	1.56	27	57		1.56	27	3.5	J	1.56	27	150		1.56	27	74		1.56	26
Dibenz(a,h)anthracene	53-70-3	--	1.5E+01	c	2.1E+02	c	<26	U	1.68	26	<26	U	1.82	26	<27	U	1.82	27	2.3	J	1.82	27	<27	U	1.82	27	<27	U	1.82	27	<26	U	1.82	26
Fluoranthene	206-44-0	--	2.3E+05	n	2.2E+06	n	5	J	2.04	26	3.3	J	2.21	26	<27	U	2.21	27	120		2.21	27	7.9	J	2.21	27	290	,J,f	2.21	27	120	,J,f	2.21	26
Fluorene	86-73-7	--	2.3E+05	n	2.2E+06	n	<26	U	1.56	26	<26	U	1.69	26	<27	U	1.69	27	<27	U	1.69	27	<27	U	1.69	27	11	J	1.69	27	<26	U	1.69	26
Indeno(1,2,3-cd)pyrene	193-39-5	--	1.5E+02	c	2.1E+03	c	<26	U	0.84	26	<26	U	0.91	26	<27	U	0.91	27	53		0.91	27	<27	U	0.91	27	100		0.91	27	46		0.91	26
Phenanthrene[3]	85-01-8	--	1.7E+05	n	1.7E+06	n	2.1	J	0.72	26	1.8	J	0.78	26	<27	U	0.78	27	43		0.78	27	2.9	J	0.78	27	130		0.78	27	50		0.78	26
Pyrene	129-00-0	--	1.7E+05	n	1.7E+06	n	3.6	J	1.08	26	3	J	1.17	26	<27	U	1.17	27	97		1.17	27	8.8	J	1.17	27	240	,J,f	1.17	27	110	,J,f	1.17	26

Table 4-1
Summary of Detected Chemicals in Soil Analytical Samples
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID / Sample Date / Sample Depth (ft bgs)	CAS #	Facility-Wide Background Point Estimate[A]	Adjusted Soil RSL (Residential)	Key	Adjusted Soil RSL (Industrial)	Key	13SB7A 10/9/2003 0-1		MDL	RL	13SB7B 10/9/2003 5-6		MDL	RL	13SB7C 10/9/2003 10-12		MDL	RL	13SB8A 10/9/2003 0-1		MDL	RL	13SB8B 10/9/2003 3.5-3.7		MDL	RL	13SB9A 10/9/2003 0-1		MDL	RL	13SB9A-DUP (SBD9) 10/9/2003 0-1		MDL	RL
							Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r		
Explosives (mg/kg)																																		
1,3,5-Trinitrobenzene	99-35-4	--	220	n	2,700	n	<0.5	U	0.14	0.5	<0.5	U	0.14	0.5	<0.5	U	0.14	0.5	<0.5	U	0.14	0.5	<0.5	U	0.14	0.5	<0.5	U	0.14	0.5	<0.5	U	0.14	0.5
2,4,6-Trinitrotoluene [4]	118-96-7	--	3.6	n	42	n	<0.5	U	0.167	0.5	<0.5	U	0.167	0.5	<0.5	U	0.167	0.5	<0.5	U	0.167	0.5	<0.5	U	0.167	0.5	<0.5	U	0.167	0.5	<0.5	U	0.167	0.5
2,4-Dinitrotoluene	121-14-2	--	12	n	120	n	<0.5	U	0.142	0.5	<0.5	U	0.142	0.5	<0.5	U	0.142	0.5	<0.5	U	0.142	0.5	<0.5	U	0.142	0.5	<0.5	U	0.142	0.5	<0.5	U	0.142	0.5
2,6-Dinitrotoluene	606-20-2	--	6.1	n	62	n	<1	U	0.25	1	<1	U	0.25	1	<1	U	0.25	1	<1	U	0.25	1	<1	U	0.25	1	<1	U	0.25	1	<1	U	0.25	1
HMX	2691-41-0	--	380	n	4,900	n	<1	U	0.229	1	<1	U	0.229	1	<1	U	0.229	1	<1	U	0.229	1	<1	U	0.229	1	<1	U	0.229	1	<1	U	0.229	1
Nitroglycerin/PETN (mg/kg)																																		
Nitroglycerin	55-63-0	--	0.61	n	6.2	n	<0.602	U	0.195	0.602	<0.617	U	0.2	0.617	<0.656	U	0.213	0.656	<0.682	U	0.221	0.682	<0.643	U	0.208	0.643	<0.682	U	0.221	0.682	0.793		0.238	0.733
Cyanide (mg/kg)																																		
Cyanide	57-12-5	--	160	n	2,000	n	0.07	J	0.0356	0.5	0.18	J	0.0356	0.5	<0.5	U	0.0356	0.5	0.25	J	0.0356	0.5	<0.5	U	0.0356	0.5	0.35	J	0.0356	0.5	0.26	J	0.0356	0.5
Dioxin/Furans (pg/g)																																		
1,2,3,4,6,7,8-HpCDD	35822-39-4	--	--	--	--	--	NT				NT				NT				NT				NT				50		0.423	6.21	40.6		0.474	6.97
1,2,3,4,6,7,8-HpCDF	67562-39-4	--	--	--	--	--	NT				NT				NT				NT				NT				5.11	J	0.489	6.21	2.14	J	0.549	6.97
1,2,3,4,7,8,9-HpCDF	55673-89-7	--	--	--	--	--	NT				NT				NT				NT				NT				0.46	J	0.436	6.21	<6.97	U	0.489	6.97
1,2,3,4,7,8-HxCDD	39227-28-6	--	--	--	--	--	NT				NT				NT				NT				NT				0.735	J	0.268	6.21	0.477	J	0.301	6.97
1,2,3,4,7,8-HxCDF	70648-26-9	--	--	--	--	--	NT				NT				NT				NT				NT				0.681	J	0.229	6.21	0.276	J	0.257	6.97
1,2,3,6,7,8-HxCDD	57653-85-7	--	--	--	--	--	NT				NT				NT				NT				NT				2.24	J,J,I	0.456	6.21	1.04	J,J,I	0.512	6.97
1,2,3,6,7,8-HxCDF	57117-44-9	--	--	--	--	--	NT				NT				NT				NT				NT				0.534	J	0.116	6.21	0.243	J	0.13	6.97
1,2,3,7,8,9-HxCDD	19408-74-3	--	--	--	--	--	NT				NT				NT				NT				NT				2.33	J,J,I	0.559	6.21	1.37	J,J,I	0.628	6.97
1,2,3,7,8-PeCDD	40321-76-4	--	--	--	--	--	NT				NT				NT				NT				NT				0.656	J	0.332	6.21	<6.97	U	0.373	6.97
1,2,3,7,8-PeCDF	57117-41-6	--	120	c	440	c	NT				NT				NT				NT				NT				0.45	J	0.193	6.21	<6.97	U	0.217	6.97
2,3,4,6,7,8-HxCDF	60851-34-5	--	--	--	--	--	NT				NT				NT				NT				NT				0.494	J	0.451	6.21	<6.97	U	0.507	6.97
2,3,4,7,8-PeCDF	57117-31-4	--	12	c	44	c	NT				NT				NT				NT				NT				0.574	J	0.232	6.21	<6.97	U	0.261	6.97
2,3,7,8-TCDF	51207-31-9	--	37	c	130	c	NT				NT				NT				NT				NT				0.784	A	0.153	1.24	0.194		0.132	1.39
OCDD	3268-87-9	--	15,000	c	61,000	c	NT				NT				NT				NT				NT				1,520	,J,f	1.12	12.4	2,900	E,J,q	1.26	13.9
OCDF	39001-02-0	--	12,000	c	44,000	c	NT				NT				NT				NT				NT				11.2	J	0.709	12.4	4.35	J	0.796	13.9
Total HpCDDs	37871-00-4	--	450	c	1,800	c	NT				NT				NT				NT				NT				96.8		0.423	6.21	93.9		0.474	6.97
Total HpCDFs	38998-75-3	--	370	c	1,300	c	NT				NT				NT				NT				NT				13		0.436	6.21	4.88	J	0.489	6.97
Total HxCDDs	34465-46-8	--	45	c	180	c	NT				NT				NT				NT				NT				21.6		0.268	6.21	10.5		0.301	6.97
Total HxCDFs	55684-94-1	--	37	c	130	c	NT				NT				NT				NT				NT				8.31		0.116	6.21	2.18	J	0.13	6.97
Total PeCDDs	36088-22-9	--	4.5	c	18	c	NT				NT				NT				NT				NT				3.82	J	0.332	6.21	2.57	J	0.373	6.97
Total PeCDFs	30402-15-4	--	--	--	--	--	NT				NT				NT				NT				NT				4.85	J	0.193	6.21	0.921	J	0.217	6.97
Total TCDDs	41903-57-5	--	--	--	--	--	NT				NT				NT				NT				NT				1.08	J	0.117	6.21	0.132	J	0.132	6.97
Total TCDFs	55722-27-5	--	--	--	--	--	NT				NT				NT				NT				NT				7.11		0.153	6.21	1.07	J,B,x	0.172	6.97
Total Organic Carbon, TOC (%)																																		
Carbon, Total Organic	--	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT				

Table 4-1
Summary of Detected Chemicals in Soil Analytical Samples
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID / Sample Date / Sample Depth (ft bgs)	CAS #	Facility-Wide Background Point Estimate[A]	Adjusted Soil RSL (Residential)	Key	Adjusted Soil RSL (Industrial)	Key	13SB9B 10/9/2003 1.5-2		MDL	RL	13SB9C 10/9/2003 3.5-4		MDL	RL	13SB10A 10/9/2003 0-1		MDL	RL	13SB10B 10/9/2003 2.5-3		MDL	RL	13SB10C 10/9/2003 4.5-4.8		MDL	RL	13SB11A 10/9/2003 0-1		MDL	RL	13SB11B 10/9/2003 4.5-5		MDL	RL
							Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r		
TAL Metals (mg/kg)																																
Aluminum	7429-90-5	40,041	7,700	n	99,000	nm	16,200		1.83	50	4,250		1.83	50	10,900		1.83	50	14,100		1.83	50	17,500		1.83	50	19,800		1.83	50	10,800		1.83	50
Antimony	7440-36-0	--	3.1	n	41	n	<0.5	U	0.0518	0.5	<0.5	U	0.0518	0.5	0.19	J,B,p	0.0518	0.5	3		0.0518	0.5	0.78		0.0518	0.5	0.27	J,B,p	0.0518	0.5	4.7		0.0518	0.5
Arsenic	7440-38-2	15.8	0.39	c*	1.6	c	1.1		0.0232	0.4	0.12	J	0.0232	0.4	2.5		0.0232	0.4	3.9		0.0232	0.4	3.6		0.0232	0.4	2.2		0.0232	0.4	2.8		0.0232	0.4
Barium	7440-39-3	209	1,500	n	19,000	nm	121		0.106	5	29		0.106	5	111		0.106	5	160		0.106	5	142		0.106	5	171		0.106	5	143		0.106	5
Beryllium	7440-41-7	1.02	16	n	200	n	<1	U	0.0391	1	<1	U	0.0391	1	0.85	J	0.167	1	0.97	J	0.167	1	0.89	J	0.0333	1	1		0.167	1	0.65	J	0.0333	1
Cadmium	7440-43-9	0.69	7	n	81	n	1.2		0.182	1	1.1		0.182	1	1.1		0.182	1	1.5		0.182	1	1		0.182	1	1.2		0.182	1	1.2		0.182	1
Calcium	7440-70-2	--	--	--	--	--	1,490	,J,m	16.6	250	1,300	,J,m	16.6	250	4,570	,J,m	16.6	250	2,240	,J,m	16.6	250	1,820	,J,m	16.6	250	4,020	,J,m	16.6	250	2,120	,J,m	16.6	250
Chromium	7440-47-3	65.3	280	c	1,400	c	31	,J,m	0.912	5	11	,B,x	0.912	5	27	,J,m	0.912	5	35	,J,m	0.912	5	35	,J,m	0.912	5	38	,J,m	0.912	5	29	,J,m	0.912	5
Cobalt	7440-48-4	72.3	2.3	n	30	n	9.8	,J,s	0.208	1	3.9	,J,s	0.208	1	11	,J,s	0.208	1	12	,J,s	0.208	1	14	,J,s	0.208	1	13	,J,s	0.208	1	9.4	,J,s	0.208	1
Copper	7440-50-8	53.5	310	n	4,100	n	13	,J,s	0.368	2	2.5	,J,s	0.368	2	16	,J,s	0.368	2	44	,J,s	0.368	2	34	,J,s	0.368	2	26	,J,s	0.368	2	98	,J,s	1.84	5
Iron	7439-89-6	50,962	5,500	n	72,000	nm	20,400		42.4	200	5,330		4.24	20	25,700		42.4	200	37,500		42.4	200	39,600		42.4	200	32,600		42.4	200	33,800		42.4	200
Lead	7439-92-1	26.8	400	n	800	n	113		0.545	25	12		0.0218	1	111		0.545	25	320		1.09	50	204		0.545	25	111		0.545	25	26,500		109	5,000
Magnesium	7439-95-4	--	--	--	--	--	2,970	,J,m	3.21	250	1,210	,J,m	3.21	250	3,850	,J,m	3.21	250	2,890	,J,m	3.21	250	3,230	,J,m	3.21	250	4,650	,J,m	3.21	250	2,520	,J,m	3.21	250
Manganese	7439-96-5	2,543	180	n	2,300	n	689		0.264	5	59		0.264	5	853		0.264	5	1,310		1.32	25	1,150		1.32	25	1,140		1.32	25	942		0.264	5
Mercury[1]	7439-97-6	0.13	2.3	n	31	n	0.027	J	0.0077	0.1	<0.1	U	0.0077	0.1	0.04	J	0.0077	0.1	0.089	J	0.0077	0.1	0.083	J	0.0077	0.1	0.052	J	0.0077	0.1	0.045	J	0.0077	0.1
Nickel	7440-02-0	62.8	160	n	2,000	n	17		0.0356	0.5	3.8		0.0356	0.5	14		0.0356	0.5	16		0.0356	0.5	16		0.0356	0.5	17		0.0356	0.5	12		0.0356	0.5
Potassium	7440-09-7	--	--	--	--	--	1,490		5	100	548		5	100	1,540		5	100	1,200		5	100	1,410		5	100	2,680		5	100	1,280		5	100
Selenium	7782-49-2	--	39	n	510	n	0.72	J	0.0502	1	0.23	J	0.0502	1	0.67	J	0.0502	1	0.77	J	0.0502	1	0.96	J	0.0502	1	0.86	J	0.0502	1	0.53	J	0.0502	1
Silver	7440-22-4	--	39	n	510	n	0.06	J	0.0044	3	0.023	J,B,p	0.0044	3	0.085	J	0.0044	3	0.18	J	0.0044	3	0.11	J	0.0044	3	0.1	J	0.0044	3	0.26	J	0.0044	3
Sodium	7440-23-5	--	--	--	--	--	54	J	18.1	100	69	J	18.1	100	36	J	18.1	100	52	J	18.1	100	48	J	18.1	100	51	J	18.1	100	63	J	18.1	100
Thallium	7440-28-0	2.11	0.51	n	6.6	n	0.25	J,B,x	0.027	0.5	0.047	J,B,x	0.027	0.5	0.32	J,B,x	0.027	0.5	0.45	J,B,x	0.027	0.5	0.5	,B,x	0.027	0.5	0.42	J,B,x	0.027	0.5	0.45	J,B,x	0.027	0.5
Vanadium	7440-62-2	108	55	n	720	n	30		0.207	1	11		0.207	1	22		0.207	1	25		0.207	1	30		0.207	1	34		0.207	1	18		0.207	1
Zinc	7440-66-6	202	2,300	n	31,000	nm	194		2.59	20	46		0.517	4	287		2.59	20	578		5.17	40	540		5.17	40	294		5.17	40	502		5.17	40
TCL VOCs (ug/kg)																																
1,2,4-Trichlorobenzene	120-82-1	--	8.7E+03	n	4.0E+04	ns	<6.8	U	0.574	6.8	<6.4	U	0.533	6.4	0.96	J	0.574	7	<6.5	U	0.533	6.5	<6.8	U	0.574	6.8	<6.5	U	0.533	6.5	<5.7	U	0.451	5.7
2-Butanone	78-93-3	--	2.8E+06	ns	1.9E+07	nms	400		7	27	24	J	6.5	26	39		7	28	39		6.5	26	36		7	27	45		6.5	26	32		5.5	23
Acetone	67-64-1	--	6.1E+06	n	6.1E+07	nms	140		7	27	31	,B,z	6.5	26	320		7	28	180	,B,z	6.5	26	160	,B,z	7	27	240		6.5	26	150	,B,z	5.5	23
Benzene	71-43-2	--	1.1E+03	c*	5.6E+03	c*	<6.8	U	0.738	6.8	<6.4	U	0.685	6.4	<7	U	0.738	7	<6.5	U	0.685	6.5	<6.8	U	0.738	6.8	0.91	J	0.685	6.5	1.5	J	0.58	5.7
cis-1,2-Dichloroethene	156-59-2	--	7.8E+04	n	1.0E+06	ns	<6.8	U	0.994	6.8	<6.4	U	0.923	6.4	<7	U	0.994	7	<6.5	U	0.923	6.5	<6.8	U	0.994	6.8	<6.5	U	0.923	6.5	1.9	J	0.781	5.7
Methylene chloride	75-09-2	--	1.1E+04	c	5.4E+04	c	5.5	J	3.93	27	5	J	3.65	26	11	J,B,z	3.93	28	6.6	J,B,z	3.65	26	7.4	J,B,z	3.93	27	7.3	J,B,z	3.65	26	6.1	J,B,z	3.09	23
Toluene	108-88-3	--	5.0E+05	ns	4.6E+06	ns	<6.8	U	0.65	6.8	<6.4	U	0.603	6.4	3.5	J	0.65	7	1	J	0.603	6.5	<6.8	U	0.65	6.8	1.9	J	0.603	6.5	1.4	J	0.51	5.7
Trichloroethene	79-01-6	--	2.8E+03	c	1.4E+04	c	<6.8	U	0.948	6.8	<6.4	U	0.88	6.4	<7	U	0.948	7	<6.5	U	0.88	6.5	<6.8	U	0.948	6.8	9.6		0.88	6.5	31		0.745	5.7
TCL SVOCs (ug/kg)																																
1,1'-Biphenyl	92-52-4	--	3.9E+05	ns	5.1E+06	ns	<230	U	3.44	230	<220	U	3.2	220	<240	U	3.44	240	<220	U	3.2	220	<230	U	3.44	230	<220	U	3.2	220	<190	U	2.71	190
2,4-Dichlorophenol	120-83-2	--	1.8E+04	n	1.8E+05	n	<230	U	4.93	230	<220	U	4.58	220	<240	U	4.93	240	<220	U	4.58	220	<230	U	4.93	230	<220	U	4.58	220	<190	U	3.87	190
2,4-Dinitrotoluene	121-14-2	--	1.2E+04	n	1.2E+05	n	<230	U	4.41	230	<220	U	4.1	220	<240	U	4.41	240	51	J	4.1	220	<230	U	4.41	230	35	J	4.1	220	87	J	3.47	190
2,6-Dinitrotoluene	606-20-2	--	6.1E+03	n	6.2E+04	n	<230	U	38.8	230	<220	U	36	220	<240	U	38.8	240	<220	U	36	220	<230	U	38.8	230	<220	U	36	220	32	J	30.5	190
2-Methylnaphthalene	91-57-6	--	3.1E+04	n	4.1E+05	ns	<230	U	3.84	230	<220	U	3.56	220	4	J	3.84	240	4	J	3.56	220	<230	U	3.84	230	5	J	3.56	220	<190	U	3.01	190
4-Chloro-3-Methylphenol[2]	59-50-7	--	3.1E+05	n	3.1E+06	n	<230	U	7.29	230	<220	U	6.77	220	15	J	7.29	240	<220	U	6.77	220	<230	U	7.29	230	9	J	6.77	220	13	J	5.73	190
Acenaphthene	83-32-9	--	3.4E+05	n	3.3E+06	n	<230	U	2.41	230	<220	U	2.24	220	9	J	2.41	240	4	J	2.24	220	<230	U	2.41	230	8	J	2.24	220	<190	U	1.89	190
Acenaphthylene[3]	208-96-8	--	1.7E+05	n	1.7E+06	n	<230	U	2.1	230	<220	U	1.95	220	4	J	2.1	240	6	J	1.95	220	6	J	2.1	230	2	J	1.95	220	2	J	1.65	190
Acetophenone	98-86-2	--	7.8E+05	ns	1.0E+07	nms	<230	U	2.66	230	<220	U	2.47	220	<240	U	2.66	240	<220	U	2.47	220	<230	U	2.66	230	<220	U	2.47	220	<190	U	2.09	190
Anthracene	120-12-7	--	1.7E+06	n	1.7E+07	nm	<230	U	6.47	230	<220	U	6.01	220	26	J	6.47	240	16	J	6.01	220	22	J	6.47	230	15	J	6.01	220	<190	U	5.08	190
Benzo(a)anthracene	56-55-3	--	1.5E+02	c	2.1E+03	c	22	J	18.6	230	<220	U	17.3	220	89	J	18.6	240	73	J	17.3	220	50	J	18.6	230	51	J	17.3	220	<190	U	14.6	190
Benzo(a)pyrene	50-32-8	--	1.5E+01	c	2.1E+02	c	22	J	7.99	230	<220	U	7.42	220	72	J	7.99	240	95	J	7.42	220	82	J	7.99	230	44	J	7.42	220	7	J	6.28	190
Benzo(b)fluoranthene	205-99-2	--	1.5E+02	c	2.1E+03	c	25	J	13.7	230	<220	U	12.7	220	120	J	13.7	240	150	J	12.7	220	140	J	13.7	230	78	J	12.7	220	13	J	10.7	190
Benzo(g,h,i)perylene[3]	191-24-2	--	1.7E+05	n	1.7E+06	n	15	J	12.2	230	<220	U	11.3	220	34	J	12.2	240	60	J	11.3	220	46	J	12.2	230	25	J	11.3	220	<190	U	9.59	190
Benzo(k)fluoranthene	207-08-9	--	1.5E+03	c	2.1E+04	c	<230	U	18.8	230	<220	U	17.4	220	49	J	18.8	240	64	J	17.4	220	48	J	18.8	230	28	J	17.4	220	<190	U	14.7	190
Bis(2-ethylhexyl)phthalate	117-81-7	--	3.5E+04	c*	1.2E+05	c*	24	J	2.9	230	15	J	2.69	220	450		2.9	240	200	J	2.69	220	31	J	2.9	230	59	J	2.69	220	380		2.28	190
Butylbenzylphthalate	85-68-7	--	2.6E+05	c*	9.1E+05	c	<230	U	6.27	230	<220	U	5.82	220	38	J	6.27	240	<220	U	5.82	220	9	J	6.27	230	13	J	5.82	220	24	J	4.93	190
Carbazole	86-74-8	--	--	--	--	--	<230	U	8.54	230	<220	U	7.93	220	<240	U	8.54	240	<220	U	7.93	220	<230	U	8.54	230	<220	U	7.93	220	<190	U	6.71	190
Chrysene	218-01-9	--	1.5E+04	c	2.1E+05	c	30	J	14.3	230	<220	U	13.3	220	120	J	14.3	240	100	J	13.3	220	83	J	14.3	230	57	J	13.3	220	<190	U	11.2	190
Di-n-butylphthalate	84-74-2	--	6.1E+05	n	6.2E+06	n	270		5.35	230	180	J	4.97	220	470		5.35	240	470		4.97	220	450		5.35	230	360		4.97	220	600		4.2	190
Dibenz(a,h)anthracene	53-70-3	--	1.5E+01	c	2.1E+02	c	<230	U	8.26	230	<220	U	7.67	220	<240	J	8.26	240	16	J	7.67	220	13	J	8.26	230	<220	U	7.67	220	<190	U	6.49	190
Dibenzofuran	132-64-9	--	--	--	--	--	<230	U	4.42	230	<220	U	4.11	220	6	J	4.42	240	<220	U	4.11	220	<230	U	4.42	230	<220	U	4.11	220	<190	U	3.48	190
Diethylphthalate	84-66-2	--	4.9E+06	n	4.9E+07	nm	8	J	2.66	230	3	J	2.47	220	110	J	2.66	240	240		2.47	220	71	J	2.66	230	93	J	2.47	220	39	J	2.09	190
Dimethylphthalate	131-11-3	--	--	--	--	--	<230	U	4.63	230	<220	U	4.3	220	140	J	4.63	240	<220	U	4.3	220	<230	U	4.63	230	<220	U	4.3	220	550		3.64	190
Fluoranthene	206-44-0	--	2.3E+05	n	2.2E+06	n	37	J	3.29	230	<220	U	3.06	220	350		3.29	240	90	J	3.06	220	29	J	3.29	230	150	J	3.06	220	12	J	2.59	190
Fluorene	86-73-7	--	2.3E+05	n	2.2E+06	n	<230	U	2.35	230	<220	U	2.18	220	12	J	2.35	240	4	J	2.18	220	<230	U	2.35	230	6	J	2.18	220	<190	U	1.85	190
Indeno(1,2,3-cd)pyrene	193-39-5	--	1.5E+02	c	2.1E+03	c	10	J	5.49	230	<220	U	5.1	220	32	J	5.49	240	54	J	5.1	220	45	J	5.49	230	22	J	5.1	220	5	J	4.31	190
Isophorone	78-59-1	--	5.1E+05	c*	1.8E+06	c*	<230	U	2.42	230	<220	U	2.25	220	<240	U	2.42	240	<220	U	2.25	220	<230	U	2.42	230	<220	U	2.25	220	<190	U	1.9	190
N-Nitrosodiphenylamine	86-30-6	--	9.9E+04	c	3.5E+05	c	<230	U	6.65	230	<220	U	6.18	220	<240	U	6.65	240	120	J	6.18	220	<230	U	6.65	230	200	J	6.18	220	950		5.23	190
Naphthalene	91-20-3	--	3.9E+03	c*	2.0E+04	c*	<230	U	3.85	230	<220	U	3.58	220	<240	U	3.85	240	<220	U	3.58	220	<230	U	3.85	230	4	J	3.58	220	<190	U	3.03	190
Phenanthrene[3]	85-01-8	--	1.7E+05	n	1.7E+06	n	17	J	3.22	230	<220	U	2.99	220	170	J	3.22	240	43	J	2.99	220	14	J	3.22	230	63	J	2.99	220	9	J	2.53	190
Pyrene	129-00-0	--	1.7E+05	n	1.7E+06	n	33	J	2.07	230	3	J	1.92	220	260		2.07	240	83	J	1.92	220	29	J	2.07	230	110	J	1.92	220	11	J	1.63	190
TCL PAHs (ug/kg)																																
Acenaphthene	83-32-9	--	3.4E+05	n	3.3E+06	n	<140	U	13.2	140	<130	U	12.2	130	14	J	13.2	140	<130	U	12.2	130	<140	U	13.2	140	<130	U	12.2	130	<110	U,UL,s	10.3	110
Anthracene	120-12-7	--	1.7E+06	n	1.7E+07	nm	4.2	J	0.98	29	<27	U	0.91	27	38		0.98	30	14	J	0.91	27	6.1	J	0.98	29	6.6	J	0.91	27	8.7	J,L,s	0.77	24
Benzo(a)anthracene	56-55-3	--	1.5E+02	c	2.1E+03	c	12	J	1.12	29	1.4	J	1.04	27	140		1.12	30	56		1.04	27	18	J	1.12	29	31		1.04	27	24	,L,s	0.88	24
Benzo(a)pyrene	50-32-8	--	1.5E+01	c	2.1E+02	c	15	J	1.4	29	<27	U	1.3	27	190		1.4	30	130		1.3	27	59		1.4	29	45		1.3	27	33	,L,s	1.1	24
Benzo(b)fluoranthene	205-99-2	--	1.5E+02	c	2.1E+03	c	10	J	1.82	29	<27	U	1.69	27	140		1.82	30	91		1.69	27	47		1.82	29	32		1.69	27	21	J,L,s	1.43	24
Benzo(g,h,i)perylene[3]	191-24-2	--	1.7E+05	n	1.7E+06	n	<29	U	17.5	29	<27	U	16.3	27	260		17.5	30	290		16.3	27	140		17.5	29	82		16.3	27	77	,L,s	13.8	24
Benzo(k)fluoranthene	207-08-9	--	1.5E+03	c	2.1E+04	c	6	J	1.4	29	<27	U	1.3	27	80		1.4	30	52		1.3	27	20	J	1.4	29	20	J	1.3	27	15	J,L,s	1.1	24
Chrysene	218-01-9	--	1.5E+04	c	2.1E+05	c	15	J	1.68	29	1.7	J	1.56	27	150		1.68	30	80		1.56	27	33		1.68	29	37		1.56	27	40	,L,s	1.32	24
Dibenz(a,h)anthracene	53-70-3	--	1.5E+01	c	2.1E+02	c	<29	U	1.96	29	<27	U	1.82	27	5.2	J	1.96	30	8	J	1.82	27	5.3	J	1.96	29	<27	U	1.82	27	<24	U,UL,s	1.54	24
Fluoranthene	206-44-0	--	2.3E+05	n	2.2E+06	n	30		2.38	29	3.8	J	2.21	27	470		2.38	30	64		2.21	27	12	J	2.38	29	73		2.21	27	<24	U,UL,s	1.87	24
Fluorene	86-73-7	--	2.3E+05	n	2.2E+06	n	<29	U	1.82	29	<27	U	1.69	27	17	J	1.82	30	<27	U	1.69	27	<29	U	1.82	29	<27	U	1.69	27	12	J,L,s	1.43	24
Indeno(1,2,3-cd)pyrene	193-39-5	--	1.5E+02	c	2.1E+03	c	9.4	J	0.98	29	<27	U	0.91	27	130		0.98	30	110		0.91	27	58		0.98	29	37		0.91	27	21	J,L,s	0.77	24
Phenanthrene[3]	85-01-8	--	1.7E+05	n	1.7E+06	n	14	J	0.84	29	1.8	J	0.78	27	210		0.84	30	27		0.78	27	7	J	0.84	29	26	J	0.78	27	110	,L,s	0.66	24
Pyrene	129-00-0	--	1.7E+05	n	1.7E+06	n	27	J	1.26	29	5.1	J	1.17	27	320		1.26	30	50		1.17	27	9.5	J	1.26	29	59		1.17	27	79	,L,s	0.99	24

Table 4-1
Summary of Detected Chemicals in Soil Analytical Samples
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID / Sample Date / Sample Depth (ft bgs)	CAS #	Facility-Wide Background Point Estimate[A]	Adjusted Soil RSL (Residential)	Key	Adjusted Soil RSL (Industrial)	Key	13SB9B 10/9/2003 1.5-2		MDL	RL	13SB9C 10/9/2003 3.5-4		MDL	RL	13SB10A 10/9/2003 0-1		MDL	RL	13SB10B 10/9/2003 2.5-3		MDL	RL	13SB10C 10/9/2003 4.5-4.8		MDL	RL	13SB11A 10/9/2003 0-1		MDL	RL	13SB11B 10/9/2003 4.5-5		MDL	RL
							Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r		
Explosives (mg/kg)																																		
1,3,5-Trinitrobenzene	99-35-4	--	220	n	2,700	n	<0.5	U	0.14	0.5	<0.5	U	0.14	0.5	<0.5	U	0.14	0.5	<0.5	U	0.14	0.5	<0.5	U	0.14	0.5	<0.5	U	0.14	0.5	<0.5	U	0.14	0.5
2,4,6-Trinitrotoluene [4]	118-96-7	--	3.6	n	42	n	<0.5	U	0.167	0.5	<0.5	U	0.167	0.5	<0.5	U	0.167	0.5	<0.5	U	0.167	0.5	<0.5	U	0.167	0.5	0.43	J	0.167	0.5	<0.5	U	0.167	0.5
2,4-Dinitrotoluene	121-14-2	--	12	n	120	n	<0.5	U	0.142	0.5	<0.5	U	0.142	0.5	<0.5	U	0.142	0.5	<0.5	U	0.142	0.5	<0.5	U	0.142	0.5	<0.5	U	0.142	0.5	<0.5	U	0.142	0.5
2,6-Dinitrotoluene	606-20-2	--	6.1	n	62	n	<1	U	0.25	1	<1	U	0.25	1	<1	U	0.25	1	<1	U	0.25	1	<1	U	0.25	1	<1	U	0.25	1	<1	U	0.25	1
HMX	2691-41-0	--	380	n	4,900	n	<1	U	0.229	1	<1	U	0.229	1	<1	U	0.229	1	<1	U	0.229	1	<1	U	0.229	1	<1	U	0.229	1	<1	U	0.229	1
Nitroglycerin/PETN (mg/kg)																																		
Nitroglycerin	55-63-0	--	0.61	n	6.2	n	0.954	J,g	0.214	0.66	<0.665	U	0.215	0.665	<0.853	U	0.276	0.853	<0.666	U	0.216	0.666	2.46	J,g	0.225	0.693	2.11	J,g	0.223	0.688	2.55	J,g	0.212	0.654
Cyanide (mg/kg)																																		
Cyanide	57-12-5	--	160	n	2,000	n	0.12	J	0.0356	0.5	<0.5	U	0.0356	0.5	0.17	J	0.0356	0.5	0.22	J	0.0356	0.5	0.11	J	0.0356	0.5	0.22	J	0.0356	0.5	0.35	J	0.0356	0.5
Dioxin/Furans (pg/g)																																		
1,2,3,4,6,7,8-HpCDD	35822-39-4	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,4,6,7,8-HpCDF	67562-39-4	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,4,7,8,9-HpCDF	55673-89-7	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,4,7,8-HxCDD	39227-28-6	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,4,7,8-HxCDF	70648-26-9	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,6,7,8-HxCDD	57653-85-7	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,6,7,8-HxCDF	57117-44-9	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,7,8,9-HxCDD	19408-74-3	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,7,8-PeCDD	40321-76-4	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,7,8-PeCDF	57117-41-6	--	120	c	440	c	NT				NT				NT				NT				NT				NT				NT			
2,3,4,6,7,8-HxCDF	60851-34-5	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
2,3,4,7,8-PeCDF	57117-31-4	--	12	c	44	c	NT				NT				NT				NT				NT				NT				NT			
2,3,7,8-TCDF	51207-31-9	--	37	c	130	c	NT				NT				NT				NT				NT				NT				NT			
OCDD	3268-87-9	--	15,000	c	61,000	c	NT				NT				NT				NT				NT				NT				NT			
OCDF	39001-02-0	--	12,000	c	44,000	c	NT				NT				NT				NT				NT				NT				NT			
Total HpCDDs	37871-00-4	--	450	c	1,800	c	NT				NT				NT				NT				NT				NT				NT			
Total HpCDFs	38998-75-3	--	370	c	1,300	c	NT				NT				NT				NT				NT				NT				NT			
Total HxCDDs	34465-46-8	--	45	c	180	c	NT				NT				NT				NT				NT				NT				NT			
Total HxCDFs	55684-94-1	--	37	c	130	c	NT				NT				NT				NT				NT				NT				NT			
Total PeCDDs	36088-22-9	--	4.5	c	18	c	NT				NT				NT				NT				NT				NT				NT			
Total PeCDFs	30402-15-4	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
Total TCDDs	41903-57-5	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
Total TCDFs	55722-27-5	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
Total Organic Carbon, TOC (%)																																		
Carbon, Total Organic	--	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			

Table 4-1
Summary of Detected Chemicals in Soil Analytical Samples
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID / Sample Date / Sample Depth (ft bgs)	CAS #	Facility-Wide Background Point Estimate[A]	Adjusted Soil RSL (Residential)	Key	Adjusted Soil RSL (Industrial)	Key	13SB11C 10/9/2003 8-8.5 Result	LQ, VQ, r	MDL	RL	13SB13A 11/12/2008 0-0.5 Result	LQ, VQ, r	MDL	RL	13SB13C 11/12/2008 5-6 Result	LQ, VQ, r	MDL	RL	13SB14A 11/12/2008 0-0.5 Result	LQ, VQ, r	MDL	RL	13SB15A 11/14/2008 0-0.5 Result	LQ, VQ, r	MDL	RL	13SB15A-DUP (DUP-13) 11/14/2008 0-0.5 Result	LQ, VQ, r	MDL	RL	13SB16A 11/14/2008 0-0.5 Result	LQ, VQ, r	MDL	RL
TAL Metals (mg/kg)																																		
Aluminum	7429-90-5	40,041	7,700	n	99,000	nm	20,900		1.83	50	10,000		2	10	8,800		2	10	11,000		2	10	11,000	,J,s	2	10	9,700	,J,s	2	10	12,000	,J,s	2	10
Antimony	7440-36-0	--	3.1	n	41	n	0.62		0.0518	0.5	0.43		0.026	0.2	0.2		0.026	0.2	0.57		0.026	0.2	0.27		0.026	0.2	0.35		0.026	0.2	0.37		0.026	0.2
Arsenic	7440-38-2	15.8	0.39	c*	1.6	c	4.7		0.0232	0.4	1.7		0.026	0.2	1.3		0.026	0.2	2		0.026	0.2	1.3	,L,m	0.026	0.2	1.3	,L,m	0.026	0.2	2.3	,L,m	0.026	0.2
Barium	7440-39-3	209	1,500	n	19,000	nm	211		0.106	5	130		0.33	1	110		0.33	1	90		0.33	1	110	,K,m	0.33	1	99	,K,m	0.33	1	140	,K,m	0.33	1
Beryllium	7440-41-7	1.02	16	n	200	n	1.2		0.167	1	<1	U	0.061	1	<1	U	0.061	1	<1	U	0.061	1	<1	U,UL,m	0.061	1	<1	U,UL,m	0.061	1	<1	U,UL,m	0.061	1
Cadmium	7440-43-9	0.69	7	n	81	n	2.7		0.182	1	0.87	J	0.45	2	0.62	J	0.45	2	0.63	J	0.45	2	<2	U	0.45	2	<2	U	0.45	2	1	J	0.45	2
Calcium	7440-70-2	--	--	--	--	--	2,970	,J,m	16.6	250	1,800	,K,m	9.8	50	1,600	,K,m	9.8	50	110,000	,K,m	980	5,000	6,300	B	9.8	50	5,500	B	9.8	50	2,000	B	9.8	50
Chromium	7440-47-3	65.3	280	c	1,400	c	39	,J,m	0.912	5	18		0.8	5	16		0.8	5	18		0.8	5	18		0.8	5	18		0.8	5	22		0.8	5
Cobalt	7440-48-4	72.3	2.3	n	30	n	16	,J,s	0.208	1	8.5		0.53	2	7.7		0.53	2	7		0.53	2	7.6		0.53	2	7.2		0.53	2	12		0.53	2
Copper	7440-50-8	53.5	310	n	4,100	n	33	,J,s	0.368	2	13		0.027	0.2	9.2		0.027	0.2	31		0.027	0.2	19		0.027	0.2	24		0.027	0.2	19		0.027	0.2
Iron	7439-89-6	50,962	5,500	n	72,000	nm	48,600		42.4	200	27,000		0.98	10	20,000		0.98	10	16,000		0.98	10	18,000		0.98	10	17,000		0.98	10	33,000		0.98	10
Lead	7439-92-1	26.8	400	n	800	n	295		1.09	50	200	,L,m	0.12	1	140	,L,m	0.12	1	160	,L,m	0.12	1	180		0.12	1	220		0.12	1	190		0.12	1
Magnesium	7439-95-4	--	--	--	--	--	3,940	,J,m	3.21	250	2,500		2.8	50	2,300		2.8	50	25,000		2.8	50	4,000		2.8	50	3,800		2.8	50	2,900		2.8	50
Manganese	7439-96-5	2,543	180	n	2,300	n	1,700		6.6	125	830		0.18	1	710		0.18	1	380		0.18	1	470		0.18	1	440		0.18	1	1,300		0.18	1
Mercury[1]	7439-97-6	0.13	2.3	n	31	n	0.071	J	0.0077	0.1	0.032	J	0.0093	0.05	0.022	J	0.0093	0.05	0.02	J	0.0093	0.05	0.038	J	0.0093	0.05	0.041	J	0.0093	0.05	0.073		0.0093	0.05
Nickel	7440-02-0	62.8	160	n	2,000	n	21		0.0356	0.5	12		0.035	0.1	10		0.035	0.1	14		0.035	0.1	10	,J,s	0.035	0.1	11	,J,s	0.035	0.1	12	,J,s	0.035	0.1
Potassium	7440-09-7	--	--	--	--	--	1,720		5	100	1,100		14	50	1,100		14	50	2,900		14	50	1,500		14	50	1,500		14	50	1,600		14	50
Selenium	7782-49-2	--	39	n	510	n	1.5		0.0502	1	0.24	J	0.028	0.3	0.16	J	0.028	0.3	0.25	J	0.028	0.3	0.18	J,L,m	0.028	0.3	0.15	J,L,m	0.028	0.3	0.23	J,L,m	0.028	0.3
Silver	7440-22-4	--	39	n	510	n	0.15	J	0.0044	3	0.057	J	0.0093	0.1	0.049	J	0.0093	0.1	0.055	J	0.0093	0.1	0.043	J	0.0093	0.1	0.037	J	0.0093	0.1	0.11		0.0093	0.1
Sodium	7440-23-5	--	--	--	--	--	64	J	18.1	100	35	J	18	100	34	J	18	100	100		18	100	46	J	18	100	42	J	18	100	40	J	18	100
Thallium	7440-28-0	2.11	0.51	n	6.6	n	0.68	,B,x	0.027	0.5	0.43		0.0068	0.1	0.3		0.0068	0.1	0.16		0.0068	0.1	0.17		0.0068	0.1	0.17		0.0068	0.1	0.38		0.0068	0.1
Vanadium	7440-62-2	108	55	n	720	n	34		0.207	1	22		0.032	0.1	18		0.032	0.1	23		0.032	0.1	22		0.032	0.1	21		0.032	0.1	27		0.032	0.1
Zinc	7440-66-6	202	2,300	n	31,000	nm	1,070		12.9	100	480		0.49	5	330		0.49	5	520		0.49	5	280		0.49	5	290		0.49	5	430		0.49	5
TCL VOCs (ug/kg)																																		
1,2,4-Trichlorobenzene	120-82-1	--	8.7E+03	n	4.0E+04	ns	<6.5	U	0.533	6.5	NT				NT				NT				NT				NT				NT			
2-Butanone	78-93-3	--	2.8E+06	ns	1.9E+07	nms	40		6.5	26	NT				NT				NT				NT				NT				NT			
Acetone	67-64-1	--	6.1E+06	n	6.1E+07	nms	200	,B,z	6.5	26	NT				NT				NT				NT				NT				NT			
Benzene	71-43-2	--	1.1E+03	c*	5.6E+03	c*	1.5	J	0.685	6.5	NT				NT				NT				NT				NT				NT			
cis-1,2-Dichloroethene	156-59-2	--	7.8E+04	n	1.0E+06	ns	4.2	J	0.923	6.5	NT				NT				NT				NT				NT				NT			
Methylene chloride	75-09-2	--	1.1E+04	c	5.4E+04	c	5.8	J,B,z	3.65	26	NT				NT				NT				NT				NT				NT			
Toluene	108-88-3	--	5.0E+05	ns	4.6E+06	ns	1.1	J	0.603	6.5	NT				NT				NT				NT				NT				NT			
Trichloroethene	79-01-6	--	2.8E+03	c	1.4E+04	c	57		0.88	6.5	NT				NT				NT				NT				NT				NT			
TCL SVOCs (ug/kg)																																		
1,1'-Biphenyl	92-52-4	--	3.9E+05	ns	5.1E+06	ns	<220	U	3.2	220	<190	U	1	190	<190	U	1	190	<180	U	0.95	180	<190	U	0.99	190	<190	U	1	190	2	J	1.1	210
2,4-Dichlorophenol	120-83-2	--	1.8E+04	n	1.8E+05	n	<220	U	4.58	220	6.8	J	2.4	190	<190	U	2.4	190	<180	U	2.3	180	<190	U	2.4	190	<190	U	2.4	190	<210	U	2.6	210
2,4-Dinitrotoluene	121-14-2	--	1.2E+04	n	1.2E+05	n	<220	U	4.1	220	100	J	4.6	190	16	J	4.5	190	13	J	4.3	180	26	J,J,f	4.5	190	7,600	,J,f	90	3,800	6.9	U	5	210
2,6-Dinitrotoluene	606-20-2	--	6.1E+03	n	6.2E+04	n	<220	U	36	220	27	J	2.6	190	16	J	2.5	190	<180	U	2.4	180	27	J	2.5	190	570		2.5	190	<210	U	2.8	210
2-Methylnaphthalene	91-57-6	--	3.1E+04	n	4.1E+05	ns	<220	U	3.56	220	1.1	J	0.83	190	<190	U	0.83	190	<180	U	0.79	180	1.1	J	0.82	190	1.1	J	0.82	190	6.1	J	0.91	210
4-Chloro-3-Methylphenol[2]	59-50-7	--	3.1E+05	n	3.1E+06	n	<220	U	6.77	220	<190	U	2.4	190	<190	U	2.3	190	<180	U	2.2	180	<190	U	2.3	190	<190	U	2.3	190	<210	U	2.6	210
Acenaphthene	83-32-9	--	3.4E+05	n	3.3E+06	n	<220	U	2.24	220	<19	U	1.8	19	<19	U	1.8	19	<18	U	1.7	18	<19	U	1.8	19	<19	U	1.8	19	3.7	J	2	21
Acenaphthylene[3]	208-96-8	--	1.7E+05	n	1.7E+06	n	<220	U	1.95	220	1.5	J	1.1	19	<19	U	1.1	19	<18	U	1.1	18	<19	U	1.1	19	<19	U	1.1	19	2.9	J	1.2	21
Acetophenone	98-86-2	--	7.8E+05	ns	1.0E+07	nms	<220	U	2.47	220	3.8	J	3.1	190	3.7	J	3.1	190	<180	U	2.9	180	<190	U	3.1	190	<190	U	3.1	190	3.7	J	3.4	210
Anthracene	120-12-7	--	1.7E+06	n	1.7E+07	nm	<220	U	6.01	220	<19	U	2.9	19	<19	U	2.8	19	<18	U	2.7	18	<19	U	2.8	19	<19	U	2.8	19	14	J	3.1	21
Benzo(a)anthracene	56-55-3	--	1.5E+02	c	2.1E+03	c	<220	U	17.3	220	14	J	1.1	19	7.4	J,B,z	1.1	19	2.8	J,B,z	1	18	9.3	J,B,z	1	19	9.7	J	1.1	19	86		1.2	21
Benzo(a)pyrene	50-32-8	--	1.5E+01	c	2.1E+02	c	14	J	7.42	220	15	J,B,x	1.3	19	9.7	J,B,z	1.3	19	3.5	J,B,z	1.2	18	10	J,B,z	1.3	19	7.8	J,B,z	1.3	19	69		1.4	21
Benzo(b)fluoranthene	205-99-2	--	1.5E+02	c	2.1E+03	c	24	J	12.7	220	20		1.1	19	14	J	1.1	19	4.6	J,B,z	1	18	18	J	1.1	19	18	J	1.1	19	140		1.2	21
Benzo(g,h,i)perylene[3]	191-24-2	--	1.7E+05	n	1.7E+06	n	17		11.3	220	13	J	1	75	8.9	J	1	75	5.7	J	0.95	71	8.5	J	1	74	4.8	J,B,z	1	75	59	J	1.1	82
Benzo(k)fluoranthene	207-08-9	--	1.5E+03	c	2.1E+04	c	<220	U	17.4	220	7.1	J,B,z	1.5	19	4.8	J,B,z	1.5	19	2.1	J,B,z	1.4	18	6.7	J,B,z	1.5	19	5.9	J,B,z	1.5	19	35		1.6	21
Bis(2-ethylhexyl)phthalate	117-81-7	--	3.5E+04	c*	1.2E+05	c*	540		2.69	220	360	B,B,z	2.2	190	230	B,B,z	2.2	190	24	JB,B,z	2.1	180	270	B,B,z	2.2	190	300	B,B,z	2.2	190	50	JB,B,z	2.4	210
Butylbenzylphthalate	85-68-7	--	2.6E+05	c*	9.1E+05	c	40	J	5.82	220	22	J,B,z	1.1	190	7.4	J,B,z	1.1	190	4.6	J,B,z	1.1	180	4.1	J,B,z	1.1	190	36	J,B,z	1.1	190	4.9	J,B,z	1.2	210
Carbazole	86-74-8	--	--	--	--	--	<220	U	7.93	220	7.9	J,B,z	0.56	190	4.1	J,B,z	0.56	190	3.2	J,B,z	0.53	180	5.2	J,B,z	0.55	190	<190	U	0.55	190	7.8	J,B,z	0.61	210
Chrysene	218-01-9	--	1.5E+04	c	2.1E+05	c	16	J	13.3	220	12	J	0.81	19	7.1	J,B,z	0.81	19	4.2	J,B,z	0.77	18	9.6	J	0.8	19	7.1	J,B,z	0.8	19	68		0.89	21
Di-n-butylphthalate	84-74-2	--	6.1E+05	n	6.2E+06	n	320		4.97	220	1,000	,B,z	5.3	380	320	,B,z	2.6	190	65	J,B,z	2.5	180	410	,B,z	2.6	190	12,000	,J,l	53	3,800	150	J,B,z	2.9	210
Dibenz(a,h)anthracene	53-70-3	--	1.5E+01	c	2.1E+02	c	<220	U	7.67	220	<75	U	4.1	75	<75	U	4.1	75	<71	U	3.9	71	<74	U	4.1	74	<75	U	4.1	75	23	J	4.5	82
Dibenzofuran	132-64-9	--	--	--	--	--	<220	U	4.11	220	<190	U	1.7	190	<190	U	1.7	190	<180	U	1.6	180	<190	U	1.7	190	<190	U	1.7	190	3.7	J	1.9	210
Diethylphthalate	84-66-2	--	4.9E+06	n	4.9E+07	nm	6	J	2.47	220	1,100		0.84	380	230		0.41	190	55	J	0.39	180	450	,J,f	0.41	190	2,900	J,J,f	8.3	3,800	140	J	0.46	210
Dimethylphthalate	131-11-3	--	--	--	--	--	<220	U	4.3	220	500		0.87	190	31	J	0.86	190	<180	U	0.82	180	7.4	J	0.85	190	20	J	0.86	190	<210	U	0.94	210
Fluoranthene	206-44-0	--	2.3E+05	n	2.2E+06	n	16	J	3.06	220	15	J,B,z	1.7	19	10	J,B,z	1.7	19	3.9	J,B,z	1.6	18	13	J,B,z	1.7	19	14	J,B,z	1.7	19	81		1.9	21
Fluorene	86-73-7	--	2.3E+05	n	2.2E+06	n	<220	U	2.18	220	<19	U	1.8	19	<19	U	1.8	19	<18	U	1.7	18	<19	U	1.8	19	<19	U	1.8	19	2.5	J	2	21
Indeno(1,2,3-cd)pyrene	193-39-5	--	1.5E+02	c	2.1E+03	c	16	J	5.1	220	11	J	2.5	75	8.2	J	2.5	75	5.3	J,B,x	2.4	71	3.3	J	2.5	74	2.6	J	2.5	75	50	J	2.7	82
Isophorone	78-59-1	--	5.1E+05	c*	1.8E+06	c*	<220	U	2.25	220	2.6	J,B,z	0.95	190	2.6	J,B,z	0.94	190	2.5	J,B,z	0.89	180	4.4	J,B,z	0.93	190	4.5	J,B,z	0.94	190	3.3	J,B,z	1	210
N-Nitrosodiphenylamine	86-30-6	--	9.9E+04	c	3.5E+05	c	<220	U	6.18	220	96	J	0.83	190	58	J	0.82	190	20	J	0.78	180	120	J,J,f	0.82	190	1,100	J,J,f	16	3,800	22	J	0.9	210
Naphthalene	91-20-3	--	3.9E+03	c*	2.0E+04	c*	<220	U	3.58	220	<19	U	2.1	19	<19	U	2.1	19	<18	U	2	18	<19	U	2.1	19	<19	U	2.1	19	8.2	J	2.3	21
Phenanthrene[3]	85-01-8	--	1.7E+05	n	1.7E+06	n	7	J	2.99	220	6.4	J,B,x	2.5	19	5.9	J,B,x	2.5	19	<18	U	2.4	18	6.3	J	2.5	19	5.6	J	2.5	19	41		2.7	21
Pyrene	129-00-0	--	1.7E+05	n	1.7E+06	n	14	J	1.92	220	14	J,B,z	0.63	19	11	J,B,z	0.62	19	4.2	J,B,z	0.59	18	13	J,B,z	0.62	19	14	J,B,z	0.62	19	81		0.68	21
TCL PAHs (ug/kg)																																		
Acenaphthene	83-32-9	--	3.4E+05	n	3.3E+06	n	<130	U	12.2	130	NT				NT				NT				NT				NT				NT			
Anthracene	120-12-7	--	1.7E+06	n	1.7E+07	nm	1.1	J	0.91	27	NT				NT				NT				NT				NT				NT			
Benzo(a)anthracene	56-55-3	--	1.5E+02	c	2.1E+03	c	4.1	J	1.04	27	NT				NT				NT				NT				NT				NT			
Benzo(a)pyrene	50-32-8	--	1.5E+01	c	2.1E+02	c	13	J	1.3	27	NT				NT				NT				NT				NT				NT			
Benzo(b)fluoranthene	205-99-2	--	1.5E+02	c	2.1E+03	c	8.8	J	1.69	27	NT				NT				NT				NT				NT				NT			
Benzo(g,h,i)perylene[3]	191-24-2	--	1.7E+05	n	1.7E+06	n	46		16.3	27	NT				NT				NT				NT				NT				NT			
Benzo(k)fluoranthene	207-08-9	--	1.5E+03	c	2.1E+04	c	4.5	J	1.3	27	NT				NT				NT				NT				NT				NT			
Chrysene	218-01-9	--	1.5E+04	c	2.1E+05	c	7.6	J	1.56	27	NT				NT				NT				NT				NT				NT			
Dibenz(a,h)anthracene	53-70-3	--	1.5E+01	c	2.1E+02	c	<27	U	1.82	27	NT				NT				NT				NT				NT				NT			
Fluoranthene	206-44-0	--	2.3E+05	n	2.2E+06	n	6.5	J	2.21	27	NT				NT				NT				NT				NT				NT			
Fluorene	86-73-7	--	2.3E+05	n	2.2E+06	n	<27	U	1.69	27	NT				NT				NT				NT				NT				NT			
Indeno(1,2,3-cd)pyrene	193-39-5	--	1.5E+02	c	2.1E+03	c	16	J	0.91	27	NT				NT				NT				NT				NT				NT			
Phenanthrene[3]	85-01-8	--	1.7E+05	n	1.7E+06	n	3.4	J	0.78	27	NT				NT				NT				NT				NT				NT			
Pyrene	129-00-0	--	1.7E+05	n	1.7E+06	n	5.6	J	1.17	27	NT				NT				NT				NT				NT				NT			

Table 4-1
Summary of Detected Chemicals in Soil Analytical Samples
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID Sample Date Sample Depth (ft bgs)	CAS #	Facility-Wide Background Point Estimate[A]	Adjusted Soil RSL (Residential)	Key	Adjusted Soil RSL (Industrial)	Key	13SB11C 10/9/2003 8-8.5		MDL	RL	13SB13A 11/12/2008 0-0.5		MDL	RL	13SB13C 11/12/2008 5-6		MDL	RL	13SB14A 11/12/2008 0-0.5		MDL	RL	13SB15A 11/14/2008 0-0.5		MDL	RL	13SB15A-DUP (DUP-13) 11/14/2008 0-0.5		MDL	RL	13SB16A 11/14/2008 0-0.5		MDL	RL
							Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r		
Explosives (mg/kg)																																		
1,3,5-Trinitrobenzene	99-35-4	--	220	n	2,700	n	<0.5	U	0.14	0.5	<2.5	U	0.074	2.5	<2.5	U	0.074	2.5	<2.5	U	0.074	2.5	0.36	J	0.074	2.5	<2.5	U	0.074	2.5	<2.5	U	0.074	2.5
2,4,6-Trinitrotoluene [4]	118-96-7	--	3.6	n	42	n	<0.5	U	0.167	0.5	3	J,g	0.15	2.5	1.3	J	0.15	2.5	0.23	J	0.15	2.5	0.45	J	0.15	2.5	<2.5	U	0.15	2.5	<2.5	U	0.15	2.5
2,4-Dinitrotoluene	121-14-2	--	12	n	120	n	<0.5	U	0.142	0.5	0.17	J	0.1	2.5	<2.5	U	0.1	2.5	<2.5	U	0.1	2.5	<2.5	U	0.1	2.5	<2.5	U	0.1	2.5	<2.5	U	0.1	2.5
2,6-Dinitrotoluene	606-20-2	--	6.1	n	62	n	<1	U	0.25	1	<2.5	U	0.2	2.5	<2.5	U	0.2	2.5	<2.5	U	0.2	2.5	0.68	J,J,g	0.2	2.5	<2.5	U	0.2	2.5	<2.5	U	0.2	2.5
HMX	2691-41-0	--	380	n	4,900	n	<1	U	0.229	1	0.72	J	0.066	2.5	0.79	J	0.066	2.5	<2.5	U	0.066	2.5	0.25	J	0.066	2.5	<2.5	U	0.066	2.5	<2.5	U	0.066	2.5
Nitroglycerin/PETN (mg/kg)																																		
Nitroglycerin	55-63-0	--	0.61	n	6.2	n	<0.695	U	0.225	0.695	<5	U	0.39	5	21	,J,g	0.39	5	<5	U	0.39	5	<5	U	0.39	5	<5	U	0.39	5	<5	U	0.39	5
Cyanide (mg/kg)																																		
Cyanide	57-12-5	--	160	n	2,000	n	0.25	J	0.0356	0.5	NT				NT				NT				NT				NT				NT			
Dioxin/Furans (pg/g)																																		
1,2,3,4,6,7,8-HpCDD	35822-39-4	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,4,6,7,8-HpCDF	67562-39-4	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,4,7,8,9-HpCDF	55673-89-7	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,4,7,8-HxCDD	39227-28-6	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,4,7,8-HxCDF	70648-26-9	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,6,7,8-HxCDD	57653-85-7	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,6,7,8-HxCDF	57117-44-9	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,7,8,9-HxCDD	19408-74-3	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,7,8-PeCDD	40321-76-4	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,7,8-PeCDF	57117-41-6	--	120	c	440	c	NT				NT				NT				NT				NT				NT				NT			
2,3,4,6,7,8-HxCDF	60851-34-5	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
2,3,4,7,8-PeCDF	57117-31-4	--	12	c	44	c	NT				NT				NT				NT				NT				NT				NT			
2,3,7,8-TCDF	51207-31-9	--	37	c	130	c	NT				NT				NT				NT				NT				NT				NT			
OCDD	3268-87-9	--	15,000	c	61,000	c	NT				NT				NT				NT				NT				NT				NT			
OCDF	39001-02-0	--	12,000	c	44,000	c	NT				NT				NT				NT				NT				NT				NT			
Total HpCDDs	37871-00-4	--	450	c	1,800	c	NT				NT				NT				NT				NT				NT				NT			
Total HpCDFs	38998-75-3	--	370	c	1,300	c	NT				NT				NT				NT				NT				NT				NT			
Total HxCDDs	34465-46-8	--	45	c	180	c	NT				NT				NT				NT				NT				NT				NT			
Total HxCDFs	55684-94-1	--	37	c	130	c	NT				NT				NT				NT				NT				NT				NT			
Total PeCDDs	36088-22-9	--	4.5	c	18	c	NT				NT				NT				NT				NT				NT				NT			
Total PeCDFs	30402-15-4	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
Total TCDDs	41903-57-5	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
Total TCDFs	55722-27-5	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
Total Organic Carbon, TOC (%)																																		
Carbon, Total Organic	--	--	--	--	--	--	NT				0.63		0.008	0.2	NT				NT				1		0.008	0.2	1.2		0.008	0.2	NT			

Table 4-1
Summary of Detected Chemicals in Soil Analytical Samples
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID / Sample Date / Sample Depth (ft bgs)	CAS #	Facility-Wide Background Point Estimate[A]	Adjusted Soil RSL (Residential)	Key	Adjusted Soil RSL (Industrial)	Key	13SB16C 11/14/2008 1.5-2		MDL	RL	13SB17A 11/14/2008 0-0.5		MDL	RL	13SB17C 11/14/2008 2.5-3		MDL	RL	13SB18A 11/13/2008 0.0-0.5		MDL	RL	13SB18C 11/13/2008 2.-2.5		MDL	RL	13SB19A 11/13/2008 0-0.5		MDL	RL	13SB19C 11/13/2008 1.5-1.8		MDL	RL
							Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r		
TAL Metals (mg/kg)																																		
Aluminum	7429-90-5	40,041	7,700	n	99,000	nm	13,000	,J,s	2	10	21,000	,J,s	2	10	10,000	,J,s	200	1,000	10,000		2	10	7,200		2	10	23,000		2	10	4,900		51	250
Antimony	7440-36-0	--	3.1	n	41	n	0.42		0.026	0.2	0.37		0.026	0.2	0.18	J	0.026	0.2	0.32		0.026	0.2	0.11	J	0.026	0.2	0.51		0.026	0.2	<0.2	U	0.026	0.2
Arsenic	7440-38-2	15.8	0.39	c*	1.6	c	2.9	,L,m	0.026	0.2	2.2	,L,m	0.026	0.2	1.5	,L,m	0.026	0.2	0.98		0.026	0.2	0.56		0.026	0.2	5.6		0.026	0.2	0.71		0.026	0.2
Barium	7440-39-3	209	1,500	n	19,000	nm	130	,K,m	0.33	1	180	,K,m	0.33	1	95	,K,m	0.33	1	87		0.33	1	62		0.33	1	290		0.33	1	54		0.33	1
Beryllium	7440-41-7	1.02	16	n	200	n	<1	U,UL,m	0.061	1	<1	U,UL,m	0.061	1	<1	U,UL,m	0.061	1	<1	U	0.061	1	<1	U	0.061	1	<1	U	0.061	1	<1	U	0.061	1
Cadmium	7440-43-9	0.69	7	n	81	n	0.93	J	0.45	2	0.84	J	0.45	2	0.51	J	0.45	2	1.1	J	0.45	2	0.51	J	0.45	2	2.6		0.45	2	<2	U	0.45	2
Calcium	7440-70-2	--	--	--	--	--	2,400	B	9.8	50	4,600	B	9.8	50	2,100	B	9.8	50	1,100	,K,m	9.8	50	1,200	,K,m	9.8	50	2,200	,K,m	9.8	50	1,200	,K,m	9.8	50
Chromium	7440-47-3	65.3	280	c	1,400	c	22		0.8	5	32		0.8	5	19		0.8	5	18		0.8	5	13		0.8	5	26		0.8	5	10		0.8	5
Cobalt	7440-48-4	72.3	2.3	n	30	n	11		0.53	2	16		0.53	2	8		0.53	2	7.7		0.53	2	5.4		0.53	2	16		0.53	2	4.7		0.53	2
Copper	7440-50-8	53.5	310	n	4,100	n	24		0.027	0.2	21		0.027	0.2	16		0.027	0.2	260		0.27	2	75		0.053	0.4	20		0.027	0.2	4.4		0.027	0.2
Iron	7439-89-6	50,962	5,500	n	72,000	nm	33,000		0.98	10	33,000		0.98	10	24,000		490	5,000	16,000		0.98	10	11,000		0.98	10	78,000		98	1,000	10,000		200	2,000
Lead	7439-92-1	26.8	400	n	800	n	200		0.12	1	65		0.047	0.4	120		0.12	1	220	,L,m	0.12	1	130	,L,m	0.12	1	440	,L,m	0.24	2	44	,L,m	0.047	0.4
Magnesium	7439-95-4	--	--	--	--	--	2,900		2.8	50	4,800		2.8	50	2,400		2.8	50	2,200		2.8	50	2,000		2.8	50	3,300		2.8	50	1,500		2.8	50
Manganese	7439-96-5	2,543	180	n	2,300	n	1,300		0.18	1	1,300		0.18	1	720		0.18	1	470		0.18	1	150		0.18	1	2,200		0.18	1	220		0.18	1
Mercury[1]	7439-97-6	0.13	2.3	n	31	n	0.073		0.0093	0.05	0.054		0.0093	0.05	0.27		0.0093	0.05	0.11		0.0093	0.05	0.039	J	0.0093	0.05	0.069		0.0093	0.05	<0.05	U	0.0093	0.05
Nickel	7440-02-0	62.8	160	n	2,000	n	14	,J,s	0.035	0.1	17	,J,s	0.035	0.1	9.8	,J,s	0.035	0.1	9.5		0.035	0.1	7.4		0.035	0.1	19		0.035	0.1	7.8		0.035	0.1
Potassium	7440-09-7	--	--	--	--	--	1,500		14	50	2,500		14	50	1,200		14	50	1,200		14	50	920		14	50	2,100		14	50	600		14	50
Selenium	7782-49-2	--	39	n	510	n	0.5	,L,m	0.028	0.3	0.48	,L,m	0.028	0.3	0.14	J,L,m	0.028	0.3	0.25	J	0.028	0.3	0.043	J	0.028	0.3	0.49		0.028	0.3	0.16	J	0.028	0.3
Silver	7440-22-4	--	39	n	510	n	0.11		0.0093	0.1	0.13		0.0093	0.1	0.066	J	0.0093	0.1	0.088	J	0.0093	0.1	0.047	J	0.0093	0.1	0.16		0.0093	0.1	0.03	J	0.0093	0.1
Sodium	7440-23-5	--	--	--	--	--	48	J	18	100	52	J	18	100	44	J	18	100	43	J	18	100	42	J	18	100	43	J	18	100	41	J	18	100
Thallium	7440-28-0	2.11	0.51	n	6.6	n	0.43		0.0068	0.1	0.42		0.0068	0.1	0.29		0.0068	0.1	0.18		0.0068	0.1	0.1		0.0068	0.1	3.5		0.0068	0.1	0.3		0.0068	0.1
Vanadium	7440-62-2	108	55	n	720	n	29		0.032	0.1	37		0.032	0.1	21		0.032	0.1	24		0.032	0.1	16		0.032	0.1	40		0.032	0.1	13		0.032	0.1
Zinc	7440-66-6	202	2,300	n	31,000	nm	410		0.49	5	260		0.49	5	270		4.9	50	660		0.49	5	360		0.49	5	1,600		0.49	5	160		0.49	5
TCL VOCs (ug/kg)																																		
1,2,4-Trichlorobenzene	120-82-1	--	8.7E+03	n	4.0E+04	ns	NT				NT				NT				NT				NT				NT				NT			
2-Butanone	78-93-3	--	2.8E+06	ns	1.9E+07	nms	NT				NT				NT				NT				NT				NT				NT			
Acetone	67-64-1	--	6.1E+06	n	6.1E+07	nms	NT				NT				NT				NT				NT				NT				NT			
Benzene	71-43-2	--	1.1E+03	c*	5.6E+03	c*	NT				NT				NT				NT				NT				NT				NT			
cis-1,2-Dichloroethene	156-59-2	--	7.8E+04	n	1.0E+06	ns	NT				NT				NT				NT				NT				NT				NT			
Methylene chloride	75-09-2	--	1.1E+04	c	5.4E+04	c	NT				NT				NT				NT				NT				NT				NT			
Toluene	108-88-3	--	5.0E+05	ns	4.6E+06	ns	NT				NT				NT				NT				NT				NT				NT			
Trichloroethene	79-01-6	--	2.8E+03	c	1.4E+04	c	NT				NT				NT				NT				NT				NT				NT			
TCL SVOCs (ug/kg)																																		
1,1'-Biphenyl	92-52-4	--	3.9E+05	ns	5.1E+06	ns	1.7	J	1.1	210	<230	U	1.2	230	<200	U	1.1	200	<210	U	1.1	210	<210	U	1.1	210	<250	U	1.3	250	<220	U	1.2	220
2,4-Dichlorophenol	120-83-2	--	1.8E+04	n	1.8E+05	n	<210	U	2.7	210	<230	U	2.9	230	<200	U	2.6	200	<210	U	2.7	210	<210	U	2.7	210	<250	U	3.2	250	<220	U	2.8	220
2,4-Dinitrotoluene	121-14-2	--	1.2E+04	n	1.2E+05	n	69	J	5	210	<230	U	5.5	230	38	J	4.8	200	<210	U	5	210	<210	U	5.1	210	<250	U	6	250	<220	U	5.3	220
2,6-Dinitrotoluene	606-20-2	--	6.1E+03	n	6.2E+04	n	<210	U	2.8	210	<230	U	3.1	230	<200	U	2.7	200	<210	U	2.8	210	<210	U	2.8	210	<250	U	3.4	250	<220	U	3	220
2-Methylnaphthalene	91-57-6	--	3.1E+04	n	4.1E+05	ns	4.1	J	0.92	210	2.7	J	0.99	230	1.6	J	0.88	200	1.2	J	0.91	210	<210	U	0.92	210	<250	U	1.1	250	<220	U	0.97	220
4-Chloro-3-Methylphenol[2]	59-50-7	--	3.1E+05	n	3.1E+06	n	<210	U	2.6	210	<230	U	2.8	230	<200	U	2.5	200	<210	U	2.6	210	<210	U	2.6	210	<250	U	3.1	250	<220	U	2.7	220
Acenaphthene	83-32-9	--	3.4E+05	n	3.3E+06	n	2.5	J	2	21	3.1	J	2.2	23	<20	U	1.9	20	<21	U	2	21	<21	U	2	21	<25	U	2.4	25	<22	U	2.1	22
Acenaphthylene[3]	208-96-8	--	1.7E+05	n	1.7E+06	n	2.5	J	1.3	21	3.6	J	1.4	23	<20	U	1.2	20	18	J	1.2	21	4.1	J	1.3	21	2	J	1.5	25	<22	U	1.3	22
Acetophenone	98-86-2	--	7.8E+05	ns	1.0E+07	nms	4.5	J	3.4	210	<230	U	3.7	230	3.6	J	3.3	200	<210	U	3.4	210	3.7	J	3.4	210	<250	U	4.1	250	<220	U	3.6	220
Anthracene	120-12-7	--	1.7E+06	n	1.7E+07	nm	7.8	J	3.1	21	11	J	3.4	23	<20	U	3	20	12	J	3.1	21	<21	U	3.2	21	<25	U	3.8	25	<22	U	3.3	22
Benzo(a)anthracene	56-55-3	--	1.5E+02	c	2.1E+03	c	62		1.2	21	130		1.3	23	17	J	1.1	20	74		1.2	21	12	J	1.2	21	3.5	J,B,z	1.4	25	1.8	J,B,z	1.2	22
Benzo(a)pyrene	50-32-8	--	1.5E+01	c	2.1E+02	c	53		1.4	21	80		1.6	23	23	,K,m	1.4	20	51		1.4	21	10	J,B,z	1.4	21	2.5	J,B,z	1.7	25	<22	U	1.5	22
Benzo(b)fluoranthene	205-99-2	--	1.5E+02	c	2.1E+03	c	120		1.2	21	190		1.3	23	38	,K,m	1.2	20	68		1.2	21	10	J,B,z	1.2	21	3.5	J,B,z	1.5	25	<22	U	1.3	22
Benzo(g,h,i)perylene[3]	191-24-2	--	1.7E+05	n	1.7E+06	n	45	J	1.1	83	47	J	1.2	90	27	J	1.1	80	21	J	1.1	82	5.4	J,B,z	1.1	83	2.5	J,B,z	1.3	99	<88	U	1.2	88
Benzo(k)fluoranthene	207-08-9	--	1.5E+03	c	2.1E+04	c	34		1.6	21	54		1.8	23	13	J	1.6	20	24		1.6	21	7.1	J,B,z	1.7	21	<25	U	2	25	<22	U	1.7	22
Bis(2-ethylhexyl)phthalate	117-81-7	--	3.5E+04	c*	1.2E+05	c*	43	JB,B,z	2.4	210	33	JB,B,z	2.6	230	38	JB,B,z	2.3	200	18	JB,B,z	2.4	210	16	JB,B,z	2.4	210	15	JB,B,z	2.9	250	15	JB,B,z	2.6	220
Butylbenzylphthalate	85-68-7	--	2.6E+05	c*	9.1E+05	c	4.1	J,B,z	1.3	210	8.1	J,B,z	1.4	230	4.4	J,B,z	1.2	200	5.7	J,B,z	1.2	210	3.3	J,B,z	1.3	210	3.9	J,B,z	1.5	250	3.9	J,B,z	1.3	220
Carbazole	86-74-8	--	--	--	--	--	6.6	J,B,z	0.62	210	13	J,B,z	0.67	230	<200	U	0.59	200	5.3	J,B,z	0.61	210	<210	U	0.62	210	<250	U	0.74	250	<220	U	0.65	220
Chrysene	218-01-9	--	1.5E+04	c	2.1E+05	c	51		0.89	21	99		0.97	23	18	J	0.86	20	81		0.89	21	14	J	0.9	21	3	J,B,z	1.1	25	1.3	J,B,z	0.95	22
Di-n-butylphthalate	84-74-2	--	6.1E+05	n	6.2E+06	n	290	,B,z	2.9	210	170	J,B,z	3.2	230	430	,B,z	2.8	200	92	J,B,z	2.9	210	90	J,B,z	2.9	210	120	J,B,z	3.5	250	110	J,B,z	3.1	220
Dibenz(a,h)anthracene	53-70-3	--	1.5E+01	c	2.1E+02	c	13	J	4.5	83	12	J	4.9	90	7.1	J	4.3	80	10	J	4.5	82	<83	U	4.5	83	<99	U	5.4	99	<88	U	4.8	88
Dibenzofuran	132-64-9	--	--	--	--	--	3.3	J	1.9	210	2.2	J	2	230	<200	U	1.8	200	<210	U	1.9	210	<210	U	1.9	210	<250	U	2.2	250	<220	U	2	220
Diethylphthalate	84-66-2	--	4.9E+06	n	4.9E+07	nm	31	J	0.46	210	12	J,B,z	0.5	230	17	J,K,m	0.44	200	1.2	J,B,z	0.46	210	1.2	J,B,z	0.46	210	2	J,B,z	0.55	250	1.3	J,B,z	0.49	220
Dimethylphthalate	131-11-3	--	--	--	--	--	<210	U	0.95	210	<230	U	1	230	1.2	J	0.91	200	<210	U	0.95	210	<210	U	0.96	210	<250	U	1.1	250	<220	U	1	220
Fluoranthene	206-44-0	--	2.3E+05	n	2.2E+06	n	58		1.9	21	160		2.1	23	21		1.8	20	99		1.9	21	16	J,B,z	1.9	21	3.9	J,B,z	2.3	25	<22	U	2	22
Fluorene	86-73-7	--	2.3E+05	n	2.2E+06	n	3.3	J	2	21	4.9	J	2.2	23	<20	U	1.9	20	6.5	J	2	21	<21	U	2	21	<25	U	2.4	25	<22	U	2.1	22
Indeno(1,2,3-cd)pyrene	193-39-5	--	1.5E+02	c	2.1E+03	c	32	J	2.8	83	44	J	3	90	21	J,L,m	2.6	80	20	J	2.7	82	3.3	J	2.8	83	<99	U	3.3	99	<88	U	2.9	88
Isophorone	78-59-1	--	5.1E+05	c*	1.8E+06	c*	4.5	J,B,z	1	210	4	J,B,z	1.1	230	5.1	J,B,z	1	200	2.5	J,B,z	1	210	2.5	J,B,z	1	210	4.9	J,B,z	1.2	250	3.5	J,B,z	1.1	220
N-Nitrosodiphenylamine	86-30-6	--	9.9E+04	c	3.5E+05	c	47	J	0.91	210	20	J	0.99	230	37	J	0.87	200	17	J	0.9	210	<210	U	0.92	210	<250	U	1.1	250	<220	U	0.97	220
Naphthalene	91-20-3	--	3.9E+03	c*	2.0E+04	c*	5.4	J	2.3	21	3.1	J	2.5	23	2.4	J	2.2	20	<21	U	2.3	21	<21	U	2.3	21	<25	U	2.8	25	<22	U	2.5	22
Phenanthrene[3]	85-01-8	--	1.7E+05	n	1.7E+06	n	27		2.8	21	66		3	23	11	J	2.6	20	60		2.7	21	8.3	J	2.8	21	<25	U	3.3	25	<22	U	2.9	22
Pyrene	129-00-0	--	1.7E+05	n	1.7E+06	n	68		0.69	21	170		0.75	23	23		0.66	20	150		0.68	21	23		0.69	21	3	J,B,z	0.82	25	1.3	J,B,z	0.73	22
TCL PAHs (ug/kg)																																		
Acenaphthene	83-32-9	--	3.4E+05	n	3.3E+06	n	NT				NT				NT				NT				NT				NT				NT			
Anthracene	120-12-7	--	1.7E+06	n	1.7E+07	nm	NT				NT				NT				NT				NT				NT				NT			
Benzo(a)anthracene	56-55-3	--	1.5E+02	c	2.1E+03	c	NT				NT				NT				NT				NT				NT				NT			
Benzo(a)pyrene	50-32-8	--	1.5E+01	c	2.1E+02	c	NT				NT				NT				NT				NT				NT				NT			
Benzo(b)fluoranthene	205-99-2	--	1.5E+02	c	2.1E+03	c	NT				NT				NT				NT				NT				NT				NT			
Benzo(g,h,i)perylene[3]	191-24-2	--	1.7E+05	n	1.7E+06	n	NT				NT				NT				NT				NT				NT				NT			
Benzo(k)fluoranthene	207-08-9	--	1.5E+03	c	2.1E+04	c	NT				NT				NT				NT				NT				NT				NT			
Chrysene	218-01-9	--	1.5E+04	c	2.1E+05	c	NT				NT				NT				NT				NT				NT				NT			
Dibenz(a,h)anthracene	53-70-3	--	1.5E+01	c	2.1E+02	c	NT				NT				NT				NT				NT				NT				NT			
Fluoranthene	206-44-0	--	2.3E+05	n	2.2E+06	n	NT				NT				NT				NT				NT				NT				NT			
Fluorene	86-73-7	--	2.3E+05	n	2.2E+06	n	NT				NT				NT				NT				NT				NT				NT			
Indeno(1,2,3-cd)pyrene	193-39-5	--	1.5E+02	c	2.1E+03	c	NT				NT				NT				NT				NT				NT				NT			
Phenanthrene[3]	85-01-8	--	1.7E+05	n	1.7E+06	n	NT				NT				NT				NT				NT				NT				NT			
Pyrene	129-00-0	--	1.7E+05	n	1.7E+06	n	NT				NT				NT				NT				NT				NT				NT			

Table 4-1
Summary of Detected Chemicals in Soil Analytical Samples
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID / Sample Date / Sample Depth (ft bgs)	CAS #	Facility-Wide Background Point Estimate[A]	Adjusted Soil RSL (Residential)	Key	Adjusted Soil RSL (Industrial)	Key	13SB16C 11/14/2008 1.5-2		MDL	RL	13SB17A 11/14/2008 0-0.5		MDL	RL	13SB17C 11/14/2008 2.5-3		MDL	RL	13SB18A 11/13/2008 0.0-5		MDL	RL	13SB18C 11/13/2008 2.-2.5		MDL	RL	13SB19A 11/13/2008 0-0.5		MDL	RL	13SB19C 11/13/2008 1.5-1.8		MDL	RL
							Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r		
Explosives (mg/kg)																																				
1,3,5-Trinitrobenzene	99-35-4	--	220	n	2,700	n	<2.5	U	0.074	2.5	<2.5	U	0.074	2.5	<2.5	U	0.074	2.5	<2.5	U	0.074	2.5	<2.5	U	0.074	2.5	<2.5	U	0.074	2.5	<2.5	U	0.074	2.5
2,4,6-Trinitrotoluene [4]	118-96-7	--	3.6	n	42	n	<2.5	U	0.15	2.5	<2.5	U	0.15	2.5	<2.5	U	0.15	2.5	<2.5	U	0.15	2.5	<2.5	U	0.15	2.5	<2.5	U	0.15	2.5	<2.5	U	0.15	2.5
2,4-Dinitrotoluene	121-14-2	--	12	n	120	n	<2.5	U	0.1	2.5	<2.5	U	0.1	2.5	<2.5	U	0.1	2.5	<2.5	U	0.1	2.5	<2.5	U	0.1	2.5	<2.5	U	0.1	2.5	<2.5	U	0.1	2.5
2,6-Dinitrotoluene	606-20-2	--	6.1	n	62	n	<2.5	U	0.2	2.5	<2.5	U	0.2	2.5	<2.5	U	0.2	2.5	<2.5	U	0.2	2.5	<2.5	U	0.2	2.5	<2.5	U	0.2	2.5	<2.5	U	0.2	2.5
HMX	2691-41-0	--	380	n	4,900	n	<2.5	U	0.066	2.5	<2.5	U	0.066	2.5	<2.5	U	0.066	2.5	<2.5	U	0.066	2.5	<2.5	U	0.066	2.5	<2.5	U	0.066	2.5	<2.5	U	0.066	2.5
Nitroglycerin/PETN (mg/kg)																																				
Nitroglycerin	55-63-0	--	0.61	n	6.2	n	<5	U	0.39	5	<5	U	0.39	5	<5	U	0.39	5	<5	U	0.39	5	<5	U	0.39	5	<5	U	0.39	5	<5	U	0.39	5
Cyanide (mg/kg)																																				
Cyanide	57-12-5	--	160	n	2,000	n	NT				NT				NT				NT				NT				NT				NT			
Dioxin/Furans (pg/g)																																				
1,2,3,4,6,7,8-HpCDD	35822-39-4	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,4,6,7,8-HpCDF	67562-39-4	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,4,7,8,9-HpCDF	55673-89-7	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,4,7,8-HxCDD	39227-28-6	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,4,7,8-HxCDF	70648-26-9	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,6,7,8-HxCDD	57653-85-7	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,6,7,8-HxCDF	57117-44-9	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,7,8,9-HxCDD	19408-74-3	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,7,8-PeCDD	40321-76-4	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
1,2,3,7,8-PeCDF	57117-41-6	--	120	c	440	c	NT				NT				NT				NT				NT				NT				NT			
2,3,4,6,7,8-HxCDF	60851-34-5	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
2,3,4,7,8-PeCDF	57117-31-4	--	12	c	44	c	NT				NT				NT				NT				NT				NT				NT			
2,3,7,8-TCDF	51207-31-9	--	37	c	130	c	NT				NT				NT				NT				NT				NT				NT			
OCDD	3268-87-9	--	15,000	c	61,000	c	NT				NT				NT				NT				NT				NT				NT			
OCDF	39001-02-0	--	12,000	c	44,000	c	NT				NT				NT				NT				NT				NT				NT			
Total HpCDDs	37871-00-4	--	450	c	1,800	c	NT				NT				NT				NT				NT				NT				NT			
Total HpCDFs	38998-75-3	--	370	c	1,300	c	NT				NT				NT				NT				NT				NT				NT			
Total HxCDDs	34465-46-8	--	45	c	180	c	NT				NT				NT				NT				NT				NT				NT			
Total HxCDFs	55684-94-1	--	37	c	130	c	NT				NT				NT				NT				NT				NT				NT			
Total PeCDDs	36088-22-9	--	4.5	c	18	c	NT				NT				NT				NT				NT				NT				NT			
Total PeCDFs	30402-15-4	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
Total TCDDs	41903-57-5	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
Total TCDFs	55722-27-5	--	--	--	--	--	NT				NT				NT				NT				NT				NT				NT			
Total Organic Carbon, TOC (%)																																				
Carbon, Total Organic	--	--	--	--	--	--	1.5		0.008	0.2	NT				NT				0.47		0.008	0.2	NT				NT				NT			

Table 4-1
Summary of Detected Chemicals in Soil Analytical Samples
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID							13SB20A				13SB20C			13SB21A			13SB21C			13SB22A			13SB22C		
Sample Date							11/12/2008				11/12/2008			11/12/2008			11/12/2008			11/12/2008			11/12/2008		
Sample Depth (ft bgs)							0-0.5				4.5-5			0-0.5			1.5-2			0-0.5			4-5		
	CAS #	Facility-Wide Background Point Estimate[A]	Adjusted Soil RSL (Residential)	Key	Adjusted Soil RSL (Industrial)	Key	Result	LQ, VQ, r	MDL	RL	Result	LQ, VQ, r	MDL	RL	Result	LQ, VQ, r	MDL	RL	Result	LQ, VQ, r	MDL	RL	Result	LQ, VQ, r	MDL	RL	Result	LQ, VQ, r	MDL	RL
TAL Metals (mg/kg)																													
Aluminum	7429-90-5	40,041	7,700	n	99,000	nm	12,000		2	10	19,000		2	10	35,000		2	10	16,000		2	10	10,000		2	10	20,000		2	10
Antimony	7440-36-0	--	3.1	n	41	n	0.32		0.026	0.2	0.4		0.026	0.2	2.9		0.026	0.2	2.5		0.026	0.2	0.83		0.026	0.2	0.39		0.026	0.2
Arsenic	7440-38-2	15.8	0.39	c*	1.6	c	1.8		0.026	0.2	4.3		0.026	0.2	2.8		0.026	0.2	4.8		0.026	0.2	1.9		0.026	0.2	3.5		0.026	0.2
Barium	7440-39-3	209	1,500	n	19,000	nm	120		0.33	1	190		0.33	1	210		0.33	1	170		0.33	1	100		0.33	1	160		0.33	1
Beryllium	7440-41-7	1.02	16	n	200	n	<1	U	0.061	1	<1	U	0.061	1	<1	U	0.061	1	<1	U	0.061	1	<1	U	0.061	1	<1	U	0.061	1
Cadmium	7440-43-9	0.69	7	n	81	n	0.73	J	0.45	2	1.8	J	0.45	2	1.4	J	0.45	2	2.8		0.45	2	0.74	J	0.45	2	1.3	J	0.45	2
Calcium	7440-70-2	--	--	--	--	--	3,000	,K,m	9.8	50	2,100	,K,m	9.8	50	1,900	,K,m	9.8	50	1,100	,K,m	9.8	50	2,000	,K,m	9.8	50	7,000	,K,m	9.8	50
Chromium	7440-47-3	65.3	280	c	1,400	c	23		0.8	5	24		0.8	5	39		0.8	5	22		0.8	5	21		0.8	5	26		0.8	5
Cobalt	7440-48-4	72.3	2.3	n	30	n	11		0.53	2	18		0.53	2	19		0.53	2	24		0.53	2	9.9		0.53	2	16		0.53	2
Copper	7440-50-8	53.5	310	n	4,100	n	16		0.027	0.2	23		0.027	0.2	31		0.027	0.2	20		0.027	0.2	15		0.027	0.2	39		0.027	0.2
Iron	7439-89-6	50,962	5,500	n	72,000	nm	28,000		0.98	10	46,000		98	1,000	41,000		0.98	10	87,000		98	1,000	29,000		0.98	10	39,000		0.98	10
Lead	7439-92-1	26.8	400	n	800	n	85	,L,m	0.047	0.4	210	,L,m	0.12	1	110	,L,m	0.12	1	290	,L,m	0.24	2	140	,L,m	0.12	1	150	,L,m	0.12	1
Magnesium	7439-95-4	--	--	--	--	--	3,600		2.8	50	3,400		2.8	50	4,500		2.8	50	2,000		2.8	50	2,800		2.8	50	6,200		2.8	50
Manganese	7439-96-5	2,543	180	n	2,300	n	940		0.18	1	1,600		0.18	1	1,200		0.18	1	1,500		0.18	1	950		0.18	1	1,200		0.18	1
Mercury[1]	7439-97-6	0.13	2.3	n	31	n	0.037	J	0.0093	0.05	0.095		0.0093	0.05	0.14		0.0093	0.05	0.093		0.0093	0.05	0.039	J	0.0093	0.05	0.22		0.0093	0.05
Nickel	7440-02-0	62.8	160	n	2,000	n	12		0.035	0.1	17		0.035	0.1	22		0.035	0.1	22		0.035	0.1	11		0.035	0.1	16		0.035	0.1
Potassium	7440-09-7	--	--	--	--	--	1,900		14	50	1,400		14	50	2,400		14	50	1,100		14	50	1,400		14	50	1,600		14	50
Selenium	7782-49-2	--	39	n	510	n	0.39		0.028	0.3	0.87		0.028	0.3	0.66		0.028	0.3	0.27	J	0.028	0.3	0.32		0.028	0.3	0.66		0.028	0.3
Silver	7440-22-4	--	39	n	510	n	0.093	J	0.0093	0.1	0.15		0.0093	0.1	0.11		0.0093	0.1	0.2		0.0093	0.1	0.097	J	0.0093	0.1	0.12		0.0093	0.1
Sodium	7440-23-5	--	--	--	--	--	36	J	18	100	49	J	18	100	67	J	18	100	27	J	18	100	41	J	18	100	61	J	18	100
Thallium	7440-28-0	2.11	0.51	n	6.6	n	0.32		0.0068	0.1	0.55		0.0068	0.1	0.46		0.0068	0.1	1.6		0.0068	0.1	0.29		0.0068	0.1	0.51		0.0068	0.1
Vanadium	7440-62-2	108	55	n	720	n	26		0.032	0.1	34		0.032	0.1	59		0.063	0.2	35		0.032	0.1	21		0.032	0.1	36		0.032	0.1
Zinc	7440-66-6	202	2,300	n	31,000	nm	300		0.49	5	680		0.49	5	380		0.49	5	1,100		0.49	5	340		0.49	5	570		0.49	5
TCL VOCs (ug/kg)																														
1,2,4-Trichlorobenzene	120-82-1	--	8.7E+03	n	4.0E+04	ns	NT				NT				NT				NT				NT				NT			
2-Butanone	78-93-3	--	2.8E+06	ns	1.9E+07	nms	NT				NT				NT				NT				NT				NT			
Acetone	67-64-1	--	6.1E+06	n	6.1E+07	nms	NT				NT				NT				NT				NT				NT			
Benzene	71-43-2	--	1.1E+03	c*	5.6E+03	c*	NT				NT				NT				NT				NT				NT			
cis-1,2-Dichloroethene	156-59-2	--	7.8E+04	n	1.0E+06	ns	NT				NT				NT				NT				NT				NT			
Methylene chloride	75-09-2	--	1.1E+04	c	5.4E+04	c	NT				NT				NT				NT				NT				NT			
Toluene	108-88-3	--	5.0E+05	ns	4.6E+06	ns	NT				NT				NT				NT				NT				NT			
Trichloroethene	79-01-6	--	2.8E+03	c	1.4E+04	c	NT				NT				NT				NT				NT				NT			
TCL SVOCs (ug/kg)																														
1,1'-Biphenyl	92-52-4	--	3.9E+05	ns	5.1E+06	ns	1.6	J	1.1	200	<210	U	1.1	210	<220	U	1.2	220	<220	U	1.2	220	2	J	1.1	200	8.8	J	1.2	240
2,4-Dichlorophenol	120-83-2	--	1.8E+04	n	1.8E+05	n	<200	U	2.6	200	<210	U	2.7	210	<220	U	2.8	220	<220	U	2.8	220	<200	U	2.5	200	<240	U	3	240
2,4-Dinitrotoluene	121-14-2	--	1.2E+04	n	1.2E+05	n	<200	U	4.8	200	<210	U	5	210	<220	U	5.3	220	<220	U	5.3	220	<200	U	4.8	200	<240	U	5.7	240
2,6-Dinitrotoluene	606-20-2	--	6.1E+03	n	6.2E+04	n	<200	U	2.7	200	<210	U	2.8	210	<220	U	3	220	<220	U	3	220	<200	U	2.7	200	<240	U	3.2	240
2-Methylnaphthalene	91-57-6	--	3.1E+04	n	4.1E+05	ns	5.1	J	0.88	200	1.6	J	0.91	210	<220	U	0.96	220	1.3	J	0.96	220	5.5	J	0.87	200	19	J	1	240
4-Chloro-3-Methylphenol[2]	59-50-7	--	3.1E+05	n	3.1E+06	n	<200	U	2.5	200	<210	U	2.6	210	<220	U	2.7	220	<220	U	2.7	220	<200	U	2.5	200	<240	U	2.9	240
Acenaphthene	83-32-9	--	3.4E+05	n	3.3E+06	n	5.5	J	1.9	20	2.9	J	2	21	<22	U	2.1	22	<22	U	2.1	22	3.5	J	1.9	20	12	J	2.3	24
Acenaphthylene[3]	208-96-8	--	1.7E+05	n	1.7E+06	n	5.1	J	1.2	20	2.9	J	1.2	21	2.6	J	1.3	22	<22	U	1.3	22	3.5	J	1.2	20	21	J	1.4	24
Acetophenone	98-86-2	--	7.8E+05	ns	1.0E+07	nms	3.9	J	3.3	200	<210	U	3.4	210	<220	U	3.6	220	<220	U	3.6	220	3.5	J	3.3	200	<240	U	3.8	240
Anthracene	120-12-7	--	1.7E+06	n	1.7E+07	nm	19	J	3	20	8.2	J	3.1	21	6.5	J,B,x	3.3	22	<22	U	3.3	22	11	J	3	20	180		3.5	24
Benzo(a)anthracene	56-55-3	--	1.5E+02	c	2.1E+03	c	120		1.1	20	29		1.2	21	17	J	1.2	22	6.9	J,B,z	1.2	22	110		1.1	20	480		1.3	24
Benzo(a)pyrene	50-32-8	--	1.5E+01	c	2.1E+02	c	100		1.4	20	35		1.4	21	28		1.5	22	9.1	J,B,z	1.5	22	83		1.4	20	290		1.6	24
Benzo(b)fluoranthene	205-99-2	--	1.5E+02	c	2.1E+03	c	180		1.2	20	54		1.2	21	47		1.3	22	13	J,B,x	1.3	22	180		1.2	20	630		1.4	24
Benzo(g,h,i)perylene[3]	191-24-2	--	1.7E+05	n	1.7E+06	n	83		1.1	79	23	J	1.1	82	15	J	1.2	87	9.5	J	1.2	87	63	J	1.1	79	170		1.2	93
Benzo(k)fluoranthene	207-08-9	--	1.5E+03	c	2.1E+04	c	55		1.6	20	23		1.6	21	21	J	1.7	22	6.9	J,B,z	1.7	22	42		1.6	20	160		1.9	24
Bis(2-ethylhexyl)phthalate	117-81-7	--	3.5E+04	c*	1.2E+05	c*	46	JB,B,z	2.3	200	25	JB,B,z	2.4	210	30	JB,B,z	2.5	220	15	JB,B,z	2.5	220	440	B,B,z	2.3	200	130	JB	2.7	240
Butylbenzylphthalate	85-68-7	--	2.6E+05	c*	9.1E+05	c	7.5	J,B,z	1.2	200	5.7	J,B,z	1.2	210	10	J,B,z	1.3	220	6.5	J,B,z	1.3	220	17	J,B,z	1.2	200	18	J,B,z	1.4	240
Carbazole	86-74-8	--	--	--	--	--	11	J,B,z	0.59	200	7	J,B,z	0.61	210	4.8	J,B,z	0.65	220	4.3	J,B,z	0.65	220	9.4	J,B,z	0.59	200	14	J,B,z	0.69	240
Chrysene	218-01-9	--	1.5E+04	c	2.1E+05	c	140		0.85	20	33		0.89	21	29		0.94	22	13	J	0.94	22	95		0.85	20	570		1	24
Di-n-butylphthalate	84-74-2	--	6.1E+05	n	6.2E+06	n	71	J,B,z	2.8	200	32	J,B,z	2.9	210	97	J,B,z	3.1	220	250	,B,z	3.1	220	250	,B,z	2.8	200	100	J	3.3	240
Dibenz(a,h)anthracene	53-70-3	--	1.5E+01	c	2.1E+02	c	35	J	4.3	79	7.4	J,B,x	4.5	82	8.2	J,B,x	4.8	87	<87	U	4.8	87	20	J	4.3	79	41	J	5.1	93
Dibenzofuran	132-64-9	--	--	--	--	--	3.6	J	1.8	200	2	J	1.9	210	<220	U	2	220	<220	U	2	220	3.9	J	1.8	200	24	J	2.1	240
Diethylphthalate	84-66-2	--	4.9E+06	n	4.9E+07	nm	56	J	0.44	200	14	J,B,z	0.46	210	4.3	J,B,z	0.48	220	4.8	J,B,z	0.48	220	37	J	0.44	200	81	J	0.52	240
Dimethylphthalate	131-11-3	--	--	--	--	--	<200	U	0.91	200	<210	U	0.95	210	<220	U	1	220	<220	U	1	220	<200	U	0.91	200	<240	U	1.1	240
Fluoranthene	206-44-0	--	2.3E+05	n	2.2E+06	n	170		1.8	20	37		1.9	21	21	J,B,z	2	22	6.1	J,B,z	2	22	140		1.8	20	130		2.1	24
Fluorene	86-73-7	--	2.3E+05	n	2.2E+06	n	5.9	J	1.9	20	2.5	J	2	21	<22	U	2.1	22	<22	U	2.1	22	4.7	J	1.9	20	33		2.3	24
Indeno(1,2,3-cd)pyrene	193-39-5	--	1.5E+02	c	2.1E+03	c	74	J	2.6	79	24	J	2.7	82	17	J	2.9	87	8.7	J,B,x	2.9	87	56	J	2.6	79	130		3.1	93
Isophorone	78-59-1	--	5.1E+05	c*	1.8E+06	c*	3.6	J,B,z	1	200	3.3	J,B,z	1	210	<220	U	1.1	220	3	J,B,z	1.1	220	3.1	J,B,z	0.99	200	2.8	J,B,z	1.2	240
N-Nitrosodiphenylamine	86-30-6	--	9.9E+04	c	3.5E+05	c	18	J	0.87	200	16	J	0.9	210	<220	U	0.96	220	<220	U	0.96	220	17	J	0.87	200	25	J	1	240
Naphthalene	91-20-3	--	3.9E+03	c*	2.0E+04	c*	4.7	J	2.2	20	2.5	J	2.3	21	<22	U	2.4	22	<22	U	2.4	22	5.9	J	2.2	20	22	J	2.6	24
Phenanthrene[3]	85-01-8	--	1.7E+05	n	1.7E+06	n	69		2.6	20	23		2.7	21	12	J	2.9	22	3.5	J,B,x	2.9	22	60		2.6	20	140		3.1	24
Pyrene	129-00-0	--	1.7E+05	n	1.7E+06	n	150		0.66	20	34		0.68	21	18	J,B,z	0.72	22	5.6	J,B,z	0.72	22	130		0.65	20	260		0.77	24
TCL PAHs (ug/kg)																														
Acenaphthene	83-32-9	--	3.4E+05	n	3.3E+06	n	NT				NT				NT				NT				NT				NT			
Anthracene	120-12-7	--	1.7E+06	n	1.7E+07	nm	NT				NT				NT				NT				NT				NT			
Benzo(a)anthracene	56-55-3	--	1.5E+02	c	2.1E+03	c	NT				NT				NT				NT				NT				NT			
Benzo(a)pyrene	50-32-8	--	1.5E+01	c	2.1E+02	c	NT				NT				NT				NT				NT				NT			
Benzo(b)fluoranthene	205-99-2	--	1.5E+02	c	2.1E+03	c	NT				NT				NT				NT				NT				NT			
Benzo(g,h,i)perylene[3]	191-24-2	--	1.7E+05	n	1.7E+06	n	NT				NT				NT				NT				NT				NT			
Benzo(k)fluoranthene	207-08-9	--	1.5E+03	c	2.1E+04	c	NT				NT				NT				NT				NT				NT			
Chrysene	218-01-9	--	1.5E+04	c	2.1E+05	c	NT				NT				NT				NT				NT				NT			
Dibenz(a,h)anthracene	53-70-3	--	1.5E+01	c	2.1E+02	c	NT				NT				NT				NT				NT				NT			
Fluoranthene	206-44-0	--	2.3E+05	n	2.2E+06	n	NT				NT				NT				NT				NT				NT			
Fluorene	86-73-7	--	2.3E+05	n	2.2E+06	n	NT				NT				NT				NT				NT				NT			
Indeno(1,2,3-cd)pyrene	193-39-5	--	1.5E+02	c	2.1E+03	c	NT				NT				NT				NT				NT				NT			
Phenanthrene[3]	85-01-8	--	1.7E+05	n	1.7E+06	n	NT				NT				NT				NT				NT				NT			
Pyrene	129-00-0	--	1.7E+05	n	1.7E+06	n	NT				NT				NT				NT				NT				NT			

Table 4-1
Summary of Detected Chemicals in Soil Analytical Samples
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID / Sample Date / Sample Depth (ft bgs)	CAS #	Facility-Wide Background Point Estimate[A]	Adjusted Soil RSL (Residential)	Key	Adjusted Soil RSL (Industrial)	Key	13SB20A 11/12/2008 0-0.5		MDL	RL	13SB20C 11/12/2008 4.5-5		MDL	RL	13SB21A 11/12/2008 0-0.5		MDL	RL	13SB21C 11/12/2008 1.5-2		MDL	RL	13SB22A 11/12/2008 0-0.5		MDL	RL	13SB22C 11/12/2008 4-5		MDL	RL
							Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r		
Explosives (mg/kg)																														
1,3,5-Trinitrobenzene	99-35-4	--	220	n	2,700	n	<2.5	U	0.074	2.5	<2.5	U	0.074	2.5	<2.5	U	0.074	2.5	<2.5	U	0.074	2.5	<2.5	U	0.074	2.5	<2.5	U	0.074	2.5
2,4,6-Trinitrotoluene [4]	118-96-7	--	3.6	n	42	n	<2.5	U	0.15	2.5	<2.5	U	0.15	2.5	<2.5	U	0.15	2.5	<2.5	U	0.15	2.5	<2.5	U	0.15	2.5	<2.5	U	0.15	2.5
2,4-Dinitrotoluene	121-14-2	--	12	n	120	n	<2.5	U	0.1	2.5	<2.5	U	0.1	2.5	<2.5	U	0.1	2.5	<2.5	U	0.1	2.5	<2.5	U	0.1	2.5	<2.5	U	0.1	2.5
2,6-Dinitrotoluene	606-20-2	--	6.1	n	62	n	<2.5	U	0.2	2.5	<2.5	U	0.2	2.5	<2.5	U	0.2	2.5	<2.5	U	0.2	2.5	<2.5	U	0.2	2.5	<2.5	U	0.2	2.5
HMX	2691-41-0	--	380	n	4,900	n	<2.5	U	0.066	2.5	<2.5	U	0.066	2.5	<2.5	U	0.066	2.5	<2.5	U	0.066	2.5	<2.5	U	0.066	2.5	<2.5	U	0.066	2.5
Nitroglycerin/PETN (mg/kg)																														
Nitroglycerin	55-63-0	--	0.61	n	6.2	n	<5	U	0.39	5	<5	U	0.39	5	<5	U	0.39	5	<5	U	0.39	5	<5	U	0.39	5	<5	U	0.39	5
Cyanide (mg/kg)																														
Cyanide	57-12-5	--	160	n	2,000	n	NT				NT				NT				NT				NT				NT			
Dioxin/Furans (pg/g)																														
1,2,3,4,6,7,8-HpCDD	35822-39-4	--	--	--	--	--	NT				NT				NT				NT				NT				NT			
1,2,3,4,6,7,8-HpCDF	67562-39-4	--	--	--	--	--	NT				NT				NT				NT				NT				NT			
1,2,3,4,7,8,9-HpCDF	55673-89-7	--	--	--	--	--	NT				NT				NT				NT				NT				NT			
1,2,3,4,7,8-HxCDD	39227-28-6	--	--	--	--	--	NT				NT				NT				NT				NT				NT			
1,2,3,4,7,8-HxCDF	70648-26-9	--	--	--	--	--	NT				NT				NT				NT				NT				NT			
1,2,3,6,7,8-HxCDD	57653-85-7	--	--	--	--	--	NT				NT				NT				NT				NT				NT			
1,2,3,6,7,8-HxCDF	57117-44-9	--	--	--	--	--	NT				NT				NT				NT				NT				NT			
1,2,3,7,8,9-HxCDD	19408-74-3	--	--	--	--	--	NT				NT				NT				NT				NT				NT			
1,2,3,7,8-PeCDD	40321-76-4	--	--	--	--	--	NT				NT				NT				NT				NT				NT			
1,2,3,7,8-PeCDF	57117-41-6	--	120	c	440	c	NT				NT				NT				NT				NT				NT			
2,3,4,6,7,8-HxCDF	60851-34-5	--	--	--	--	--	NT				NT				NT				NT				NT				NT			
2,3,4,7,8-PeCDF	57117-31-4	--	12	c	44	c	NT				NT				NT				NT				NT				NT			
2,3,7,8-TCDF	51207-31-9	--	37	c	130	c	NT				NT				NT				NT				NT				NT			
OCDD	3268-87-9	--	15,000	c	61,000	c	NT				NT				NT				NT				NT				NT			
OCDF	39001-02-0	--	12,000	c	44,000	c	NT				NT				NT				NT				NT				NT			
Total HpCDDs	37871-00-4	--	450	c	1,800	c	NT				NT				NT				NT				NT				NT			
Total HpCDFs	38998-75-3	--	370	c	1,300	c	NT				NT				NT				NT				NT				NT			
Total HxCDDs	34465-46-8	--	45	c	180	c	NT				NT				NT				NT				NT				NT			
Total HxCDFs	55684-94-1	--	37	c	130	c	NT				NT				NT				NT				NT				NT			
Total PeCDDs	36088-22-9	--	4.5	c	18	c	NT				NT				NT				NT				NT				NT			
Total PeCDFs	30402-15-4	--	--	--	--	--	NT				NT				NT				NT				NT				NT			
Total TCDDs	41903-57-5	--	--	--	--	--	NT				NT				NT				NT				NT				NT			
Total TCDFs	55722-27-5	--	--	--	--	--	NT				NT				NT				NT				NT				NT			
Total Organic Carbon, TOC (%)																														
Carbon, Total Organic	--	--	--	--	--	--	NT				0.75		0.008	0.2	NT				NT				NT				NT			

Notes:
CAS = Chemical Abstracts Service
ft bgs = Feet Below Ground Surface
mg/kg = Milligram Per Kilogram
µg/kg = Microgram Per Kilogram
pg/g = Picogram Per Gram
TAL = Target Analyte List
TCL = Target Compound List
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
PETN = Pentaerythritol Tetranitrate
MDL = Method Detection Limit
RL = Reporting Limit
LQ = Laboratory Qualifier
VQ = Validation Qualifier
r = Reason Code
NT = Not Tested

[A] = Facility-Wide Background Point Estimate as Reported in the Facility-Wide Background Study Report (IT 2001)
RSL = Regional Screening Level (RSL) from October 2008 RSL Table
Adjusted RSLs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
Key: c = cancer
n = noncancer
* = where: n SL < 100X c SL
** = where n SL < 10X c SL
m = concentration may exceed ceiling limit
s = concentration may exceed Csat

-- = No Screening Value Available

[1] = Mercuric chloride soil RSL value used
[2] = 3-Methylphenol RSLs used
[3] = Pyrene RSLs used
[4] = Noncarcinogenic Residential RSL value for 2,4,6-Trinitrotoluene was used for screening

= Concentration Exceeds Adjusted Soil Residential RSL

= Concentration Exceeds Adjusted Soil Industrial RSL

underline = Concentration Exceeds Facility Background Values

Data Qualifiers:

Laboratory Qualifiers
- B Analyte found in associated blank as well as in the sample.
- J Estimated value.
- E Concentration exceeded the upper level of the calibration range of the instrument for that specific analysis. For TICs, compound not present in calibration standard, calculated using total peak areas ion chromatographs and response factor of 1.
- U The compound was analyzed for but not detected. The reporting limit will be adjusted to reflect any dilution, and for soil, the percent moisture.
- A Amount detected is less than the Lower Calibration Limit.

Validation Qualifiers
- B Not detected substantially above the level reported in laboratory or field blanks.
- N Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
- J Analyte present. Reported value may not be accurate or precise.
- K Analyte present. Reported value may be biased high. Actual value is expected to be lower.
- L Analyte present. Reported value may be biased low. Actual value is expected to be higher.
- U Not detected. The associated number indicates the approximate sample concentration necessary to be detected.
- UJ Not detected, quantitation limit may be inaccurate or imprecise.
- UL Not detected, quantitation limit is probably higher.

Reason Codes
GC/MS Organics
- c Calibration failure; poor (RRF) or unstable (%D) response
- d MS/MSD or LCS/LCSD RPD imprecision
- f Field duplicate imprecision
- l MS/MSD recovery failure
- m Internal standard failure
- q Concentration exceeded the linear range
- s Surrogate failure
- t Tentatively identified Compound
- x Field and/or equipment blank contamination
- z Method blank and/or storage blank contamination

Inorganics and Conventionals
- m MS/MSD recovery failure
- p Preparation blank contamination
- s Serial dilution failure
- x CRDL standard recovery failure

GC and HPLC Organics
- f Field du[licate imprecision
- g Dual column confirmation imprecision

Table 4-2
Summary of Lead in Soil Analytical Samples
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID	Sample Date	Sample Depth (ft bgs)	Lead			
			Result	LQ, VQ, r	MDL	RL
13SB7A	10/9/2003	0-1	141		0.545	25
13SB7B	10/9/2003	5-6	235		1.09	50
13SB7C	10/9/2003	10-12	239		1.09	50
13SB8A	10/9/2003	0-1	8,620		21.8	1,000
13SB8B	10/9/2003	3.5-3.7	46		0.0218	1
13SB9A	10/9/2003	0-1	434		1.09	50
13SB9A-DUP (SBD9)	10/9/2003	0-1	396		1.09	50
13SB9B	10/9/2003	1.5-2	113		0.545	25
13SB9C	10/9/2003	3.5-4	12		0.0218	1
13SB10A	10/9/2003	0-1	111		0.545	25
13SB10B	10/9/2003	2.5-3	320		1.09	50
13SB10C	10/9/2003	4.5-4.8	204		0.545	25
13SB11A	10/9/2003	0-1	111		0.545	25
13SB11B	10/9/2003	4.5-5	26,500		109	5,000
13SB11C	10/9/2003	8-8.5	295		1.09	50
13SB13A	11/12/2008	0-0.5	200	,L,m	0.12	1
13SB13C	11/12/2008	5-6	140	,L,m	0.12	1
13SB14A	11/12/2008	0-0.5	160	,L,m	0.12	1
13SB15A	11/14/2008	0-0.5	180		0.12	1
13SB15A-DUP (DUP-13)	11/14/2008	0-0.5	220		0.12	1
13SB16A	11/14/2008	0-0.5	190		0.12	1
13SB16C	11/14/2008	1.5-2	200		0.12	1
13SB17A	11/14/2008	0-0.5	65		0.047	0.4
13SB17C	11/14/2008	2.5-3	120		0.12	1
13SB18A	11/13/2008	0.0-5	220	,L,m	0.12	1
13SB18C	11/13/2008	2.-2.5	130	,L,m	0.12	1
13SB19A	11/13/2008	0-0.5	440	,L,m	0.24	2
13SB19C	11/13/2008	1.5-1.8	44	,L,m	0.047	0.4
13SB20A	11/12/2008	0-0.5	85	,L,m	0.047	0.4
13SB20C	11/12/2008	4.5-5	210	,L,m	0.12	1
13SB21A	11/12/2008	0-0.5	110	,L,m	0.12	1
13SB21C	11/12/2008	1.5-2	290	,L,m	0.24	2
13SB22A	11/12/2008	0-0.5	140	,L,m	0.12	1
13SB22C	11/12/2008	4-5	150	,L,m	0.12	1
13SB23A	11/12/2008	0-0.5	140		2.9	10
13SB23B	11/12/2008	2-3	190		2.9	10
13SB23C	11/12/2008	5-6	220		2.9	10
13SB24A	11/12/2008	0-5	190		2.9	10
13SB24B	11/12/2008	2-3	200		2.9	10
13SB24C	11/12/2008	5-6	170		2.9	10
13SB25A	11/12/2008	0-0.5	180		2.9	10
13SB25B	11/12/2008	2-3	760		2.9	10
13SB25C	11/12/2008	5-6	1,300		2.9	10
13SB26A	11/12/2008	0-0.5	300		2.9	10
13SB26B	11/12/2008	1-1.5	220		2.9	10
13SB26B-DUP (DUP-1)	11/12/2008	1-1.5	230		2.9	10
13SB27A	11/12/2008	0-0.5	27		2.9	10
13SB28A	11/12/2008	0-0.5	92		2.9	10
13SB29A	11/12/2008	0-0.3	76	,K,m	2.9	10
13SB30A	11/12/2008	0-0.5	250		2.9	10
13SB31A	11/12/2008	0-0.5	80		2.9	10
13SB32A	11/12/2008	0-0.25	90	,K,m	2.9	10
13SB33A	11/12/2008	0-0.25	1,600	,J,f	2.9	10
13SB33A-DUP (DUP-6)	11/12/2008	0-0.25	210	,K,m	2.9	10
13SB34A	11/13/2008	0-0.5	230		2.9	10
13SB34B	11/13/2008	1.5-2	190		2.9	10
13SB35A	11/13/2008	0-0.5	230	,L,m	2.9	10

Table 4-2
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Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID	Sample Date	Sample Depth (ft bgs)	Lead			
			Result	LQ, VQ, r	MDL	RL
13SB35B	11/13/2008	2-3	130	,L,m	2.9	10
13SB35C	11/13/2008	5-6	100	,L,m	2.9	10
13SB36A	11/13/2008	0-0.5	400	,L,m	2.9	10
13SB36B	11/13/2008	2-3	250	,L,m	2.9	10
13SB36B-DUP (DUP-7)	11/13/2008	2-3	250	,L,m	2.9	10
13SB36C	11/13/2008	5-6	290	,L,m	2.9	10
13SB37A	11/13/2008	0-0.5	390	,L,m	2.9	10
13SB38A	11/13/2008	0-0.5	740		2.9	10
13SB38B	11/13/2008	2-3	460		29	100
13SB38B-DUP (DUP-8)	11/13/2008	2-3	370		2.9	10
13SB38C	11/13/2008	5-6	240		2.9	10
13SB39A	11/13/2008	0-0.5	330	,L,m	2.9	10
13SB39A-DUP (DUP-9)	11/13/2008	0-0.5	360	,L,m	2.9	10
13SB39B	11/13/2008	2-3	210	,L,m	2.9	10
13SB39C	11/13/2008	4-4.5	200	,L,m	2.9	10
13SB40A	11/13/2008	0-0.5	170	,L,m	2.9	10
13SB40B	11/13/2008	2-2.25	300	,L,m	2.9	10
13SB41A	11/13/2008	0-0.5	400		2.9	10
13SB41B	11/13/2008	1.5-2	300		2.9	10
13SB42A	11/14/2008	0-0.5	400	,K,m	2.9	10
13SB42B	11/14/2008	1-1.5	430	,K,m	2.9	10
13SB43A	11/14/2008	0-0.5	240	,K,m	2.9	10
13SB43B	11/14/2008	2-3	92	,K,m	2.9	10
13SB43C	11/14/2008	5-6	250	,K,m	2.9	10
13SB44A	11/14/2008	0-0.5	330	,K,m	2.9	10
13SB44B	11/14/2008	2-3	190	,K,m	2.9	10
13SB44C	11/14/2008	5-5.5	610	,K,m	2.9	10
13SB45A	11/14/2008	0-0.5	440	,K,m	2.9	10
13SB45B	11/14/2008	2-3	210	,K,m	2.9	10
13SB46A	11/14/2008	0-0.5	300	,K,m	2.9	10
13SB46B	11/14/2008	2-3	240	,K,m	2.9	10
13SB46C	11/14/2008	5-6	160	,K,m	2.9	10
13SB47A	11/14/2008	0-0.5	200	,L,m	2.9	10
13SB47B	11/14/2008	1.5-2.5	160	,L,m	2.9	10
13SB48A	11/14/2008	0-0.5	110	,K,m	2.9	10
13SB48B	11/14/2008	2-3	170	,K,m	2.9	10
13SB48C	11/14/2008	5-6	420	,K,m	2.9	10
13SB49A	11/14/2008	0-0.5	180	,L,m	2.9	10
13SB50A	11/14/2008	0-0.5	69	,L,m	2.9	10
13SB50B	11/14/2008	2-3	75	,L,m	2.9	10
13SB50C	11/14/2008	4.5-5	110	,L,m	2.9	10
13SB51A	11/14/2008	0-0.5	100	,K,m	2.9	10
13SB51B	11/14/2008	0.5-1	190	,K,m	2.9	10
13SB52A	11/14/2008	0-0.5	52	,K,m	2.9	10
13SB52B	11/14/2008	2-2.25	34	,K,m	2.9	10
13SB53A	11/14/2008	0-0.5	91	,L,m	2.9	10
13SB53B	11/14/2008	0.5-1	70	,L,m	2.9	10
13SB54A	11/14/2008	0-0.5	100	,K,m	2.9	10
13SB54B	11/14/2008	2-2.75	110	,K,m	2.9	10
13SB55A	11/14/2008	0-0.5	140	,K,m	2.9	10
13SB56A	11/14/2008	0-0.5	560	,K,m	2.9	10
13SB56B	11/14/2008	1-1.25	870	,K,m	2.9	10
13SB56B-DUP (DUP-14)	11/14/2008	1-1.25	530	,K,m	2.9	10
13SB57A	11/14/2008	0-0.5	95	,L,m	2.9	10
13SB57B	11/14/2008	2-3	120	,L,m	2.9	10
13SB57C	11/14/2008	3.5-4	110	,L,m	2.9	10

Table 4-2
Summary of Lead in Soil Analytical Samples
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID	Sample Date	Sample Depth (ft bgs)	Lead			
			Result	LQ, VQ, r	MDL	RL
13SB58A	11/14/2008	0-0.5	120	,K,m	2.9	10
13SB58A-DUP (DUP-12)	11/14/2008	0-0.5	110	,K,m	2.9	10
13SB58B	11/14/2008	2-3	130	,K,m	2.9	10
13SB59A	11/14/2008	0-0.5	190	,L,m	2.9	10
13SB59B	11/14/2008	0.5-1	190	,L,m	2.9	10
13SB60A	11/14/2008	0-0.5	120	,L,m	2.9	10
13SB60B	11/14/2008	0.5-1	190	,L,m	2.9	10
13SB61A	11/14/2008	0-0.5	110	,K,m	2.9	10
13SB61B	11/14/2008	1.5-2.5	820	,L,m	2.9	10
13SB62A	11/14/2008	0-0.5	460	,K,m	2.9	10
13SB62A-DUP (DUP-11)	11/14/2008	0-0.5	610	,K,m	2.9	10
13SB63A	11/14/2008	0-0.5	1,300	,K,m	2.9	10
13SB64A	11/14/2008	0-0.5	240	,K,m	2.9	10
13SB64B	11/14/2008	0.5-1	260	,K,m	2.9	10
13SB65A	11/14/2008	0-0.5	260	,L,m	2.9	10
13SB65B	11/14/2008	0.5-1	280	,L,m	2.9	10
13SB66A	11/13/2008	0-0.5	200	,L,m	2.9	10
13SB66B	11/13/2008	2-3	38	,L,m	2.9	10
13SB67A	11/13/2008	0-0.5	220		2.9	10
13SB67B	11/13/2008	2-3.5	130		2.9	10
13SB68A	11/13/2008	0-0.5	280	,L,m	2.9	10
13SB68B	11/13/2008	2-2.75	220	,L,m	2.9	10
13SB69A	11/13/2008	0-0.5	280	,L,m	2.9	10
13SB70A	11/13/2008	0-0.5	780	,L,m	2.9	10
13SB70B	11/13/2008	2-2.5	240	,L,m	2.9	10
13SB71A	11/13/2008	0-0.5	66		2.9	10
13SB71B	11/13/2008	2-3	93		2.9	10
13SB71C	11/13/2008	5-6	200		2.9	10
13SB72A	11/13/2008	0-0.5	97		2.9	10
13SB72B	11/13/2008	2-3	110		2.9	10
13SB72C	11/13/2008	5-6	230		2.9	10
13SB73A	11/13/2008	0-0.5	83		2.9	10
13SB73B	11/13/2008	2-3	100		2.9	10
13SB73C	11/13/2008	5-5.5	270		2.9	10
13SB74A	11/12/2008	0-0.5	97		2.9	10
13SB74B	11/12/2008	2-3	180		2.9	10
13SB74C	11/12/2008	3.5-4	190		2.9	10
13SB74C-DUP (DUP-3)	11/12/2008	3.5-4	270	,K,m	2.9	10
13SB75A	11/12/2008	0-0.5	100	,K,m	2.9	10
13SB75B	11/12/2008	2-3	210	,K,m	2.9	10
13SB75B-DUP (DUP-4)	11/12/2008	2-3	200	,L,m	2.9	10
13SB75C	11/12/2008	3.5-4	190	,K,m	2.9	10
13SB76A	11/12/2008	0-0.5	89		2.9	10
13SB76B	11/12/2008	2-3	170		2.9	10
13SB76B-DUP (DUP-2)	11/12/2008	2-3	190		3.2	11
13SB76C	11/12/2008	4.5-5	190		2.9	10
13SB77A	11/12/2008	0-0.5	85		2.9	10
13SB77B	11/12/2008	2-3	110		2.9	10
13SB78A	11/12/2008	0-0.5	600		2.9	10
13SB78B	11/12/2008	2-2.5	120		2.9	10
13SB79A	11/12/2008	0-0.5	130		2.9	10
13SB79B	11/12/2008	0.5-1	150		2.9	10
13SB80A	11/12/2008	0-0.5	170		2.9	10
13SB80B	11/12/2008	2-3	460		29	100
13SB81A	11/12/2008	0-0.5	170		2.9	10
13SB81B	11/12/2008	2-3	290		2.9	10
13SB82A	11/12/2008	0-0.5	110		2.9	10

Table 4-2
Summary of Lead in Soil Analytical Samples
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID	Sample Date	Sample Depth (ft bgs)	Lead			
			Result	LQ, VQ, r	MDL	RL
13SB82B	11/12/2008	2-3	170		2.9	10
13SB82C	11/12/2008	5-6	220		2.9	10
13SB83A	11/12/2008	0-0.5	100		2.9	10
13SB83B	11/12/2008	2-3	180		2.9	10
13SB84A	11/14/2008	0-0.5	210	,K,m	2.9	10
13SB84A-DUP (DUP-10)	11/14/2008	0-0.5	210	,K,m	2.9	10
13SB84B	11/14/2008	1.5-2	370	,K,m	2.9	10
13SB85A	11/12/2008	0-0.5	83	,K,m	2.9	10
13SB85B	11/12/2008	2-3	150	,K,m	2.9	10
13SB85C	11/12/2008	4.5-5	170	,K,m	2.9	10
13SB86A	11/12/2008	0-0.5	120	,K,m	2.9	10
13SB86B	11/12/2008	2-2.5	350	,K,m	2.9	10
13SB87A	11/12/2008	0-0.5	120	,K,m	2.9	10
13SB87B	11/12/2008	2-3	110	,K,m	2.9	10
13SB87C	11/12/2008	3.5-4	190	,K,m	2.9	10
13SB88A	11/12/2008	0-0.5	160	,K,m	2.9	10
13SB88B	11/12/2008	2-2.75	140	,K,m	2.9	10
13SB89A	11/12/2008	0-0.5	130	,K,m	2.9	10
13SB89A-DUP (DUP-5)	11/12/2008	0-0.5	150	,L,m	2.9	10
13SB89B	11/12/2008	2-3	320	,K,m	2.9	10
13SB90A	11/12/2008	0-0.5	130		2.9	10
13SB90B	11/12/2008	2-2.5	170	,K,m	2.9	10
13SB91A	12/17/2008	0-0.5	130		2.9	10
13SB91B	12/17/2008	2-3	160		2.9	10
13SB91C	12/17/2008	5-6	140		2.9	10
13SB91C-DUP (DUP-15)	12/17/2008	5-6	130		2.9	10
13SB92A	12/17/2008	0-0.5	82		2.9	10
13SB92B	12/17/2008	2-3	150		2.9	10
13SB92C	12/17/2008	5-5.5	200		2.9	10

Notes:
ft bgs = Feet Below Ground Surface
mg/kg = Milligram Per Kilogram
MDL = Method Detection Limit
RL = Reporting Limit
LQ = Laboratory Qualifier
VQ = Validation Qualifier
r = Reason Code

Data Qualifiers:
J = Analyte present. Reported value may not be accurate or precise.
K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.
f = Field duplicate imprecision
m = MS/MSD recovery failure

= Concentration Exceeds Adjusted Soil Residential RSL of 400 mg/kg

= Concentration Exceeds Adjusted Soil Industrial RSL of 800 mg/kg

underline = Concentration Exceeds Facility Background Value of 26.8 mg/kg

Table 4-3
Summary of Risk Screening Results for Total Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

	CAS #	Facility Background [A]	Adjusted R-RSL	Key	Adjusted I-RSL	Key	Minimum Detected Concentration	Maximum Detected Concentration	# of Samples Above Adj. R-RSL[A]	# of Samples Above Adj. I-RSL[A]	# of Detections	# of Samples
TAL Metals (mg/kg)												
Aluminum	7429-90-5	40,041	7,700	n	99,000	nm	4,250	35,000	0	0	32	32
Antimony	7440-36-0	--	3.1	n	41	n	0.069	4.7	**1**	0	27	32
Arsenic	7440-38-2	15.8	0.39	c*	1.6	c	0.12	5.6	0	0	32	32
Barium	7440-39-3	209	1,500	n	19,000	nm	29	290	0	0	32	32
Beryllium	7440-41-7	1.02	16	n	200	n	0.65	1.3	0	0	11	32
Cadmium	7440-43-9	0.69	7	n	81	n	0.51	2.8	0	0	30	32
Calcium	7440-70-2	--	--	--	--	--	1,100	110,000	--	--	32	32
Chromium	7440-47-3	65.3	280	c	1,400	c	10	39	0	0	32	32
Cobalt	7440-48-4	72.3	2.3	n	30	n	3.9	24	0	0	32	32
Copper	7440-50-8	53.5	310	n	4,100	n	2.5	260	0	0	32	32
Iron	7439-89-6	50,962	5,500	n	72,000	nm	5,330	87,000	**2**	**2**	32	32
Lead	7439-92-1	26.8	400	n	800	n	12	26,500	**21**	**6**	183	183
Magnesium	7439-95-4	--	--	--	--	--	1,210	25,000	--	--	32	32
Manganese	7439-96-5	2,543	180	n	2,300	n	59	2,200	0	0	32	32
Mercury [1]	7439-97-6	0.13	2.3	n	31	n	0.0087	0.27	0	0	30	32
Nickel	7440-02-0	62.8	160	n	2,000	n	3.8	22	0	0	32	32
Potassium	7440-09-7	--	--	--	--	--	548	2,900	--	--	32	32
Selenium	7782-49-2	--	39	n	510	n	0.043	1.5	0	0	32	32
Silver	7440-22-4	--	39	n	510	n	0.023	0.45	0	0	32	32
Sodium	7440-23-5	--	--	--	--	--	27	100	--	--	32	32
Thallium	7440-28-0	2.11	0.51	n	6.6	n	0.047	3.5	**1**	0	32	32
Vanadium	7440-62-2	108	55	n	720	n	11	59	0	0	32	32
Zinc	7440-66-6	202	2,300	n	31,000	nm	46	1,600	0	0	32	32
TCL VOCs (ug/kg)												
1,2,4-Trichlorobenzene	120-82-1	--	8.7E+03	n	4.0E+04	ns	0.96	0.96	0	0	1	14
2-Butanone	78-93-3	--	2.8E+06	ns	1.9E+07	nms	24	400	0	0	14	14
Acetone	67-64-1	--	6.1E+06	n	6.1E+07	nms	31	320	0	0	14	14
Benzene	71-43-2	--	1.1E+03	c*	5.6E+03	c*	0.91	1.5	0	0	3	14
cis-1,2-Dichloroethene	156-59-2	--	7.8E+04	n	1.0E+06	ns	1.9	4.2	0	0	2	14
Methylene chloride	75-09-2	--	1.1E+04	c	5.4E+04	c	4.1	11	0	0	14	14
Toluene	108-88-3	--	5.0E+05	ns	4.6E+06	ns	0.66	3.5	0	0	7	14
Trichloroethene	79-01-6	--	2.8E+03	c	1.4E+04	c	9.6	57	0	0	3	14
TCL SVOCs (ug/kg)												
1,1'-Biphenyl	92-52-4	--	3.9E+05	ns	5.1E+06	ns	1.6	8.8	0	0	5	32
2,4-Dichlorophenol	120-83-2	--	1.8E+04	n	1.8E+05	n	6.8	6.8	0	0	1	32
2,4-Dinitrotoluene	121-14-2	--	1.2E+04	n	1.2E+05	n	6.9	3813	0	0	11	32
2,6-Dinitrotoluene	606-20-2	--	6.1E+03	n	6.2E+04	n	16	298.5	0	0	4	32
2-Methylnaphthalene	91-57-6	--	3.1E+04	n	4.1E+05	ns	1.1	22	0	0	16	32
4-Chloro-3-Methylphenol [2]	59-50-7	--	3.1E+05	n	3.1E+06	n	8	24	0	0	8	32
Acenaphthene	83-32-9	--	3.4E+05	n	3.3E+06	n	2.5	19	0	0	12	32
Acenaphthylene [3]	208-96-8	--	1.7E+05	n	1.7E+06	n	1.5	21	0	0	19	32
Acetophenone	98-86-2	--	7.8E+05	ns	1.0E+07	nms	3.5	4.5	0	0	8	32
Anthracene	120-12-7	--	1.7E+06	n	1.7E+07	nm	6.5	180	0	0	15	32
Benzo(a)anthracene	56-55-3	--	1.5E+02	c	2.1E+03	c	1.8	480	**2**	0	25	32
Benzo(a)pyrene	50-32-8	--	1.5E+01	c	2.1E+02	c	2.5	290	**19**	**1**	29	32
Benzo(b)fluoranthene	205-99-2	--	1.5E+02	c	2.1E+03	c	3.5	630	**6**	0	29	32
Benzo(g,h,i)perylene [3]	191-24-2	--	1.7E+05	n	1.7E+06	n	2.5	170	0	0	27	32
Benzo(k)fluoranthene	207-08-9	--	1.5E+03	c	2.1E+04	c	2.1	160	0	0	22	32
Bis(2-ethylhexyl)phthalate	117-81-7	--	3.5E+04	c*	1.2E+05	c*	15	540	0	0	32	32
Butylbenzylphthalate	85-68-7	--	2.6E+05	c*	9.1E+05	c	3.3	40	0	0	25	32
Carbazole	86-74-8	--	--	--	--	--	2.7375	20.4825	--	--	15	32
Chrysene	218-01-9	--	1.5E+04	c	2.1E+05	c	1.3	570	0	0	29	32
Di-n-butylphthalate	84-74-2	--	6.1E+05	n	6.2E+06	n	32	6205	0	0	32	32
Dibenz(a,h)anthracene	53-70-3	--	1.5E+01	c	2.1E+02	c	7.1	41	**7**	0	14	32
Dibenzofuran	132-64-9	--	--	--	--	--	2	24	--	--	9	32
Diethylphthalate	84-66-2	--	4.9E+06	n	4.9E+07	nm	1.2	1675	0	0	32	32
Dimethylphthalate	131-11-3	--	--	--	--	--	1.2	550	--	--	7	32
Fluoranthene	206-44-0	--	2.3E+05	n	2.2E+06	n	3.9	370	0	0	28	32
Fluorene	86-73-7	--	2.3E+05	n	2.2E+06	n	2.5	33	0	0	13	32
Indeno(1,2,3-cd)pyrene	193-39-5	--	1.5E+02	c	2.1E+03	c	2.95	130	0	0	27	32

Table 4-3
Summary of Risk Screening Results for Total Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

	CAS #	Facility Background [A]	Adjusted R-RSL	Key	Adjusted I-RSL	Key	Minimum Detected Concentration	Maximum Detected Concentration	# of Samples Above Adj. R-RSL[A]	# of Samples Above Adj. I-RSL[A]	# of Detections	# of Samples
Isophorone	78-59-1	--	5.1E+05	c*	1.8E+06	c*	2.5	5.1	0	0	17	32
N-Nitrosodiphenylamine	86-30-6	--	9.9E+04	c	3.5E+05	c	16	950	0	0	18	32
Naphthalene	91-20-3	--	3.9E+03	c*	2.0E+04	c*	2.4	22	0	0	10	32
Phenanthrene [3]	85-01-8	--	1.7E+05	n	1.7E+06	n	3.5	170	0	0	26	32
Pyrene	129-00-0	--	1.7E+05	n	1.7E+06	n	1.3	260	0	0	30	32
Explosives (mg/kg)												
1,3,5-Trinitrobenzene	99-35-4	--	2.2E+02	n	2.7E+03	n	0.1985	0.1985	0	0	1	32
2,4,6-Trinitrotoluene [4]	118-96-7	--	3.6E+00	n	4.2E+01	n	0.23	3	0	0	5	32
2,4-Dinitrotoluene	121-14-2	--	1.2E+01	n	1.2E+02	n	0.17	0.17	0	0	1	32
2,6-Dinitrotoluene	606-20-2	--	6.1E+00	n	6.2E+01	n	0.39	0.39	0	0	1	32
Dinitrotoluene Mixture, 2,4/2,6	25321-14-6	--	7.1E-01	c	2.5E+00	c	0.37	0.59	0	0	2	32
HMX	2691-41-0	--	3.8E+02	n	4.9E+03	n	0.1415	0.79	0	0	3	32
Nitroglycerin/PETN (mg/kg)												
Nitroglycerin	55-63-0	--	6.1E-01	n	6.2E+00	n	0.45175	21	**5**	**1**	6	32
Cyanide (mg/kg)												
Cyanide	57-12-5	--	1.6E+02	n	2.0E+03	n	0.07	0.35	0	0	11	14
Dioxin/Furans (pg/g)												
1,2,3,4,6,7,8-HpCDD	35822-39-4	--	--	--	--	--	45.3	45.3	--	--	1	1
1,2,3,4,6,7,8-HpCDF	67562-39-4	--	--	--	--	--	3.625	3.625	--	--	1	1
1,2,3,4,7,8,9-HpCDF	55673-89-7	--	--	--	--	--	0.35225	0.35225	--	--	1	1
1,2,3,4,7,8-HxCDD	39227-28-6	--	--	--	--	--	0.606	0.606	--	--	1	1
1,2,3,4,7,8-HxCDF	70648-26-9	--	--	--	--	--	0.4785	0.4785	--	--	1	1
1,2,3,6,7,8-HxCDD	57653-85-7	--	--	--	--	--	1.64	1.64	--	--	1	1
1,2,3,6,7,8-HxCDF	57117-44-9	--	--	--	--	--	0.3885	0.3885	--	--	1	1
1,2,3,7,8,9-HxCDD	19408-74-3	--	--	--	--	--	1.85	1.85	--	--	1	1
1,2,3,7,8-PeCDD	40321-76-4	--	--	--	--	--	0.42125	0.42125	--	--	1	1
1,2,3,7,8-PeCDF	57117-41-6	--	1.2E+02	c	4.4E+02	c	0.27925	0.27925	0	0	1	1
2,3,4,6,7,8-HxCDF	60851-34-5	--	--	--	--	--	0.37375	0.37375	--	--	1	1
2,3,4,7,8-PeCDF	57117-31-4	--	1.2E+01	c	4.4E+01	c	0.35225	0.35225	0	0	1	1
2,3,7,8-TCDF	51207-31-9	--	3.7E+01	c	1.3E+02	c	0.489	0.489	0	0	1	1
OCDD	3268-87-9	--	1.5E+04	c	6.1E+04	c	2210	2210	0	0	1	1
OCDF	39001-02-0	--	1.2E+04	c	4.4E+04	c	7.775	7.775	0	0	1	1
Total HpCDDs	37871-00-4	--	4.5E+02	c	1.8E+03	c	95.35	95.35	0	0	1	1
Total HpCDFs	38998-75-3	--	3.7E+02	c	1.3E+03	c	8.94	8.94	0	0	1	1
Total HxCDDs	34465-46-8	--	4.5E+01	c	1.8E+02	c	16.05	16.05	0	0	1	1
Total HxCDFs	55684-94-1	--	3.7E+01	c	1.3E+02	c	5.245	5.245	0	0	1	1
Total PeCDDs	36088-22-9	--	4.5E+00	c	1.8E+01	c	3.195	3.195	0	0	1	1
Total PeCDFs	30402-15-4	--	--	--	--	--	2.8855	2.8855	--	--	1	1
Total TCDDs	41903-57-5	--	--	--	--	--	0.606	0.606	--	--	1	1
Total TCDFs	55722-27-5	--	--	--	--	--	4.09	4.09	--	--	1	1
2,3,7,8-TCDD TEQ	--	--	4.5E+00	c	1.8E+01	c	2.1	2.1	0	0	1	1

Notes:

COPC = Chemical of Potential Concern
mg/kg = Milligram Per Kilogram
CAS = Chemical Abstracts Service
TAL = Target Analyte List
TCL = Target Compound List
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PETN = Pentaerythritol Tetranitrate
RSL = Regional Screening Level (RSL) from October 2008 RSL Table
Adjusted RSLs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
-- = No Value Available
R-RSL = Adjusted Residential RSL
I-RSL = Adjusted Industrial RSL

[A] = For inorganics, number of samples that exceed background (if available) and screening level
[1] = Mercuric chloride soil RSL value used
[2] = 3-Methylphenol RSLs used
[3] = Pyrene RSLs used
[4] = Noncarcinogenic Residential RSL value for 2,4,6-Trinitrotoluene was used for screening

Key per October 2008 Regional RSL Table:
c = cancer
n = noncancer
c* = cancer where n SL < 100X c SL
c** = cancer where n SL <10X c SL
m = concentration may exceed ceiling
s = concentration may exceed Csat

5.0 FATE AND TRANSPORT ASSESSMENT

This section discusses the fate and transport of site-related COPCs. Primary fate and transport mechanisms occurring at the site are discussed. The objective of the fate and transport analysis is to identify the primary mechanisms affecting the distribution and migration of COPCs and their ultimate fate. COPCs identified at the site are summarized in the following table.

Site COPCs from Nature and Extent Assessment

Soil – Human Health		Soil to Groundwater SL DAF 10 (Section 5.1.4)	
Antimony	Benzo(a)anthracene	Iron	Benzo(a)pyrene
Iron	Benzo(a)pyrene	Lead*	Benzo(b)fluoranthene
Lead	Benzo(b)fluoranthene	Thallium	2,4,6-Trinitrotoluene (TNT)
Thallium	Dibenz(a,h)anthracene	Trichloroethene (TCE)	2,6-Dinitrotoluene (DNT)
Nitroglycerin		Benzo(a)anthracene	Nitroglycerin

Note: *Although lead does not have a risk based SSL it is included in the evaluation due to the nature of the site.

The potential for transport of chemicals in environmental media is largely controlled by the physiochemical properties of the chemicals and the matrix through which they travel or migrate. Table 5-1a describes the physiochemical properties of chemicals that affect their fate in environmental media. Table 5-1b describes the fate processes affecting metals including: ion exchange, chemical speciation, and oxidation-reduction potential. Table 5-1c describes the fate processes affecting organic chemicals including: sorption, volatilization, hydrolysis, and abiotic and biotic degradation. Chemicals can be transported with little attenuation or retardation due to these fate processes or they can be delayed or transformed so that minimal migration occurs. The physical and chemical properties of organic COPCs detected in soil are summarized in Table 5-2.

Primary fate and transport mechanisms for COPCs potentially present at the site include the following:

- Volatilization of chemicals from soil;
- Erosion of particulate-bound chemicals from soil;
- Degradation of chemicals in soil;
- Leaching of chemicals from soil with infiltrating water; and
- Transport of chemicals with groundwater flow.

Fate and transport processes for site media are discussed in the following sections.

5.1 FATE AND TRANSPORT - SOIL

Fate and transport processes for soil are discussed in the following sections including volatilization, erosion and mass transport, and degradation of chemicals in soil, and leaching of chemical from soil with infiltrating water.

5.1.1 Volatilization

Volatilization can significantly affect the distribution of a chemical in the environment. This process will result in the mass and concentration of a chemical in soil as the chemical volatilizes to soil gas and ultimately discharges to the atmosphere. Volatilization reactions are most significant in surface soil that is in direct (or near-direct) contact with the atmosphere. Chemical volatility is typically quantified by a chemical's Henry's constant, which may be calculated from the chemical's vapor pressure, molecular weight, and solubility. The lower the Henry's constant, the less volatile the chemical. Values of Henry's constant for soil COPCs are summarized in Table 5-2.

One VOC (TCE) and one SVOC (naphthalene) with Henry's constants less than 0.1 were identified as COPCs for the soil-to-groundwater migration pathway based on detections in one or more samples above calculated site-specific SLs (Section 5.1.4). Low concentrations of these COPCs have been detected in soil and therefore, volatilization is not expected to be a significant influence on the fate of this compound in soil. Other COPCs at the site are characterized by low Henry's constants (i.e., < 0.01) and are not considered highly volatile, and therefore, volatilization is not expected to be a significant influence on the fate of these compounds at the site.

5.1.2 Erosion Processes in Soil

Erosion processes can substantially affect the distribution of soil-bound particulates in the environment and thus influence the distribution of constituents in soil. High winds can scour fine particles from the soil surface and redistribute these particles downwind. Mass transport from surface water runoff during heavy precipitation events can also scour fine soil particles from surface soil, eventually depositing the particles during sedimentation downstream. As presented in Section 4.4, this potential migration pathway is impeded by the presence of significant vegetation in the RFI study area. Section 4.4 presents a quantitative evaluation of soil erosion in the RFI study area with respect to potential lead transport to the adjacent New River by erosion processes. The results of this evaluation indicated that minimal mass of lead would be potentially transported to the river by erosion processes and the potential soil loss is not considered a significant future risk to the New River.

5.1.3 Degradation of Chemicals in Soil

Many organic chemicals that are found in the environment are subject to naturally occurring biotic (biologically based) and abiotic (non-biologically based) transformation reactions. These reactions result in degradation of the chemical. Biodegradation reactions can occur under aerobic (in the presence of oxygen) and anaerobic (in the absence of oxygen) conditions. During biodegradation, naturally occurring microorganisms in the subsurface transform a chemical to another state as a direct or indirect consequence of their metabolic processes. In many cases, biodegradation reactions break down organic chemicals to less toxic forms.

Several naturally occurring abiotic reactions can significantly affect the fate of chemicals in the environment. Common abiotic reactions include photodegradation and hydrolysis. Photodegradation is the process of decomposition of a chemical upon exposure to radiant energy such as the action of light, and is most significant to chemicals in surface soil that are in direct contact with sunlight. Hydrolysis is the degradation reaction of the chemical with components of water (e.g., hydroxyl and hydronium ions) and is therefore most important in saturated environments.

5.1.3.1 Metals

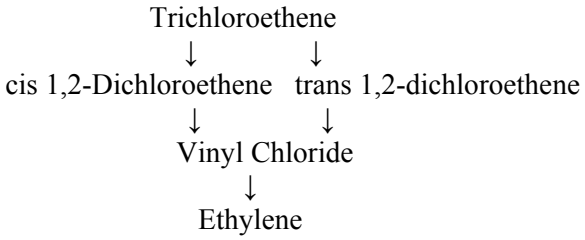
Metal COPCs, such as antimony, iron, lead, and thallium will not be significantly influenced by degradation processes in soil.

5.1.3.2 VOCs

VOCs were detected low concentrations in soil at the site. The VOC COPC identified for the soil-to-groundwater migration pathway was TCE.

TCE: TCE was detected in 3 of 14 samples at low level concentrations. TCE is resistant to aerobic degradation in soil although biodegradation may proceed co-metabolically. Under anaerobic conditions, TCE is slowly biodegraded through reductive dechlorination, with the extent and rate of degradation dependant on the degree of the reducing environment. The reductive dechlorination pathway for TCE is shown below. Vinyl chloride is an intermediate degradation by product in this pathway as shown below; this compound has not been detected at the site. Ethylene is an end- product of this degradation process.

TCE Degradation Pathway – Reductive Dechlorination



5.1.3.3 SVOCs

SVOCs identified as COPCs in soil at the site consisted of high molecular weight PAH compounds benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene, and naphthalene (soil to groundwater). Microbial metabolism is the primary process for degradation of PAHs in soil. Hydrolysis, oxidation reduction, and photodegradation are not considered important processes for the degradation of PAHs in soil. The higher molecular weight PAHs that are COPCs at the site will tend to have lower rates and degrees of degradation than middle to lower molecular weight PAHs. The rate and extent of biodegradation of PAHs in soil is also influenced by soil properties such as organic content, structure, particle size, pH, temperature, and oxygen content, and the characteristics of microbial populations in the soil. The presence of metals in soil that are toxic to microorganisms will impede degradation (ATSDR 1995).

Experimentally reported half-lives for high molecular weight PAHs in soil are typically in the range of 1 to 1.5 years but will vary depending soil and site characteristics. Specific information on the relative degradation rates of PAHs in site soil is not available; it is possible that some degradation of PAHs has occurred at the site given the low concentrations of high molecular weight compounds detected. The presence of lead in soil is not expected to have an adverse impact on PAH degradation given the low-levels or absence of detectable levels of PAHs in soil.

5.1.3.4 Explosives – 2,4,6-TNT, 2,6-DNT, and Nitroglycerin

Explosive compounds identified as COPCs in soil include: 2,4,6-TNT (soil to groundwater only), 2,6-DNT (soil to groundwater only), and nitroglycerin.

2,4,6-TNT transformation generally occurs by sequential reduction of nitro groups to amino groups. 2,4,6-TNT is readily reduced in soil under anaerobic conditions, with sequential microbial transformations producing 4ADNT and 2ADNT and other degradation by products. Recent studies indicate that 2,4,6-TNT can be degraded under aerobic conditions with production of amino DNT and other degradation byproducts. There is some data to suggest that 2,4,6-TNT in uppermost layers of surface soil may be photolyzed to trinitrobenzene and trinitrobenzaldehyde (HSDB 2009). The half lives of 2,4,6-TNT in soil have been reported as ranging from 4 to 10 years, with a microbial oxidative decomposition rate of 0.017 to 0.05 percent per day (Cataldo et al 1989).

2,6-DNT is an impurity of TNT and may undergo some degradation in soil by microorganisms with a reduction of the nitro group to form amino groups including 4-amino-2-nitrotoluene and 2-amino-4-nitrotoluene. DNT may undergo photolysis in uppermost surface soil layers based on a rapid rate of photolysis observed in water. DNT is not expected to undergo hydrolysis in soil due to a lack of functional hydrolyzable functional groups (HSDB 2009).

Nitroglycerin undergoes rapid biodegradation using batch reactors and digestors but its rate of biodegradation in soil is unknown. Hydrolysis of nitroglycerin in soil may be important under alkaline conditions but is not expected to be an operable degradation process at the site due to the neutral pH of the soil (HSDB 2009).

5.1.4 Leaching of Chemicals from Soil to Groundwater

Chemicals in soil have the potential to migrate to greater depths with infiltrating water. As precipitation infiltrates, chemicals may be leached from the soil and carried to greater depths and potentially to groundwater. Table 5-3 summarizes the screening results for soil data including: constituents detected, minimum and maximum concentrations detected, number of detections, number of samples, and number of samples above risk-based soil to groundwater screening levels (SLs) and background (inorganics only) to evaluate the potential migration of chemicals in soil to groundwater. Risk-based SLs were obtained from the April 2009 Regional Screening table (USEPA 2009) and utilize a dilution attenuation factor (DAF) 10. A DAF 10 was used for the site due to the lack of an infinite source, the depth to groundwater, and the attenuation of chemicals due to soil types. The screening identified the following chemicals with detected concentrations above their generic DAF 10 SLs and background point estimates (inorganics only):

Chemical	# Detects/ # Samples	# Detects Above SL
Iron	32/32	2
Thallium	32/32	1
Trichloroethene	3/14	3
Benzo(a)anthracene	25/32	2
Benzo(a)pyrene	29/32	12
Benzo(b)fluoranthene	29/32	1
Naphthalene	10/32	4
2,4,6-Trinitrotoluene	5/32	5
2.6-Dinitrotoluene	1/32	1
Nitroglycerin	6/32	6

Factors affecting leaching are discussed below followed by assessments for soil to groundwater COPCs identified summarized above with concentrations above SLs. The degree to which a chemical is leached is strongly influenced by the chemical's tendency to partition to the solid or aqueous phases, which is largely a function of the chemical's solubility and particle affinity.

Water Solubility

Water solubility of a chemical is the mass of chemical that will dissolve in a unit volume of water at a specific temperature. Chemicals with a high solubility can often be readily dissolved in water and therefore are susceptible to being mobilized from the soil matrix with infiltrating water and migrating downward to groundwater. Chemicals with a low solubility tend to partition to soil.

The solubility of organic chemicals is typically a function of the hydrophobic nature of the chemical. Many organic chemicals are non-polar and therefore do not dissolve readily into water, which is a polar solution. The organic COPCs identified in soil at the site (PAHs and nitroglycerin) have low to moderate water solubility. Water solubility data for COPCs are summarized in Table 5-2.

Adsorption

The aqueous concentration of chemicals in soil systems can also be substantially influenced by adsorption reaction to the soil matrix. Adsorption is the ability of a substance to bind to the surface of soil particles from reactions that occur between the chemical and the soil particle surface. Organic compounds are frequently non-polar, and therefore, tend to interact with organic matter commonly associated with the soil matrix. The tendency for a chemical to be adsorbed to the organic fraction of soil (or sediment) can be measured by the chemical's organic carbon partition coefficient (K_{oc}). The lower the K_{oc} values the more leaching potential from soil to water as summarized below. Organic compounds with a K_{oc} less than 100 liters per kilogram (L/kg) have a high potential to leach from soil to water such as TCE. Progressively higher values of K_{oc} indicate lower leaching potential. Organic compounds with K_{oc} values

in the range of 1E+04 to 1E+06 L/kg, such as the high molecular weight PAHs, are generally immobile or nearly immobile in soil. Values of K_{oc} for COPCs are summarized in Table 5-2.

Site-specific distribution coefficients (K_d) can be estimated for each organic COPC, as the product of the K_{oc} of the chemical and the fraction of the organic carbon (f_{oc}) in the soil matrix. The distribution coefficient is a measure of the ratio of chemical mass that partitions to the solid and liquid phases under equilibrium conditions. The fraction of organic carbon measured in site soil ranged from 0.47 to 1.5% based on physical data collected at the site. Calculated K_d values are presented in Table 5-2. Based on solubility, K_{oc} and K_d values, the high molecular weight PAHs are expected to be immobile in soil while the nitroglycerin is expected to have low to moderate mobility.

5.1.4.1 Development of Site Specific Soil-to-Groundwater SLs

Site-specific soil-to-groundwater SLs have been calculated for organic chemicals to evaluate the potential for leaching of soil to groundwater COPCs to groundwater at concentrations of potential concern. EPA equation B-13 included in Appendix B of the Supplemental Guidance for Developing SSLs for Superfund Site (USEPA 2002) has been modified to incorporate the following site-specific parameter data for each disposal area as summarized in the following table.

$$C_t = C_w(K_{oc} * f_{oc} + \frac{\theta_a + \theta_w * H'}{\rho_b}) \qquad \text{Equation } 5-1$$

where:

Parameter	Definition (Units)	Value	Source
DAF	Dilution Attenuation Factor (unitless)	10	DAF Value
C_t	Screening level in soil, (mg/kg)	Calculated Using Equation 5-1	USEPA 2002c
C_w	Target leachate concentration (mg/L) x DAF	Chemical Specific T-RSL DAF (10)	USEPA April 2009 RSL Table
K_{oc}	Soil organic carbon-water partition coefficient (L/kg)	Chemical Specific	RAIS (2007)
f_{oc}	Organic carbon content of soil, (kg/kg)	0.01 (1%)	Average Concentration of TOC from Table 2-1
θ_w	Water-filled soil porosity, (L_{water}/L_{soil})	0.3	Default (USEPA 2002)
θ_a	Air-filled soil porosity, (L_{air}/L_{soil}), (η - θ_w)	0.09	Calculated based on Average of RFI Physical Soil Results
ρ_b	Dry soil bulk density	1.61 kg/L	Average of RFI Physical Soil Test Results (Table 2-1)
H’	Henry's law constant	Chemical-specific	RAIS (2007)

Notes: RAIS = Risk Assessment Information System – Chemical Specific Factors at http://rais.ornl.gov/

Detailed SL calculations are presented in Appendix C.7. The leaching potential of COPCs is evaluated in the following based on the chemical properties of the COPCs, comparisons of the site data to SLs, and an evaluation of groundwater data from the OBG (source of chemicals in the RFI Study Area).

5.1.4.2 Iron

Iron naturally occurs at appreciable levels in soil at RFAAP with a background point estimate of 50,962 mg/kg. Adsorption of iron to soil is dependent on pH and organic matter, with an increase in either of these parameters resulting in increased adsorption. Mobility is also influenced by oxidation reduction potential, with iron becoming more mobile under reducing conditions than oxidizing conditions (HSDB 2009). Soil pH values are in the range of 5 to 7 and will likely reduce the mobility of iron along with the presence of appreciable organic matter in surface and near surface soil (3.5%). Site data indicate that iron concentrations detected above the SL and background point estimate are limited to surface or near surface intervals in 2 of 32 samples collected from the RFI study area. In addition as presented in Section 6.4.2, background statistical evaluations identified iron as consistently below background. Based on the background evaluation, near neutral pH of site soil, and appreciable organic matter in surface and near surface soil, iron is not considered a potential concern for the soil-to-groundwater pathway in the RFI study area.

5.1.4.3 Lead

Although lead does not have a risk-based soil to groundwater SL (USEPA 2009), due to the nature of the RFI study area the migration of lead from soil to groundwater was assessed utilizing the SESOIL model (Appendix C.7). The SESOIL unsaturated zone fate-and-transport model was used to evaluate the mobility of lead in soil within the RFI study area (Environmental Software Consultants, Inc., 2008). SESOIL is a one-dimensional vertical fate-and-transport screening level model for the unsaturated zone. It simulates chemical fate-and-transport based on diffusion, adsorption, volatilization, biodegradation, and hydrolysis. The model is designed to simultaneously model both chemical and soil water transport in the soil column under natural seasonal climatic variations.

Lead mass loading parameters for this assessment assumed a lead concentration equal to the mean concentration detected in site soil (414 milligram per kilogram) across the entire 1.6 study area for a depth interval of 0 to 5.5 ft. Local climate data for Radford, Virginia and site-specific physical soil data were also incorporated into the assessment.

The results of the SESOIL assessment indicated that over the 30-year period modeled, lead is immobile in site soil, with 99.87 percent of the lead mass remaining adsorbed to soil, with the remaining mass present in the soil air phase. Over the 30-year modeled period, the net change in lead depth in the soil column is 1.2 centimeters or less than 0.5 inches. It is therefore concluded from the assessment that substantial vertical migration of lead in soil is unlikely within the evaluated study area.

As the model demonstrates, most lead is retained strongly in soil and very little leaches to groundwater. Lead has not been identified as a COPC for the soil-to-groundwater migration pathway at the OBG adjacent to the RFI study area and lead was not detected in groundwater samples collected from the OBG in 2008 (Draper Aden 2009a in Appendix G). Based on the results of the SESOIL model, the immobile nature of lead in soil and lack of groundwater detections at the OBG (the source area for the chemicals at the RFI study area), lead is not considered a potential concern for the soil-to-groundwater pathway in the RFI study area.

5.1.4.4 Thallium

Thallium commonly occurs as salts in soils but can be immobilized by clays and retained in soil by aluminum, and iron oxides, and organic matter, which are present at appreciable levels in site soil (HSDB 2009). Site data indicate the thallium concentration detected above the SL and background point estimate is limited to the surface interval in 1 of 32 samples collected from the RFI study area. Thallium has not been identified as a COPC for the soil-to-groundwater migration pathway at the OBG adjacent to the RFI study area and thallium was not detected in groundwater samples collected from the OBG in 2008 (Draper Aden 2009a in Appendix G). In addition as presented in Section 6.4.2, background statistical

evaluations identified thallium as consistently below background. Based on the above information, thallium is not considered a potential concern for the soil-to-groundwater pathway in the RFI study area.

5.1.4.5 VOCs - TCE

TCE was identified as a COPC for the soil-to-groundwater migration pathway. This compound has a high solubility, lower K_{oc} values, and moderate mobility in subsurface (Table 5-2). As presented in the table below, the detected concentrations of TCE in soil above site-specific SLs (Appendix C.7) was limited to two samples above the site-specific SL and the mean soil concentration was below the site-specific SL.

	Detected Concentrations (mg/kg)				
COPC	MDC	Mean	Site-Specific SL	MDC Above SL	Mean Above SL
Trichloroethene	0.057	0.0073	0.015	Yes (2)	No

Based on the limited detections above site-specific SL, the low levels of these detections, and the mean concentrations below the site-specific SL, TCE is not considered a potential concern for the soil-to-groundwater pathway in the RFI study area.

5.1.4.6 PAHs

Several high molecular weight PAH compounds were identified as COPCs for the soil-to-groundwater migration pathway at the RFI study area. As presented in the table below, the detected concentration of PAHs in soil above site-specific SLs (Appendix C.7) was limited to one sample slightly above the site-specific SL for benzo(a)pyrene and the mean soil concentration was below the site-specific SL.

	Detected Concentrations (mg/kg)				
COPC	MDC	Mean	Site-Specific SL	MDC Above SL	Mean Above SL
Benzo(a)anthracene	0.480	0.056	0.67	No	No
Benzo(a)pyrene	0.290	0.047	0.23	Yes (1)	No
Benzo(b)fluoranthene	0.630	0.086	2.3	No	No
Naphthalene	0.022	0.0032	0.026	No	No

High molecular weight PAHs identified as COPCs tend to be immobile in soil due to negligible solubility and high K_{oc} values. High molecular weight PAHs have not been identified as COPCs for the soil-to-groundwater migration pathway at the OBG adjacent to the RFI study area and these PAHs have not been detected in groundwater samples collected from the OBG in 2008 (Draper Aden 2009a in Appendix G). Based on the limited detection above site-specific SLs, the immobile nature of the high molecular weight PAHs in soil, and lack of groundwater detections at the OBG, PAHs are not considered a potential concern for the soil-to-groundwater pathway in the RFI study area.

5.1.4.7 Explosives - 2,4,6-TNT, 2,6-DNT, and Nitroglycerin

Explosives detected as COPCs in soil have moderate solubility in water. The K_{oc} values for the explosives range from medium low for nitroglycerin, to moderate for 2,6-DNT, and to moderately high for 2,4,6-TNT. Based on their solubility and K_{oc} values, explosives are expected to have some mobility in soil and potential to leach to groundwater if present at sufficiently high concentrations. As presented in the table below, 2,4,6-TNT and nitroglycerin had detected concentrations in one or more samples above

their site-specific SLs (Appendix C.7) and the mean soil concentration of 2,3,6-TNT was below its site-specific SL.

COPC	Detected Concentrations (mg/kg)			MDC Above SL	Mean Above SL
	MDC	Mean	Site-Specific SL		
2,4,6-Trinitrotoluene	3	0.23	0.408	Yes (3)	No
2.6-Dinitrotoluene	0.39	N/A	1.5	No	No
Nitroglycerin	21	1.06	0.056	Yes (6)	Yes

Although low levels of explosives have been detected at concentrations above site-specific SLs, based on the limited number of samples above SLs, the mean concentrations being below the site-specific SL with the exception of nitroglycerin, and the lack of explosives detections in groundwater at the OBG (the source area for chemicals in the RFI study area), explosives are not considered a potential concern for the soil-to-groundwater pathway in the RFI study area.

5.2 FATE AND TRANSPORT SUMMARY

Volatilization was not identified as an important fate and transport process in the RFI study area given the identification of one volatile COPC (TCE) in soil for the soil to groundwater migration pathway only. Degradation processes are not expected to be a significant fate and transport process in soil given that lead is the primary COPC. Erosion processes and mass transport of surface soil are expected to be impeded by the presence of thick vegetative cover across the RFI study area. A quantitative evaluation of soil erosion in the RFI study area indicated that minimal mass of lead would be potentially transported to the river by erosion processes and the potential soil loss is not considered a significant future risk to the New River (Section 4.4). Leaching from soil is not expected to be a significant fate and transport process given that lead is strongly adsorbed to soil. The latest groundwater data (2008) from monitoring wells located adjacent to the perimeter berm separating the OBG from the RFI study area did not indicate leaching of detectable levels of lead or other site soil COPCs to groundwater.

Table 5-1a
Chemical Properties Affecting Fate and Transport
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, VIrginia

Property	Description
Specific Gravity	Specific gravity is the ratio of the density of a chemical to the density of water and its tendency to float (specific gravity <1) or sink (specific gravity >1) in water. Chemicals that are immiscible in water can exist as non-aqueous phase liquids and are referred to as light non-aqueous phase liquid if their specific gravity is less than one, or dense non-aqueous phase liquid if their specific gravity is greater than one.
Water Solubility	Water solubility of a chemical is the mass of chemical that will dissolve in a unit volume of water at a specific temperature. Chemicals with a high solubility tend to remain dissolved in water rather than partition to soil or sediment are less likely to volatilize, and more likely to biodegrade. Chemicals with a low solubility tend to partition to soil or sediment, are more likely to volatilize and less likely to biodegrade.
Vapor Pressure	Vapor pressure of a chemical is how readily it will volatilize to the atmosphere. Volatilization from water is dependent upon vapor pressure and Henry's law constant. Vapor pressures in their pure state range from 0.001 to 760 millimeters mercury (mm Hg) for liquids to less than 1E-10 mm Hg for solids.
Henry's Law Constant	Henry's law constant of a chemical is a measure of how a chemical will partition between air and water at equilibrium. It is the ratio of the vapor pressure to the water solubility (atm-m^3/mole) and can be used to calculate the rate of volatilization of a chemical from water. Chemicals with a high Henry's law constant more readily volatilize from water.
Organic Carbon Partition Coefficient (K_{oc})	K_{oc} is a measure of the tendency for a chemical to be sorbed to the organic fraction of soil and sediment. The lower the K_{oc} values the more leaching potential from soil or sediment to water. Chemicals with a K_{oc} less than 100 milliliters per gram (mL/g) have a high potential to leach from soil or sediment to water, while K_{oc} values in the range of 100 to 500 mL/g indicate a moderate leaching potential.
Octanol-Water Partition Coefficient (Ko_w)	K_{ow} describes the partitioning of an organic chemical between a polar phase (water) and a relatively nonpolar phase (1-octanol). It is equated to the partitioning (sorption) in an aquifer of a chemical between the water and the porous media organic content. A chemical with a high K_{ow} is hydrophobic and may be relatively immobile in an aqueous system but may be mobilized in the presence of an organic solvent.

Table 5-1b
Fate Processes Affecting Metals
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Process	Description
Ion Exchange	Ion exchange is a specific category of adsorption due to an affinity of the solid surface for the chemical. Ion exchange occurs when the adsorbent charge deficiency can be neutralized more efficiently by ions in solution than by those ions currently adsorbed. As an example, if sodium ions (monovalent) have accumulated at the interface and suddently calcium ions (divalent) appear, the surface excess can be more efficiently neutralized by the calcium ions than by the sodium ions; thus, the sodium ions will desorb and the calcium ions will adsorb and an exchange of ions will occur. Clay minerals are frequently the dominant source of ion exchange in the subsurface. The surface charge of clays and many other mineral surfaces is a function of pH. At low pH (excess hydrogen ions), the surface can exhibit a positive net charge while at higher pH (excess hydroxyl ions) the surface can exhibit a negative charge (Knox et al 1993). The surface area of the exchange site significantly influences the level of adsorption; this parameter is typically discussed in terms of the cation exchange capacity (CEC) of the medium and is expressed in units of milliequivalents of exchanging cations per 100 grams of solids (meq/100 g). CEC values indicate the likely type of clay present; the higher the CEC value the greater the absorption potential.
Chemical Speciation	Most metals occur in more than one ionic form (species) in solid and aqueous media. These species form from hydrolysis, oxidation reduction reactions, and complexation reactions, which may have different valences and mobilities in soil water, groundwater, and surface water due to different affinities for adsorption and different solubilty controls. Simple ionic specifies frequently combine ligands to form ionic or neutral-charge aqueous complexes. Environmental conditions that affect speciation of metals include pH, redox potential, and organic ligands.
Oxidation Reduction Potential (ORP)	Redox refers to the transfer of electrons and resultant specifies change of ions or compounds. Oxidation is the loss of electrons and reduction is the gain of electrons. Redox can cause changes in the mobility of many metals, such as site COPCs iron, manganese, and arsenic. The ability of a redox reaction to occur is a function of the redox potential. Redox potential is typically defined in terms of the negative logarithm of the free-electron activity (pE). The redox potential can also be expressed in terms of volts (Eh). Low values of pE indicate high electron activity and favor electron-rich species (reduced). High values of pE indicate low electron activity and favor electron-poor species (oxidized) (Knox et al 1993).

Table 5-1c
Fate Processes Affecting Organics
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Process	Description
Sorption	Sorption includes the processes of adsorption and absorption. Adsorption is a mass transfer process where a substance is transferred from a phase to the surface of a medium (e.g. soil or sediment) where it is bounded by chemical or physical forces. Absorption is the partitioning between two phases (Knox et al. 1993). Sorption reactions are either sorbent or solvent-motivated. Sorbent-motived reactions occur when there is an attraction between the sorbent and the solute and the chemical accumulates at the surface due to the affinity of the surface for the chemical. Solvent-motivated reactions occur when the chemical is hydrophobic, such as nonionic organics, where the chemical will accumulate at an interface or partition into a nonionic phase (associate with the organic content of the medium). For nonionic organics, the fraction of organic content (foc) of the subsurface material is the dominant soil characteristic affecting sorption (Knox et al. 1993). Primary indicators of the partitioning of a chemical are the organic carbon water partition coefficient (Koc), soil/water distribution coefficient (Kd), the octanol water partitioning coeffient (Kow), and the calculated retardation factor.
Hydrolosis	Hydrolysis is the degradation process via chemical reactions (oxidation, reduction, hydrolysis) without the participation of organisms. Hydrolysis is a chemical decomposition process that uses water to split chemical bonds of substances. There are two types of hydrolysis, acid and enzymatic. Hydrolysis is limited to chemical that contain hydrolyzable groups and is effected by the contaminants hydrolysis half life.
Volatilization	Volatilization is the process by which a contaminant changes from a liquid phase to a gas phase. This process applies to organic comtaminants migrating from the soil or surface water. Volatile organic chemicals are a class of chemicals that easily evaporate or mix with the atmosphere. The potential volatilization of a chemical is affected by the compounds vapor pressure, solubility, organic carbon partitioning coefficient, and the temperature.
Abiotic Degradation	Abiotic degradation includes degradation processes in which organisms do not participate. Photolysis describes the abiotic degradation process via photochemical reactions such as photooxidation, photomineralisation without the participation of organisms. As described above, hydrolysis is an additional process of abiotic degradation.
Biotic Degradation	Biotic degradations the process in which chemical degradation of a contaminant is aided by soil organisms. Biotic degradation can be either aerobic or anaerobic. The rate of metabolism/cometabolism is affected by the contaminant's biochemical oxygen demand, chemical oxygen demand, degree of halogenation, etc. Reactions include but are not limited to oxidation/reduction and hydrolysis, as described above.

Table 5-2
Physical Constants for COPCs
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Molecular Weight (g/mol)	Henry's Law Constant (atm-m^3/mol)	Unitless Henry's Law Constant	Organic Carbon Partition Coef. (Koc) (L/kg)	Site-Specific Soil-Water Partition Coef. (Kd)	Log of Octanol-Water Partition Coef. (log Kow)	Octanol-Water Partition Coef. (Kow) (L/kg)	Water Solubility (mg/L)	Vapor Pressure (mm Hg)
Benz[a]anthracene	56553	228.3	3.35E-06	1.38E-04	3.98E+05	2,905	5.76	5.75E+05	9.40E-03	1.90E-06
Benzo[a]pyrene	50328	252.32	1.13E-06	4.63E-05	1.02E+06	7,446	6.13	1.35E+06	1.62E-03	5.49E-09
Benzo[b]fluoranthene	205992	252.32	6.56E-07	2.69E-05	8.03E+05	5,862	5.78	6.03E+05	1.50E-03	5.00E-07
Dibenz[a,h]anthracene	53703	278.36	1.23E-07	5.03E-06	2.62E+06	19,126	6.54	3.47E+06	1.03E-03	1.39E-11
Nitroglycerin	55630	227.09	2.54E-09	1.04E-07	1.31E+02	1.0	1.62	4.17E+01	1.38E+03	4.00E-02

Notes:
CAS = Chemical Abstract System
g/mol = Grams per mole
atm-m^3/mol = Cubic meters atmosphere per mole
L/kg = Liters per kilogram
mg/L = Milligrams per liter
mm Hg = Millimeters Mercury

6.0 HUMAN HEALTH RISK ASSESSMENT

This human health risk assessment (HHRA) evaluates the probability and magnitude of potential adverse effects on human health associated with exposure to site-related chemicals in soil and groundwater. Refer to Section 2.0 for additional information regarding the site background. The HHRA was conducted for the site consistent with guidance included in USEPA's *Interim Final Risk Assessment Guidance for Superfund* (RAGS), as well as other USEPA guidance (USEPA 1989a,b; 1991; 1997a; 2001; 2002c; and 2004). Guidance documents are also noted on the RAGS Part D tables provided in Appendix E.1.

This HHRA consists of the following six sections:

- **Section 6.1: Data Summary and Selection of COPCs:** Relevant site data are gathered, examined, and discussed. Basic constituent statistics and screening levels are summarized. COPCs are identified by comparison to screening criteria as discussed in Section 6.1.2;
- **Section 6.2: Exposure Assessment:** Potentially exposed populations (e.g., receptors) and exposure routes are identified, and exposure point concentrations (EPCs) are calculated for COPCs. Standard exposure factors and health-protective assumptions are used to assess the magnitude, frequency, and duration of exposure for each exposure route and intakes are calculated;
- **Section 6.3: Toxicity Assessment:** Toxicity criteria for COPCs are gathered and presented;
- **Section 6.4: Risk Characterization:** Quantitative risks and hazards are estimated and summarized by combining toxicity criteria with intakes for each exposure route;
- **Section 6.5: Summary and Conclusions:** The results of the HHRA are summarized; and
- **Section 6.6: Uncertainties Analysis:** Uncertainties, "including uncertainties in the physical setting definition for the site, in the models used, in the exposure parameters, and in the toxicity assessment" (USEPA 1989) are discussed; and

As previously stated, the tabulated risk assessment results are presented in accordance with USEPA guidance described in RAGS: Volume I - Human Health Evaluation Manual (Part D, Standardized Planning, Reporting, and Review of Superfund Risk Assessments) (USEPA 2001). RAGS D requires the risk assessment results to be presented in a series of standardized tables, which are presented in Appendix E.1.

6.1 DATA SUMMARY AND SELECTION OF COPCS

6.1.1 Data Summary

Table 6-1 identifies the samples used in the COPC screening for soil. Refer to Section 4.0 for complete data tables for detected analytes for each media. Additional information regarding the data used in the HHRA is summarized below:

- Though several dioxins are known to be toxic, toxicity criteria are limited; therefore, the HHRA uses the method outlined in Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-dioxins and Dibenzofurans (CDDs and CDFs) (USEPA 1989a and WHO 2005) to assess risks due to exposure to dioxins and/or furans. Each congener is assigned a TEF, which corresponds to its toxicity relative to 2,3,7,8-TCDD. Each congener detection is multiplied by its corresponding TEF; the adjusted concentrations are then summed to derive one total 2,3,7,8-TCDD equivalent concentration for each sample. This concentration is then compared with toxicity criteria for 2,3,7,8-TCDD to calculate risks. TEFs are presented and total 2,3,7,8-TCDD equivalents are calculated for the site in Table 6-2.

- Flagged data such as J-flagged data (estimated concentration) and B-flagged data (detected in an associated blank) are considered detections and are used without modification;
- Rejected results (R-flagged) are not used;
- Data from duplicate sample pairs are averaged and treated as one result. If an analyte is detected in one of the sample pair, one half the detection limit of the non-detect is averaged with the detected result and the result is considered detected; and
- Chemicals that were not detected in at least one sample were considered as uncertain analytes in the evaluation of risk. Other qualified analytical data were retained in the assessment.

Additional information regarding specific soil and groundwater samples used in the HHRA is provided in Sections 6.1.1.1 and 6.1.1.2.

6.1.1.1 Surface Soil and Total Soil

As presented in Table 6-1, soil samples collected during SSP sampling events completed in 2003 and RFI sampling events completed in 2008 were used for the COPC screenings. In addition as presented in Table 6-1, the soil samples for the site have been divided into surface soil (0 to 1 ft bgs) and subsurface soil (1 to 15 ft bgs). The two soil data groupings used for COPC screening and the HHRA are surface soil (0 to 1 ft bgs) and total soil (0 to 15 ft bgs). The total soil data grouping consists of combining surface and subsurface soil to address mixing of potential constituents in soil during construction or land development activities. A total of 92 surface soil samples and 91 subsurface soil samples were used in the HHRA. Refer to Figures 3-1a and 3-1b for boring and associated soil sample locations.

The one dioxin/furan sample used in the COPC screening was the sample collected during the SSP investigation. The additional four dioxin/furan samples were collected as part of the Subpart X permit for the open burning ground and are screened in Table 2-4 of the RFI. The concentrations were below the applicable screening levels; therefore, would not result in the inclusion of dioxin/furans as a COPC. Given that the detected concentrations for dioxin/furans for a total of five samples were below applicable screening levels, no additional sampling for dioxin/furans is necessary.

6.1.1.2 Groundwater

As presented in Section 2.2.3, groundwater in the area of OBG is currently being evaluated under the facility's Subpart X permit issued by the VDEQ in October 2005. Groundwater monitoring and any required corrective action for groundwater will be addressed under the facility's Subpart X permit; therefore, groundwater will not be further investigated or addressed under this RFI. Therefore, groundwater samples were not collected as part of the RFI.

6.1.2 Identification of COPCs

COPCs were identified for the site by comparing the MDC to the following screening levels for each media: R-RSLs and I-RSLs for soil as presented in the October 2008 Regional SL Table (USEPA 2008). The lowest screening criterion for each medium was used to identify the COPCs. In accordance with USEPA Region III guidance, RSLs for non-carcinogenic chemicals were adjusted downward to a HQ of 0.1 to ensure that chemicals with additive effects were not prematurely eliminated during screening.

For nutrients detected in soil (calcium, potassium, magnesium, and sodium) that have no available RSL, the MDC was compared to the recommended daily allowance (RDA)-derived soil ingestion screening criteria. RDAs used to calculate the RDA-derived ingestion screening criteria were obtained from Recommended Dietary Allowances, 10th edition ©1989 by the National Academy of Sciences (National Academy Press, Washington, D.C.). Table 6-3 presents the equation, exposure parameters, and RDAs used, as well as the calculated screening criteria for the adult resident and child resident receptors. The lowest screening criterion for each nutrient (e.g., the screening criteria for the child resident) was selected as the screening criterion.

Analytes detected at a maximum concentration greater than the corresponding adjusted RSLs or screening values identified above (or those for which no screening criteria exists) were selected as COPCs. COPC screening tables the site are presented in Appendix E.1, Tables E.1-2.1 (COPC Determination - Surface Soil), E.1-2.2 (COPC Determination - Total Soil), and E.1-2.3 (Non-Detect Screening – Soil). A summary of the results of the human health COPC screenings for the site are presented in the table below.

Human Health COPCs Identified

Chemical	Surface Soil	Total Soil
Aluminum	X	X
Antimony		X
Arsenic	X	X
Cobalt	X	X
Iron	X	X
Lead	X	X
Manganese	X	X
Thallium	X	X
Vanadium	X	X
Benzo(a)anthracene	X	X
Benzo(a)pyrene	X	X
Benzo(b)fluoranthene	X	X
Carbazole*	X	X
Dibenz(a,h)anthracene	X	X
Dibenzofuran*	X	X
Dimethylphthalate*	X	X
Nitroglycerin	X	X

Note: * denotes COPC identified due to no screening value available

6.2 EXPOSURE ASSESSMENT

The objective of the exposure assessment is to estimate "the type and magnitude of exposures to chemicals of potential concern" (USEPA 1989b). When combined with chemical-specific toxicity information (summarized in the toxicity assessment), these exposures produce estimations of potential cancer risks and non-cancer hazards.

6.2.1 Conceptual Site Model/Receptor Characterization

A refined conceptual site model (CSM) for the RFI study area is presented on Figure 6-1. The site is an approximate 40 to 60 ft wide area between the operational area of OBG and the New River within the 100 year floodplain. This area is outside of the RFAAP perimeter security fence and slopes moderately to steeply from the outside of the OBG perimeter berm down to the river, with a vertical elevation difference of approximately 10 ft. Thick grass and stands of trees cover the RFI study area. Subsurface geology consists of fill material and alluvial deposits overlying carbonate bedrock of the Elbrook Formation. Groundwater is present within the lower portion of the alluvial deposits and in underlying bedrock. Groundwater flows south from OBG toward the RFI study area and the New River.

Potentially affected media include surface soil, subsurface soil, groundwater, and sediment of the New River. Runoff controls within the OBG prevent storm water runoff or drainage from the active burning ground from entering the RFI study area. Within the RFI study area, depending on the amount of precipitation, stormwater will either infiltrate into soil due to thick vegetative cover or flow downslope toward the New River. As presented in Section 4.4, this potential migration pathway is impeded by the presence of significant vegetation in the RFI study area.

Potential source areas at the RFI study area consist of soil due to potential releases to soil associated with historical operations at the adjacent OBG prior to modification of the OBG operations to prevent potential releases to the RFI study area. Other constituent sources have not been identified in the RFI study area.

Historical operations at the burning ground may have resulted potential releases to soil in the RFI study area due to runoff from the adjacent burning areas and deposition of particulate matter from burning operations. Chemicals released to surface soil at the site may be transported by stormwater runoff and overland flow to the RFI study area or to the New River located adjacent to the site. Leaching of chemicals to subsurface soil and groundwater is another potential release mechanism. Potential releases to the New River (surface water and sediment) could also occur from any discharging groundwater containing dissolved phase constituents associated with the OBG. Groundwater in the area of OBG is currently being evaluated under the facility's Subpart X permit issued by the Virginia Department of Environmental Quality (VDEQ) in October 2005 which includes semi-annual compliance groundwater monitoring; therefore, groundwater will not be further investigated or addressed under this RFI. Although historic activities at the burning ground may have impacted the New River via stormwater runoff and discharging of groundwater, this RFI focuses on the existing soil conditions within the RFI study area and evaluates potential migration pathways to the New River via stormwater runoff from the RFI study area. As presented in Section 4.4, based on the limited extent of chemicals in soil within the study area above RSLs, the low lying, lush vegetation present at the site (see photo log in Appendix A), and the percentage of ground cover (90%), the potential for RFI study area related releases from soil to the New River via runoff at levels of concern is not considered significant. Potential release mechanisms and affected media quantitatively assessed as part of this RFI are shown on the conceptual site diagram presented on Figure 6-2.

Lead concentrations in New River sediment are below the human health residential SL of 400 mg/kg, with the exception of station NR-SED-16 (500 mg/kg) located downstream of the OBG, SWMU 54, and the RFAAP MMA. The mean concentration of lead for each sub-segment sampled and the entire reach sampled was below 400 mg/kg.

The SWMU 54 RFI/CMS Report (URS 2008b) concluded that attributing lead and other metals detected in sediment samples to a specific source or sources is not possible for the RFI given the complex transient flow and depositional patterns in the river, and therefore, it is recommended that these data be used holistically as part of any overall evaluations of the facility and potential receptors conducted for the RCRA Corrective Action Permit.

During the SWMU 54 RFI/CMS investigation, it was established that lead tends to partition to sediment rather than remain in surface water: therefore, the risk to human health receptors is considered minimal with regard to exposure to lead in surface water.

6.2.2 Identification of Exposure Pathways

Although current and likely future land-use scenarios are limited to industrial operations, both residential and industrial scenarios were evaluated. Potential receptors that were evaluated include current/future maintenance workers, current/future trespasser (due to site's location outside of the Installation perimeter fence), future construction workers, future commercial workers, future adult residents, and future child residents. Carcinogenic risk was assessed for the hypothetical lifetime resident to account for cumulative lifetime risk. The exposure duration for the lifetime resident scenario was assumed to be 30 years total; therefore, for carcinogens, exposures are combined for hypothetical child resident (6 years) and adult resident (24 years). Potentially complete pathways for each receptor and pathways to be assessed are summarized on Figure 6-2, Conceptual Site Diagram.

In Appendix E.1, Table E.1-1 summarizes the selection of exposure pathways for the SWMU and receptor listing the rationale for the inclusion or exclusion of each pathway. A conceptual site diagram presenting the sources, release mechanisms, pathways, and receptors for the site are presented on Figure

6-2. The table below summarizes the exposure pathways and media evaluated for each of the potential receptor populations.

Media/Exposure Pathways	Exposure Scenarios				
	Current/Future		Future		
	Maintenance Worker	Adolescent Trespasser	Commercial Worker	Construction Worker	Resident [1]
Surface Soil					
Ingestion	X	X			X
Dermal Absorption	X	X			X
Inhalation of Fugitive Dust	X	X			X
Inhalation of Outdoor Vapors [2]					
Total Soil [3]					
Ingestion	X	X	X	X	X
Dermal Absorption	X	X	X	X	X
Inhalation of Fugitive Dust	X	X	X	X	X
Media/Exposure Pathways	**Current/Future**		**Future**		
	Maintenance Worker	**Adolescent Trespasser**	**Commercial Worker**	**Construction Worker**	**Resident [1]**
Inhalation of Outdoor Vapors [2]					
Inhalation of Indoor Vapors [2]					

X = Quantitative Evaluation

[1] The exposure duration for the lifetime resident scenario is assumed to be 30 years total; therefore, for carcinogens, exposures are combined for hypothetical child resident (6 years) and adult resident (24 years).

[2] VOCs not identified as COPC for soil for SSP; therefore, not tested for in RFI.

[3] The evaluation of total soil assumes that construction, excavation, or other activities "mix" the surface and subsurface soil, thus changing the constituent concentrations available on the surface.

6.2.2.1 Current/Future Land Use Scenario

Two receptors, the maintenance worker and the adolescent trespasser, were identified under the current land use scenario. The receptors are assumed to contact surface soil. It is assumed that the maintenance worker scenario and adolescent trespasser scenario are likely to exist in the future; therefore, exposure to total soil is possible if excavation activities resulting in the mixing of surface soil and subsurface soil occur in the future.

6.2.2.2 Future Land Use Scenario Only

In the event that construction occurs at the site, soil that was previously found at depth may be brought to the surface and become available to receptors. Therefore, the future hypothetical industrial use scenarios of the construction worker and commercial worker are assumed to come into contact with total soil at the site. Although the site is assumed to remain industrial in nature, the residential scenario is evaluated in this HHRA to meet clean closure requirements under RCRA. Future hypothetical resident is assumed to come into contact with surface soil and/or total soil.

6.2.3 Calculation of EPCs

To calculate intakes, the mean concentration of each COPC is estimated and is referred to as the EPC. To account for uncertainty when estimating EPCs from sample data, the 95% upper confidence limit of the mean (95% UCL) is used instead of the mean itself (USEPA 1989b). Methods used to calculate 95% UCLs are based on guidance provided in the following documents *Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites* (USEPA 2002b) and *On the Computation of*

a 95% Upper Confidence Limit of the Unknown Population Mean Based Upon Data Sets with Below Detection Limit Observations (USEPA 2006a).

In general, the method used to calculate a 95% UCL depends on: 1) the number of samples, 2) the prevalence of non-detects, and 3) the data distribution (e.g., normal or lognormal). Non-detects introduce uncertainty in the data set because the true concentration may be between zero to just below the detection limit. Therefore, distributional assumptions are difficult to make for COPCs with a high rate of non-detects. ProUCL 4.0 (USEPA 2007c) is used to calculate EPCs for the site with the exception of data sets with a low frequency of detection for which the MDC was used in the risk assessment. EPCs for soil COPCs are presented in Tables E.1-3.1 and E.1-3.2 of Appendix E.1. EPC calculations for the site are included in Appendix D.1.

To address the inhalation of fugitive dust from soil exposure pathway, particulate emission factors (PEFs) were used to derive ambient air EPCs for soil COPCs. The PEFs used to calculate inhalation daily intakes were calculated in accordance with the *Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites* (USEPA 2002c), as provided in Appendix E.1, Table E.1-4.3. VOCs were not identified as COPCs in soil; therefore, the inhalation pathway for vapors from soil was not evaluated for the site.

6.2.4 Quantification of Exposure: Calculation of Daily Intakes

For each receptor and pathway with the exception of inhalation, chronic daily intake (CDI, expressed as milligrams of COPC per kilogram body weight per day) for each COPC is estimated by combining the EPC with exposure parameters such as ingestion rate, frequency of contact, duration, and frequency of exposure. For the inhalation pathway an exposure concentration, expressed as milligrams of COPC per meter cubed of air, is estimated by combining the EPC with exposure parameters such as PEFs, volatilization factors, frequency of exposure, exposure time, and exposure duration (USEPA 2009). In addition, intake parameters are selected so the combination of intake variables results in an estimate of the reasonable maximum exposure for that pathway (USEPA 1989b).

Intake formulas, exposure parameters, and chemical-specific parameters are provided in Appendix E.1, Tables E.1-4.1a through E.1-4.1d. The results of the intake and exposure concentration calculations are presented for each receptor in Appendix E.1, Tables E.1-7.1 through E.1-7.12.

6.3 TOXICITY ASSESSMENT

The methodology used for classifying health effects from exposure to chemicals is recommended by USEPA and considers chronic exposures. The chronic toxicity criteria were obtained from the September 2008 USEPA Regional Screening Table which utilizes the following hierarchy:

- Tier 1 – USEPA's Integrated Risk Information System (IRIS);
- Tier 2 – Provisional Peer-Reviewed Toxicity Values (PPRTVs), as developed on a chemical-specific basis by the Office of Research and Development/National Center for Environmental Assessment/Superfund Health Risk Technical Support Center; and
- Tier 3 – Other sources of toxicological reference values that include those from Cal EPA, Minimal Risk Levels (MRLs) from the Agency for Toxic Substances and Disease Registry (ATSDR), and finally the Human Health Effects Assessment Summary Table (HEAST) toxicity values.

Toxicity criteria used to quantify non-carcinogenic hazards (reference doses (RfDs) and reference concentrations (RfCs)) and carcinogenic risks (cancer slope factors (CSFs) and unit risks) are presented in Appendix E.1, Tables E.1-5.1, E.1-5.2, E.1-6.1, and E.1-6-2.

6.3.1 Health Effects Classification and Criteria Development

According to USEPA's science policy, there are two primary approaches to developing toxicity values or health effects criteria. The non-threshold approach is based on USEPA's scientific policy position that a small number of molecular events can evoke changes in a single cell or a small number of cells. This is described as a non-threshold initiator mechanism because there is essentially no level of exposure (i.e., a threshold) to a constituent that will not result in some finite possibility of causing an adverse effect. Another assumption stemming from USEPA's science policy is that the dose-response curve is linear at low doses. For most carcinogens, toxicity criteria are based on the non-threshold approach.

The threshold approach is based on the assumption that organisms have repair and detoxification capabilities that must be exceeded by some critical concentration (threshold) before the adverse effect is manifested. For example, an organ can have a large number of cells performing the same or similar functions that must be significantly depleted before the effect on the organ is realized. This threshold view holds that a range of exposures from just above zero to some finite value can be tolerated by the organism without an appreciable risk of adverse effects. Toxicity criteria for non-carcinogens are based on the threshold approach. Furthermore, as additional information regarding the mechanisms of toxicity becomes available, the threshold approach may also apply to some carcinogens (*e.g.*, chloroform).

6.3.1.1 Cancer Slope Factors

For carcinogens, USEPA estimates the excess lifetime cancer risks associated with various levels of exposure by developing CSFs and unit risks. CSFs are expressed in terms of reciprocal dose, as units of: $(\text{mg chemical/kg body weight - day})^{-1}$, and describe the upper-bound increase in an individual's risk of developing cancer over a 70-year lifetime per unit of exposure. Unit risks, used to assess the inhalation pathway, are expressed either as a reciprocal air concentration, in units of micrograms per meter cubed $(\mu g/m^3)^{-1}$. Similarly, they are defined as the probability of an individual developing cancer over a 70-year lifetime from exposure to one unit of concentration in air or water. Because regulatory efforts are geared to be protective of public health, including even the most sensitive members of the population, the CSFs and unit risks are derived using conservative assumptions.

CSFs and unit risks are derived from the results of human epidemiological studies or chronic animal bioassays. Animal studies usually must be conducted using relatively high doses to detect possible adverse effects. Because humans are expected to be exposed to doses lower than doses used in the animal studies, the potential cancer risks at lower doses are estimated by using mathematical models. The data from animal studies are typically fitted to the linearized multistage model to obtain a dose-response relationship. In general, after the data are fit to the dose-response model, the 95% UCL of the slope of the resulting dose-response relationship at low doses is calculated. This upper-bound limit is subjected to various adjustments and an interspecies scaling factor is applied to derive the slope factor or unit risk for humans. Thus, the actual risks associated with a given intake of a potential carcinogen quantitatively evaluated based on animal data are generally regarded as not likely to be above the risks estimated using these CSFs or unit risks and they may be as low as zero (USEPA 1986b). Dose-response data derived from human epidemiological studies are fitted to dose-time-response curves. These models provide rough, but plausible, estimates of the upper limits on lifetime risk. CSFs and unit risks based on human epidemiological data are derived using conservative assumptions and are unlikely to underestimate risks for a given level of exposure.

Weight-of-evidence categories represent an assessment of the amount and quality of the data, which support the finding that specific chemicals and elements can cause cancer in humans. Although USEPA's guideline for carcinogen risk assessment (USEPA 1996) proposes a weight-of-evidence narrative, IRIS currently uses the original alphanumeric classification. Under the existing guidelines (USEPA 1986a), chemicals are classified as either Group A, Group B1, Group B2, Group C, Group D, or Group E. Group A includes those substances for which high-quality studies have demonstrated a relationship between the exposure to the substance in question and the development of cancer in human populations. Groups B1, B2, and C represent chemicals with limited (B1) or insufficient (B2) human evidence of carcinogenicity,

and sufficient (B1, B2) or insufficient (C) animal data. Group D substances are those for which there is insufficient evidence or not evidence of carcinogenicity in humans or animals and Group E substances are those not having evidence of carcinogenicity available in adequate human or animal studies.

6.3.1.2 Reference Doses and Reference Concentrations

Toxicity criteria for non-carcinogens are generally developed using verified risk reference doses (RfDs) and reference concentrations (RfCs). These are developed by USEPA and listed in IRIS or can be obtained from HEAST (USEPA 1997c) and supplements. RfDs are expressed in units of dose (mg chemical/kg body weight-day) and are usually derived either from human studies involving workplace exposures or from animal studies. RfCs, used to assess the inhalation pathway, are expressed as air concentrations (mg/m^3). In addition, RfDs are estimates (with uncertainty spanning perhaps an order of magnitude) of the daily exposure to the human population (including sensitive subpopulations) that is likely to be without an appreciable risk of deleterious effects during a lifetime. The RfD is used as a reference point for gauging the potential effects of exposures. Usually, exposures (as chemical intakes or doses) that are less than the RfD are not likely to be associated with adverse health effects.

RfDs are developed for both chronic and sub-chronic exposures. Chronic RfDs are presented in IRIS or HEAST and are intended for use in evaluating exposures of durations greater than seven years. Sub-chronic RfDs are developed by USEPA's National Center for Environmental Assessment (NCEA) and are used to characterize the potential for the occurrence of non-carcinogenic effects associated with short-term exposures [two weeks to seven years as defined by USEPA (USEPA 1989)]. The sub-chronic RfDs are developed similarly to chronic RfDs and are typically equal to chronic RfDs or are an order of magnitude greater (less stringent). Sub-chronic RfDs are presented in HEAST but are no longer being reviewed and updated in the same manner as IRIS. Because there is greater uncertainty associated with the sub-chronic RfDs, chronic RfDs have been used in this HHRA with the exception of construction worker for which the sub-chronic values (if available) are used due to exposure duration.

RfDs are derived using uncertainty factors that reflect scientific judgment regarding the various types of data used to estimate the RfD. RfDs are typically estimated from no observable adverse effect levels (NOAELs) or lowest observable adverse effect levels (LOAELs) in human or animal studies. Uncertainty factors, generally 10-fold factors, are intended to account for:

- The variation in sensitivity among members of the human population;
- The uncertainty in extrapolating animal data to the case of humans;
- The uncertainty in extrapolating from data obtained in a study that is less-than-lifetime exposure;
- The uncertainty in using LOAEL data, when necessary, rather than NOAEL data; and
- The inability of a single study to adequately address every possible adverse outcome in humans.

To derive RfDs, NOAELs or LOAELs are divided by one or more uncertainty factors, as appropriate. When taken together, these uncertainty factors may confer an extra margin of safety of up to a factor of 10,000 below a LOAEL. In some cases, modifying factors are also applied to RfDs to take into account other uncertainties in the toxicity database and reflect the professional judgment of those reviewing the database. The net result is that RfDs are generally considered to provide a conservative estimate of the likelihood of adverse non-carcinogenic effects.

6.3.1.3 Adjustment for Dermal Absorption

Toxicity criteria have not been developed by USEPA specifically for dermal absorption; instead, oral toxicity criteria are adjusted to assess this pathway. In order to have a meaningful comparison between the dermal absorption dose estimates, which represent internal (or absorbed) doses, and oral toxicity criteria, which typically represent potential (or administered) doses, toxicity criteria are modified to represent absorbed doses. The method for modifying toxicity criteria involves calculation of an absolute

oral absorption factor for each chemical and use of this value to increase the chemical's CSF or to decrease the chemical's RfD, as shown in the following equations:

- Adjusted Dermal CSF = CSF/Absolute oral absorption factor; and
- Adjusted Dermal RfD = RfD x Absolute oral absorption factor.

The absolute oral absorption factors should reflect the specific conditions under which the toxicological study was conducted (e.g., method of administration such as gavage, water or diet, and vehicle of administration such as solvent or solution). The absolute oral absorption factors and adjusted toxicity criteria for the COPCs used when evaluating dermal absorption are presented in RAGS D Tables E.1-5.1 and E.1-6.1. The adjusted CSFs and RfDs presented in these tables were used to evaluate potential risks associated with dermal absorption.

6.4 RISK CHARACTERIZATION

Quantitative risks and hazards due to exposure to COPCs are estimated and summarized by combining toxicity criteria (presented in the Toxicity Assessment) with CDIs and exposure concentrations (calculated in the Exposure Assessment). Methods used to calculate risks and hazards are taken from (USEPA 1989b).

For exposures to potential carcinogens, the individual upper-bound excess lifetime cancer risk was calculated by multiplying the estimated CDI or exposure concentration for each COPC by the CSF. In order to assess the individual excess lifetime cancer risks associated with simultaneous exposure to COPCs, the risks derived from the individual chemicals are summed within each exposure pathway. For the residential scenario, carcinogenic risk was evaluated for the lifetime resident. In addition, carcinogenic risk for the residential scenario for carcinogens that act via a mutagenic mode of action (i.e., benzo(a)pyrene) as identified in the September 2008 Regional Screening Table were evaluated utilizing default age-dependant adjustment factors in accordance with the Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens (USEPA 2005a).

Non-carcinogenic adverse health effects are calculated by dividing the CDI for each COPC by its RfD or the exposure concentration for inhalation for each COPC by its RfC, forming a HQ. HQs greater than one (1) indicate the potential for adverse health effects. To estimate non-carcinogenic adverse health effects due to simultaneous exposure to several COPCs, HQs for individual COPCs are summed within each exposure pathway to form a HI. As with HQs, HIs that are greater than 1 indicate potential adverse health effects. In such cases, COPCs are divided into categories based on the target organ affected (e.g., liver, kidney) and target organ-specific HIs are recalculated. Non-carcinogenic hazards were evaluated for child and adult residents independently.

Excess lifetime cancer risks derived in this report are compared to USEPA's target risk range for Superfund sites of 1E-06 to 1E-04 (USEPA 1989). In addition, USEPA's Office of Solid Waste and Emergency Response has issued a directive (USEPA 1991) clarifying the role of HHRA in the Superfund process. The directive states that, if the cumulative carcinogenic risk to a receptor (based on reasonable maximum exposure for both current and future land use) is less than 1E-04 and the non-carcinogenic HI is equal to or less than 1, action generally is not warranted unless adverse environmental effects are likely.

Calculation of risks and hazards due to exposure to COPCs are presented in Appendix E.1 in Tables E.1-7.1 through E.1-7.12. A refinement of the HIs based on target organs is conducted. As shown in Appendix E.1 in Tables E.1-9.1 through E.1-9.12, the refinement consists of calculating HIs based on a target organ-specific basis. In addition in Appendix E.1, Table E.1-10.1 summarizes risks and hazards for risk/HI drivers (i.e., those COPCs contributing to a total risk greater than 1.E-04 or a total target organ hazard greater than 1).

Risks and hazards presented in Appendix E.1 in Tables E.1-9.1 through E.1-9.12 are summarized in the tables below. The total risk for each receptor is below or within USEPA's target risk range for Superfund sites (1E-06 to 1E-04, USEPA 1989). The total HIs after target organ segregation for all receptors are

equal to or below the USEPA reference HI of 1E+00 with the exception of the hypothetical future construction worker (CNS).

Summary of Risks and Hazards

Timeframe/Receptor	Risk	HI	Risk Drivers	Target Organ Segregation HI>1
Current Maintenance Worker (Surface Soil)	4.E-07	0.06	None	None
Future Maintenance Worker (Total Soil)	4.E-07	0.05	None	None
Current Adolescent Trespasser (Surface Soil)	2.E-07	0.05	None	None
Future Adolescent Trespasser (Total Soil)	2.E-07	0.05	None	None
Hypothetical Future Commercial Worker (Total Soil)	1.E-06	0.2	None	None
Hypothetical Future Construction Worker (Total Soil)	6.E-07	**6**	None	CNS (HI=5) – Soil (Al – Inh (0.6), Mn – Inh (4))
Hypothetical Future Adult Resident (Surface Soil)	See Lifetime Resident	0.4	NA	None
Hypothetical Future Adult Resident (Total Soil)	See Lifetime Resident	0.4	NA	None
Hypothetical Future Child Resident (Surface Soil)	See Lifetime Resident	**3.5**	NA	None
Hypothetical Future Child Resident (Total Soil)	See Lifetime Resident	**3**	NA	None
Hypothetical Lifetime Resident (Surface Soil)	2.E-05	NA	None	NA
Hypothetical Lifetime Resident (Total Soil)	2.E-05	NA	None	NA

Note: NA = Not Applicable
CNS = Central Nervous System
Al = Aluminum, Mn = Manganese
Inh = Inhalation
HI = Hazard Index
Bold = Above USEPA Risk or Hazard Range
Segregated Target Organ HIs provided in Appendix E.1, Table 9's

6.4.1 Lead Exposure Assessment

The MDC for lead in surface soil and total soil for the study was above the residential lead screening level of 400 mg/kg, and therefore, the potential hazard associated with lead was evaluated using the Integrated Exposure Uptake Biokinetic (IEUBK) model for the child resident scenario (USEPA 2007a) and the EPA Adult Lead Model (USEPA 2005b) for adult workers.

Site-specific lead exposures were evaluated for residential exposures at the RFI study area using the IEUBK model. The results of the model are presented in Appendix E.2. The corresponding input parameters and distribution probability plot are also provided in the Appendix E.2. The results of the modeling presented in Appendix E.2 predict the probability of children expected to have blood levels of 10 microgram per deciliter (μg/dL) or greater. The lead risks are considered unacceptable if the child-blood lead level for more than 5% of children is estimated to be equal to or greater than the Center for Disease Control and Prevention (CDCP) threshold of 10 μg/dL.

USEPA developed a physiologically-based pharmacokinetic adult lead model (ALM) (version 05/19/2005) that can be applied to adult worker receptors. The ALM is currently the accepted and standard model to assess adult non-residential exposures to lead in soil and indoor dust. The model uses a simplified representation of lead biokinetics to predict quasi steady-state blood level concentrations among adults who have relatively steady patterns of site exposures. The methodology focuses on estimating fetal blood lead concentrations in female workers. All of the equations in the model are used to calculate target concentrations based on the probability of a blood lead level equal to or greater than 10 μg/dL for a fetus. Lead risks are considered unacceptable for a non-residential (worker) receptor if the fetal blood lead level for more than 5% of fetuses of adult female workers is estimated to equal or greater than the CDCP concern threshold of 10 μg/dL. The ALM is used to evaluate risks of lead exposure to the fetus of pregnant female commercial workers, construction workers, and other workers that are identified as relevant receptors at a site.

6.4.1.1 Lead Exposure Assessment

Default parameters were utilized for the ALM with the following ingestion rates and exposure frequencies: maintenance worker – ingestion rate (100 mg/day) and exposure frequency (219 days), commercial worker – ingestion rate (50 mg/day) and exposure frequency (250 days), and construction worker – ingestion rate (100 mg/day) and exposure frequency (250 days). Default parameters were used for the IEUBK model. An arithmetic mean for lead of 313.9 mg/kg was used in the models for surface soil and an arithmetic mean for lead of 414.9 mg/kg was used in the models for total soil. Lead was not detected in groundwater at SWMU 13; therefore, the reporting limit for lead (1 μg/L) was used in the model for the lead concentration in groundwater. The lead modeling predicts the probability of the receptors to have blood levels of 10 μg/dL or greater. This probability is then compared to an established threshold of 5%. The results of the ALMs for the South region/all ethnicities and IEUBK models are presented in Appendix E.2 and summarized below:

- Current/Future Maintenance Worker (Surface Soil): 1.5% probability that fetal blood levels would be greater than 10 μg/dL (<5%);
- Hypothetical Future Maintenance Worker (Total Soil): 2.3% probability that fetal blood levels would be greater than 10 μg/dL (<5%);
- Hypothetical Future Commercial Worker: 0.9% probability that fetal blood levels would be greater than 10 μg/dL (<5%);
- Hypothetical Future Construction Worker: 2.8% probability that fetal blood levels would be greater than 10 μg/dL (<5%);

- Hypothetical Future Child resident (Surface Soil): 1.4% probability that child blood levels would be greater than 10 μg/dL (<5%); and
- Hypothetical Future Child resident (Total Soil): 4.1% probability that child blood levels would be greater than 10 μg/dL (<5%).

The results of the lead modeling predicted the probability of the receptors for the RFI study area expected to have blood levels of 10 μg/dL or greater were below the established threshold of 5%.

6.4.2 Background

Statistical evaluations were conducted to compare metals concentrations in soil at the RFI study area to background concentrations presented in the RFAAP Facility-Wide Background Study Report (IT 2001). These evaluations followed the procedures outlined in the USEPA *Guidance for Comparing Background and Chemical Concentrations in Soil for CERCLA Sites* (USEPA 2002a) and included distribution testing and comparisons of site data to background using ProUCL 4.0 (USEPA 2007c). At the RFI study area, if the distribution testing showed that either site data sets and background data sets in each case were not normal, consistent with Section 4.1 of the above referenced USEPA guidance, comparisons of site to background were conducted using non-parametric testing to evaluate whether site concentrations were consistently higher or lower than the background data set. If the distribution of the site and background data sets were both distributed normally, a paired t-test was conducted to evaluate whether site concentrations were consistently higher or lower than the background data set unless non-detects were present in either data set then the default comparison using ProUCL 4.0 is nonparametric. Appendix D.2 presents the results of the statistical evaluations. Summaries of the means comparison results are provided Appendix D.2, Tables D.2.-1a (surface soil) and D.2-1b (total soil).

Based on the background evaluations presented in Appendix D.2, COPCs identified for the RFI study area that are consistently lower than background include arsenic, cobalt, manganese, and vanadium for surface soil and aluminum, arsenic, cobalt, iron, thallium, and vanadium for total soil. Note that background comparisons could not be conducted for antimony (surface and total soil) due to the number of detections in the background data set.

Recent investigations conducted within flood plain areas at RFAAP (SWMUs 54, 45, 35, 37, 38, and AOC Q), have indicated naturally occurring manganese levels in alluvial soil that are consistently similar to or above facility background, when tests are conducted using means comparisons (t-test or rank sum) but substantially below the background point estimate of 2,543 mg/kg. A similar situation is apparent at the RFI study area, where total manganese concentrations in soil are consistently above the background data set when means tests are conducted, but detected manganese concentration are below the background point estimate.

As presented in the SWMU 54 RFI/CMS Report (URS 2008b), further statistical evaluation of the nature of manganese concentrations at SWMU 54 was conducted utilizing background samples located outside of the site area between the perimeter fence and the New River. SWMU 54 is located downstream of the RFI study area at SWMU 13 within the HSA (Figure 2-10). SWMU 54 and the RFI study area exhibit similar geology (i.e., alluvial in nature); therefore, a statistical evaluation of manganese (total) soil data was conducted for the RFI study area and the background area at SWMU 54. As presented in Appendix D.3, a non-parametric Wilcoxon-Mann-Whitney Test was conducted given the non-normal distribution of manganese for the SWMU 54 background data. The result of these evaluations indicated that the concentrations of manganese for the samples from the RFI study area at SWMU 13 were equal to or below the concentrations of manganese for the background samples from SWMU 54. Based on the results of this evaluation, the concentrations of manganese for total soil within the RFI study area were considered to be within background for alluvial soil and not indicative of effects from operational activities at the OBG on the RFI study area.

6.5 HHRA SUMMARY AND CONCLUSIONS

This HHRA was performed to evaluate the potential human health effects associated with previous activities adjacent to the RFI study area. Receptors evaluated included: current/future maintenance worker, current/future adolescent trespasser, hypothetical future construction worker, hypothetical future commercial worker, hypothetical future adult resident, hypothetical future child resident, and hypothetical future lifetime resident.

As presented in Section 6.4, the total risk for each receptor is below or within USEPA's target risk range for Superfund sites (1E-06 to 1E-04, USEPA 1989). The results of the lead modeling predicted the probability of the receptors expected to have blood levels of 10 μg/dL or greater were below the established threshold of 5%. The total HIs after target organ segregation for all receptors are equal to or below the USEPA reference HI of 1E+00 with the exception of the hypothetical future construction worker (CNS) due to aluminum and manganese concentrations in total soil via the inhalation pathway (CNS HI of 5). COPCs contributing to the CNS HI of 5 for the construction worker (arsenic, aluminum, and manganese) were below background; therefore, the site-related CNS hazard for the construction worker is negligible at the site.

6.6 UNCERTAINTIES ANALYSIS

Risk assessments involve the use of assumptions, judgments, and incomplete data to varying degrees that contribute to the uncertainty of the final estimates of risk. Uncertainties result both from the use of assumptions or models in lieu of actual data and from the error inherent in the estimation of risk related parameters and may cause risk to be overestimated or underestimated. Based on the uncertainties described below, this risk assessment should not be construed as presenting an absolute estimate of risk to persons potentially exposed to COPCs.

Consideration of the uncertainty attached to various aspects of the risk assessment allows better interpretation of the risk assessment results and understanding of the potential adverse effects on human health. In general, the primary sources of uncertainty are associated with environmental sampling and analysis, selection of chemicals for evaluation, toxicological data, and exposure assessment. The effects of these uncertainties on the risk estimates are discussed below.

6.6.1 Environmental Sampling and Analysis

If the samples do not adequately represent media at the RFI study area, hazard/risk estimates could be overestimated or underestimated. The sampling and analysis plan was designed to investigate anticipated areas of concern at the SWMU. Therefore, there is less chance that the hazard/risk estimates are biased low. Also, if the analytical methods used do not apply to some chemicals that are present at the site, risk could be underestimated. Because the analytical methods at the site were selected to address all chemicals that are known or suspected to be present on the basis of the site history, the potential for not identifying a COPC is reduced.

Uncertainty in environmental chemical analysis can stem from several sources including errors inherent in the sampling or analytical procedures. Analytical accuracy errors or sampling errors can result in rejection of data, which decreases the available data for use in the HHRA, or in the qualification of data, which increases the uncertainty in the detected chemical concentrations. There is uncertainty associated with chemicals reported in samples at concentrations below the method reporting limit but still included in data analysis and with those chemicals qualified "J" indicating that the concentrations are estimated. Another issue involves the amount of blank related (i.e., B-qualified) data in the data set. These data were retained in the HHRA without modification. The inclusion of "B" qualified data in the risk assessment may overestimate risk.

Another uncertainty associated with sampling and analysis concerns the inclusion of chemicals that are potentially present in the environment due to anthropogenic sources. For example, PAHs are considered ubiquitous in soil from anthropogenic sources, such as the burning of fossil fuels, forest fires, and

airborne particulates eroded from roadways and automobile tires. If such chemicals are not site-related, the risks associated with the site may be overestimated. This uncertainty may have a low-to-moderate effect on overestimating risks.

6.6.2 Selection of Chemicals for Evaluation

A comparison of maximum detected chemical concentrations to USEPA RSLs was conducted for both surface and total soil. Chemicals whose maximum concentrations were below their respective RSLs were not carried through the assessment. It is unlikely that this risk based screening excluded chemicals that should be included, based on the conservative exposure assumptions and conservatively derived toxicity criteria that are the basis of the RSLs. Although following this methodology does not provide a quantitative risk estimate for every chemical, it focuses the assessment on the chemicals accounting for the greatest risks (i.e., chemicals whose maximum concentrations are above their respective RSLs) and the cumulative risk estimates would not be expected to be significantly greater. As presented on the non-detect MDL screening tables in Appendix E.1, Table E.1-2.3, the maximum MDL is above the adjusted RSLs for only one target analyte (herbicide MCPP) in one soil sample; therefore, the site-related risks and hazards are not considered significantly underestimated for the risk assessments due to inadequate detection limits.

Background concentrations of metals in soil at RFAAP have been characterized and are used in statistical comparisons to site soil to evaluate whether concentrations of metals detected at the RFI study area are consistently higher or lower than background. Uncertainties associated with the use of these data may lead to a low-to-moderate overestimation or underestimation of surface and total soil risks due to metals.

Screening criteria are derived from RDAs for essential human dietary minerals, trace elements, and electrolytes that are toxic at very high doses (i.e., calcium, magnesium, potassium, and sodium). Omitting these essential human nutrients from further evaluation is expected to have a low effect on risk and hazard estimates.

The use of the Regional SL Table (USEPA 2008) rather than the April 2009 Regional SL Table for the COPC selection could result in the inclusion or exclusion of chemicals based on outdated toxicity data. Therefore to lessen the uncertainty associated with the use of these screening levels, an assessment of the data was conducted with respect to the April 2009 Regional Screening Levels which did not result in the identification of any additional COPCs for the site.

6.6.3 Exposure Assessment

The primary areas of uncertainty affecting exposure parameter estimation involve the assumptions regarding exposure pathways, the estimation of exposure point concentrations, and the exposure parameters used to estimate chemical doses.

An underlying assumption in the HHRA is that individuals at the site would engage in activities that result in exposures via each selected pathway. For example, it was assumed that maintenance workers engage in regular activities (once a week) under current and future land use conditions resulting in exposure to COPCs. This assumption is conservative, in that it is more likely that the activity patterns occur occasionally.

In establishing EPCs, the concentrations of chemicals in the media evaluated are assumed to remain constant over time. Depending on the properties of the chemical and the media in which it was detected, this assumption could over estimate risks, depending on the degree of chemical transport to other media or the rate and extent a chemical degrades over time.

When calculating EPCs from sample data, one half of the MDL was sometimes used for non-detect samples in the calculation of the 95% UCL of the mean. Approaches which substitutes values for non-detected chemical concentrations are associated with uncertainty, because chemicals that were not detected at the specified sample MDL may be absent from the medium or may be present at a concentration below the sample MDL. The uncertainty of the exposure point concentration will increase

as the number of non-detects in a data set increases and the uncertainty could result in either the overestimation or underestimation of EPCs.

The exposure parameters used to describe the extent, frequency, and duration of exposure is associated with uncertainty. Actual risks for individuals within an exposed population may differ from those predicted, depending upon their actual intake rates (e.g., soil ingestion rates), nutritional status, or body weight. Exposure assumptions were selected to produce an upper bound estimate of exposure in accordance with USEPA guidelines regarding evaluation of potential exposures at Superfund sites (e.g., exposures were assumed to occur for 25 years for workers). In addition, many USEPA default exposure parameters are highly conservative and are based on risk management interpretations of limited data (USEPA 1991). For example, although current USEPA guidance recommends default soil ingestion rates of 100 mg/day for individuals over 6 years of age, other studies, such as Calabrese et al. (1990), have shown that the USEPA default soil ingestion rate of 100 mg/day is likely to greatly overestimate adult exposures and risks. In addition, chemicals in soil are assumed 100% bioavailable; this assumes that ingested chemicals present in a soil matrix are absorbed through the gastrointestinal (GI) tract, which is unlikely due to the affinity of chemicals for soil particles. Therefore, based on the conservative exposure assumptions used in the HHRA, exposures and estimated potential risks are likely to be overestimated for the ingestion of soil pathways.

Evaluation of the dermal absorption exposure pathway is affected by uncertainties in dermal exposure parameters. For example, there is uncertainty associated with the exposed skin surface areas used, since the choice of exposed body parts could slightly overestimate or underestimate risks. Uncertainties that are more significant are associated with the selection and use of dermal absorption factors. For this HHRA, the dermal absorption factors and calculations were based on USEPA Region III guidance, USEPA's *Risk Assessment Guidance for Superfund (RAGS): Part E, Supplemental Guidance for Dermal Risk Assessment* (USEPA 2004). Very limited information is available on dermal absorption of chemicals from contacted soil under environmental conditions. In fact, there are not actual human epidemiological data to support the hypothesis that absorption of soil bound compounds under exposure conditions is a complete route of exposure. For example, the Public Health Statements from the Agency for Toxic Substance Disease Registry (ATSDR 1999b) indicates cadmium is not known to result in human health effects by dermal absorption because virtually zero cadmium can enter the body through the skin under normal circumstances (i.e., without exposure to very high concentrations for long periods or exposure to skin that is damaged (ATSDR 1999a). Therefore, using the dermal absorption factors to evaluate dermal absorption exposures to soil may result in an overestimation of risks.

6.6.4 Toxicological Data

The HHRA relies on USEPA derived dose response criteria. These health effects criteria are conservative and are designed to be protective of sensitive subpopulations. The health criteria used to evaluate long-term exposures, such as RfDs or CSFs, are based on concepts and assumptions that bias an evaluation in the direction of overestimation of health risk. As USEPA notes in its *Guidelines for Carcinogenic Risk Assessment* (USEPA 1986a), there are major uncertainties in extrapolating both from animals to humans and from high to low doses. There are important species differences in uptake, metabolism, and organ distribution of carcinogens, as well as species and strain differences in target site susceptibility, human populations are variable with respect to genetic constitution, diet, occupational and home environment, activity patterns, and other cultural factors.

These uncertainties are compensated for using upper bound 95% UCLs for CSFs (carcinogens), and safety factors for RfDs (non-carcinogens). The assumptions used here provide a rough but plausible estimate of the upper limit of risk; in other words, it is not likely that the true risk would be much more than the estimated risk, but it could very well be considerably lower. More refined modeling in the area of dose response calculation (e.g., using maximum likelihood dose response values rather than the 95% UCL) would be expected to substantially lower the final risk.

For dermal absorption exposure pathways, the absence of dermal toxicity criteria necessitates the use of oral toxicity data. To calculate risk estimates for the dermal absorption pathway, absorbed dermal absorption doses are combined with oral toxicity values (also discussed above in Section 6.3.1.3). Oral toxicity values, which are typically expressed in terms of potential (or administered) doses, should be adjusted when assessing dermal absorption doses, which are expressed as internal (or absorbed) doses. In this assessment, absolute oral absorption factors that reflect the toxicity study conditions were used to modify the oral toxicity criteria. For those chemicals lacking sufficient information, a default oral absorption factor of 1.0 was used. The risk estimates for the dermal absorption pathways may be overestimated or underestimated, depending on how the values used in the HHRA reflect the difference between the oral and dermal routes.

Inhalation toxicity criteria are unavailable for many of the COPCs. This HHRA does not use oral-based toxicity criteria to estimate risks from inhalation exposure because of the following uncertainties associated with such a substitution:

- Many chemicals show portal-of-entry toxicity – that is, adverse health effects occur primarily at the tissue site at which the chemical is introduced into the body (e.g., GI tract, lung, or skin). For example, orally administered benzo(a)pyrene is associated with benign and malignant tumors in the gut mucosa (Neal and Rigdon 1967), but inhaled benzo(a)pyrene produces an increased incidence of upper respiratory tract tumors (Thyssen et al. 1981). Therefore, quantitative risk estimates based on these two administration routes are dissimilar;

- Physiological and anatomical differences between the GI tract and respiratory systems invalidate a cross-route quantitative risk extrapolation. The small intestine of humans contains a very large surface area that readily absorbs most compounds by passive diffusion (Klaasen et al. 1986). The oral absorption of a few compounds, such as iron, is an energy-dependent (active-transport) process, wherein; the absorption rate is proportional to the body's current need for iron;

- The rate and extent of pulmonary absorption are much more complex and depend on such factors as particle size distribution of the airborne toxicant and blood-gas solubility of the toxicant (Klaasen et al. 1986). Particles with median aerodynamic diameters of approximately 1 micrometer (μm) or less are absorbed by the alveolar region of the human lung. Larger particles deposit in the tracheobronchial or nasopharyngeal regions where they are cleared by mucociliary mechanisms and subsequently swallowed or physically removed and exhaled. Therefore, pulmonary absorption is more highly dependent on the physiochemical properties of the material than oral absorption;

- Because highly soluble gases (e.g., chloroform) are more rapidly absorbed into the blood than poorly soluble gases (e.g., ethylene), they take much longer to reach equilibrium. Thus, the inhalation absorption rate of a gas is more dependent on blood solubility than the oral absorption rate of the same substance administered as a liquid; and

- Human inhalation risk estimates based on oral toxicity data in subhuman species are distorted by both route-to-route extrapolation and interspecies extrapolation. For example, the rodent GI tract, which includes a structurally unique fore stomach, is anatomically and functionally distinct from the human lung, which contains a very large alveolar surface area for extensive absorption. The rate and extent of absorption across these distinct physiological systems are not alike.

In addition, for inhalation exposure to substances present as dusts, vapors, gases, or airborne particulate matter, dose extrapolation is far more complex, and therefore associated with uncertainty. The major confounding factors that prohibit a direct dose extrapolation of an inhaled toxicant are the following:

- Over 40 functionally different cell types in the lung – the distribution, consequent metabolic reactions, and air exchange rates vary widely across species;

- Differential concentration and activity of the detoxifying protein glutathione;
- Interspecies and intraspecies differences in the ability to repair pulmonary cell damage, and to clear toxic chemicals and immune complexes from the respiratory tract. For example, species vary in the ability to activate macrophages – nonspecific immune cells that can both protect the inner lining of the respiratory system and, at high concentrations, damage healthy tissues;
- Anatomical variations in the respiratory pathway, which affect both absorption rates and time to reach steady-state blood levels; and
- Sensitivity to solubility and concentration variables; because of metabolic saturation (i.e., the exhaustion of normal metabolic activity caused by exposure to high concentrations), highly soluble chemicals deviate from first-order kinetics – which makes it difficult to predict the rates and extent of biotransformation and detoxification reactions. Furthermore, intermittent inhalation exposure to highly blood-soluble chemicals results in bioaccumulation in fat tissue because of the insufficient time between exposure sessions for complete clearance of the chemical. Such slow release from the fat compartment to other body tissues can result in toxicological and metabolic effects that are difficult to assess and vary across species.

For chemicals without IRIS toxicity criteria, provisional toxicity criteria were used where available (Appendix E.1 - Tables E.1-5.1 through E.1-6.2). Provisional toxicity criteria present a source of uncertainty, since USEPA has evaluated the compound, but consensus has not been established on the toxicity criteria. Provisional oral toxicity values were used for aluminum, antimony, arsenic, carbazole, cobalt, iron, thallium, vanadium, and nitroglycerin. For this assessment, use of provisional toxicity criteria was preferable to not evaluating the chemical in order to limit data gaps. However, because these toxicity criteria have not been formally accepted by USEPA, there is uncertainty with these values and, therefore, with the risks calculated using these toxicity criteria.

Some detected constituents (carbazole, dibenzofuran, and dimethylphthalate) do not have Regional RSLs and were therefore carried forward as COPCs into the HHRA. Provisional/surrogate toxicity values were not available for these COPCs with the exception of carbazole. The risk assessment could be biased low due to the lack of toxicity data for these COPCs.

For some chemicals, toxicity criteria for all pathways (i.e., oral, dermal, and inhalation) were unavailable (Appendix E.1 -Tables E.1-5.1 through E.1-6.2). Although lack of published toxicity data could result in an underestimation of risk, an attempt is made to balance this uncertainty with the use of available toxicological data derived using conservative methodologies.

6.6.5 Risk Characterization

Minor uncertainty is associated with rounding of the risk and hazard estimates. Thus, the actual risk or hazard may be slightly greater or less than the presented values. A related issue is that rounding causes minor differences between summed risk and hazard values, depending on how the summing is performed. For example, RAGS Table 7s in Appendix E.1 presents risks and hazards that are summed for exposure route, exposure point, exposure medium, and medium total. Only for the first (exposure route) are the individual chemical-specific risks and hazards summed to derive the total. For the subsequent summations (exposure point, exposure medium, and medium total), each is the summation of the preceding sums. For this reason, there can be minor rounding-related differences between the same risk and hazard summed values presented in RAGS Table 7s verses RAGS Tables 9s and Table 10s. RAGS tables are provided in Appendix E.1.

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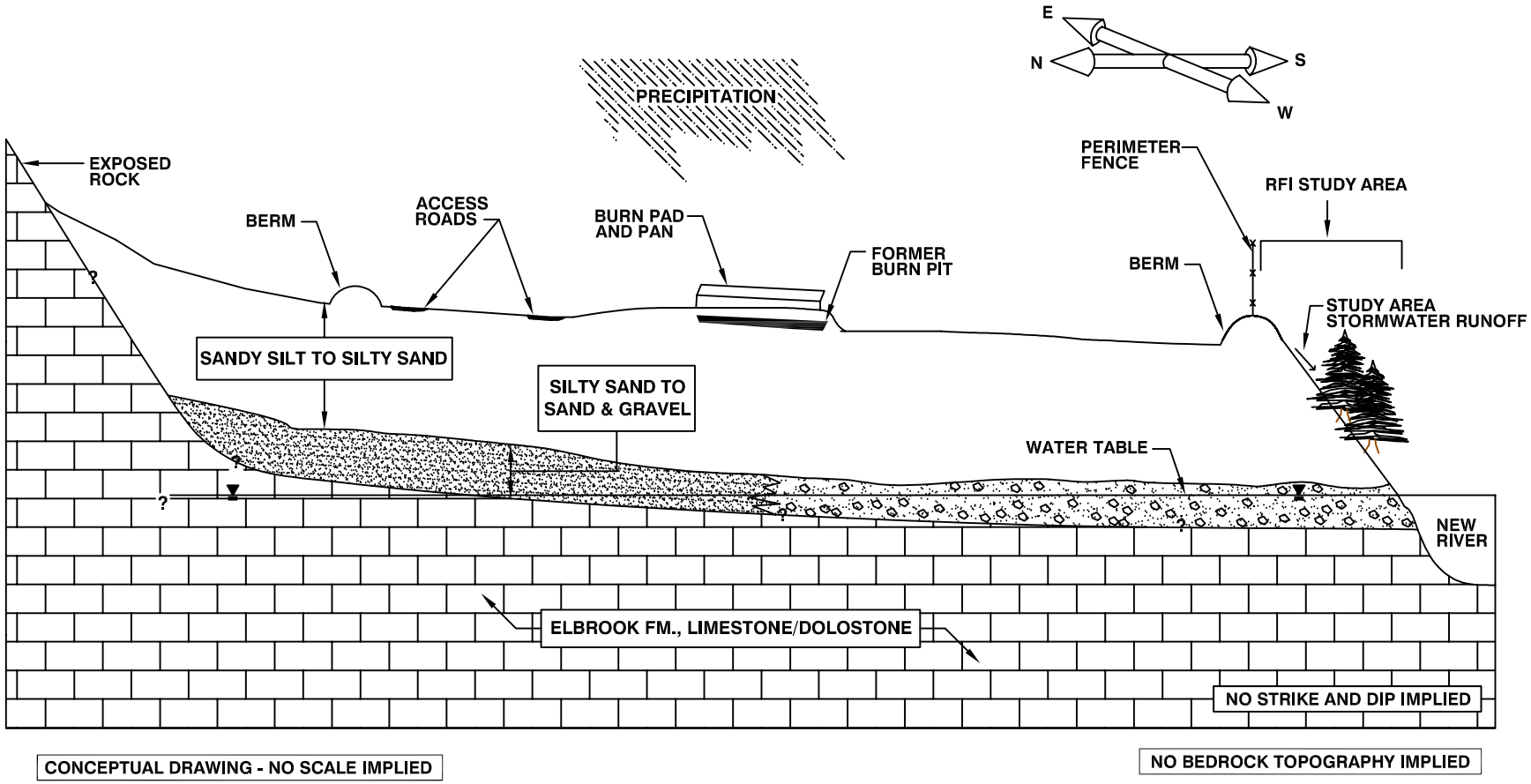


FIGURE 6-1

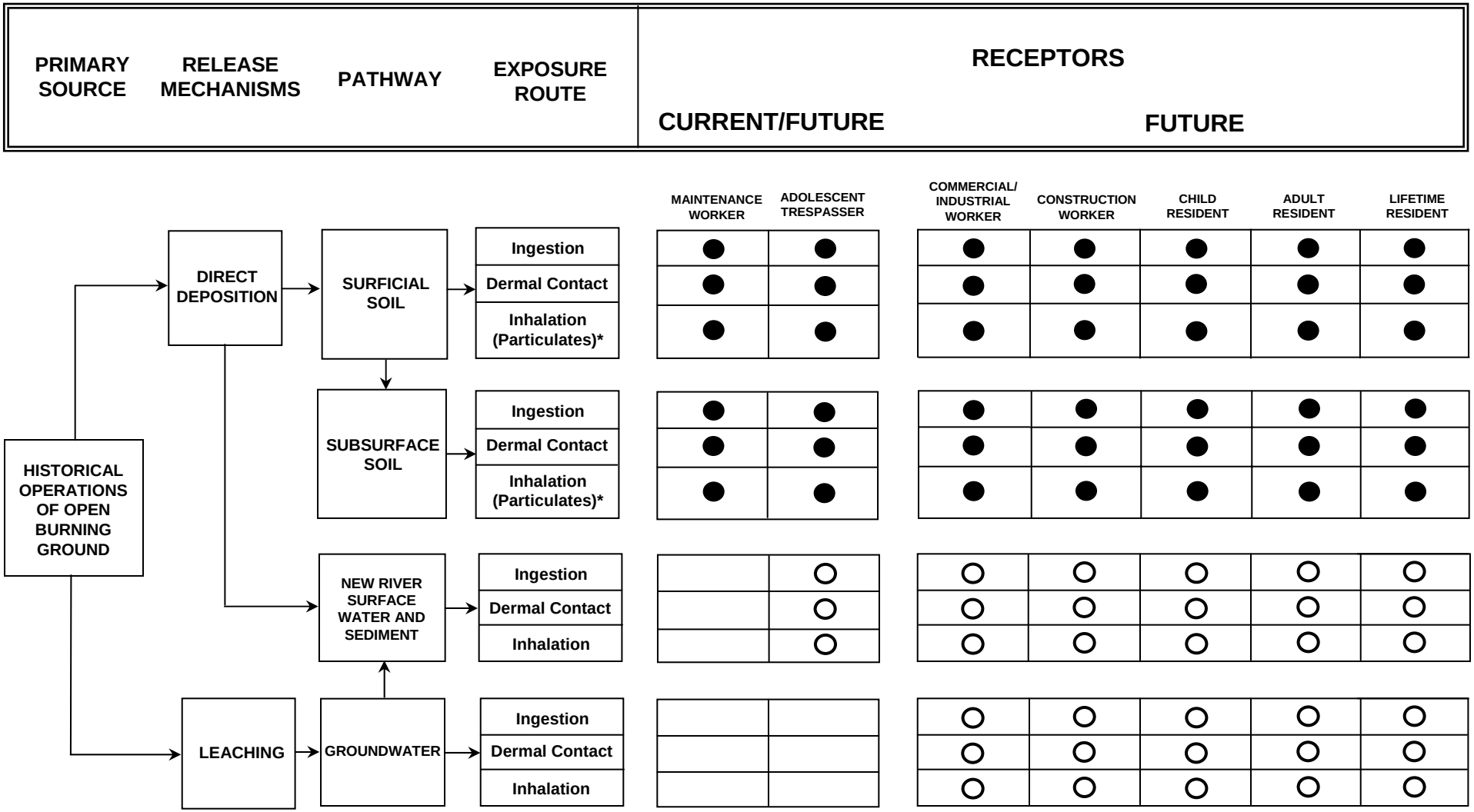
Conceptual Site Model

Date: March 2009	Job Number: 11656367
Prepared By: MRF	Reviewed By: JOS
Scale: Not to Scale	File Name: Fig. 6-1 CSM

Study Area at SWMU 13

RFI Report
Radford Army Ammunition Plant
Radford, Virginia

URS Group, Inc.
5540 Falmouth Street
Suite 201
Richmond, Virginia 23320



● POTENTIALLY COMPLETE PATHWAY EVALUATED QUANTITATIVELY

○ POTENTIALLY COMPLETE PATHWAY EVALUATED QUALITATIVELY

* VOCs were not analytes of interest for the site; therefore, the outdoor and indoor vapor inhalation pathways are not quantitatively assessed for the site

FIGURE 6-2
Conceptual Site Diagram

Date: *March 2009*	**URS Project #:** *11656367*
Prepared by: *MRF*	**Approved by:** *JOS*
Scale: *Not to Scale*	**File Name:** *Fig.6-2 CSD*

Study Area at SWMU 13
RFI Report
Radford Army Ammunition Plant
Radford, Virginia

URS
URS Group, Inc.
5540 Falmouth Street,
Suite 201
Richmond, VA 23230

Table 6-1
Sample Assemblages for Soil COPC Screening
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Surface Soil							
13SB7A	13SB21A	13SB34A	13SB47A	13SB58A	13SB67A	13SB79B	13SB92A
13SB8A	13SB22A	13SB35A	13SB48A	13SB59A	13SB68A	13SB80A	
13SB9A	13SB23A	13SB36A	13SB49A	13SB59B	13SB69A	13SB81A	
13SB10A	13SB24A	13SB37A	13SB50A	13SB60A	13SB70A	13SB82A	
13SB11A	13SB25A	13SB38A	13SB51A	13SB60B	13SB71A	13SB83A	
13SB13A	13SB26A	13SB39A	13SB51B	13SB61A	13SB72A	13SB84A	
13SB14A	13SB27A	13SB40A	13SB52A	13SB62A	13SB73A	13SB85A	
13SB15A	13SB28A	13SB41A	13SB53A	13SB63A	13SB74A	13SB86A	
13SB16A	13SB29A	13SB42A	13SB53B	13SB64A	13SB75A	13SB87A	
13SB17A	13SB30A	13SB43A	13SB54A	13SB64B	13SB76A	13SB88A	
13SB18A	13SB31A	13SB44A	13SB55A	13SB65A	13SB77A	13SB89A	
13SB19A	13SB32A	13SB45A	13SB56A	13SB65B	13SB78A	13SB90A	
13SB20A	13SB33A	13SB46A	13SB57A	13SB66A	13SB79A	13SB91A	
Subsurface Soil							
13SB7B	13SB21C	13SB38C	13SB48C	13SB71C	13SB82B	13SB92C	
13SB7C	13SB22C	13SB39B	13SB50B	13SB72B	13SB82C		
13SB8B	13SB23B	13SB39C	13SB50C	13SB72C	13SB83B		
13SB9B	13SB23C	13SB40B	13SB52B	13SB73B	13SB84B		
13SB9C	13SB24B	13SB41B	13SB54B	13SB73C	13SB85B		
13SB10B	13SB24C	13SB42B	13SB56B	13SB74B	13SB85C		
13SB10C	13SB25B	13SB43B	13SB57B	13SB74C	13SB86B		
13SB11B	13SB25C	13SB43C	13SB57C	13SB75B	13SB87B		
13SB11C	13SB26B	13SB44B	13SB58B	13SB75C	13SB87C		
13SB13C	13SB34B	13SB44C	13SB61B	13SB76B	13SB88B		
13SB16C	13SB35B	13SB45B	13SB66B	13SB76C	13SB89B		
13SB17C	13SB35C	13SB46B	13SB67B	13SB77B	13SB90B		
13SB18C	13SB36B	13SB46C	13SB68B	13SB78B	13SB91B		
13SB19C	13SB36C	13SB47B	13SB70B	13SB80B	13SB91C		
13SB20C	13SB38B	13SB48B	13SB71B	13SB81B	13SB92B		

Table 6-2
Dioxin/Furan 2,3,7,8-TCDD Equivalents Calculation - Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID Sample Date Sample Depth (ft bgs)	CAS #	Adjusted Soil RSL (Residential)	Key	Adjusted Soil RSL (Industrial)	Key	TEF	13SB9A DUP AVG 9/30/2003 0-1	
							Result	LQ, VQ, r
Dioxin/Furans (pg/g)								
1,2,3,4,6,7,8,9-OCDD (OCDD)	3268-87-9	15,000	c	61,000	c	0.0003	2,210	J
1,2,3,4,6,7,8,9-OCDF (OCDF)	39001-02-0	12,000	c	44,000	c	0.0003	7.775	J
1,2,3,4,6,7,8-HpCDD	35822-39-4	--	--	--	--	0.01	45.3	
1,2,3,4,6,7,8-HpCDF	67562-39-4	--	--	--	--	0.01	3.625	J
1,2,3,4,7,8,9-HpCDF	55673-89-7	--	--	--	--	0.01	0.3522	J
1,2,3,4,7,8-HxCDD	39227-28-6	--	--	--	--	0.1	0.606	J
1,2,3,4,7,8-HxCDF	70648-26-9	--	--	--	--	0.1	0.4785	J
1,2,3,6,7,8-HxCDD	57653-85-7	--	--	--	--	0.1	1.64	J
1,2,3,6,7,8-HxCDF	57117-44-9	--	--	--	--	0.1	0.3885	J
1,2,3,7,8,9-HxCDD	19408-74-3	--	--	--	--	0.1	1.85	
1,2,3,7,8,9-HxCDF	72918-21-9	--	--	--	--	0.1	<0.588	
1,2,3,7,8-PeCDD	40321-76-4	--	--	--	--	1	0.421	J
1,2,3,7,8-PeCDF	57117-41-6	120	c	440	c	0.03	0.279	J
2,3,4,6,7,8-HxCDF	60851-34-5	--	--	--	--	0.1	0.373	J
2,3,4,7,8-PeCDF	57117-31-4	12	c	44	c	0.3	0.37	J
2,3,7,8-TCDD	1746-01-6	4.5	c*	18	c*	1	<0.132	
2,3,7,8-TCDF	51207-31-9	37	c	130	c	0.1	0.489	A
Total 2,3,7,8-TCDD Equivalents	--	4.5E+00	c*	1.8E+01	c*		2.281	

Notes:

CAS = Chemical Abstracts Service
pg/g = Picogram per gram
LQ = Laboratory Qualifier
VQ = Validation Qualifier
r = Reason Code

Data Qualifiers:
A = Amount detected is less than the Lower Calibration Limit.
J = Analyte present. Reported value may not be accurate or precise.

RSL = Regional Screening Level (RSL) from October 2008 RSL Table
Adjusted RSLs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
-- = No Value Available

Key per October 2008 Regional RSL Table:
c = cancer
n = noncancer
c* = cancer where n SL < 100X c SL
c** = cancer where n SL <10X c SL
m = concentration may exceed ceiling
s = concentration may exceed Csat

TEF = Toxicity Equivalency Factor (WHO 2005)

Total 2,3,7,8-TCDD Equivalents are calculated by summing the detected concentration times the TEF for each chemical. Non-detects, R-flagged data, and B-flagged data are excluded from summed total.

= Concentration Exceeds Adjusted Soil Residential RSL

= Concentration Exceeds Adjusted Soil Industrial RSL

Table 6-3
RDA-based Screening Criteria Calculations
SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

SOIL AND GROUNDWATER CRITERIA		Parameter Definition		Value	Units
Soil Screening = Criteria (mg/kg)	$\frac{\text{RDA/AI}}{(IR_S \times EF \times ED \times 10^{-6}\ \text{kg/mg} \times \text{year}/365\ \text{days}) / AT}$	RDA/AI	= Recommended Daily Allowance/Adequate Intake	nutrient-specific	mg/day
		IR_S	= Soil Ingestion Rate		
			- adult resident	100	mg soil/day
			- child resident	200	mg soil/day
		IR_W	= Tap water ingestion rate		
			- adult resident	2	L water/day
			- child resident	1	L water/day
		EF	= Exposure frequency		
			- residential	350	days/year
Groundwater Screening = Criteria (µg/L)	$\frac{\text{RDA/AI} \times 1000\ \mu\text{g/mg}}{(IR_W \times EF \times ED \times \text{year}/365\ \text{days}) / AT}$	ED	= Exposure duration		
			- adult resident	24	years
			- child resident	6	years
		AT	= Averaging time		
			- adult resident	24	years
			- child resident	6	years

			RDA/AI[c,d] (mg/day)		Soil Screening Criteria (mg/kg)			Groundwater Screening Criteria (µg/L)		
	Reference	CAS	Adult	Child	Adult Resident	Child Resident	Selected Criteria (Minimum)	Adult Resident	Child Resident	Selected Criteria (Minimum)
Calcium	(a)	7440-70-2	800	210	8.3E+06	1.1E+06	1.1E+06	4.2E+05	2.2E+05	2.2E+05
Magnesium	(a)	7439-95-4	130	30	1.4E+06	1.6E+05	1.6E+05	6.8E+04	3.1E+04	3.1E+04
Potassium	(b)	2023-69-5	1600	500	1.7E+07	2.6E+06	2.6E+06	8.3E+05	5.2E+05	5.2E+05
Sodium	(b)	7440-23-5	400	120	4.2E+06	6.3E+05	6.3E+05	2.1E+05	1.3E+05	1.3E+05

(a) Recommended Dietary Allowances, 10th edition ©1989 by the National Academy of Sciences (National Academy Press, Washington, D.C.)
(b) Dietary Reference Intakes for Calcium, Phosphorus, Magnesium, Vitamin D, and Fluoride, ©1997 by the Standing Committee on the Scientific Evaluation of Dietary Reference Intakes, Food and Nutrition Board, Institute of Medicine (National Academy Press, Washington, D.C.)
(c) RDA/AIs for calcium and magnesium represent the lower end of the RDA/AI for persons 7 years old and over (adults) and 6 years old and under (children).
(d) RDA/AIs for potassium and sodium represent the lower end of the minimum requirement for healthy persons 7 years old and over (adults) and 6 years old and under (children).

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7.0 ECOLOGICAL RISK SCREENING PROCESS

The purpose of the ecological risk screening is to provide conclusions and recommendations regarding potential ecological risk associated with the RFI study area. The Screening Level Ecological Risk Assessment (SLERA) was performed in accordance with the Final Process for Ecological Risk Assessment – Radford AAP (URS 2007b). The SLERA process is summarized below in Sections 7.1 through 7.8. Refer to Appendix F.1 for a detailed description of the SLERA process utilized for the site evaluations and an example calculation. A summary of the SLERA results are provided below and the complete tables for the SLERA are provided in Appendix F.2.

7.1 SCOPE OF WORK

The SLERA includes Steps 1, 2, and 3a of Ecological Risk Assessment Guidance for Superfund [ERAGS] (USEPA 1997b). Step 1 includes a screening-level problem formulation and ecological effects evaluation. Step 2 includes a preliminary exposure estimate and risk calculation. Step 3a reviews and refines the conservative assumptions used in the risk calculation (Step 2). The addition of Step 3a focuses the outcome of the SLERA, streamlines the review process, and functions as the initial basis for ecological risk management decision making.

The objectives of the ecological risk screening are to:

- Identify potentially complete exposure pathways between COPECs and receptors;
- Assess whether the COPECs are above toxicological screening values that are considered to be protective of ecological receptors;
- Identify uncertainty and/or data gaps in the ecological risk screening; and
- Identify an appropriate SMDP for the site area based on the ecological risk screening results.

7.1.1 Ecological Site Characterization

An overview of the site physiography, water resources, geology, and soil is presented in Section 2.0. The RFI study area is located in the western section of the HSA between the perimeter berm of the OBG and the north bank of the New River. This area is approximately 1,700 feet (ft) long and 40 to 60 ft wide or approximately 1.6 acres. The RFI study area is vegetated with tall grass and stands of trees, and it is located in the 100-year flood plain of the New River (see photographic log, Appendix A). Indications of chemical vegetative stress were not observed.

In addition to the information contained in Section 2.0, additional site characterization is required for the ecological risk screening, which includes local ecological receptors (threatened and endangered species) and ecological resources. A discussion of potential biota likely to use the site area is included in this section. During site visits, wildlife species were observed at the site such as squirrels. Deer tracks were also observed in the area.

The Virginia Department of Game and Inland Fisheries Installation-Wide Biological Survey (VDGIF 1999) recorded various species associated with the grassland communities at RFAAP. Based on their survey of the grassland habitats, the invertebrates (approximately 250 species) and birds (83 species) accounted for the majority of species observations at RFAAP. Potential species utilizing the grassland areas of the site include common passerine birds (e.g., American robin) and small mammals (e.g., short-tailed shrew). Larger mammals (e.g., white-tailed deer and red fox) and raptors (e.g., red-tailed hawk) may potentially utilize the grassland habitat for foraging. Animals such as the mallard duck, belted kingfisher, and raccoon could be expected to forage in the New River.

The Virginia Department of Game and Inland Fisheries survey identified three threatened wildlife species and two rare plant species associated with RFAAP grassland communities (currently not on the 2002 Plant Watch List; http://www.dcr.state.va.us/dnh/plantlist02.pdf). They include:

- Regal Fritillary Butterfly (*Speyeria idalia*);
- Henslow's Sparrow (*Ammodramus henslowii*);
- Loggerhead Shrike (*Lanius ludovicianus*);
- Midland Sedge (*Carex mescochorea*); and
- Shaggy False Gromwell (*Onosmodium hispidissimum*).

Threatened wildlife observations in 1999 at RFAAP included the Regal Fritillary Butterfly (VDGIF 1999). The Regal Fritillary Butterfly was documented in the east-central and eastern edges of the MMA. No threatened wildlife species or rare plant species were identified at the site.

7.2 IDENTIFICATION OF CHEMICALS OF POTENTIAL ECOLOGICAL CONCERN

7.2.1 Approach

Soil samples were collected from 0 to 1 ft bgs below organic layers at the surface. This layer contains the zone of highest biological activity of soil organisms and the soil that is most frequently contacted by terrestrial biota. Although fossorial wildlife may be in contact with soil below 1 ft bgs, the preys of these animals are primarily associated with surficial soil. Furthermore, incidental exposure to the soil below 1 ft bgs is likely to be insignificant relative to surface soil exposure.

Surficial soil (0 to 1 ft bgs) represents the potential exposure media to ecological receptors. The following sections describe the process used to evaluate soil, the selection of COPECs evaluated in the SLERA, and the uncertainties associated with COPEC selection.

7.2.2 Terrestrial

Potential ecological receptors at the RFI study area may be exposed to COPECs in soil through the following exposure routes:

- Direct contact/absorption from soil;
- Direct ingestion of soil;
- Incidental ingestion of soil; and
- Direct ingestion of biota with accumulated COPECs.

Although receptors may be exposed to COPECs through inhalation or drinking surface water, sufficient literature regarding toxicity due to these pathways is lacking to quantitatively evaluate such exposure routes. Given the potential mobility of COPECs between food web trophic levels, a number of terrestrial categories were selected. Individual receptor species were selected to represent five wildlife receptor categories and these species possess the following characteristics that are essential for assessing COPEC mobility within the food web:

- Highly likely to occur at the site;
- Limited home range;
- Important role in the local food web; and

- Sufficient toxicological information is available in the literature.

Receptor categories and the species selected to represent the wildlife categories include:

- Plant communities;
- Soil invertebrate/microbial communities;
- Omnivorous birds: American Robin (*Turdus migratorius*);
- Carnivorous birds: Red-tailed Hawk (*Buteo jamaicensis*);
- Herbivorous animals: Meadow Vole (*Microtus pennsylvanicus*);
- Omnivorous mammals: Red Fox (*Vulpes vulpes*); and
- Carnivorous mammals: Short-tailed Shrew (*Blarina brevicauda*).

Potential wildlife utilizing the site includes passerine bird and small mammalian species common to RFAAP grasslands (VDGIF 1999).

7.3 IDENTIFICATION OF EXPOSURE PATHWAYS AND POTENTIAL RECEPTORS ANALYSIS

7.3.1 Data Organization

The following table identifies the soil samples used for the SLERA. Each of these samples was analyzed for lead. Samples 13SB7A through 13SB11A were analyzed for TAL metals, TCL pesticides, TCL PCBs (selected samples), TCL herbicides (selected samples), TCL VOCs, TCL SVOCs, explosives (including nitroglycerin and PETN), PAHs, and dioxin/furans (selected samples). Samples 13SB13A through 13SB22A were analyzed for TAL metals, TCL SVOCs, explosives, and nitroglycerin/PETN. Refer to Table 3-1 for a detailed list of samples and analytes.

Soil Samples Evaluated for SLERA

RFI Study Area at SWMU 13							
13SB7A	13SB20A	13SB32A	13SB44A	13SB54A	13SB64A	13SB74A	13SB85A
13SB8A	13SB21A	13SB33A	13SB45A	13SB55A	13SB64B	13SB75A	13SB86A
13SB9A	13SB22A	13SB34A	13SB46A	13SB56A	13SB65A	13SB76A	13SB87A
13SB10A	13SB23A	13SB35A	13SB47A	13SB57A	13SB65B	13SB77A	13SB88A
13SB11A	13SB24A	13SB36A	13SB48A	13SB58A	13SB66A	13SB78A	13SB89A
13SB13A	13SB25A	13SB37A	13SB49A	13SB59A	13SB67A	13SB79A	13SB90A
13SB14A	13SB26A	13SB38A	13SB50A	13SB59B	13SB68A	13SB79B	13SB91A
13SB15A	13SB27A	13SB39A	13SB51A	13SB60A	13SB69A	13SB80A	13SB92A
13SB16A	13SB28A	13SB40A	13SB51B	13SB60B	13SB70A	13SB81A	
13SB17A	13SB29A	13SB41A	13SB52A	13SB61A	13SB71A	13SB82A	
13SB18A	13SB30A	13SB42A	13SB53A	13SB62A	13SB72A	13SB83A	
13SB19A	13SB31A	13SB43A	13SB53B	13SB63A	13SB73A	13SB84A	

Detected chemical occurrence and distribution tables for surface soil are presented in Table F.2-1. Refer to Table 4-1 for a complete list of results for detected analytes. In addition, to evaluate the adequate sensitivity of the MDL for the necessary screening levels, Table F.2-2 provides a screening of the maximum MDL versus available ecological screening values for non-detected chemicals in surface soil.

Chemicals that were not detected in at least one sample were considered as uncertain analytes in the evaluation of risk. Other qualified analytical data were retained in the assessment. Data from duplicate sample pairs are averaged and treated as one result. If an analyte is detected in one of the sample pair,

one half the detection limit of the non-detect is averaged with the detected result and the result is considered detected.

In cases where chemicals were analyzed using multiple laboratory methods, the analytical results for the method with the lowest MDL were retained for the risk assessment. For example, concentrations of explosives were assessed using Method 8330 rather than the SVOC Method 8270. Eliminating the method having the higher detection limit did not result in exclusion of samples with higher detected concentrations.

7.3.2 Ecological Conceptual Site Model (ECSM)

The terrestrial ECSM is presented on Figure 7-1. Surface soil is a potential exposure medium of concern based on historical activities at the site. Based on the site characterization and data, the terrestrial receptor exposure to surface soil pathway exists.

7.4 IDENTIFICATION OF ASSESSMENT AND MEASUREMENT ENDPOINTS

Assessment endpoints are explicit statements of ecological resources (entities) and attributes of those entities that are important to protect (USEPA 1998). Measurement endpoints represent quantifiable ecological characteristics that can be measured, interpreted, and related to ecological resources chosen as assessment endpoints. Assessment and measurement endpoints for the resources in the terrestrial site are outlined below.

7.4.1 Terrestrial

Assessment and measurement endpoints for terrestrial receptors are as follows:

Assessment Endpoints	Measurement Endpoints
• Survival, growth, and reproduction of terrestrial plants	• MDCs for chemicals detected in surface soil will be compared to concentrations representing no adverse effects thresholds to the survival of plants communities reported in the scientific literature
• Survival, growth, and reproduction of soil invertebrates and microbial communities	• MDCs for chemicals detected in surface soil will be compared to concentrations representing no adverse effects thresholds to the survival of soil invertebrates or microbial communities reported in the scientific literature
• Survival, growth, and reproduction of terrestrial wildlife (birds and mammals) populations and communities	• MDCs for detected bioaccumulative chemicals in soil will be compared to NOAELs and LOAELs associated with effects on growth, reproduction, or survival of terrestrial wildlife

7.5 PRELIMINARY EXPOSURE ESTIMATE AND ECOLOGICAL EFFECTS EVALUATION

The preliminary exposure estimate and ecological effects evaluation considers the most conservative risk scenario. Highly conservative assumptions are used to estimate COPEC exposure to terrestrial receptors for pathways to be quantitatively evaluated. Conservative toxicity reference values (TRVs) are used to evaluate the ecological effects of exposure using the two approaches discussed below.

Risk is assessed by comparing the preliminary exposure estimate (MDC) of each detected chemical to the established TRV (detailed in Appendix F.1, Section 2.1). The preliminary risk is characterized in terms of a HQ, which is expressed as:

HQ = MDC/TRV

where:

HQ = Hazard Quotient for the chemical (unitless)

MDC = Maximum Detected Concentration for chemical (mg/kg)

TRV = Screening Level for chemical (mg/kg)

An HQ of less than one indicates that the chemical alone is unlikely to cause adverse ecological effects. The potential for risk increases as the HQ increases above one. However, this result should be considered in the context of other characteristic of the exposure area. In addition, it should be noted that the calculation of chemical specific HQs does not account for multiple chemicals acting through the same exposure mechanism. The results of the preliminary exposure assessment are presented in Appendix F.2.

7.5.1 Direct Contact Approach

The maximum soil concentrations for detected chemicals are used as the preliminary exposure estimate concentrations to develop a conservative risk scenario for the direct contact pathway to soil invertebrates and terrestrial plants. The results of the preliminary exposure assessments for plants and invertebrates are provided below.

Terrestrial Plants

Preliminary direct contact HQs calculated for plants are presented in Table F.2-6 for detected chemicals. Of the detected chemicals for which screening values were available, the concentrations of aluminum, chromium, cobalt, copper, lead, manganese, selenium, thallium, vanadium, zinc, and 2,4,6-TNT resulted in HQ values that were greater than 1.

Soil Invertebrates and Microbial Communities

Preliminary direct contact HQs calculated for invertebrates are presented in Table F.2-8 for detected chemicals. Of the detected chemicals for which screening values were available, the concentrations of chromium, copper, iron, lead, manganese, mercury, vanadium, zinc, and 2,4,6-TNT resulted in HQ values that were greater than 1.

7.5.2 Dose Rate Modeling Approach

Preliminary risk characterization for wildlife receptors uses the conservative preliminary exposure estimate and ecological effects evaluation to characterize risk to potential terrestrial receptors. Risk is assessed by comparing the preliminary exposure estimate of each detected bioaccumulative chemical, as defined in Table 4-2 in *Bioaccumulative Testing and Interpretation for the Purpose of Sediment Quality Assessment, Status, and Needs*, EPA-823-R-00-001, to the TRV developed in the ecological effects evaluation. An example calculation for dose rate modeling is provided in Appendix F.1, Section 4.1, utilizing the equation below.

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \ (BAF_{food} \cdot DF) + IR_s)AF}$$

where:

C_{TRV} = NOAEL or LOAEL-based screening level (mg chemical/kg soil)
ADD = NOAEL or LOAEL (mg COPEC/kg body weight-day)
BW = Minimum Body Weight of the receptor (kg)
IR_{food} = Maximum Ingestion Rate of food (kg food ingested per day, dry weight)

BAF_{food} = Bioaccumulation Factor (BAF) of most contaminated dietary component used, specific to prey type and COPEC (ratio of mg of COPEC/kg fauna, wet weight to mg COPEC/ kg substrate, dry weight)
DF = Dietary Fraction (most contaminated dietary component assumed to be 100% of diet)
IR_s = Maximum Incidental Ingestion Rate of soil (kg substrate ingested per day, dry weight)
AF = 100% Area Use Factor

In the preliminary dose rate modeling approach, the maximum COPEC concentrations for detected bioaccumulative chemicals, along with assumptions of maximum ingestion rate, minimum body weight, 100% area use, and 100% bioavailability are used in the conservative risk scenario as the preliminary exposure estimate for soil and compared to the calculated TRVs. Preliminary receptor-specific exposure parameters are presented on Table F.2-9. A summary of the results of the preliminary exposure assessment for terrestrial wildlife is provided below.

Terrestrial Wildlife

Quantitative risk characterization for terrestrial wildlife is limited to direct ingestion of biota and incidental ingestion of soil. The preliminary risks for detected bioaccumulative chemicals are summarized in Table F.2-24 for each terrestrial wildlife receptor and the chemicals with HQs greater than 1 are characterized as follows:

Receptor	NOAEL Only HQ>1	NOAEL and LOAEL HQ>1
Meadow Vole	cadmium, 2,4,6-TNT	arsenic, copper, lead, selenium, zinc
Short-tailed Shrew	chromium, selenium, 2,3,7,8-TCDD TEQ	arsenic, cadmium, copper, lead, zinc
Red Fox	chromium, 2,4,6-trinitrotoluene	arsenic, cadmium, copper, lead, selenium, zinc, 2,3,7,8-TCDD TEQ
American Robin	2,4-DNT, 2,6-DNT	cadmium, chromium, copper, lead, mercury, selenium, zinc, 2,4,6-TNT
Red-tailed Hawk	2,4,6-TNT	lead, zinc

7.6 REFINED EXPOSURE ESTIMATE AND RISK CHARACTERIZATION

Refined exposure estimates and ecological effects are developed for two major receptor categories having complete exposure pathways to be quantitatively evaluated: 1) direct contact to plants and invertebrates, and 2) wildlife ingestion (i.e., omnivorous birds and mammals, carnivorous birds and mammals, and herbivorous mammals). The refined exposure and risk characterization, Step 3a of ERAGS, reviews and refines the conservative assumptions used in the risk calculation (USEPA 1997b). In Step 3a, conservative assumptions used in the preliminary exposure and risk characterization are replaced with more environmentally realistic assumptions to evaluate risk posed by constituents identified in the preliminary risk characterization. The addition of Step 3a focuses the outcome of the SLERA, streamlines the review process, and functions as the initial basis for ecological risk management decision-making.

As noted below for the refined exposure estimate and risk characterization, the 95% UCL is used as the exposure concentration rather than the MDC. Methods used to calculate 95% UCLs are based on guidance provided in the following documents *Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites* (USEPA 2002b) and *On the Computation of a 95% Upper*

Confidence Limit of the Unknown Population Mean Based Upon Data Sets with Below Detection Limit Observations (USEPA 2006a).

In general, the method used to calculate a 95% UCL depends on: 1) the prevalence of non-detects, and 2) the data distribution (e.g., normal or lognormal). Non-detects introduce uncertainty in the data set because the true concentration may be between zero to just below the detection limit. Therefore, distributional assumptions are difficult to make for COPCs with a high rate of non-detects. ProUCL 4.0 (USEPA 2007c) is used to calculate EPCs for the site. EPCs for soil COPECs are presented in Table F.2-4 for the RFI study area (Appendix F.2)

For the refined evaluation, risk is assessed by comparing the EPC (95% UCL) of each detected chemical to the TRV. The refined risk HQ is expressed as:

$$\mathbf{HQ = EPC/TRV}$$

where:

HQ = Hazard Quotient for the chemical (unitless)

EPC = Calculated Exposure Point Concentration for chemical (mg/kg)

TRV = Screening Level for chemical (mg/kg)

An HQ of less than one indicates that the chemical alone is unlikely to cause adverse ecological effects. The potential for risk increases as the HQ increases above one. However, this result should be considered in the context of other characteristic of the exposure area. In addition, it should be noted that the calculation of chemical specific HQs does not account for multiple chemicals acting through the same exposure mechanism. The results of the preliminary exposure assessment are presented in Appendix F.2.

7.6.1 Direct Contact Approach

The refined exposure estimate for the direct contact pathway to soil invertebrate and microbial communities incorporates the 95% UCL as the exposure concentration for evaluating the COPECs using a conservative yet more realistic exposure assumption than MDCs. A summary of the results of the refined exposure assessment for plants and invertebrates is provided below.

Terrestrial Plants

Refined direct contact HQs calculated for plants are presented in Table F.2-6 for detected chemicals. Of the detected chemicals for which screening values were available, the concentrations of aluminum, chromium, cobalt, copper, lead, manganese, selenium, thallium, vanadium, and zinc resulted in refined HQ values that were greater than 1.

Soil Invertebrates and Microbial Communities

Refined direct contact HQs calculated for invertebrates are presented in Table F.2-8 for detected chemicals. Of the detected chemicals for which screening values were available, the concentrations of chromium, copper, iron, manganese, vanadium, and zinc resulted in refined HQ values that were greater than 1.

7.6.2 Dose Rate Modeling Approach

The conservative assumptions used in the preliminary exposure estimate and ecological effects evaluation were replaced with more environmentally realistic assumptions resulting in a more realistic estimate of potential risk. An example calculation for dose rate modeling is provided in Appendix F.1, Section 4.4, utilizing the equation below.

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + IR_s) AF_{refined}}$$

where:

C_{TRV} = NOAEL or LOAEL-based screening level (mg chemical/kg soil)
ADD = NOAEL or LOAEL (mg COPC/kg body weight-day)
BW = Average Body Weight of the receptor (kg)
IR_{food} = Average Ingestion Rate of food (kg food ingested per day, dry weight)
BAF_{food} = BAF of dietary component used, specific to prey type and COPC (ratio of mg of COPEC/kg fauna, wet weight to mg COPEC/ kg substrate, dry weight)
DF = Dietary Fraction
IR_s = Average Incidental Ingestion Rate of soil (kg substrate ingested per day, dry weight)
$AF_{refined}$ = Refined Area Use Factor (detailed below)

The refined exposure estimates and ecological effects are developed for wildlife receptors having complete exposure pathways to be quantitatively evaluated (i.e., omnivorous birds, and carnivorous and herbivorous mammals). In the refined model, an average body weight, average ingestion rate, and a 95% UCL as the EPC are used. Refined receptor-specific exposure parameters are presented on Table F.2-9 (Appendix F.2). In addition, a realistic area use factor ($AF_{refined}$) was calculated as the ratio of the site area to the average home range of the receptor which is also presented in Table F.2-9 (Appendix F.2). A summary of the results of the refined exposure assessment for terrestrial wildlife is provided below.

Terrestrial Wildlife

The refined risk characterization results are presented in Table F.2-24 and summarized below for each of the receptors with chemical HQs greater than 1:

Receptor	NOAEL Only HQ>1	NOAEL and LOAEL HQ>1
Meadow Vole	none	none
Short-tailed Shrew	lead (1.8), 2,3,7,8-TCDD TEQ (2.5)	none
Red Fox	none	none
American Robin	chromium (1.2), zinc (6.0), 2,4-DNT (1.1), 2,6-DNT (2.5), 2,4,6-TNT (7.1)	lead (19/1.9)
Red-tailed Hawk	none	none

*Note: (1.8) = NOAEL-based HQ
(19/1.9) = NOAEL-based HQ/LOAEL-based HQ

7.7 RISK MANAGEMENT – SCIENTIFIC MANAGEMENT DECISION POINT

The findings of the ecological risk screen including site characterization and risk calculations are used as input to risk management decision-making for the site. The SMDP reached from the ecological risk screening concludes that one of the following statements is true:

- There is adequate information to conclude that ecological risks are not significant and therefore there is no need for further action at the site on the basis of ecological risk;
- The information is not adequate to make a decision at this point and further refinement of data is needed to augment the ecological risk screening; or
- The information collected and presented indicates that a more thorough assessment is warranted.

Terrestrial plant COPECs with refined HQs greater than 1 included: aluminum (HQ=370), chromium (HQ=29), copper (HQ=1.5), lead (HQ=6), manganese (HQ=5.6), selenium (HQ=1.1), thallium (HQ=1.5), vanadium (HQ=17), and zinc (HQ=4.2). Although the refined aluminum HQ is greater than 1, the average pH in the surface soil is greater than 5.5 (see Appendix C.1). Therefore, since aluminum is biologically inactive in circumneutral to alkaline conditions (pH 5.5-8.0) such as those present at the site, aluminum is not considered a COPEC (USEPA 2003). Chromium, manganese, thallium, and vanadium are below background; therefore, these chemicals are not considered site-related. A discussion of the methodology of site versus background comparison is provided in Section 6.4.2. Even though the refined HQs for copper (1.5), lead (6.0), selenium (1.1), and zinc (4.2) are greater than 1, these HQs present low risk to terrestrial plants at the site. In addition although metals concentrations in plants were above the screening levels, indications of chemical vegetative stress were not observed at the site.

Soil invertebrates and microbial processes COPECs with refined HQs greater than 1 included chromium (HQ=73), copper (HQ=1.3), iron (HQ=190), manganese (HQ=2.8), vanadium (HQ=1.7), and zinc (HQ=5.6). Chromium, manganese and vanadium are below background; therefore, these chemicals are not considered site-related. A discussion of the methodology of site versus background comparison is provided in Section 6.4.2. Even though the refined HQs for copper (1.3) and zinc (5.6) are greater than 1, these presents low risk to invertebrates and microbial processes at the site. In addition although the iron HQ is greater than 1, since only one surface soil sample exceeded iron's background point estimate for the site indicating iron concentrations at the site are not considered significantly above background, iron is not considered a COPEC at the site.

The refined risk characterization for wildlife resulted in the identification of lead (HQ=1.9) with a LOAEL-based HQ greater than 1 for the American robin. Even though the refined HQ for lead (1.9) is greater than 1, this presents low risk to the American robin.

After consideration of the limited metals concentrations above ecological screening levels, the spatial distribution of data at the site (see Section 4.0), and background, the SMDP is the following:

There is adequate information to conclude that ecological risks are not significant and therefore there is no need for further action at the site on the basis of ecological risk.

7.8 EXPOSURE AND RISK UNCERTAINTY ANALYSIS

Based on this assessment, while factors such as lack of TSV and wildlife profile assumptions may create limited uncertainty, the overall result of the conservative nature of the process has produced a conservative assessment of potential ecological risks associated with the site.

Assumptions and other factors that tend to overestimate, underestimate, or have an unknown effect on the findings of the ecological risk screening are presented below with a discussion of their uncertainty.

7.8.1 Data Quality

Insufficient sampling density or the analyte list may not provide a representative estimate of exposure to COPECs. Misrepresentation of exposure results in uncertainty and may lead to an overestimation or underestimation of risk. Ten or more sampling locations at the site under consideration reduce this uncertainty. Moreover, the extensive list of constituents analyzed reduces the likelihood of failing to identify a COPEC. Therefore, the uncertainty in the ecological risk screening results associated with data quality is likely minimal.

7.8.2 COPEC Bioavailability

Chemical analyses of exposure media measured the total levels of the COPECs rather than the more bioavailable toxic forms. The availability of the total concentrations alone assumes that the entire fraction is bioavailable and toxic. This is likely to be a very conservative assumption that varies from constituent to constituent. It was also assumed that no geochemical factors limited receptor exposure to, or the

potential for toxic expression of COPECs. It is likely that COPECs may, to some degree, adsorb to fine-grained particles and/or complex with chemical complexing agents and organic ligands in the exposure media. Such actions may change the chemical speciation of the COPECs to a less toxic form, or reduce the concentrations of bioavailable chemicals and subsequent uptake by receptors. Therefore, risk is likely to be overestimated.

7.8.3 Wildlife Profile Assumptions

Dose rate models require a number of assumptions, which could result in either an overestimation or underestimation of risk to receptors. For example, body weights and ingestion rates are estimated from limited information. In addition, receptors are assumed to feed on specified food sources, although some such as the Red Fox may feed opportunistically on a greater variety of food types.

AFs were estimated based on the size of the site relative to the home ranges of the receptors. However, the foraging of birds and mammals is not assessed simply by size, but rather a function of habitat suitability, habitat productivity, and species-specific foraging behaviors. Therefore, because habitat quality is not accounted for in estimating AF, the risk to terrestrial receptors in this assessment is likely to be overestimated.

The qualitative nature of the conclusion of lack of risk to the plant community based on the lack of indicator of chemical vegetative stress and lush vegetation present at the site creates uncertainty since it is not known that if the local plant community shows a response in terms of lower species diversity, reduced growth, or other more subtle responses that might be observable when compared to an unimpacted reference location.

7.8.4 Lack of Toxicological Data

The evaluation of ecological effects was limited in the direct contact and wildlife ingestion pathways due to limited toxicological data of the COPECs. The effects of many COPECs evaluated for the direct contact pathway to invertebrates and microbial communities were not quantified due to the lack of invertebrate derived TRVs. In addition, NOAEL and LOAEL TRVs were not available for receptors exposed to multiple COPECs. Therefore, due to the lack of toxicological data, the risk to potential receptors may be underestimated or unknown.

7.8.5 TRVs

NOAEL and LOAEL TRVs identified for wildlife receptors represent the most conservative application of toxicity test results identified from the literature. High uncertainty factors were used to provide TRVs representative of chronic exposure and sub-lethal effects. This approach is likely to overestimate the sensitivity of many ecological receptors and likely overestimates risk to potential receptors.

7.8.6 Hazard Quotients

Uncertainties in characterizing risks are primarily associated with the assumption that an HQ greater than 1 is an adequate indicator of the potential for ecological risks of individual chemicals. Given the use of conservative and realistic exposure and effects assumptions previously discussed, there is minimal uncertainty that the potential for ecological risks of individual chemicals are not identified in the ecological risk screening of the site. Conversely, there is a strong possibility for false positive identification of ecological risks for some individual chemicals.

An HQ of less than one indicates that the contaminant alone is unlikely to cause adverse ecological effects. The potential for risk increases as the HQ increases above one. However, this result should be considered in the context of other characteristic of the exposure area. In addition, it should be noted that the calculation of chemical specific HQs does not account for multiple chemicals acting through the same exposure mechanism.

7.8.7 Exposure and Risk Uncertainty Conclusions

While factors such as lack of TRV and wildlife profile assumptions may create limited uncertainty, these limited uncertainties have produced a conservative assessment of potential ecological risks associated with the RFI study area.

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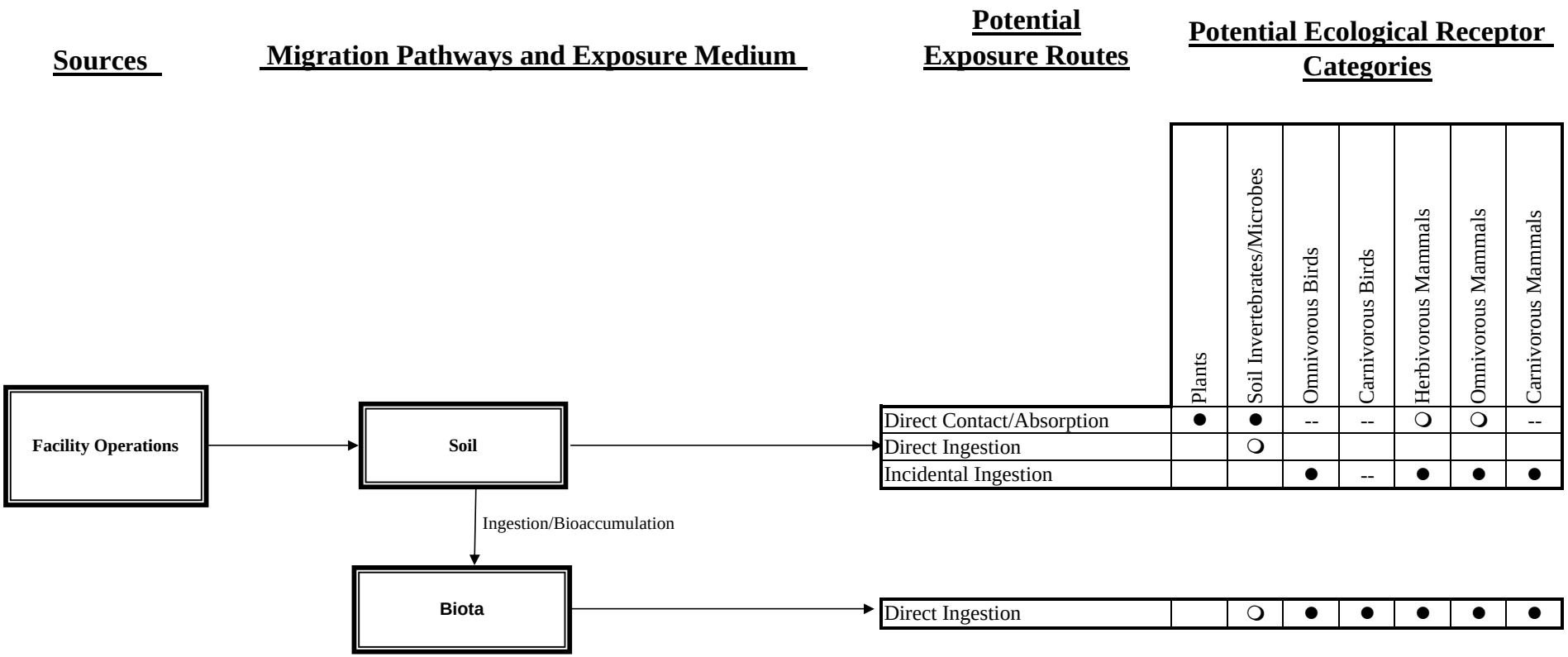
Figure 7-1
Terrestrial Ecological Conceptual Site Model
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia



Notes:
● = POTENTIALLY COMPLETE PATHWAY EVALUATED QUANTITATIVELY
❍ = COMPLETE PATHWAY EVALUATED QUALITATIVELY
-- = PATHWAY IS INSIGNIFICANT
BLANK = INCOMPLETE PATHWAY

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8.0 CONCLUSIONS AND RECOMMENDATION FOR FUTURE ACTION

An RFI has been completed for SWMU 13, which consists of an approximate 1.6 acre area located outside the current operational area of the OBG between the OBG perimeter berm and the New River. The purpose of the RFI was to evaluate potential releases to soil within the RFI study area from historical operations at the OBG. Groundwater at the OBG and below the RFI study area is being monitored and addressed separately from this RFI under the RCRA Subpart X Permit with the VDEQ.

Soil sampling with the RFI study area indicated that lead was the primary COPC based on limited detections of lead above R-RSL of 400 mg/kg (21 of 183 samples) and I-RSL of 800 mg/kg (6 of 183 samples). Most of the detections of lead above RSL were in samples collected adjacent or proximate to OBG perimeter berm at isolated locations. Approximately 40% of these detections were closest to OBG Burning Pad 6. Other COPCs that were identified in soil included antimony, iron, thallium, four high molecular weight PAHs, and nitroglycerin. Groundwater monitoring conducted within the OBG adjacent to the perimeter berm has not indicated leaching of lead or other site COPCs from soil to groundwater at detectable levels. As presented in Section 4.4, based on the limited extent of chemicals in soil within the study area above RSLs, the low lying, lush vegetation present at the site (see photo log in Appendix A), and the percentage of ground cover (90%), the potential for RFI study area related releases from soil to the New River via runoff at levels of concern is not considered significant.

A HHRA was performed to evaluate the potential human health effects associated with releases to soil in the RFI study area. Receptors evaluated included: current/future maintenance worker, current/future adolescent trespasser, hypothetical future construction worker, hypothetical future commercial worker, hypothetical future adult resident, hypothetical future child resident, and hypothetical future lifetime resident. Total carcinogenic risk calculated for each receptor was below or within USEPA's target risk range for Superfund sites (1E-06 to 1E-04, USEPA 1989). The results of the lead modeling predicted the probability of the receptors expected to have blood levels of 10 μg/dL or greater were below the established threshold of 5%. Total non carcinogenic hazards after target organ segregation and consideration of background for all receptors were equal to or below the USEPA reference HI of 1E+00. The results of the human health risk assessment did not indicate a requirement for further action for soil in the RFI study area.

A SLERA was performed to evaluate potential ecological risk associated with soil in the RFI study area. Receptors evaluated included soil invertebrates and microbes, plants, and terrestrial wildlife. The results of the screening level ecological risk assessment indicated there is adequate information to conclude that ecological risks were not significant at the RFI study area, and therefore, there was no need for further action for soil at the RFI study area on the basis of ecological risk.

Based on the results of the RFI, HHRA, and SLERA, no further action beyond the implementation of institutional controls to prevent future digging at the RFI study area is recommended. ICs are being implemented at the RFI study area at SWMU 13 within the boundaries depicted on Figure 1-2. The objective of the ICs is to prevent future digging at the site. Specifically this site has been incorporated into plant management manual to ensure long-term protection of human health and the environment. The management manual provides for advance notice, assessment and approval of intrusive work that may occur within the plant with a general digging prohibition at sites such as this. In the event the property is transferred or leased, equivalent ICs will be put into terms and conditions of the deed or lease, which are no less restrictive than the IC objectives described above. Furthermore, the transferee or lessee will be responsible for ensuring IC compliance by any future users. However, the Army acknowledges the responsibility for all original liability under CERCLA and its right and responsibility to enforce ICs.

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STUDY AREA AT SOLID WASTE MANAGEMENT UNIT 13 RCRA FACILITY INVESTIGATION REPORT

RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

FINAL
JULY 2010

URS

CONTRACT NO.
W9128F-04-D-0001
DELIVERY ORDER NO. DA02

STUDY AREA AT SOLID WASTE MANAGEMENT UNIT 13 RCRA FACILITY INVESTIGATION REPORT

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APPENDIX A

PHOTOGRAPHIC LOG

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PHOTO 1: Typical vegetation in RFI Study area.

PHOTO 2: Slope of RFI study area looking from fence adjacent to HWMU 13 towards the New River.

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APPENDIX B

STANDARD OPERATING PROCEDURES

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Standard Operating Procedures

SOP SERIES	TITLE
10.0	**DOCUMENTATION**
10.1	Field Logbook
10.2	Surface Water, Groundwater, and Soil/Sediment Field Logbooks
10.3	Boring Logs
10.4	Chain-of-Custody Forms
30.0	**SAMPLING**
30.1	Soil Sampling
30.7	Sampling Strategies
50.0	**SAMPLE MANAGEMENT**
50.1	Sample Labels
50.2	Sample Packaging
70.0	**INVESTIGATION-DERIVED MATERIAL**
70.1	Investigation-Derived Material
80.0	**DECONTAMINATION**
80.1	Decontamination
90.0	**AIR MONITORING EQUIPMENT**
90.1	Photoionization Detector (HNu Model PI-101 and HW-101)

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STANDARD OPERATING PROCEDURE 10.1
FIELD LOGBOOK

1.0 SCOPE AND APPLICATION

The purpose of this standard operating procedure (SOP) is to delineate protocols for recording daily site investigation activities.

Records should contain sufficient information so that anyone can reconstruct the sampling activity without relying on the collector's memory.

2.0 MATERIALS

- Field Logbook;
- Indelible ink pen; and
- Clear tape.

3.0 PROCEDURE

Information pertinent to site investigations will be recorded in a bound logbook. Each page/form will be consecutively numbered, dated, and signed. All entries will be made in indelible ink, and all corrections will consist of line out deletions that are initialed and dated. If only part of a page is used, the remainder of the page should have an "X" drawn across it. At a minimum, entries in the logbook will include but not be limited to the following:

- Project name (cover);
- Name and affiliation of personnel on site;
- Weather conditions;
- General description of the field activity;
- Sample location;
- Sample identification number;
- Time and date of sample collection;
- Specific sample attributes (e.g., sample collection depth flow conditions or matrix);
- Sampling methodology (grab or composite sample);
- Sample preservation, as applicable;
- Analytical request/methods;
- Associated quality assurance/quality control (QA/QC) samples;
- Field measurements/observations, as applicable; and
- Signature and date of personnel responsible for documentation.

4.0 MAINTENANCE

Not applicable.

5.0 PRECAUTIONS

None.

6.0 REFERENCES

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STANDARD OPERATING PROCEDURE 10.2
SURFACE WATER, GROUNDWATER, AND SOIL/SEDIMENT FIELD LOGBOOKS

1.0 SCOPE AND APPLICATION

The purpose of this standard operating procedure (SOP) is to delineate protocols for recording surface water, groundwater, and soil/sediment sampling information, as well as instrument calibration data in field logbooks.

2.0 MATERIAL

- Applicable field logbook (see attached forms); and
- Indelible ink pen.

3.0 PROCEDURE

All information pertinent to surface water, groundwater, or soil/sediment sampling will be recorded in the appropriate logbook. Each page/form of the logbook will be consecutively numbered. All entries will be made with an indelible ink pen. All corrections will consist of line out deletions that are initialed and dated.

3.1 SOIL/SEDIMENT

3.1.1 Field Parameters/Logbook (Form 10.2-a)

1. HIGH CONCENTRATION EXPECTED?: Answer "Yes" or "No.";
2. HIGH HAZARD?: Answer "Yes" or "No.";
3. INSTALLATION/SITE: Record the complete name of the installation or site;
4. AREA: Record the area designation of the sample site;
5. INST. NAME: Record the two-letter installation name for Radford Army Ammunition Plant – "RD";
6. SAMPLE MATRIX CODE: Record the appropriate sample matrix code. Common codes are "SD" for solid - sediment, "SI" for soil - gas, "SL for solid sludge, "SO" for surface other, "SS" for solid – soil, "SW" for surface wipe, "WD" for water – potable, "WG" for water – ground, "WS" water – surface, "WT" – water treated and "WW" water -waste;
7. SITE ID: Record a code up to 20 characters or numbers that is unique to the site;
8. ENV. FIELD SAMPLE IDENTIFIER: Record a code up to 20 characters specific for the sample;
9. DATE: Enter the date the sample was taken;
10. TIME: Enter the time (12-hour or 24-hour clock acceptable as long as internally consistent) the sample was taken;
11. AM PM: Circle "AM" or "PM" to designate morning or afternoon (12-hour clock);
12. SAMPLE PROG: Record "RFI" (RCRA Facility Investigation) or other appropriate sample program;
13. DEPTH (TOP): Record the total depth sampled;
14. DEPTH INTERVAL: Record the intervals at which the plug will be sampled;

15. UNITS: Record the units of depth (feet, meters);
16. SAMPLE MEASUREMENTS: Check the appropriate sampling method;
17. CHK: Check off each container released to a laboratory;
18. ANALYSIS: Record the type of analysis to be performed on each sample container;
19. SAMPLE CONTAINER: Record the sample container type and size;
20. NO.: Record the number of containers;
21. REMARKS: Record any remarks about the sample;
22. TOTAL NUMBER OF CONTAINERS FOR SAMPLE: Record the total number of containers;
23. SITE DESCRIPTION: Describe the location where the sample was collected;
24. SAMPLE FORM: Record the form of the sample (i.e., clay, loam, etc.) using The Unified Soil Classification System (USCS);
25. COLOR: Record the color of the sample as determined from standard Munsell Color Charts;
26. ODOR: Record the odor of the sample or "none";
27. PID: Record the measured PID values or other similar measurement instrument value;
28. UNUSUAL FEATURES: Record anything unusual about the site or sample;
29. WEATHER/TEMPERATURE: Record the weather and temperature; and
30. SAMPLER: Record your name.

3.1.2 Map File Form (refer to form 10.2-c)

1. SITE ID: Record the Site ID from the field parameter form;
2. POINTER: Record the field sample number for the sample being pointed to;
3. DESCRIPTION/MEASUREMENTS: Describe the location where the sample was taken, along with distances to landmarks;
4. SKETCH/DIMENSIONS: Diagram the surroundings and record the distances to landmarks;
5. MAP REFERENCE: Record which U.S.G.S. Quad Map references the site;
6. COORDINATE DEFINITION: Write the compass directions and the X- and Y-coordinates of the map run;
7. COORDINATE SYSTEM: Write "UTM" (Universal Transverse Mercator);
8. SOURCE: Record the 1-digit code representing the Map Reference;
9. ACCURACY: Give units (e.g., write "1-M" for 1 meter);
10. X-COORDINATE: Record the X-coordinate of the sample site location;
11. Y-COORDINATE: Record the Y-coordinate of the sample site location;
12. UNITS: Record the units used to measure the map sections;
13. ELEVATION REFERENCE: Record whether topography was determined from a map or a topographical survey;
14. ELEVATION SOURCE: Record the 1-digit code representing the elevation reference;

15. ACCURACY: Record the accuracy of the map or survey providing the topographical information;
16. ELEVATION: Record the elevation of the sampling site;
17. UNITS: Write the units in which the elevation is recorded; and
18. SAMPLER: Write your name.

3.2 SURFACE WATER

3.2.1 Field Parameter Logbook (Forms 10.2-b and 10.2-c)

1. CAL REF: Record the calibration reference for the pH meter;
2. pH: Record the pH of the sample;
3. TEMP: Record the temperature of the sample in degrees Celsius;
4. COND: Record the conductivity of the water;
5. Description of site and sample conditions (refer to 10.2-b);
6. Map File Form (refer to Section 3.1.2).

3.3 GROUNDWATER (FORMS 10.2- D)

3.3.1 Field Parameter Logbook (Form 10.2.b)

Refer to Section 3.2.1.

3.3.2 Map File and Purging Forms

1. WELL NO. OR ID: Record the abbreviation appropriate for where the sample was taken. Correct abbreviations can be found on pages 18-21 of the IRDMIS User's Guide for chemical data entry;
2. SAMPLE NO.: Record the reference number of the sample;
3. WELL/SITE DESCRIPTION: Describe the location where the sample was taken, along with distances to landmarks;
4. X-COORD AND Y-COORD: Record the survey coordinates for the sampling site;
5. ELEV: Record the elevation where the sample was taken;
6. UNITS: Record the units the elevation was recorded in;
7. DATE: Record the date in the form MM/DD/YY;
8. TIME: Record the time, including a designation of AM or PM;
9. AIR TEMP.: Record the air temperature, including a designation of C or F (Celsius or Fahrenheit);
10. WELL DEPTH: Record the depth of the well in feet and inches;
11. CASING HEIGHT: Record the height of the casing in feet and inches;
12. WATER DEPTH: Record the depth (underground) of the water in feet and inches;
13. WELL DIAMETER: Record the diameter of the well in inches;
14. WATER COLUMN HEIGHT: Record the height of the water column in feet and inches;
15. SANDPACK DIAM.: Record the diameter of the sandpack. Generally, this will be the same as the bore diameter;

16. EQUIVALENT VOLUME OF STANDING WATER: Use one of the following equations to determine one equivalent volume (EV);

    1 EV = volume in casing + volume in saturated sandpack. Or:

    $1\ EV = [\pi R_w^2 h_w + 0.30p(R_s^2 - R_w^2)h_s] * (0.0043)$

Where:

R_s = radius of sandpack in inches
R_w = radius of well casing in inches
h_s = height of sandpack in inches
h_w = water depth in inches

$0.0043 = gal/in^3$

and filter pack porosity is assumed as 30%, or

Volume in casing =
$(0.0043\ gal/in^3)(p)(12\ in/ft)(R_c^2)(W_h)$

Where:

R_c = radius of casing in inches, and
W_h = water column height in feet

Vol. in sandpack =
(0.0043 gal/in3)(p)(12 in/ft)(Rb2 - Rc2)(Wh)(0.30)

(if Wh is less than the length of the sandpack), or

Vol. in sandpack =
(0.0043 gal/in3)(p)(12 in/ft)(Rb2 - Rc2)(Sh)(0.30)

(if Wh is greater than the length of the sandpack).

where:

Rb = radius of the borehole, and
Sh = length of the sandpack.

Show this calculation in the comments section.

1. PUMP RATE: Record pump rate;
2. TOTAL PUMP TIME: Record total purge time and volume;
3. WELL WENT DRY? Write “YES” or “NO”;
4. PUMP TIME: Record pump time that made the well go dry;
5. VOLUME REMOVED: Record the volume of water (gal) removed before the well went dry;
6. RECOVERY TIME: Record the time required for the well to refill;
7. PURGE AGAIN?: Answer “YES” or “NO”;
8. TOTAL VOL. REMOVED: Record the total volume of water (in gallons) removed from the well;

9. CAL REF.: Record the calibration reference for the pH meter;
10. TIME: Record time started (INITIAL T(0)), 2 times DURING the sampling and the time sampling ended (FINAL);
11. pH: Record the pH at start of sampling (INITIAL), twice DURING the sampling, and at the end of sampling (FINAL);
12. TEMP: Record the water temperature (Celsius) at the start of sampling, twice DURING the sampling, and at the end of sampling (FINAL);
13. COND: Record the conductivity of the water at the start of sampling, twice DURING the sampling, and at the end of sampling (FINAL);
14. D.O.: Record the dissolved oxygen level in the water at the start of sampling, twice DURING the sampling, and at the end of sampling (FINAL);
15. TURBIDITY: Record the readings from the turbidity meter (nephelometer) and units at the start of sampling, twice DURING the sampling, and at the end of sampling (FINAL);
16. ORD: Record the oxidation/reduction (RedOx) potential of the water sample at the start of sampling, twice DURING the sampling, and at the end of sampling (FINAL);
17. HEAD SPACE: Record any positive readings from organic vapor meter reading taken in well headspace before sampling;
18. NAPL: Record the presence and thickness of any non-aqueous phase liquids (LNAPL and DNAPL)
19. COMMENTS: Record any pertinent information not already covered in the form; and
20. SIGNATURE: Sign the form.

3.4 FIELD CALIBRATION FORMS (REFER TO FORM 10.2-E)

1. Record time and date of calibration;
2. Record calibration standard reference number;
3. Record meter ID number;
4. Record initial instrument reading, recalibration reading (if necessary), and final calibration reading on appropriate line;
5. Record value of reference standard (as required);
6. COMMENTS: Record any pertinent information not already covered on form; and
7. SIGNATURE: Sign form.

4.0 MAINTENANCE

Not applicable.

5.0 PRECAUTIONS

None.

6.0 REFERENCE

USEPA. 1991. *User's Guide to the Contract Laboratory Program*. EPA/540/O-91/002, Directive 9240.0-01D, Office of Emergency and Remedial Response, January.

FIELD PARAMETER/LOGBOOK FORM 10.2-a
SOIL AND SEDIMENT SAMPLES

HIGH CONCENTRATION EXPECTED? _____ HIGH HAZARD?

INSTALLATION/SITE _____ AREA _____

INST NAME _____ FILE NAME _____

SAMPLE MATRIX CODE _____ SITE ID _____
ENV. FIELD SAMPLE IDENTIFIER _____

DATE (MM/DD/YY) __/__/__ TIME _____ AM PM SAMPLE PROGRAM

DEPTH (TOP) _____ DEPTH INTERVAL _____ UNIT _____

SAMPLING METHOD:

SPLIT SPOON ___ AUGER ___ SHELBY TUBE ___ SCOOP ___ OTHER

CHK	ANALYSIS	SAMPLE CONTAINER	NO.	REMARKS

TOTAL NUMBER OF CONTAINERS FOR SAMPLE_____

DESCRIPTION OF SITE AND SAMPLE CONDITIONS

SITE DESCRIPTION:_____

_____

_____

SAMPLE FORM _____ COLOR _____ ODOR _____

PID (HNu)_____ UNUSUAL FEATURES_____

_____

WEATHER/TEMPERATURE

SAMPLER _____

FIELD PARAMETER/LOGBOOK FORM 10.2-b
GROUNDWATER AND SURFACE WATER SAMPLES

HIGH CONCENTRATION EXPECTED? _____ HIGH HAZARD?

INSTALLATION/SITE _____ AREA

INST CODE _____ FILE NAME _____ SITE TYPE

SITE ID _____ FIELD SAMPLE NUMBER

DATE (MM/DD/YY) __/__/__ TIME _____ AM PM SAMPLE PROG.

DEPTH (TOP) _____ DEPTH INTERVAL _____ UNITS

SAMPLING MEASUREMENTS

CAL REF. _____ pH _____ TEMPERATURE °C _____ CONDUCTIVITY _____ REDOX _____

DISSOLVED OXYGEN ____ TURBIDITY _____ OTHER

CHK	ANALYSIS	SAMPLE CONTAINER	NO.	REMARKS

TOTAL NUMBER OF CONTAINERS FOR SAMPLE_____

DESCRIPTION OF SITE AND SAMPLE CONDITIONS

SITE DESCRIPTION_____

SAMPLING METHOD_____

SAMPLE FORM _____ COLOR _____ ODOR _____

PID (HNu)_____

UNUSUAL FEATURES_____

WEATHER/TEMPERATURE_____ SAMPLER _____

EXAMPLE MAP FILE LOGBOOK FORM 10.2-c
SURFACE WATER, SOIL, AND SEDIMENT SAMPLES

SITE ID_____ POINTER_____

DESCRIPTION/MEASUREMENTS_____

SKETCH/DIMENSIONS :

MAP REFERENCE_____

COORDINATE DEFINITION (X is _____ Y is _____)

COORDINATE SYSTEM _____ SOURCE _____ ACCURACY_____

X-COORDINATE _____ Y-COORDINATE _____ UNITS_____

ELEVATION REFERENCE_____

ELEVATION SOURCE _____ ACCURACY _____ELEVATION_____

UNITS_____

SAMPLER_____

EXAMPLE MAP FILE AND PURGING LOGBOOK FORM 10.2-d
GROUNDWATER SAMPLES

WELL COORD. OR ID _____ SAMPLE NO._____

WELL/SITE DESCRIPTION_____

_____

X-COORD. _____ Y-COORD. _____ ELEV. _____ UNITS

DATE ____/____/____ TIME _____ AIR TEMP.

WELL DEPTH _____ FT. _____ IN. CASING HT. _____ FT. _____ IN.

WATER DEPTH _____ FT. _____ IN. WELL DIAMETER _____ IN.

WATER COLUMN HEIGHT _____ FT. _____ IN. SANDPACK DIAM. _____ IN.

EQUIVALENT VOLUME OF STANDING WATER _____ (GAL) (L)

VOLUME OF BAILER _____ (GAL) (L) or PUMP RATE _____ (GPM) (LPM)

TOTAL NO. OF BAILERS (5 EV) _____ or PUMP TIME _____ MIN.

WELL WENT DRY? [Yes] [No] NUM. OF BAILERS _____ or PUMP TIME

VOL. REMOVED _____ (GAL) (L) RECOVERY TIME

PURGE AGAIN? [Yes] [No] TOTAL VOL. REMOVED _____ (GAL) (L)

DATE & TIME	QUANTITY REMOVED	TIME REQ'D	pH	Cond	Temp	ORD	Turb	DO	Character of water (color / clarity / odor / partic.)
(before)									
(during)									
(during)									
(during									
(after)									

COMMENTS_____

SIGNATURE_____

EXAMPLE FIELD CALIBRATION FORM 10.2-e
FOR pH, CONDUCTIVITY, TEMPERATURE, TURBIDITY,
ORD, AND DISSOLVED OXYGEN METERS

INITIAL CALIBRATION	FINAL CALIBRATION
DATE:	**DATE:**
TIME:	**TIME:**

pH METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

pH STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
7.0			
10.0			
4.0			

CONDUCTIVITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

COND. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

TEMPERATURE METER CALIBRATION

METER ID_____

TEMP. STANDARD	INITIAL READING	RECALIB. READING	FINAL READING
ICE WATER			
BOILING WATER			
OTHER _____			

EXAMPLE FIELD CALIBRATION FORM 10.2-e
FOR pH, CONDUCTIVITY, TEMPERATURE, TURBIDITY,
ORD, AND DISSOLVED OXYGEN METERS

TURBIDITY METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

ORD METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

DISSOLVED OXYGEN METER CALIBRATION

CALIBRATION STANDARD REFERENCE NO:_____

METER ID_____

STANDARD	INITIAL READING	RECALIB. READING	FINAL READING

COMMENTS_____

SIGNATURE_____

STANDARD OPERATING PROCEDURE 10.3
BORING LOGS

1.0 INTRODUCTION

The purpose of this standard operating procedure (SOP) is to describe the methods to be followed for classifying soil and rock, as well as preparing borehole logs and other types of soil reports.

2.0 MATERIALS

The following equipment is required for borehole logging:

- HTRW ENG Form 5056-R and 5056A-R boring log forms;
- Daily inspection report forms;
- Chain-of-custody forms;
- Request for analysis forms;
- ASTM D 2488 classification flow chart;
- Soil and/or Rock color chart (i.e., Munsell®);
- Grain size and roundness chart;
- Graph paper;
- Engineer's scale;
- Previous reports and boring logs;
- Pocketknife or putty knife;
- Hand lens;
- Dilute hydrochloric acid (10% volume);
- Gloves;
- Personal protective clothing and equipment, as described in work plan addenda health and safety plan;
- Photoionization detector or other appropriate monitoring equipment per site-specific health and safety plan; and
- Decontamination supplies (SOP 80.1).

3.0 PROCEDURE

Each boring log should fully describe the subsurface environment and the procedures used to obtain this description.

Boring logs should be prepared in the field on USACE Engineer Form 5056-R and 5056-R. Logs should be recorded in the field directly on the boring log form and not transcribed from a field book.

A “site geologist” should conduct borehole logging and soil/rock identification and description or other professional trained in the identification and description of soil/rock.

3.1 BORING LOG INFORMATION

As appropriate, the following information should be recorded on the boring log during the course of drilling and sampling activities:

- Project information including name, location, and project number;
- Each boring and well should be uniquely numbered and located on a sketch map as part of the log;
- Type of exploration;
- Weather conditions including events that could affect subsurface conditions;
- Dates and times for the start and completion of borings, with notations by depth for crew shifts and individual days;
- Depths/heights in feet and in decimal fractions of feet;
- Descriptions of the drilling equipment including rod size, bit type, pump type, rig manufacturer and model, and drilling personnel;
- Drilling sequence and descriptions of casing and method of installation;
- Description and identification of soils in accordance with ASTM Standard D 2488;
- Descriptions of each intact soil sample for the parameters identified in Section 3.2;
- Descriptions and classification of each non-intact sample (e.g., wash samples, cuttings, auger flight samples) to the extent practicable;
- Description and identification of rock;
- Description of rock (core(s)) for the parameters identified in Section 3.7;
- Scaled graphic sketch of the rock core (included or attached to log) according to the requirements identified in Section 3.7;
- Lithologic boundaries, with notations for estimated boundaries;
- Depth of water first encountered in drilling, with the method of first determination (any distinct water level(s) below the first zone will also be noted);
- Interval by depth for each sample taken, classified, and/or retained, with length of sample recovery and sample type and size (diameter and length);
- Blow counts, hammer weight, and length of fall for driven samplers;
- Rate of rock coring and associated rock quality designation (RQD) for intervals cored;
- Drilling fluid pressures, with driller’s comments;
- Total depth of drilling and sampling;
- Drilling fluid losses and gains should be recorded;
- Significant color changes in the drilling fluid returned;
- Soil gas or vapor readings with the interval sampled, with information on instrument used and calibration;

- Depth and description of any in-situ test performed; and
- Description of other field tests conducted on soil and rock samples.

3.2 SOIL PARAMETERS FOR LOGGING

In general, the following soil parameters should be included on the boring log when appropriate:

- Identification per ASTM D 2488 with group symbol;
- Secondary components with estimated percentages per ASTM D 2488;
- Color;
- Plasticity per ASTM D 2488;
- Density of non-cohesive soil or consistency of cohesive soil;
- Moisture condition per ASTM D 2488 (dry, moist, or wet);
- Presence of organic material;
- Cementation and HCL reaction testing per ASTM D 2488;
- Coarse-grained particle description per ASTM D 2488 including angularity, shapes, and color;
- Structure per ASTM D 2488 and orientation;
- Odor; and
- Depositional environment and formation, if known.

ASTM D 2488 categorizes soils into 13 basic groups with distinct geologic and engineering properties based on visual-manual identification procedures. The following steps are required to classify a soil sample:

1. Observe basic properties and characteristics of the soil. These include grain size grading and distribution, and influence of moisture on fine-grained soil.
2. Assign the soil an ASTM D 2488 classification and denote it by the standard group name and symbol.
3. Provide a written description to differentiate between soils in the same group if necessary.

Many soils have characteristics that are not clearly associated with a specific soil group. These soils might be near the borderline between groups, based on particle distribution or plasticity characteristics. In such a case, assigning dual group names and symbols (e.g., GW/GC or ML/CL) might be an appropriate method of describing the soil. The two general types of soils, for which classification is performed, coarse- and fine-grained soils, are discussed in the following sections.

3.3 COURSE-GRAINED SOIL IDENTIFICATION

For soils in the coarse-grained soils group, more than half of the material in the soil matrix will be retained by a No. 200 sieve (75-μm).

1. Coarse-grained soils are identified on the basis of the following:
   a) Grain size and distribution;
   b) Quantity of fine-grained material (i.e., silt and clay as a percentage); and
   c) Character of fine-grained material.

2. The following symbols are used for classification:

Basic Symbols			Modifying Symbols
G	=	gravel	W = well graded
S	=	sand	P = poorly graded
			M = with silty fines
			C = with clayey fines

3. The following basic facts apply to coarse-grained soil classification.

- The basic symbol G is used if the estimated percentage of gravel is greater than that for sand. In contrast, the symbol S is used when the estimated percentage of sand is greater than the percentage of gravel.
- Gravel ranges in size from 3-inch to 1/4-inch (No. 4 sieve) diameter. Sand ranges in size from the No. 4 sieve to No. 200 sieve. The Grain Size Scale used by Engineers (ASTM Standard D 422-63) is the appropriate method to further classify grain size as specified by ASTM D 2488.
- Modifying symbol W indicates good representation of all particle sizes.
- Modifying symbol P indicates that there is an excess or absence of particular sizes.
- The symbol W or P is used only when there are less than 15% fines in a sample.
- Modifying symbol M is used if fines have little or no plasticity (silty).
- Modifying symbol C is used if fines have low to high plasticity (clayey).

Figure 10.03a is a flowchart for identifying coarse-grained soils by ASTM D 2488.

3.4 FINED-GRAINED SOIL IDENTIFICATON

If one-half or more of the material will pass a No. 200 sieve (75 μm), the soil is identified as fine-grained.

1. Fine-grained soils are classified based on dry strength, dilatancy, toughness, and plasticity.
2. Classification of fine-grained soils uses the following symbols:

Basic Symbols			Modifying Symbols		
M	=	silt (non plastic)	L	=	low liquid limit (lean)
C	=	clay (plastic)	H	=	high liquid limit (fat)
O	=	organic			
Pt	=	peat			

3. The following basic facts apply to fine-grained soil classification:
    - The basic symbol M is used if the soil is mostly silt, while the symbol C applies if it consists mostly of clay.
4. Use of symbol O (group name OL/OH) indicates that organic matter is present in an amount sufficient to influence soil properties. The symbol Pt indicates soil that consists mostly of organic material.

- Modifying symbols (L and H) are based on the following hand tests conducted on a soil sample:
    — Dry strength (crushing resistance).
    — Dilatancy (reaction to shaking).

— Toughness (consistency near plastic limit).

- Soil designated ML has little or no plasticity and can be recognized by slight dry strength, quick dilatency, and slight toughness.
- CL indicates soil with slight to medium plasticity, which can be recognized by medium to high dry strength, very slow dilatancy, and medium toughness.

Criteria for describing dry strength per ASTM D 2488 are as follows:

Description	Criteria
None	Dry sample crumbles into powder with pressure of handling
Low	Dry specimen crumbles into powder with some finger pressure
Medium	Dry specimen breaks into pieces or crumbles with considerable finger pressure
High	Dry specimen cannot be broken with finger pressure but will break into pieces between thumb and a hard surface
Very high	Dry specimen cannot be broken between the thumb and a hard surface stiffness

Criteria for describing dilatancy per ASTM D 2488 are as follows:

None	No visible change in the sample
Slow	Water appears slow on the surface of the sample during shaking and does not disappear or disappears slowly upon squeezing
Rapid	Water appears quickly on the surface of the sample during shaking and disappears quickly upon squeezing

Criteria for describing toughness per ASTM D 2488 are as follows:

Description	Criteria
Low	Only slight pressure is required to roll the thread near the plastic limit and the thread and lump are weak and soft
Medium	Medium pressure is required to roll the thread to near the plastic limit and the thread and lump have medium stiffness
High	Considerable pressure is required to roll the thread to near the plastic limit and the thread and lump have very high stiffness

Figure 10.03b is a flowchart for identifying fine-grained soils by ASTM D 2488.

3.5 DENSITY AND CONSISTENCY

Relative density for coarse-grained soils and consistency for fine-grained soils can be estimated using standard penetration test blow count data (ASTM D 1586). The number of blows required for each 6 inches of penetration or fraction thereof is recorded. If the sampler is driven less than 18 inches, the number of blows per each complete 6-inch interval and per partial interval is recorded.

For partial increments, the depth of penetration should be recorded to the nearest 1 inch. If the sampler advances below the bottom of the boring under the weight of rods (static) and/or hammer, then this information should be recorded on the log.

The following are some "rule-of-thumb" guidelines for describing the relative density of coarse-grained soils:

Blow Count	Relative Density for Sand
0–4	Very loose
4–10	Loose
10–30	Medium dense
30–50	Dense
>50	Very Dense

The following are some "rule-of-thumb" guidelines for describing the consistency of fine-grained soils:

Blow Count	Consistency for Clays	Description
0–2	Very Soft	Sample sags or slumps under its own weight
2–4	Soft	Sample can be pinched in two between the thumb and forefinger
4–8	Medium Stiff	Sample can be easily imprinted with fingers
8–16	Stiff	Sample can be imprinted only with considerable pressure of fingers
16–32	Very Stiff	Sample can be imprinted very slightly with fingers
>32	Hard	Sample cannot be imprinted with fingers; can be pierced with pencil

3.6 OTHER DESCRIPTIVE INFORMATION

The approximate percentage of gravel, sand, and fines (use a percentage estimation chart) should be recorded per ASTM D 2488 as follows:

Modifiers	Descriptions
Trace	Less than 5%
Few	5%–10%
Little	15%–25%
Some	30%–45%
Mostly	50%–100%

Color/discoloration should be recorded and described using a soil color chart, such as the Munsell® Soil Color Charts. A narrative and numerical description should be given from the color chart, such as Brown 10 YR, 5/3 (Munsell®). Odor should be described if organic or unusual.

Plasticity should be described as follows:

Description	Criteria
Non-plastic	A 1/8-inch thread cannot be rolled at any water content
Low	Thread can barely be rolled and lump cannot be formed when drier than plastic limit.
Medium	Thread is easy to roll; plastic limit can be reached with little effort and lump crumbles when drier than plastic limit.
High	Considerable time is required to reach the plastic limit and lump can be formed without crumbling when drier than plastic limit.

Moisture condition should be recorded as dry (absence of moisture), moist (damp but no visible water) or wet (visible free water).

Cementation should be recorded (carbonates or silicates) along with the results of HCL reaction testing. The reaction with HCL should be described as none (no visible reaction), weak (some reaction with slowly forming bubbles) or strong (violent reaction with bubbles forming immediately).

Particle description information for coarse-grained soil should be recorded where appropriate per ASTM D 2488 including maximum particle size, angularity (angular, subangular, subrounded, or rounded), shape (flat, elongated or flat and elongated), and color.

Structure (along with orientation) should be reported using the following ASTM D 2488 descriptions:

Description	Criteria
Stratified	Alternating layers of varying material or color with layers greater than 6 millimeters thick
Laminated	Alternating layers of varying material or color with layers less than 6 millimeters thick
Fissured	Breaks along definite planes of fracture with little resistance
Slickensided	Fracture planes that appear polished or glossy, can be striated
Blocky	Inclusion of small pockets of different soils
Homogeneous	Same color and appearance throughout

3.7 ROCK CORE PARAMETERS FOR LOGGING

In general, the following parameters should be included on the boring log when rock coring is conducted:

- Rock type;
- Formation;
- Modifier denoting variety;
- Bedding/banding characteristics;
- Color;
- Hardness;
- Degree of cementation;
- Texture;
- Structure and orientation;
- Degree of weathering;
- Solution or void conditions;
- Primary and secondary permeability including estimates and rationale; and
- Lost core interval and reason for loss.

A scaled graphic sketch of the core should provided on or attached to the log, denoting by depth, location, orientation, and nature (natural, coring-induced, or for fitting into core box) of all core breaks. Where fractures are too numerous to be shown individually, their location may be drawn as a zone.

The RQD values for each core interval (run) should be calculated and included on the boring log. The method of calculating the RQD is as follows per ASTM D 6032:

RQD = [Σ length of intact core pieces > 100 mm (4-inches)] x 100%/total core length.

3.8 PROCEDURES FOR ROCK CLASSIFICATION

For rock classification record mineralogy, texture, and structural features (e.g., biotite and quartz fine grains, foliated parallel to relict bedding oriented 15 to 20 degrees to core axis, joints coated with iron oxide). Describe the physical characteristics of the rock that are important for engineering considerations such as fracturing (including minimum, maximum, and most common and degree of spacing), hardness, and weathering.

1. The following is to be used as a guide for assessing fracturing:

AEG Fracturing	Spacing
Crushed	up to 0.1 foot
Intense	0.1–0.5 foot
Moderate	0.5 foot–10 feet
Slight	1.0 foot–3.0 feet
Massive	>3.0 feet

2. Record hardness using the following guidelines:

Hardness	Criteria
Soft	Reserved for plastic material
Friable	Easily crumbled by finger pressure
Low	Deeply gouged or carved with pocketknife
Moderate	Readily scratched with knife; scratch leaves heavy trace of dust
Hard	Difficult to scratch with knife; scratch produces little powder and is often faintly visible
Very Hard	Cannot be scratched with knife

3. Describe weathering using the following guidelines:

Weathering	**Decomposition**	**Discoloration**	**Fracture Condition**
Deep	Moderate to complete alteration of minerals feldspars altered to clay, etc.	Deep and thorough	All fractures extensively coated with oxides, carbonates, or clay
Moderate	Slight alteration of minerals, cleavage surface lusterless and stained	Moderate or localized and intense	Thin coatings or stains
Weak	No megascopic alteration of minerals	Slight and intermittent and localized	Few strains on fracture surfaces
Fresh	Unaltered, cleavage, surface glistening		

3.9 PROCEDURE FOR LOGGING REFUSE

The following procedure applies to the logging of subsurface samples composed of various materials in addition to soil as may be collected from a landfill or other waste disposal site.

1. Observe refuse as it is brought up by the hollow stem auger, bucket auger, or backhoe.
2. If necessary, place the refuse in a plastic bag to examine the sample.
3. Record observations according to the following criteria:

- Composition (by relative volume), e.g., paper, wood, plastic, cloth, cement, or construction debris. Use such terms as "mostly" or "at least half." Do not use percentages;
- Moisture condition: dry, moist, or wet;
- State of decomposition: highly decomposed, moderately decomposed, slightly decomposed, etc.;
- Color: obvious mottling and/or degree of mottling;
- Texture: spongy, plastic (cohesive), friable;
- Odor;
- Combustible gas readings (measure down hole and at surface); and
- Miscellaneous: dates of periodicals and newspapers, ability to read printed materials, degree of drilling effort (easy, difficult, and very difficult).

3.10 SUBMITTAL REQUIREMENTS

Each original boring log should be submitted to the Contracting Officer Representative (CRO) after completion of the boring. When a monitoring well will be installed in a boring, the boring log and well installation diagram should be submitted together.

4.0 MAINTENANCE

Not applicable.

5.0 PRECAUTIONS

Not applicable.

6.0 REFERENCES

ASTM Standard D 422-63 (2002)e1. 2002. *Standard Test Method for Particle-Size Analysis of Soils.*

ASTM Standard D 1586–99 (1999). 1999. *Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils.*

ASTM Standard D 2488-06. 2006. *Standard Practice for Description and Identification of Soils Visual-Manual Procedure).*

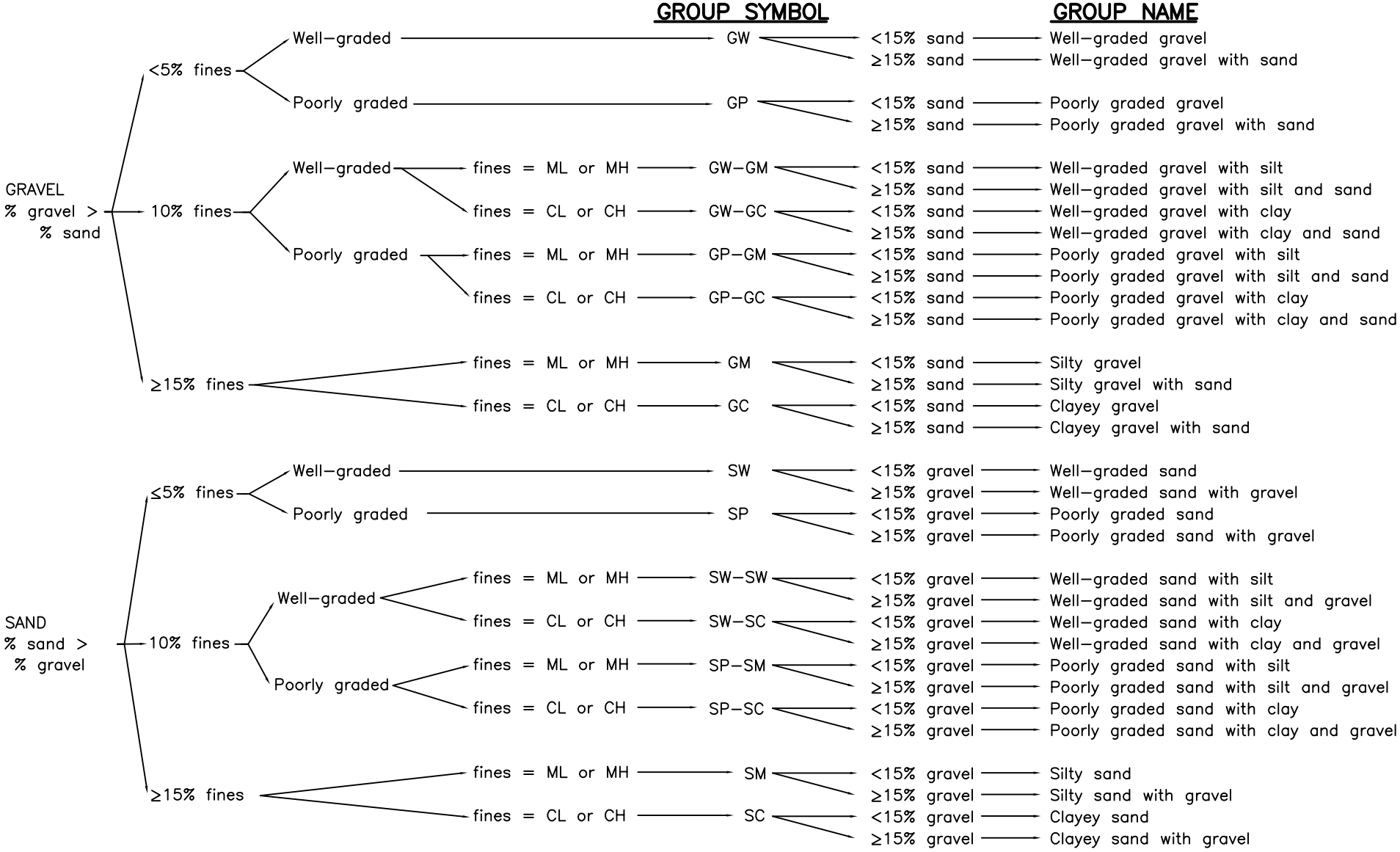
ASTM Standard D 5434-03. 2003. *Guide for Field Logging of Subsurface Explorations of Soil and Rock.*

ASTM Standard D 6032-02 (2006). 2006. *Standard Test Method for Determining Rock Quality Designation (RQD) of Rock Core.*

Compton, R. R. 1962. *Manual of Field Geology.* John Wiley & Sons, Inc., New York.

USACE. 1998. *Monitoring Well Design, Installation, and Documentation at Hazardous, Toxic, and Radioactive Waste Sites.* EM 1110-1-4000, 1, November.

U.S. Department of the Interior. 1989. *Earth Manual.* Water and Power Resources Service, Washington, DC.



NOTE: PERCENTAGES ARE BASED ON ESTIMATING AMOUNTS OF FINES, SAND, AND GRAVEL TO THE NEAREST 5%.

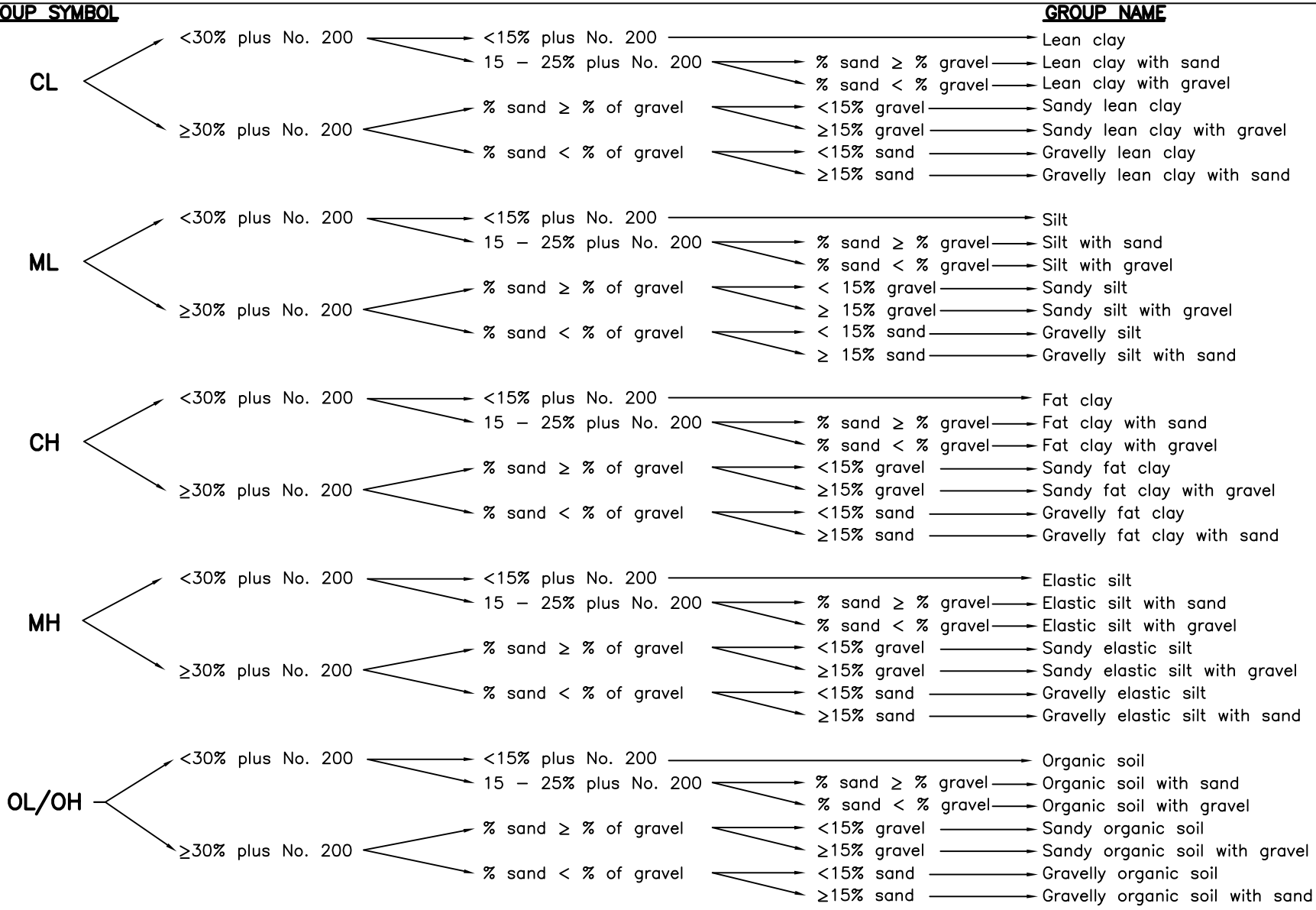
SOURCE: ASTM D 2488

Radford Army Ammuntion Plant

FIGURE 10.03a

FLOW CHART FOR IDENTIFYING COARSE-GRAINED SOILS

Date: *October 2007*	**Prepared By:** *DBC/TLD*
Scale: *N.T.S.*	**File Name:** *SOP Figure 10.03a_Coarse*



NOTE: PERCENTAGES ARE BASED ON ESTIMATING AMOUNTS OF FINES, SAND, AND GRAVEL TO THE NEAREST 5%.

SOURCE: ASTM D 2488

Radford Army Ammuntion Plant		FIGURE 10.03b
Date: *October 2007*	**Prepared By:** *DBC/TLD*	**FLOW CHART FOR IDENTIFYING FINE-GRAINED SOILS**
Scale: *N.T.S.*	**File Name:** *SOP Figure 10.03b_Fine*	

STANDARD OPERATING PROCEDURE 10.4
CHAIN-OF-CUSTODY FORM

1.0 SCOPE AND APPLICATION

The purpose of this standard operating procedure (SOP) is to delineate protocols for use of the chain-of-custody form. An example is provided as part of this SOP. Other formats with similar levels of detail are acceptable.

2.0 MATERIALS

- Chain-of-custody form; and
- Indelible ink pen.

3.0 PROCEDURE

1. Record the project name and number.
2. Record the project contact's name and phone number.
3. Print sampler's names in "Samplers" block.
4. Enter the Field Sample No.
5. Record the sampling dates for all samples.
6. List the sampling times (military format) for all samples.
7. Indicate, "grab" or "composite" sample with an "X."
8. Record matrix (e.g., aqueous, soil).
9. List the analyses/container volume across top.
10. Enter the total number of containers per Field Sample No. in the "Subtotal" column.
11. Enter total number of containers submitted per analysis requested.
12. State the carrier service and airbill number, analytical laboratory, and custody seal numbers.
13. List any comments or special requests in the "Remarks" section.
14. Sign, date, and time the "Relinquished By" section when the cooler is relinquished to the next party.
15. Upon completion of the form, retain the shipper copy and place the forms and the other copies in a zip seal bag to protect from moisture. Affix the zip seal bag to the inside lid of the sample cooler to be sent to the designated laboratory.

4.0 MAINTENANCE

Not applicable.

5.0 PRECAUTIONS

None.

6.0 REFERENCES

USEPA. 1990. *Sampler's Guide to the Contract Laboratory Program.* EPA/540/P-90/006, Directive 9240.0-06, Office of Emergency and Remedial Response, Washington, DC, December 1990.

USEPA. 1991. *User's Guide to the Contract Laboratory Program..* EPA/540/O-91/002, Directive 9240.0-01D, Office of Emergency and Remedial Response, January 1991.

USEPA. 1998. *EPA Requirements for Quality Assurance Project Plans.* EPA/600/R-98/018, QA/R5, Final, Office of Research and Development, Washington, D.C.

FIGURE 10.4-a
EXAMPLE CHAIN-OF-CUSTODY FORM

Project Number	Project Name				Matrix	A N A L Y S E S									LAB :
Project Contact (Name and Phone Number)															AIRBILL No:
Samplers:															Courier:
Field Sample No.	Date (MM-DD-YY)	Time	Comp	Grab										Subtotal	REMARKS
TOTAL															

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Relinquished by:	Date/time	Received by: (for lab)	Date/Time	Remarks	

STANDARD OPERATING PROCEDURE 30.1
SOIL SAMPLING

1.0 SCOPE AND APPLICATION

The purpose of this standard operating procedure (SOP) is to delineate protocols for sampling surface and subsurface soils.

2.0 MATERIALS

- Stainless steel scoop, spoon, trowel, knife, spatula, (as needed);
- Split-spoon, Shelby tube, or core barrel sampler;
- Hand auger or push tube sampler;
- Drill rig and associated equipment (subsurface soil);
- Stainless steel bowls;
- Photoionization detector or other appropriate instrument as specified in site-specific health and safety plan;
- Sampling equipment for collection of volatile organic samples;
- Appropriate sample containers;
- Appropriate sample labels and packaging material.;
- Personal protective equipment and clothing (PPE) per site-specific health and safety plan; and
- Decontamination equipment and supplies (SOP 80.1).

3.0 PROCEDURE

3.1 DOCUMENTATION

Soil sampling information should be recorded in the field logbooks as described in SOPs 10.1 and 10.2.

3.2 SURFICIAL SOIL SAMPLES

The targeted depths for surficial soil samples (surface and near surface) will be specified in the work plan addenda developed for site-specific investigations.

1. All monitoring equipment should be appropriately calibrated before beginning sampling according to the requirements of the work plan addenda and SOP 90.1 or 90.2.
2. All sampling equipment should be appropriately decontaminated before and after use according to the requirements of the work plan addendum and SOP 80.1.
3. Use a spade, shovel, or trowel or other equipment (manufactured from material, which is compatible with the soil to be sampled) to remove any overburden material present (including vegetative mat) to the level specified for sampling.
4. Measure and record the depth at which the sample will be collected with an engineers scale or tape.

5. Remove the thin layer that was in contact with the overburden removal equipment using a clean stainless steel scoop or equivalent and discard it.
6. Begin sampling with the acquisition of any discrete sample(s) for analysis of volatile organic compounds (VOCs), with as little disturbance as possible. VOC samples will not be composited or homogenized.
7. When a sample will not be collected with a core type of sampler (push tube, split spoon, etc.), the sample for VOC analysis will be collected from freshly exposed soil. The method of collection will follow the procedures specified in SOP 30.8 (Methanol Preservation Method) or 30.9 (En Core® Method) based on the requirements of the work plan addenda.
8. Field screen the sample with properly calibrated photoionization detector (PID) or other appropriate instrument. Cut a cross-sectional slice from the core or center of the sample and insert the monitoring instrument(s). Based on the screening results, collect the VOC fraction, as applicable.
9. Collect a suitable volume of sample from the targeted depth with a clean stainless steel scoop (or similar equipment), push tube sampler, or bucket auger
10. For core type of samplers, rough trimming of the sampling location surface should be considered if the sampling surface is not fresh or other waste, different soil strata, or vegetation may contaminate it. Surface layers can be removed using a clean stainless steel, spatula, scoop, or knife. Samples collected with a bucket auger or core type of sampler should be logged per the requirements of SOP 10.3.
11. If homogenization or compositing of the sampling location is not appropriate for the remaining parameters, the sample should be directly placed into appropriate sample containers with a stainless steel spoon or equivalent.
12. If homogenization of the sample location is appropriate or compositing of different locations is desired, transfer the sample to a stainless steel bowl for mixing. The sample should be thoroughly mixed with a clean stainless steel spoon, scoop, trowel, or spatula and then placed in appropriate sample containers per the requirements for containers and preservation specified in work plan addenda. Secure the cap of each container tightly.
13. Appropriately, label the samples (SOP 50.1), complete the chain-of-custody (SOP 10.4), and package the samples for shipping (SOP 50.2).
14. Return any remaining unused soil to the original sample location. If necessary, add clean sand to bring the subsampling areas back to original grade. Replace the vegetative mat over the disturbed areas.

3.3 SUBSURFACE SAMPLES

All sampling equipment should be appropriately decontaminated before and after use according to the requirements of the work plan addendum and SOP 80.1.

1. All monitoring equipment should be appropriately calibrated before sampling according to the requirement of the work plan addendum and SOP 90.1 or SOP 90.2.
2. All sampling equipment should be appropriately decontaminated before and after use according to the requirements of the work plan addendum and SOP 80.1.
3. Collect split-spoon; core barrel, Shelby tube, sonic core or other similar samples during drilling.
4. Upon opening sampler or extruding sample, immediately screen soil for VOCs using a PID or appropriate instrument. If sampling for VOCs, determine the area of highest concentration; use a

stainless steel knife, trowel, or lab spatula to cut the sample; and screen for VOCs with monitoring instrument(s).

5. Log the sample on the boring log before extracting from the sampler per the requirements of SOP 10.3.
6. Any required VOC samples will be collected first followed by the other parameters. VOC samples will not be composited or homogenized and will be collected from the area exhibiting the highest screening level. The method of VOC sample collection will follow the procedures specified in SOP 30.8 (Methanol Preservation Method) or 30.9 (En Core® Method) based on the requirements of the work plan addenda.
7. Field screen the sample with properly calibrated photoionization detector (PID) or other appropriate instrument. Cut a cross-sectional slice from the core or center of the sample and insert the monitoring instrument(s). Based on the screening results, collect the VOC fraction, as applicable.
8. Rough trimming of the sampling location surface should be considered if the sampling surface is not fresh or other waste, different soil strata, or vegetation may contaminate it. Surface layers can be removed using a clean stainless steel, spatula, scoop, or knife.
9. If homogenization or compositing of the sampling location is not appropriate for other parameters, the sample should be directly placed into appropriate sample containers with a stainless steel spoon or equivalent.
10. If homogenization of the sample location is appropriate or compositing of different locations is desired, transfer the sample to a stainless steel bowl for mixing. The sample should be thoroughly mixed with a clean stainless steel spoon, scoop, trowel, or spatula and placed in appropriate sample containers per the requirements for containers and preservation specified in work plan addenda. Secure the cap of each container tightly.
15. Appropriately, label the samples (SOP 50.1), complete the chain-of-custody (SOP 10.4), and package the samples for shipping (SOP 50.2).
16. Discard any remaining sample into the drums used for collection of cuttings.
17. Abandon borings according to procedures outlined in SOP 20.2.

3.4 INVESTIGATION-DERIVED MATERIAL

Investigation-derived material will be managed in accordance with procedures defined in the work plan addenda for the site being investigated and SOP 70.1.

NOTES: If sample recoveries are poor, it may be necessary to composite samples before placing them in jars. In this case, the procedure will be the same except that two split-spoon samples (or other types of samples) will be mixed together. The boring log should clearly state that the samples have been composited, which samples were composited, and why the compositing was done. In addition, VOC fraction should be collected from the first sampling device.

When specified, samples taken for geotechnical analysis (e.g., percent moisture, density, porosity, and grain size) will be undisturbed samples, such as those collected using a thin-walled (Shelby tube) sampler, sonic core sampler, etc.

4.0 MAINTENANCE

Not applicable.

5.0 PRECAUTIONS

Refer to the site-specific health and safety plan.

Soil samples will not include vegetative matter, rocks, or pebbles unless the latter are part of the overall soil matrix.

6.0 REFERENCES

ASTM Standard D 1586-99. 1999. *Standard Test Method for Penetration Test and Split-Barrel Sampling of Soils.*

ASTM Standard D 1587-00 (2007) e1. 2007. *Standard Practice for Thin-Walled Tube Sampling of Soils for Geotechnical Purposes.*

ASTM Standard D 5633-04. 2004. *Standard Practice for Sampling with a Scoop.*

USACE. 2001. *Requirements for the Preparation of Sampling and Analysis Plans.* EM 200-1-3. 1 February.

STANDARD OPERATING PROCEDURE 30.7
SAMPLING STRATEGIES

1.0 SCOPE AND APPLICATION

The purpose of this standard operating procedure (SOP) is to delineate sampling strategies for sampling various media.

2.0 MATERIALS

- Historical site data;
- Site topography;
- Soil types; and
- Sampled media.

3.0 PROCEDURE

The primary goal of any investigation is to collect samples representative of existing site conditions. Statistics are generally used to ensure samples are as representative as possible. Sampling plans may employ more than one approach to ensure project data quality objectives are adequately addressed. A comparison of sampling strategies is presented in Table 1.

3.1 CLASSICAL STATISTICAL SAMPLING

Classical statistical sampling strategies are appropriately applied to either sites where the source of contamination is known or small sites where the entire area is remediated as one unit. Primary limitations of this sampling approach include (1) inability to address media variability; (2) inadequate characterization of heterogenous sites; and (3) inadequate characterization of sites with unknown contamination characteristics.

3.1.1 Simple Random Sampling

Simple random sampling is generally more costly than other approaches because of the number of samples required for site characterization. This approach is generally used when minimal site information is available and visible signs of contamination are not evident and includes the following features:

- Sampling locations are chosen using random chance probabilities.
- This strategy is most effective when the number of sampling points is large.

3.1.2 Stratified Random Sampling

This sampling approach is a modification to simple random sampling. This approach is suited for large site investigations that encompass a variety of soil types, topographic features, and/or land uses. By dividing the site into homogenous sampling strata based on background and historical data, individual random sampling techniques are applied across the site. Data acquired from each stratum can be used to determine the mean or total contaminant levels and provide these advantages:

- Increased sampling precision results due to sample point grouping and application of random sampling approach.
- Control of variances associated with contamination, location, and topography.

3.1.3 Systematic Grid

The most common statistical sampling strategy is termed either systematic grid or systematic random sampling. This approach is used when a large site must be sampled to characterize the nature and extent of contamination.

Samples are collected at predetermined intervals within a grid pattern according to the following approach:

- Select the first sampling point randomly; remaining sampling points are positioned systematically from the first point.
- Determine the grid design: one or two-dimensional. One-dimensional sample grids may be used for sampling along simple man-made features. Two-dimensional grid systems are ideal for most soil applications.
- Determine the grid type: square or triangular. Sampling is usually performed at each grid-line intersection. Other strategies include sampling within a grid center or obtaining composite samples within a grid.
- Each stratum is sampled based on using the simple random sampling approach but determined using a systematic approach.

3.1.4 Hot-Spot Sampling

Hot spots are small, localized areas of media characterized by high contaminant concentrations. Hot-spot detection is generally performed using a statistical sampling grid. The following factors should be addressed:

- Grid spacing and geometry. The efficiency of hot-spot searches is improved by using a triangular grid. An inverse relationship exists between detection and grid point spacing, e.g., the probability of hot-spot detection is increased as the spacing between grid points is decreased.
- Hot-spot shape/size. The larger the hot spot, the higher the probability of detection. Narrow or semi-circular patterns located between grid sampling locations may not be detected.
- False-negative probability. Estimate the false negative (β-error) associated with hot-spot analysis.

3.1.5 Geostatistical Approach

Geostatistics describe regional variability in sampling and analysis by identifying ranges of correlation or zones of influence. The general two-stage approach includes the following:

- Conducting a sampling survey to collect data defining representative sampling areas.
- Defining the shape, size, and orientation of the systematic grid used in the final sampling event.

3.2 NON-STATISTICAL SAMPLING

3.2.1 Biased Sampling

Specific, known sources of site contamination may be evaluated using biased sampling. Locations are chosen based on existing information.

3.2.2 Judgmental Sampling

This sampling approach entails the subjective selection of sampling locations that appear to be representative of average conditions. Because this method is highly biased, it is suggested that a measure of precision be included through the collection of multiple samples.

4.0 MAINTENANCE

Not applicable.

5.0 REFERENCES

Gilbert, R.O. 1987. *Statistical Methods for Environmental Pollution Monitoring.* John Wiley & Sons, Inc. 320 p.

USACE. 2001. *Requirements for the Preparation of Sampling and Analysis Plans.* EM200-1-3. 1 February.

TABLE 1
SAMPLING STRATEGIES

SAMPLING STRATEGY	DESCRIPTION	APPLICATION	LIMITATIONS
Classical Statistical Sampling Strategies			
Simple Random Sampling	Representative sampling locations are chosen using the theory of random chance probabilities.	Sites where background information is not available and no visible signs of contamination are present.	May not be cost-effective because samples may be located too close together. Does not take into account spatial variability of media.
Stratified Random Sampling	Site is divided into several sampling areas (strata) based on background or site survey information.	Large sites characterized by a number of soil types, topographic features, past/present uses, or manufacturing storage areas.	Often more cost-effective than random sampling. More difficult to implement in the field and analyze results. Does not take into account spatial variability of media.
Systematic Grid Sampling	Most common statistical strategy; involves collecting samples at predetermined, regular intervals within a grid pattern.	Best strategy for minimizing bias and providing complete site coverage. Can be used effectively at sites where no background information exists. Ensures that samples will not be taken too close together.	Does not take into account spatial variability of media.
Hot-Spot Sampling	Systematic grid sampling strategy tailored to search for hot spots.	Sites where background information or site survey data indicate that hot spots may exist.	Does not take into account spatial variability of media. Tradeoffs between number of samples, chance of missing a hot spot, and hot spot size/shape must be weighed carefully.
Geostatistical Approach	Representative sampling locations are chosen based on spatial variability of media. Resulting data are analyzed using kriging, which creates contour maps of the contaminant concentrations and the precision of concentration estimates.	More appropriate than other statistical sampling strategies because it takes into account spatial variability of media. Especially applicable to sites where presence of contamination is unknown.	Previous investigation data must be available and such data must be shown to have a spatial relationship.
Non-Statistical Sampling Strategies			
Biased Sampling	Sampling locations are chosen based on available information.	Sites with known contamination sources.	Contaminated areas can be overlooked if background information or visual signs of contamination do not indicate them. Best used if combined with a statistical approach, depending on the project objectives.
Judgmental Sampling	An individual subjectively selects sampling locations that appear to be representative of average conditions.	Homogenous, well-defined sites.	Not usually recommended due to bias imposed by individual, especially for final investigations.

STANDARD OPERATING PROCEDURE 50.1
SAMPLE LABELS

1.0 SCOPE AND APPLICATION

Every sample will have a sample label uniquely identifying the sampling point and analysis parameters. The purpose of this standard operating procedure (SOP) is to delineate protocols for the use of sample labels. An example label is included as Figure 50.1-A. Other formats with similar levels of detail are acceptable.

2.0 MATERIALS

- Sample label; and
- Indelible marker.

3.0 PROCEDURE

The use of preprinted sample labels is encouraged and should be requested from the analytical support laboratory during planning activities.
As each sample is collected, fill out a sample label ensuring the following information has been collected:

- Project name;
- Sample ID: enter the SWMU number and other pertinent information concerning where the sample was taken. This information should be included in site-specific work plan addenda;
- Date of sample collection;
- Time of sample collection;
- Initials of sampler(s);
- Analyses to be performed (NOTE: Due to number of analytes, details of analysis should be arranged with lab *a priori*); and
- Preservatives (water samples only).

Double-check the label information to make sure it is correct. Detach the label, remove the backing and apply the label to the sample container. Cover the label with clear tape, ensuring that the tape completely encircles the container.

4.0 MAINTENANCE

Not applicable.

5.0 PRECAUTIONS

None.

6.0 REFERENCES

USEPA. 2001 (Reissued May 2006). *EPA Requirements for Quality Assurance Project Plans.* EPA/240/B-01/003, QA/R5, Final, Office of Research and Development, Washington, D.C. March 2001.

FIGURE 50.1-A
SAMPLE LABEL

PROJECT NAME _____

SAMPLE ID _____

DATE: ____/____/____ TIME: _____:_____

ANALYTES: VOC SVOC P/P METALS CN
PAH D/F HERBs ANIONS TPH
ALK TSS

PRESERVATIVE: [HCl] [HNO_3] [NaOH] [H_2SO_4]

SAMPLER: _____

STANDARD OPERATING PROCEDURE 50.2
SAMPLE PACKAGING

1.0 SCOPE AND APPLICATION

The purpose of this standard operating procedure (SOP) is to delineate protocols for the packing and shipping of samples to the laboratory for analysis.

2.0 MATERIALS

- Waterproof coolers (hard plastic or metal);
- Metal cans with friction-seal lids (e.g., paint cans);
- Chain-of-custody forms;
- Chain-of-custody seals (optional);
- Packing material;
- Sample documentation;
- Ice;
- Plastic garbage bags;
- Clear Tape;
- Zip-top plastic bags; and
- Temperature blanks provided by laboratory for each shipment.

3.0 PROCEDURE

1. Check cap tightness and verify that clear tape covers label and encircles container.
2. Wrap sample container in bubble wrap or closed cell foam sheets. Samples may be enclosed in a secondary container consisting of a clear zip-top plastic bag. Sample containers must be positioned upright and in such a manner that they will not touch during shipment.
3. Place several layers of bubble wrap, or at least 1 in. of vermiculite on the bottom of the cooler. Line cooler with open garbage bag, place all the samples upright inside the garbage bag and tie.
4. Double bag and seal loose ice to prevent melting ice from soaking the packing material. Place the ice outside the garbage bags containing the samples.
5. Pack shipping containers with packing material (closed-cell foam, vermiculite, or bubble wrap). Place this packing material around the sample bottles or metal cans to avoid breakage during shipment.
6. A temperature blank (provided by laboratory) will be included in each shipping container to monitor the internal temperature. Samples should be cooled to 4 degrees C on ice immediately after sampling.
7. Enclose all sample documentation (i.e., Field Parameter Forms, Chain-of-Custody forms) in a waterproof plastic bag and tape the bag to the underside of the cooler lid. If more than one cooler is being used, each cooler will have its own documentation. Add the total number of shipping containers included in each shipment on the chain-of-custody form.

8. Seal the coolers with signed and dated custody seals so that if the cooler were opened, the custody seal would be broken. Place clear tape over the custody seal to prevent damage to the seal.
9. Tape the cooler shut with packing tape over the hinges and place tape over the cooler drain.
10. Ship all samples via overnight delivery on the same day they are collected if possible.

4.0 MAINTENANCE

Not applicable.

5.0 PRECAUTIONS

5.1 PERMISSIBLE PACKAGING MATERIALS

- Non-absorbent
  - — Bubble wrap; and
  - — Closed cell foam packing sheets.
- Absorbent
  - — Vermiculite.

5.2 NON-PERMISSIBLE PACKAGING MATERIALS

- Paper;
- Wood shavings (excelsior); and
- Cornstarch “peanuts”.

6.0 REFERENCES

USEPA. 1990. *Sampler's Guide to the Contract Laboratory Program.* EPA/540/P-90/006, Directive 9240.0-06, Office of Emergency and Remedial Response, Washington, D.C., December 1990.

USEPA. 1991. *User's Guide to the Contract Laboratory Program.* EPA/540/O-91/002, Directive 9240.0-01D, Office of Emergency and Remedial Response. January 1991.

USEPA. 2001 (Reissued May 2006). *EPA Requirements for Quality Assurance Project Plans.* EPA/240/B-01/003, QA/R5, Final, Office of Research and Development, Washington, D.C. March 2001

STANDARD OPERATING PROCEDURE 70.1
INVESTIGATION-DERIVED MATERIAL

1.0 SCOPE AND APPLICATION

Management of investigation-derived material (IDM) minimizes the potential for the spread of waste material onsite or offsite through investigation activities. The purpose of this standard operating procedure (SOP) is to provide general guidelines for appropriate management of potentially contaminated materials derived from the field investigations. Specific procedures related to the transportation and disposal of hazardous waste are beyond the scope of this SOP.

2.0 INTRODUCTION

Investigation derived material (IDM) consists of waste materials that are known or suspected to be contaminated with waste substances through the actions of sample collection or personnel and equipment decontamination. These materials include decontamination solutions, disposable equipment, drill cuttings and fluids, and water from groundwater monitoring well development and purging. To the extent possible, the site manager will attempt to minimize the generation of these materials through careful design of decontamination schemes and groundwater sampling programs. Testing conducted on soil and water investigation-derived material will show if they are also hazardous wastes as defined by RCRA. This will determine the proper handling and ultimate disposal requirements.

The criteria for designating a substance as hazardous waste according to RCRA is provided in 40 CFR 261.3. If IDM meet these criteria, RCRA requirements will be followed for packaging, labeling, transporting, storing, and record keeping as described in 40 CFR 262.34. Those materials that are judged potentially to meet the criteria for a regulated solid or hazardous waste will be placed in DOT-approved 55-gallon steel drums or another type of DOT approved container; based on waste characteristics and volume.

Investigation-derived material will be appropriately placed in containers, labeled, and tested to determine disposal options in accordance with RCRA regulations and Virginia Hazardous Waste Management Regulations.

3.0 INVESTIGATION-DERIVED MATERIAL MANAGEMENT

Procedures that minimize potential for the spread of waste material include minimizing the volume of material generated, material segregation, appropriate storage, and disposal according to RCRA requirements.

3.1 WASTE MINIMIZATION

In the development of work plan addenda, each aspect of the investigation will be reviewed to identify areas where excess waste generation can be eliminated. General procedures that will eliminate waste include avoidance of unnecessary exposure of materials to hazardous material and coordination of sampling schedules to avoid repetitious purging of wells and use of sampling equipment.

3.2 WASTE SEGREGATION

Waste accumulation and management procedures to be used depend upon the type of material generated. For this reason, IDM described below are segregated into separate 55-gallon storage drums or other appropriate DOT containers. Waste materials that are known to be free of potential hazardous waste contamination (such as broken sample bottles or equipment containers and wrappings) must be collected separately for disposal to municipal systems. Large plastic garbage or "lawn and leaf" bags are useful for collecting this trash. Even "clean" sample bottles or Tyvek should be disposed of with care. Although they are not legally a problem, if

they are discovered by the public they may cause concern. Therefore, items that are known to be free from contamination but are also known to represent "hazardous or toxic waste" to the public must not be disposed of in any public trash receptacle, such as found at your hotel or park.

3.2.1 Decontamination Solutions

Solutions considered investigation-derived materials range from detergents, organic solvents, and acids used to decontaminate small hand samplers to steam-cleaning rinsate used to wash drill rigs and other large equipment. These solutions are to be placed in 55-gallon drums with bolt-sealed lids or other appropriate DOT approved containers. Residual liquid IDM from decontamination pads will be removed and appropriately placed in container(s) at the end of each field day.

3.2.2 Soil Cuttings and Drilling Muds

Soil cuttings are solid to semi-solid soils generated during trenching activities or drilling for the collection of subsurface soil samples or the installation of monitoring wells. Depending on the type of drilling, drilling fluids known as "muds" may be used to remove soil cuttings. Drilling fluids flushed from the borehole must be directed into a settling section of a mud pit. This allows reuse of the decanted fluids after removal of the settled sediments. Drill cuttings, whether generated with or without drilling fluids, are to be removed with a flat-bottomed shovel and placed in 55-gallon drums with bolt-sealed lids or other appropriate DOT containers, as conditions or volume of IDM dictate.

3.2.3 Well Development and Purge Water

Well development and purge water is removed from monitoring wells to repair damage to the aquifer following well installation, obtain characteristic aquifer groundwater samples, or measure aquifer hydraulic properties. The volume of groundwater to be generated will determine the appropriate container to be used for accumulation of IDM.

For well development and purging, 55-gallon drums are typically an efficient container for accumulation. When larger volumes of water are removed from wells, such as when pumping tests are conducted, the use of large-volume portable tanks such as "Baker Tanks" should be considered for IDM accumulation.

Analytical data for groundwater samples associated with the well development and purge water will be used to assist in characterizing IDM and evaluating disposal options.

3.2.4 Personal Protective Equipment and Disposable Sampling Equipment

Personal protective equipment and clothing (PPE) may include such items as Tyvek coveralls, gloves, booties, and APR cartridges. Disposable sampling equipment may include such items as plastic sheeting, bailers, disposable filters, disposable tubing and paper towels. PPE and disposable sampling equipment that have or may have contacted contaminated media (soil, water, etc.) will be segregated and placed in 55-gallon drums separate from soil and water IDM. Disposition of this type of IDM will be determined by the results of IDM testing of the media in which the PPE and sampling equipment contacted.

3.3 MATERIAL ACCUMULATION

The IDM in containers must be placed in an appropriate designated RCRA container accumulation area at RFAAP, where it is permissible to accumulate such waste. IDM placed into a designated 90-day accumulation area will be properly sealed, labeled and covered. All drums will be placed on pallets.

A secure and controlled waste staging area will be designated by the installation prior the commencement of field sampling activities. Per the facility's requirements as a RCRA large quantity generator, waste accumulation cannot exceed 90 days for materials presumed or shown to be RCRA-designated hazardous wastes; waste which is known not to be RCRA-designated waste should be promptly disposed to municipal waste systems or appropriate facility.

3.3.1 IDM Accumulation Containers

Containers will be DOT-approved (DOT 17H 18/16GA OH unlined) open-head steel drums or other DOT approved container, as appropriate.

Container lids should lift completely off and be secured by a bolt ring (for drum). Order enough containers to accumulate all streams of expected IDM including soil, PPE and disposable sampling equipment, decontamination water, purge water, etc.

Solid and liquid waste streams will not be mixed in a container. PPE and expendable sampling equipment will be segregated from other IDM and placed in different containers than soil. Containers inside containers are not permitted. PPE must be placed directly in a drum not in a plastic bag.

Pallets are often required to allow transport of filled drums to the staging area with a forklift. Normal pallets are 3×4 ft and will hold two to three 55-gallon drums depending on the filled weight. If pallets are required for drum transport or storage, field personnel are responsible for ensuring that the empty drums are placed on pallets before they are filled and that the lids are sealed on with the bolt-tighten ring after the drums are filled. Because the weight of one drum can exceed 500 lbs, under no circumstances should personnel attempt to move the drums by hand.

3.3.2 Container Labeling

Each container that is used to accumulate IDM will be appropriately labeled at the time of accumulation and assigned a unique identification number for tracking purposes. The following information will be written in permanent marker on a drum label affixed on the exterior side at a location at least two-thirds of the way up from the bottom of the drum.

- Facility name.
- Accumulation start date and completion date.
- Site identifier information (SWMU, boring, well, etc.).
- Description of IDM.
- Drum ID No.

4.0 MATERIAL CHARACTERIZATION AND DISPOSAL

IDM will be characterized and tested to determine whether it is a hazardous waste as defined by 40 CFR Part 261 and to determine what disposal options exist in accordance with RCRA regulations and the Virginia Hazardous Waste Management Regulations (VHWMR).

In general, IDM will be considered a hazardous waste if it contains a listed hazardous waste or if the IDM exhibits a characteristic of hazardous waste.

Work plan addenda will identify the appropriate characterization and testing program for IDM based on the following:

- Site-specific conditions related to chemicals of concern, etc.
- The nature and quantity of expected IDM to be generated during site-specific investigations.
- Applicable Federal, State, and local regulations, such as RCRA, VHWMR regulations and policies and procedures, and Army Regulation 200-1.
- RFAAP specific requirements and policies for IDM characterization and disposal at the time of the investigation.

In general, appropriate USEPA SW 846 Test Methods for Evaluating Solid Waste will be used for testing IDM and will be specified in work plan addenda. Other appropriate test methods may be specified by RFAAP in addition to SW 846 Methods that are specific to installation operations, the site of interest (percent explosive content, reactivity, etc.), or requirements for disposal at RFAAP water treatment facilities or publicly owned treatment works.

Responsibility for the final disposal of IDM will be determined before field activities are begun and will be described in work plan addenda. Off-site disposal of IDM will be coordinated with RFAAP (generator) to ensure appropriate disposition. The contractor will coordinate IDM transportation and disposal activities for RFAAP (generator).

At the direction of RFAAP, appropriate waste manifests will be prepared by the USACE contractor or Alliant Techsystems subcontractor for transportation and disposal. Alliant Techsystems or other appropriate RFAAP entity will be listed as the generator and an appointed representative from RFAAP will review and sign the manifest for offsite disposal.

RFAAP will make the final decision on the selection of the transporter, storage, and disposal facility (TSDFs) or recycling facility. RFAAP will provide the contractor a listing of previously used TSDFs for priority consideration. Proposed facilities that are not included on the listing are required to provide a copy of the TSDFs most recent state or federal inspection to the installation. Waste characterization and testing results will be submitted to RFAAP (generator) for review and approval before final disposition of the material.

Hazardous waste: Prior to final disposition, a hazardous waste manifest will be furnished by the TSDF to accompany transport to the disposal facility. Following final disposition, a certificate of disposal will be furnished by the disposal facility. Copies of the manifests and certificates of disposal are to be provided to RFAAP and retained on file by the contractor or subcontractor.

4.0 PRECAUTIONS

- Because the weight of one drum can exceed 500 lbs, under no circumstances should personnel attempt to move drums by hand.
- Refer to the site-specific health and safety plan when managing IDM.

5.0 REFERENCES

Safety Rules for Contractors and Subcontractors, (As Updated). Alliant Techsystems, Incorporated, Radford Army Ammunition Plant.

STANDARD OPERATING PROCEDURE 80.1
DECONTAMINATION

1.0 SCOPE AND APPLICATION

Before leaving the site, all personnel or equipment involved in intrusive sampling or having entered a hazardous waste site during intrusive sampling must be thoroughly decontaminated to prevent adverse health effects and minimize the spread of contamination. Equipment must be decontaminated between sites to preclude cross-contamination. Decontamination water will be free of contaminants as evidenced through either chemical analyses or certificates of analysis. This standard operating procedure (SOP) describes general decontamination requirements for site personnel and sampling equipment. Decontamination procedures for contaminants requiring a more stringent procedure, e.g., dioxins/furans, will be included in site-specific addenda.

2.0 MATERIALS

- Plastic sheeting, buckets or tubs, pressure sprayer, rinse bottles, and brushes;
- U.S. Army Corps of Engineers or installation approved decontamination water source;
- Deionized ultra-filtered, HPLC-grade organic free water (DIUF);
- Non-phosphate laboratory detergent;
- Nitric Acid, 0.1 Normal (N) solution;
- Pesticide-grade solvent, Methanol;
- Aluminum foil;
- Paper towels;
- Plastic garbage bags; and
- Appropriate containers for management of investigation-derived material (IDM).

3.0 PROCEDURE

3.1 SAMPLE BOTTLES

At the completion of each sampling activity the exterior surfaces of the sample bottles must be decontaminated as follows:

- Be sure that the bottle lids are on tight.
- Wipe the outside of the bottle with a paper towel to remove gross contamination.

3.2 PERSONNEL DECONTAMINATION

Review the site-specific health and safety plan for the appropriate decontamination procedures.

3.3 EQUIPMENT DECONTAMINATION

3.3.1 Drilling Rigs

Drilling rigs and associated equipment, such as augers, drill casing, rods, samplers, tools, recirculation tank, and water tank (inside and out), will be decontaminated before site entry, after over-the-road mobilization and immediately upon departure from a site after drilling a hole. Supplementary cleaning will be performed before site entry. There is a likelihood that contamination has accumulated on tires and as spatter or dust en route from one site to the next.

1. Place contaminated equipment in an enclosure designed to contain all decontamination residues (water, sludge, etc.).
2. Steam-clean equipment until all dirt, mud, grease, asphaltic, bituminous, or other encrusting coating materials (with the exception of manufacturer-applied paint) has been removed.
3. Water used will be taken from an approved source.
4. When cross-contamination from metals is a concern, rinse sampling components such as split spoons, geo-punch stems, and augers with nitric acid, 0.1N.
5. Rinse with DIUF water.
6. When semi-volatile and non-volatile organics may be present, rinse the sampling components with pesticide-grade solvent methanol.
7. Double rinse the sampling components with DIUF water.
8. Decontamination residues and fluids will be appropriately managed as IDM per work plan addenda and SOP 80.1.

3.3.2 Well Casing and Screen

Prior to use, well casing and screen materials will be decontaminated. This activity will be performed in the leak proof, decontamination pad, which will be constructed prior to commencement of the field investigation. The decontamination process will include:

- Steam cleaning with approved source water.
- Rinse with DUIF water.
- Air-dry on plastic sheeting.
- Wrap in plastic sheeting to prevent contamination during storage/transit.

3.3.3 Non Dedicated Submersible Pumps Used for Purging and Sampling

1. Scrub the exterior of the pump to remove gross (visible) contamination using appropriate brushes, approved water, and non-phosphate detergent (steam cleaning may be substituted for detergent scrub).
2. Pump an appropriate amount of laboratory detergent solution (minimum 10 gallons) to purge and clean the interior of the pump.
3. Rinse by pumping no less than 10 gallons of approved water to rinse.
4. Rinse the pump exterior with approved decontamination water.
5. When cross-contamination from metals is a concern, rinse the pump exterior with approved nitric acid 0.1N solution.

6. Rinse the pump exterior with DIUF water.
7. When semi-volatile and non-volatile organics may be present, rinse the pump exterior with pesticide-grade solvent methanol.
8. Double rinse the pump exterior with DIUF water.
9. Air-dry on aluminum foil or clean plastic sheeting.
10. Wrap pump in aluminum foil or clean plastic sheeting, or store in a clean, dedicated PVC or PTFE storage container.
11. Solutions and residuals generated from decontamination activities will be managed appropriately as IDM per work plan addenda and SOP 80.1.

3.3.4 Sample Equipment and Measuring Water Level Devices

1. Scrub the equipment to remove gross (visible) contamination using appropriate brush (es), approved water, and non-phosphate detergent.
2. Rinse with approved source water.
3. When cross-contamination from metals is a concern, rinse the sampling equipment with approved nitric acid 0.1N solution.
4. Rinse equipment with DIUF water.
5. When semi-volatile and non-volatile organics may be present, rinse the sampling equipment with pesticide-grade solvent methanol.
6. Double rinse the sampling equipment with DIUF water.
7. Air-dry on aluminum foil or clean plastic sheeting.
8. Wrap in aluminum foil, clean plastic sheeting, or zip top bag or store in a clean, dedicated PVC or PTFE storage container.
9. Solutions and residuals generated from decontamination activities will be managed appropriately as IDM per work plan addenda and SOP 80.1.

3.3.5 Other Sampling and Measurement Probes

Temperature, pH, conductivity, Redox, and dissolved oxygen probes will be decontaminated according to manufacturer's specifications. If no such specifications exist, remove gross contamination and triple-rinse probe with DIUF water.

4.0 PRECAUTIONS

- Manage IDM appropriately according to the requirements specified in work plan addenda.
- Follow appropriate procedures as specified in the site-specific health and safety plan.

5.0 REFERENCES

USACE. 2001. Requirements for the Preparation of Sampling and Analysis Plans. EM 200-1-3. 1 February.

STANDARD OPERATING PROCEDURE 90.1
PHOTOIONIZATION DETECTOR (HNu Model PI–101 and HW–101)

1.0 SCOPE AND APPLICATION

The purpose of this standard operating procedure (SOP) is to delineate protocols for field operations with a photoionization detector (HNu Systems Model PI–101 or HW–101). The photoionization detector (PID) detects total ionizables; hence it is used to monitor both organic and inorganic vapors and gases to determine relative concentrations of air contaminants. This information is used to establish level of protection and other control measures such as action levels. The PID cannot effectively detect compounds having ionization potentials above the photon energy level of the lamp used; therefore, methane, which has an ionization potential of 12.98 eV, is undetectable by PIDs because the lamps produce 9.5, 10.2, or 11.7 eV.

Use of brand names in this SOP is in not intended as an endorsement or mandate that a given brand be used. Alternate equivalent brands of detectors, sensors, meters, etc., are acceptable. If alternate equipment is to be used, the contractor shall provide applicable and comparable SOPs for its maintenance and calibration.

2.0 MATERIALS

- HNu Systems Model PI–101 or HW–101 survey probe with 9.5, 10.2, or 11.7 eV lamp;
- Lead-acid gel-cell battery;
- Calibration gas (e.g., isobutylene, 101 ppm) with regulator;
- Tygon tubing;
- Tedlar bag (optional);
- Instrument logbook; and
- Field logbook.

3.0 PROCEDURE

These procedures are to be followed when using the HNu in the field.

3.1 STARTUP

1. Before attaching the probe, check the function switch on the control panel to ensure that it is in the off position. Attach the probe by plugging it into the interface on the top of the readout module.
2. Turn the function switch to the battery check position. The needle on the meter should read within or above the green battery arc on the scale; if not, recharge the battery. If the red indicator light comes on, the battery needs recharging or service may be indicated.
3. Turn the function switch to any range setting. Listen for the hum of the fan motor. Check meter function by holding a solvent-based marker pen near the sample intake. If there is no needle deflection, look briefly into the end of the probe (no more than 1 or 2 sec) to see if the lamp is on; if it is on, it will give a purple glow. Do not stare into the probe any longer than 2 sec. Long-term exposure to UV light can damage the eyes. (See further information in Section 5.)
4. To zero the instrument, turn the function switch to the standby position and rotate the zero adjustment until the meter reads zero. A calibration gas is not needed since this is an electronic zero adjustment. If the span adjustment setting is changed after the zero is set, the zero should be rechecked and adjusted if

necessary. Allow the instrument to warm up for 3–5 min to ensure that the zero reading is stable. If necessary, readjust the zero.

3.2 OPERATIONAL CHECK

Follow the startup procedure in Section 3.1.

With the instrument set on the 0–20 range, hold a solvent-based marker near the probe tip. If the meter deflects upscale, the instrument is working.

3.3 FIELD CALIBRATION PROCEDURE

1. Follow the startup procedures in Section 3.1 and the operational check in Section 3.2.
2. Set the function switch to the range setting for the concentration of the calibration gas.
3. Attach a regulator HNu P/N 101-351 or equivalent (flow = 200 to 300 ml/min) to a disposable cylinder of isobutylene (HNu 101-351 or equivalent). Connect the regulator to the probe of the HNu with a piece of clean Tygon tubing. Turn on the valve of the regulator.
4. After 5 sec, adjust the span dial until the meter reading equals the benzene concentration of the calibration gas used, corrected to its equivalence, which should be marked on the canister (Isobutylene ~0.7X benzene).
5. Record in the field log the instrument ID No., serial No., initial and final span settings, date, time, location, concentration and type of calibration gas used, and the signature of the person who calibrated the instrument.
6. If the HNu does not function or calibrate properly, the project equipment manager is to be notified as soon as possible. Under no circumstances is work requiring monitoring with a PI–101 or HW–101 to be done with a malfunctioning instrument.

3.4 CALIBRATION TO A GAS OTHER THAN ISOBUTYLENE

The HNu may be calibrated to any certified calibration gas. However, after calibration, all subsequent instrument readings will be relative to the calibration gas used. General procedures include the following:

1. Calibrate according to procedure 3.3.
2. Partially fill and flush one-to-two times a gas bag (Tedlar recommended) with the certified National Institute of Standards and Technology (NIST) (formerly NBS) traceable calibration gas. Then fill the bag with 1–3L of the calibration gas. If the gas is toxic, this must be done in a fume hood.
3. Feed the calibration gas into the probe with the range set for the value of the gas. After 5 sec, adjust the span control until the meter reads the value of the calibration gas.
4. Record the results of the calibration on the calibration/maintenance log and attach a new calibration sticker (if available) or correct the existing sticker to reflect the new calibration data. All subsequent readings will be relative to the new calibration gas.

3.5 OPERATION

1. Follow the startup procedure, operational check, and calibration check (refer to Section 3.1).
2. Set the function switch to the appropriate range. If the concentration of gas vapors is unknown, set the function switch to 0-20 ppm range. Adjust if necessary.
3. Prevent exposing the HNu to excessive moisture, dirt, or contaminant while monitoring the work activity as specified in the Site Health and Safety Plan.

4. When the activity is completed, or at the end of the day, carefully clean the outside of the HNu with a damp disposable towel to remove all visible dirt. Return the HNu to a secure area and place on charge. Charge after each use; the lead acid batteries cannot be ruined by over charging.
5. With the exception of the probe's inlet and exhaust, the HNu can be wrapped in clear plastic to prevent it from becoming contaminated and to prevent water from getting inside in the event of precipitation. If the instrument becomes contaminated, make sure to take necessary steps to decontaminate it. Call the Equipment Administrator if necessary; under no circumstances should an instrument be returned from the field in a contaminated condition.

4.0 MAINTENANCE

Calibration/maintenance logs are to be filled in completely whenever a PI-101 or HW-101 receives servicing. This is true of both contractor-owned and rental instruments.

The equipment manager should be called to arrange for a fresh instrument when necessary. The contractor's equipment facility is responsible for arranging all repairs that cannot be performed by the project equipment manager.

4.1 ROUTINE SERVICE

The PID's performance is affected by a number of factors. These include but are not limited to the decay of the UV lamp output over time and the accumulation of dust and other particulate material and contaminates on the lamp and in the ion chamber. Because of these factors, the PID should not be left in the field for a period of more than 2 weeks before being replaced with a fresh instrument. If a site is going to be inactive for a period of more than a week, all monitoring instruments are to be returned to the project equipment manager or his trained designee for servicing and/or reassignment. The following procedures are to be performed at the designated intervals for routine service.

Procedure	Frequency
Operational check	Before use and at instrument return
Field calibration	Before use and at instrument return
Full calibration	Bi-weekly (return instrument to equipment manager for replacement with a fresh unit)
Clean UV lamp and	Bi-weekly or as needed ion chamber
Replace UV Lamp	As needed

4.1.1 UV Lamp and Ion Chamber Cleaning

During periods of analyzer operation, dust and other foreign materials are drawn into the probe forming deposits on the surface of the UV lamp and in the ion chamber. This condition is indicated by meter readings that are low, erratic, unstable, non-repeatable, or drifting and show apparent moisture sensitivity. These deposits interfere with the ionization process and cause erroneous readings. Check for this condition regularly to ensure that the HNu is functioning properly. If the instrument is malfunctioning, call your equipment manager to arrange to have a fresh replacement.

4.1.2 Lamp eV Change

If different applications for the analyzer would require different eV lamps, separate probes, each with its own eV lamp, must be used. A single readout assembly will serve for any of the probes (9.5, 10.2, and 11.7 eV). A change in probe will require resetting of the zero control and recalibrating the instrument. The 11.7 eV

lamp will detect more compounds than either of the two lower eV lamps. However, the 11.7 eV probe needs more frequent calibration; it burns out much faster than the lower eV lamps.

5.0 PRECAUTIONS

- The HNu PI–101 and HW–101 are designed to sample air or vapors only. *Do not allow any liquids or low boiling vapors to get into the probe or meter assembly.*
- High concentrations of any gas can cause erroneous readings. High humidity can also cause the instrument readings to vary significantly from the actual concentration of gases or vapors present. This is true even through the HNu cannot react to water vapor.
- High humidity, dust, and exposure to concentrations of low boiling vapors will contaminate the ion chamber, causing a steady decrease in sensitivity.
- Continued exposure to ultraviolet light generated by the light source can be harmful to eyesight. If a visual check of the UV lamp is performed *do not look at the light source from a distance closer than 6 inches with unprotected eyes.* Use eye protection (UV-blocking sunglasses or safety glasses). Only look briefly—never more than about 2 sec.
- Place the instrument on charge after each use; the lead batteries cannot be ruined by over charging.
- If at any time the instrument does not check out or calibrate properly in the field, the equipment manager is to be notified immediately and a replacement obtained for the malfunctioning instrument. Under no circumstances should fieldwork requiring continuous air monitoring for organic vapors and/or gases be done with a malfunctioning Hnu or without a HNu or an approved comparable instrument.

6.0 REFERENCES

Manufacturer's Equipment Manual.

APPENDIX C

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APPENDIX C
List of Sub-Appendices

Appendix C.1 – Physical Soil Sample Results

Appendix C.2 – SSP Boring Logs

Appendix C.3 – RFI Field Sampling Data Sheets

Appendix C.4 – Investigation-Derived Material Analytical Results

Appendix C.5 – Sample Location Coordinates

Appendix C.6 – Soil Loss Calculations

Appendix C.7 – Site-Specific SSL and SESOIL Calculations

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APPENDIX C.1

PHYSICAL SOIL SAMPLE RESULTS

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APPENDIX C.1-1

SSP PHYSICAL SOIL SAMPLE RESULTS

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Radford Army Ammunition Plant

LABORATORY TESTING DATA SUMMARY

BORING NO.	DEPTH (ft)	IDENTIFICATION TESTS													PERMEABILITY (cm/sec)	REMARKS
		WATER CONTENT (%)	LIQUID LIMIT	PLASTIC LIMIT	PLAS. IND.	USCS SYMB. (1)	SIEVE MINUS NO. 200 (%)	HYDROMETER % MINUS 2 μm (%)	ORGANIC CONTENT (burnoff) (%)	pH		TOTAL UNIT WEIGHT (pcf)	DRY UNIT WEIGHT (pcf)	SPECIFIC GRAVITY		
										Distilled Water	0.01 M CaCl Solution					
13SB10	2-3	29.6		np		SM	28.6		3.5	6.9	6.6	115.9	89.4	2.688	1.3E-5	
13SB7	12.7	16.0				GC	13.3		1.1	6.3	6.2	130.0	112.0	2.711		
37SB1	6-6.5	21.8	22	18	4	SC-SM	43.0		1.5	6.3	6.0	130.1	106.8	2.677	1.6E-7	
37SB2	15.5-16	17.0				SM	33.7		1.6	5.1	5.4	122.7	104.9	2.746	2.3E-4	
38SB1	7	20.9				SM	34.8		1.7	7.1	6.6	125.8	104.1	2.713		
38SB2	15.5	3.7				SM	13.8		1.1	6.8	6.3	116.0	111.9	2.702	2.0E-3	
46SB1	14.5	24.5	32	18	14	SC	50.0	23	2.2	5.7	5.9	127.5	102.4	2.729	3.0E-8	
46SB2	9.5-10	20.4				SM	26.9		1.8	6.2	5.7	123.4	102.5	2.735		
57SB2	7.5-8	28.4				CL-ML	70.2		2.6	5.6	3.9	94.1	73.3	2.701		
57SB3	16.5-17	46.4	83	29	54	CH	89.6	46	3.6	5.3	*	106.4	72.7	2.694	1.8E-7	
68SB2	18-18.5	30.4				CL-ML	54.9		1.5	6.8	6.2	100.2	76.8	2.680		
68SB3	7-7.5	35.8	49	29	20	ML	75.9	26	3.6	5.2	3.8	115.4	85.0	2.744	1.9E-6	
69SB1	11-12	34.1	34	19	15	CL	74.1		3.3	9.5	7.8	128.2	95.6	2.688		
69SB3	7.5-8.5	32.7				CL	77.7		3.5	7.1	6.0	117.7	88.7	2.707	6.6E-9	
ASB1	22-24	36.6	63	30	33	CH	58.8		3.6	4.2	3.8	115.6	84.7	2.735		
ASB2	14-16	43.4	56	35	21	MH	78.4		2.5	4.3	3.9	110.2	76.8	2.662	6.7E-7	
FSB1	18.5-19	30.6	47	20	27	CL	79.2	30	1.4	7.1	*	119.2	91.2	2.628	8.6E-8	
FSB2	7.5-8	15.6				SM	19.9		1.4	6.8	6.3	111.0	96.1	2.807		
QSB1	9.5-10	26.4	31	21	10	CL	52.6		1.8	6.4	6.5	123.8	97.9	2.717	1.2E-7	
QSB2	24	6.2				GP	3.9		0.6	6.4	6.2	121.6	114.6	2.692		

Note: (1) CS symbol based on visual observation and Sieve and Atterberg limits reported.

TABLE _____

Radford Army Ammunition Plant

SUMMARY OF LABORATORY PERMEABILITY TESTS PERFORMED ON RECONSTITUTED SAMPLES

BORING NO.	SAMPLE NO.	DEPTH	WATER CONTENTS	TOTAL UNIT WGTS	DRY UNIT WGTS	STRESSES	DURING CONSOL.	DURING TEST	COEFFICIENT OF PERM. K,	REMARKS
			INITIAL	INITIAL	INITIAL	EFFECTIVE	TIME	PERMEANT	(@ 20 C)	
			PRE-TEST	PRE-TEST	PRE-TEST	BACK PRESSURE	VOLUMETRIC STRAIN	INITIAL GRADIENT		
		(ft)	(%)	(pcf)	(pcf)	(psi)	(days, %)		(cm/sec)	
13SB10		2-3	29.6	115.9	89.4	5.0	over night	tap water	1.3E-5	P6775
			33.2	122.9	92.3	100.0	3.2	18		
37SB1		6-6.5	21.8	130.1	106.8	5.0	over night	tap water	1.6E-7	P6776
			20.5	131.7	109.3	100.0	2.3	21		
37SB2		15.5-16	17.0	122.7	104.9	5.0	over night	tap water	2.3E-4	P6779
			23.9	130.3	105.2	100.0	0.3	4		
38SB2		15.5	3.7	116.0	111.9	5.0	over night	tap water	2.0E-3	P6785
			18.2	133.7	113.1	100.0	1.1	1		
46SB1		14.5	24.5	127.5	102.4	5.0	over night	tap water	3.0E-8	P6782
			24.4	127.8	102.8	100.0	0.4	23		
57SB3		16.5-17	46.4	106.4	72.7	5.0	over night	tap water	1.8E-7	P6783
			48.3	108.4	73.0	100.0	0.5	21		
68SB3		7-7.5	35.8	115.4	85.0	5.0	over night	tap water	1.9E-6	P6780
			36.5	116.8	85.6	100.0	0.8	18		not recon.
69SB3		7.5-8.5	32.7	117.7	88.7	5.0	over night	tap water	6.6E-9	P6773
			32.2	121.4	91.8	100.0	3.4	39		
ASB2		14-16	43.4	110.2	76.8	5.0	over night	tap water	6.7E-7	P6774
			42.0	111.4	78.4	100.0	2.1	16		
FSB-1		18.5-19.0	30.6	119.2	91.2	5.0	over night	tap water	8.6E-8	P6784
			28.8	120.8	93.8	100.0	2.7	23		
QSB1		9.5-10	26.4	123.8	97.9	5.0	over night	tap water	1.2E-7	P6781
			24.6	126.7	101.7	100.0	3.7	22		

PERMEABILITY TEST: FALLING HEAD - CONSTANT VOLUME U-TUBE

ASTM D 5084 - 90

Project No.: 31737767 BORING: 13SB10 Test No.: P6775

Project Name: Radford Army Ammunition Plant SAMPLE: DEPTH (ft): 2-3

Specimen - Apparatus set-up - Test Information Cell No. 5 Apparatus No. 4 Stage No.: 2

Preliminary Length/Area Calculations

Lo = 3.035 in Lo= 7.709 cm

dLc= 0.032 in Ao = 19.83 cm^2

Lc= 3.003 in Vo = 152.91 cm^3

Lc= 7.628 cm

dVc = 3 Vo * (dLc/Lo) dVc= 4.84 cm^3

Vc = 148.07 cm^3

Sc = 0.393 cm^{-1} Ac= 19.412 cm^2

1) Specimen Tested in :	x	Triaxial Cell or		Compaction Mold or		
	x	with stones or		Stones with filter paper or		top + bottom
2) Specimen orientation for:	x	Vertical or		Horizontal permeability determination		
3) During saturation: Water flushed up sides of specimen to remove ai	x	No		Yes		
4) During consolidation:	x	Top and bottom drainage or		Top		Bottom only
5) Direction of permeant :	x	Up during or		Down during permeation		
6) Permeant: water used	x	Tap		Distilled		
or		Demineralized		0.005 N calcium sulfate (CaSO4)		

Equations Used

Kt = - 0.0000750 * Sc/dT(min) * ln (ho/hf)

RT = (-0.02452*(ave. temp in C) + 1.495)

K @ 20 ºC = RT * Kt TubeC= 1.3181

TEST SUMMARY

Final Specimen and Test Conditions

Lc = 7.628 cm ε_{axial} = 1.1%

Ac = 19.415 cm^2

Vc= 148.09 cm^3 ε_{vol} = 3.2%

Sc = 0.393 cm^{-1} Sc = Lc / Ac , final

	w (%)	γ_τ (pcf)	γ_d (pcf)	S (%)
Initial	29.62	115.9	89.4	83.8
PreTest	33.17	122.9	92.3	100.0

HYDRAULIC CONDUCTIVITY SUMMARY

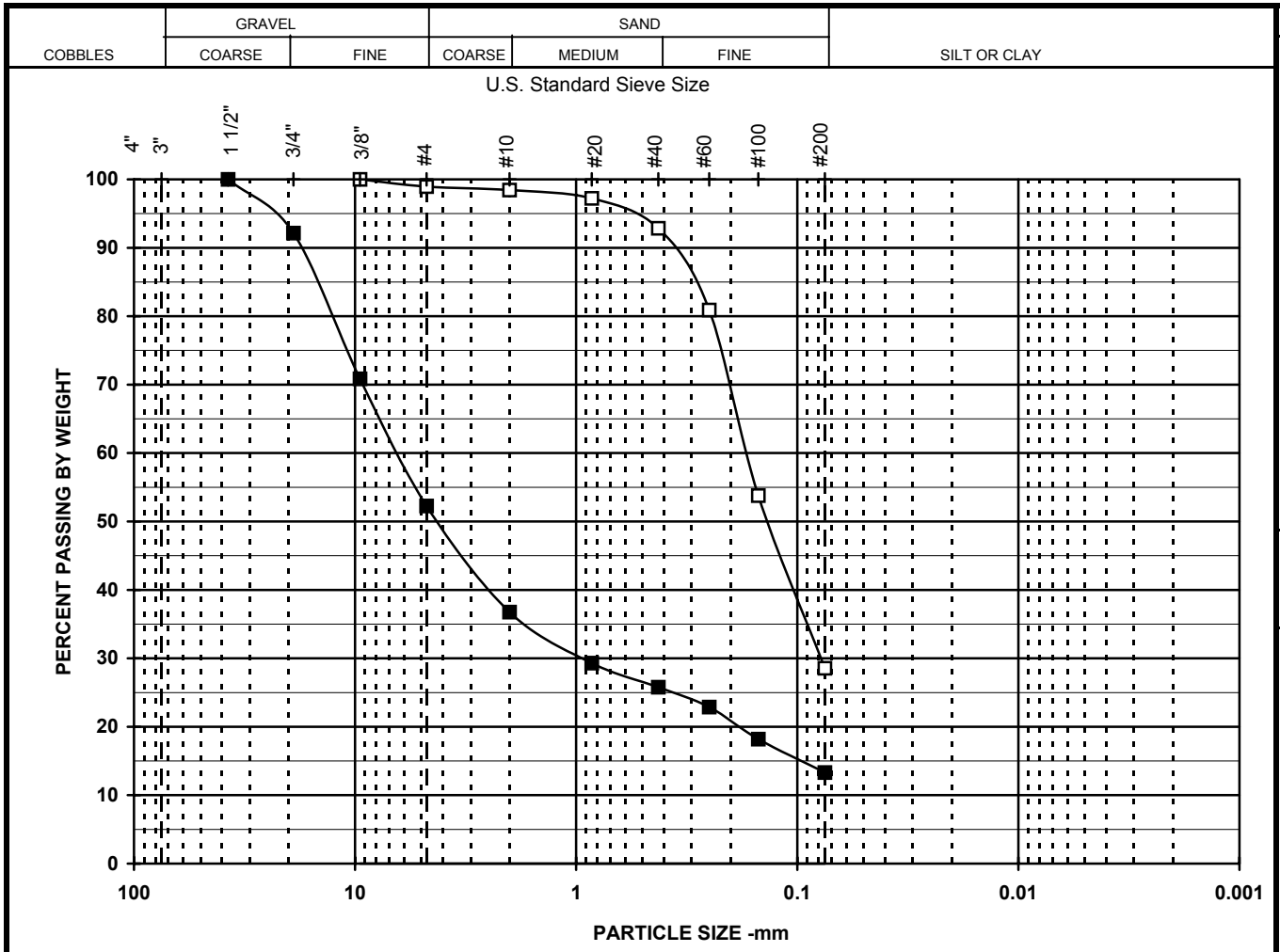
Averages for trials: 1-4

ave K @ 20 ºC: **1.28E-05** cm/sec

(i_o)ave = 17.5

Tested By: DT Reviewed By: G. Thomas

Consol Stage-Trial No.	Temp. ° C	Date	Time hr	Time min	Time sec	Initial σ_c psi	Initial Ub psi	U-tube Reading Head (cm) (cc)	U-tube Reading Tail (cm) (cc)	Flow in/out gradient	Preliminary Final at 20ºC cm/sec Dev. from Ave.
initial	22.2	10/31/03	00	00	00	105.0	100.0	57.00	46.37	1.01	1.35E-05
final	22.2	10/31/03	00	01	30			53.00	47.63		1.28E-05
1	RT = 0.951	dT =		1.50 min		σ'_c =	0.7 ksf	0.298	0.295	io= 17.5	0%
initial	22.2	10/31/03	00	00	00	105.0	100.0	57.00	46.37	1.01	1.35E-05
final	22.2	10/31/03	00	01	30			53.00	47.63		1.28E-05
2	RT = 0.951	dT =		1.50 min		σ'_c =	0.7 ksf	0.298	0.295	io= 17.5	0%
initial	22.2	10/31/03	00	00	00	105.0	100.0	57.00	46.37	1.01	1.35E-05
final	22.2	10/31/03	00	01	30			53.00	47.63		1.28E-05
3	RT = 0.951	dT =		1.50 min		σ'_c =	0.7 ksf	0.298	0.295	io= 17.5	0%
initial	22.2	10/31/03	00	00	00	105.0	100.0	57.00	46.37	1.01	1.35E-05
final	22.2	10/31/03	00	01	30			53.00	47.63		1.28E-05
4	RT = 0.951	dT =		1.50 min		σ'_c =	0.7 ksf	0.298	0.295	io= 17.5	0%



SYMBOL	DESCRIPTION AND REMARKS
□	brown m-f SAND, some silt, trace f. gravel, c. sand.
■	brown c-f sandy GRAVEL, some clay.
○	

Symbol	□	■	○
Boring	13SB10	13SB7	
Sample			
Spec			
Depth	2-3	12.7	
% +3"			
% Gravel	1.1	47.7	
% SAND	70.3	39.0	
% FINES	28.6	13.3	
% -2μ			
Cc			
Cu			
LL			
PL	np		
PI			
USCS	SM	GC	
w (%)		16.0	

Particle Size	PERCENT FINER		
(Sieve #)	□	■	○
4"			
3"			
1 1/2"		100.0	
3/4"		92.1	
3/8"	100.0	70.9	
4	98.9	52.3	
10	98.4	36.7	
20	97.2	29.3	
40	92.9	25.8	
60	80.9	22.9	
100	53.8	18.2	
200	28.6	13.3	

PARTICLE SIZE DISTRIBUTION

Radford Army Ammunition Plant

Project No.		
31737767	December 2003	Figure

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APPENDIX C.1-2

RFI PHYSICAL SOIL SAMPLE RESULTS

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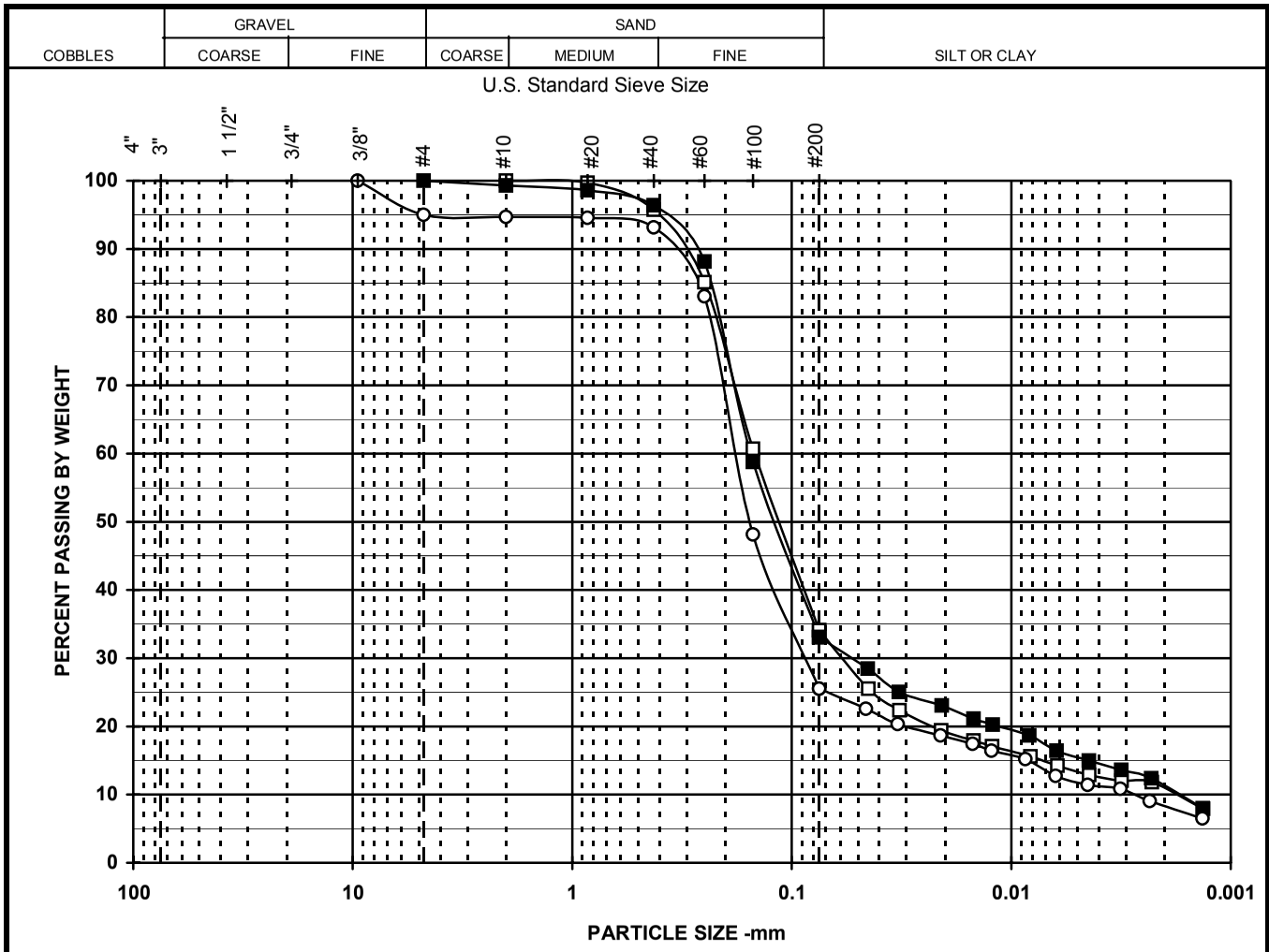
RFAAP SWMU 13 RFI

LABORATORY TESTING DATA SUMMARY

BORING NO.	SAMPLE NO.	DEPTH (ft)	IDENTIFICATION TESTS									REMARKS
			WATER CONTENT (%)	LIQUID LIMIT (-)	PLASTIC LIMIT (-)	PLAS. INDEX (-)	USCS SYMB. (1)	SIEVE MINUS NO. 200 (%)	HYDROMETER % MINUS 2 μm (%)	pH Distilled Water	pH 0.01 M CaCl Solution	
13	SB13A	0-0.5	12.3	np	np	np	SM	34.1	11	6.3	5.6	
13	SB16A	0-0.5	23.9	np	np	np	SM	33.1	11	5.9	5.4	
13	SB16C	1.5-2.0										
13	SB18A	0-0.5	16.9	np	np	np	SM	25.5	8	6.5	5.6	
13	SB19C	1.5-1.8										

Note: (1) USCS symbol based on visual observation and Sieve and Atterberg limits reported.



SYMBOL	DESCRIPTION AND REMARKS
□	brown silty fine SAND, tr. m. sand
■	brown silty fine SAND, tr. m. sand
○	brown fine SAND, some silt, trace f. gravel, m. sand

Symbol	□	■	○
Boring	13	13	13
Sample	SB13A	SB16A	SB18A
Spec			
Depth	0-0.5	0-0.5	0-0.5
% +3"			
% Gravel			5.0
% SAND	65.9	66.9	69.5
% FINES	34.1	33.1	25.5
% -2μ	11	11	8
Cc			
Cu			
LL	np	np	np
PL			
PI			
USCS	SM	SM	SM
w (%)	12.3	23.9	16.9

Particle Size	PERCENT FINER		
(Sieve #)	□	■	○
4"			
3"			
1 1/2"			
3/4"			
3/8"			100.0
4		100.0	95.0
10	100.0	99.3	94.7
20	99.7	98.6	94.5
40	95.7	96.4	93.1
60	85.1	88.1	83.1
100	60.7	58.7	48.1
200	34.1	33.1	25.5

PARTICLE SIZE DISTRIBUTION

RFAAP SWMU 13 RFI

Project No.		Figure
11656367	December 2008	

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http://njaes.rutgers.edu/services
Soil Testing Laboratory
ASB-II, Room 152
New Jersey Agricultural Experiment Station
Rutgers, The State University of New Jersey
57 US Highway 1
New Brunswick, NJ 08901

Plant Diagnostic and Soil Testing Laboratories

soiltest@aesop.rutgers.edu

732-932-7000, Ext. 4231
Fax: 732-932-9292

Soil Test Research Report

U R S Corporation
Gregory Thomas
45 J Commerce Way
Totowa, NJ 07512

Date Reported: 03/19/2009

LabNo	Sample ID	
0465	S B 13A	Cation Exchange Capacity: 5.8 meq/100g
0466	S B 16A	Cation Exchange Capacity: 8.8 meq/100g
0467	S B 16C	Cation Exchange Capacity: 8.2 meq/100g
0468	S B 18A	Cation Exchange Capacity: 2.7 meq/100g
0469	S B 19C	Cation Exchange Capacity: 3.4 meq/100g

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APPENDIX C.2

SOIL SCREENING PROCESS BORING LOGS

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Project: Radford Army Ammunition Plant- SSP Project Location: Radford, Virginia Project Number: 09604-317	Log of Borehole 13SB7 Sheet 1 of 1

Date(s) Drilled	10-09-03 0940-1015	Logged By	J. Spangler	Reviewed By	C. Lawrence
Drilling Method	Geoprobe - Direct Push Technology	Drilling Contractor	Richard Simmons Drilling	Total Depth of Borehole	12.7 feet
Drill Rig Type	Tractor- mounted Geoprobe	Drill Bit Size/Type	4 ft x 2 in Rectractable Macrocore Sampler	Ground Surface Elevation	
Groundwater Level(s)	12.5 ft bgs during drilling	Sampling Method	4 ft x 2 in Macrocore Sampler with Liner	Hammer Data	NA
Borehole Backfill	Bentonite Pellets	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	Number	Recovery (feet)	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0				ND			7.5YR 3/3 dark brown, Silty Sand, very fine, slightly moist, loose, micaceous, homogeneous	Sample 13SB7A collected 0.0-1.0 ft bgs
	1				ND				
	2		1	3.6	ND		SM		
	3				ND				
	4				ND				
	5				ND				
							SP	7.5YR 4/4 brown, Sand, medium, slightly moist, loose	Sample 13SB7B collected 5.0-6.0 ft bgs
	6		2	2.7	ND			7.5YR 3/4 dark brown, Silty Sand, very fine, moist, micaceous, loose to moderately dense	
	7				ND				
	8				ND		SM		
	9				ND				
	10		3	4.0	ND				Sample 13SB7C, MS, MSD collected 10.0-12.0 ft bgs
	11				ND			Decomposed wood chips at 10.9 ft bgs	
							SM	7.5YR 4/4 brown, Silty Sand, fine, moist	
	12				ND		GC	7.5YR 4/4 brown, Silty Gravel, moist	
			4	0.3				Groundwater at 12.5 ft bgs ▽	
	13							Boring Refusal 12.7 ft bgs	
	14								
	15								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_SSP.GPJ; 12/8/2003 13SB7

URS

Project: Radford Army Ammunition Plant- SSP
Project Location: Radford, Virginia
Project Number: 09604-317

Log of Borehole 13SB8

Sheet 1 of 1

Date(s) Drilled	10-09-03 1515-1530	Logged By	J. Spangler	Reviewed By	C. Lawrence
Drilling Method	Hand Auger	Drilling Contractor	URS Group, Inc.	Total Depth of Borehole	3.9 feet
Drill Rig Type	NA	Drill Bit Size/Type	3-inch Hand Auger	Ground Surface Elevation	
Groundwater Level(s)	3.7 ft bgs during drilling	Sampling Method	Stainless-Steel 3-inch Hand Auger	Hammer Data	NA
Borehole Backfill	Bentonite Pellets	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (feet)	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0			1.0				5YR 4/4 reddish brown, Silty Sand, fine, moist, loose, micaceous	Sample 13SB8A collected 0.0-1.0 ft bgs
	1			1.0	ND		SM	Increasing moisture with depth	
	2			1.0				Rounded Gravel, fine to coarse, 2.0-3.0 ft bgs	
	3			0.9	ND			Groundwater at 3.7 ft bgs ▽	Sample 13SB8B collected 3.5-3.7 ft bgs
	4							Boring Refusal 3.9 ft bgs	
	5								
	6								
	7								
	8								
	9								
	10								

URS

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_SSP.GPJ; 12/8/2003 13SB8

Project: Radford Army Ammunition Plant- SSP
Project Location: Radford, Virginia
Project Number: 09604-317

Log of Borehole 13SB9

Sheet 1 of 1

Date(s) Drilled	10-09-03 1350-1430	Logged By	J. Spangler	Reviewed By	C. Lawrence
Drilling Method	Hand Auger	Drilling Contractor	URS Group, Inc.	Total Depth of Borehole	4.0 feet
Drill Rig Type	NA	Drill Bit Size/Type	3-inch Hand Auger	Ground Surface Elevation	
Groundwater Level(s)	NA	Sampling Method	Stainless-Steel 3-inch Hand Auger	Hammer Data	NA
Borehole Backfill	Bentonite Pellets	Comments			

Elevation, feet / Downhole Depth, feet	SAMPLES: Type / Number	SAMPLES: Recovery (feet)	SAMPLES: PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
0					SM	5YR 3/3 dark reddish brown, Silty Sand, very fine, moist, micaceous, loose	Sample 13SB9A, MS, MSD, and SBD9 collected 0.0-1.0 ft bgs
1					SM	7.5YR 4/6 strong brown, Silty Sand, fine to medium, moist	Sample 13SB9B collected 1.5-2.0 ft bgs
2							
3					GM	Silty Gravel with sand, moist	Sample 13SB9C collected 3.5-4.0 ft bgs
4						Boring Refusal 4.0 ft bgs	
5							
6							
7							
8							
9							
10							

URS

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_SSP.GPJ; 12/8/2003 13SB9

Project: Radford Army Ammunition Plant- SSP
Project Location: Radford, Virginia
Project Number: 09604-317

Log of Borehole 13SB10

Sheet 1 of 1

Date(s) Drilled	10-09-03 1300-1330	Logged By	J. Spangler	Reviewed By	C. Lawrence
Drilling Method	Hand Auger	Drilling Contractor	URS Group, Inc.	Total Depth of Borehole	4.8 feet
Drill Rig Type	NA	Drill Bit Size/Type	3-inch Hand Auger	Ground Surface Elevation	
Groundwater Level(s)	NA	Sampling Method	Stainless-Steel 3-inch Hand Auger	Hammer Data	NA
Borehole Backfill	Bentonite Pellets	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (feet)	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0							10YR 3/3 dark brown, Silty Sand, fine, dry to slightly moist, loose, micaceous	Sample 13SB10A collected 0.0-1.0 ft bgs
				1.0					
	1				ND			7.5YR 4/4 brown, 1.0-2.0 ft bgs	
				1.0					
	2						SM	10YR 3/4 dark yellowish brown, 2.0-3.0 ft bgs	Sample 13SB10B collected 2.5-3.0 ft bgs
				1.0					
	3				ND			Silt and moisture increases with depth	
				1.0				3.5-4.8 ft bgs, 10YR 3/4 dark yellowish brown, moist	
	4								Sample 13SB10C collected 4.5-4.8 ft bgs
				0.8					
	5							Boring Refusal 4.8 ft bgs	
	6								
	7								
	8								
	9								
	10								

URS

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_SSP.GPJ; 12/8/2003 13SB10

Project: Radford Army Ammunition Plant- SSP Project Location: Radford, Virginia Project Number: 09604-317	Log of Borehole 13SB11 Sheet 1 of 1

Date(s) Drilled	10-09-03 1215-1245	Logged By	J. Spangler	Reviewed By	C. Lawrence
Drilling Method	Hand Auger	Drilling Contractor	URS Group, Inc.	Total Depth of Borehole	8.6 feet
Drill Rig Type	NA	Drill Bit Size/Type	3-inch Hand Auger	Ground Surface Elevation	
Groundwater Level(s)	NA	Sampling Method	Stainless-Steel 3-inch Hand Auger	Hammer Data	NA
Borehole Backfill	Bentonite Pellets	Comments			

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (feet)	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0			1.0	ND		ML	7.5YR 4/4 brown, Sandy Silt, very fine, slightly moist, loose, micaceous	Sample 13SB11A collected 0.0-1.0 ft bgs
	1			1.0			SM	7.5YR 4/2 brown, Silty Sand with gravel	
	2			1.0			SM	7.5YR 4/2 brown, Silty Sand Metal fragment/wire found 2.5 ft bgs	
	3			1.0	ND				
	4			1.0					Sample 13SB11B collected 4.5-5.0 ft bgs
	5			1.0	ND		SC	7.5YR 5/6 strong brown, Clay Sand, silty, very fine, slightly moist, plastic	
	6			1.0			SM	5YR 4/6 yellowish red, Silty Sand, very fine, slightly moist, micaceous, loose	
	7			1.0	ND		ML	5YR 4/6 yellowish red, Silt, trace medium sand, soft, micaceous, cohesive	
	8			0.6					Sample 13SB11C collected 8.0-8.5 ft bgs
	9							Boring Refusal 8.6 ft bgs	
	10								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_SSP.GPJ; 12/8/2003 13SB11

URS

Project: Radford Army Ammunition Plant- SSP
Project Location: Radford, Virginia
Project Number: 09604-317

Log of Borehole 13SB12

Sheet 1 of 1

Date(s) Drilled	10-09-03 1045-1115	Logged By	J. Spangler	Reviewed By	C. Lawrence
Drilling Method	Hand Auger	Drilling Contractor	URS Group, Inc.	Total Depth of Borehole	4.0 feet
Drill Rig Type	NA	Drill Bit Size/Type	3-inch Hand Auger	Ground Surface Elevation	
Groundwater Level(s)	NA	Sampling Method	Stainless-Steel 3-inch Hand Auger	Hammer Data	NA
Borehole Backfill	Bentonite Pellets	Comments	Boring located inside settling lagoon		

Elevation, feet	Downhole Depth, feet	SAMPLES Type	SAMPLES Number	Recovery (feet)	PID (ppm)	Graphic Log	Lithologic Log (USCS Code)	MATERIAL DESCRIPTION	FIELD NOTES
	0			1.0			SP/SM	7.5YR 4/4 brown, Sand, medium, trace silt, moist, loose	Sample 13SB12A collected 0.0-1.0 ft bgs
	1			1.0	ND			sand grades to fine with increasing silt 1.0-2.0 ft bgs 1.0-2.0 ft bgs, micaceous	
	2			1.0			ML	7.5YR 2.5/1 black, Silt with trace fine sand, very moist	Sample 13SB12B and SBD8 collected 2.0-3.0 ft bgs
	3			1.0	ND			3.0-4.0 ft bgs, Color grades to 7.5YR 3/1 very dark gray; sand grades fine to coarse Groundwater at 4.0 ft bgs ▽	Sample 13SB12C collected 3.5-4.0 ft bgs
	4							Boring terminated at 4.0 ft bgs	
	5								
	6								
	7								
	8								
	9								
	10								

Report: ENV_12AS_CLEVELAND+/-USCS; File: RFAAP_SSP.GPJ; 12/8/2003 13SB12

URS

APPENDIX C.3

RCRA FACILITY INVESTIGATION
FIELD SAMPLING DATA SHEETS

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Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:		Sampling Team:	MF,BF,KH,HA

Sample ID: 135B13A Sample Collection Time: 1100

Sampling Device: Hand Auger Depth (top): 0.0.5ft

Depth Interval: .5

Sample Containers/Preservatives

Pb (6010B)

SVOC (8270C) ✓

NG (8332) ✓

Expl (8330) ✓

Metals (6010B/6020) ✓ TOC

Physical Analysis:

PID Reading:

Comments: sandy-silt w/ organics, no odor, slightly moist, medium brown 7.5yr 2.5/3

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):

Depth Interval:

Sample Containers/Preservatives

Pb (6010B)

SVOC (8270C)

NG (8332)

Expl (8330)

Metals (6010B/6020)

Physical Analysis:

PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Sample ID: 135B13C Sample Collection Time: 1018

Sampling Device: Hand Auger Depth (top): 5-6ft.

Depth Interval:

Sample Containers/Preservatives

Pb (6010B)

SVOC (8270C) ✓

NG (8332) ✓

Expl (8330) ✓

Metals (6010B/6020) ✓

Physical Analysis:

PID Reading:

Comments: silty-sand, no odor, moist, 7.5yr 3/3

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/12/08

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, ~50°	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB14A Sample Collection Time: 1600

Sampling Device: Hand Auger Depth (top): 0

Depth Interval: 0.5 ft.

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)	1	Physical Analysis:	
NG (8332)	1	PID Reading:	
Expl (8330)	1		
Metals (6010B/6020)	1		

Comments: 7.5YR 3/2, silty w/organics, brown, dry, gravel, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13SB14B Sample Collection Time:

Sampling Device: Hand Auger Depth (top):

Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13SB14C Sample Collection Time:

Sampling Device: Hand Auger Depth (top):

Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/12/08

Refusal @ 0.5' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, ≈ 60°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B15A Sample Collection Time: 1253

Sampling Device: Hand Auger Depth (top): 0 ft.
Depth Interval: 0.5 ft.

Sample Containers/Preservatives

Pb (6010B)	
SVOC (8270C)	1
NG (8332)	1
Expl (8330)	1
Metals (6010B/6020)	1
TOC	1

Physical Analysis:
PID Reading:

Comments: 7.5YR3/4, brown silt w/ organics, dry, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: X Photo No:
MS/MSD Samples Taken Here:

★DUP-13 collected here

Sample ID: 135B15B Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)	
SVOC (8270C)	
NG (8332)	
Expl (8330)	
Metals (6010B/6020)	

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 135B15C Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)	
SVOC (8270C)	
NG (8332)	
Expl (8330)	
Metals (6010B/6020)	

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/14/08

★Refusal @ 0.5' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11657307	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~62°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB16A Sample Collection Time: 1300

Sampling Device: Hand Auger Depth (top): 0

Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)	1	Physical Analysis:	
NG (8332)	1	PID Reading:	
Expl (8330)	1		
Metals (6010B/6020)	1		

Comments: 7.5YR3/3 brown silt, moist, loose, w/ organics

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID: _____ Sample Collection Time: _____

Sampling Device: Hand Auger Depth (top): _____

Depth Interval: _____

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID: 13SB16C Sample Collection Time: 1309

Sampling Device: Hand Auger Depth (top): 1.5

Depth Interval: 2.0

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)	✓	Physical Analysis:	
NG (8332)	✓	PID Reading:	
Expl (8330)	✓		
Metals (6010B/6020)	✓		

Comments: TOC ✓ same

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Signature of Samplers: [signature] Date Completed: 11/14/08

Refusal @ 2.0' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:		Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB17A — Sample Collection Time: 1005

Sampling Device: Hand Auger — Depth (top): 0 — Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)	✓	Physical Analysis:	
NG (8332)	✓	PID Reading:	
Expl (8330)	✓		
Metals (6010B/6020)	✓		

Comments: 7.5YR3/3 brown silt w/ organics, slightly moist, loose

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13SB17C — Sample Collection Time: 1015

Sampling Device: Hand Auger — Depth (top): 2.5 — Depth Interval: 3

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)	✓	Physical Analysis:	
NG (8332)	✓	PID Reading:	
Expl (8330)	✓		
Metals (6010B/6020)	✓		

Comments: same, some gravel

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here: ✓

* MS/MSD Collected here

Signature of Samplers: [signature] — Date Completed: 11/14/08

Refusal @ 3' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	~~cloudy~~, mostly cloudy, ~60°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB18A | Sample Collection Time: 1521

Sampling Device: Hand Auger | Depth (top): 0 | Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)	1	Physical Analysis:	
NG (8332)	1	PID Reading:	
Expl (8330)	1		
Metals (6010B/6020)	1		
TOC	1		

Comments: 10 yr 3/2, sandy-silt, dry, no odor, loose

Field QC / Photo ID

Duplicate Sample Taken Here: | Photo No:

MS/MSD Samples Taken Here:

Sample ID: | Sample Collection Time:

Sampling Device: Hand Auger | Depth (top): | Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: | Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13SB18C | Sample Collection Time: 1529

Sampling Device: Hand Auger | Depth (top): 2 | Depth Interval: 2.5

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)	1	Physical Analysis:	
NG (8332)	1	PID Reading:	
Expl (8330)	1		
Metals (6010B/6020)	1		

Comments: 7.5 yr 3/3, silty-sand, no odor, slightly moist, slightly plastic

Field QC / Photo ID

Duplicate Sample Taken Here: | Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: [signature] | Date Completed: 11/13/08

*refusal @ 2.25' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11657367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Rainy ~50° F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB19A — Sample Collection Time: 1222

Sampling Device: Hand Auger — Depth (top): 0 — Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)	1	Physical Analysis:	
NG (8332)	1	PID Reading:	
Expl (8330)	1		
Metals (6010B/6020)	1		

Comments: 7.5YR3/3 Clayey silt, slightly plastic, moist

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13SB19C — Sample Collection Time: 1227

Sampling Device: Hand Auger — Depth (top): 1.5 — Depth Interval: 1.8

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)	1	Physical Analysis:	
NG (8332)	1	PID Reading:	
Expl (8330)	1		
Metals (6010B/6020)	1		

Comments: 10YR3/1 Sandy silt, moist, gray

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here: ✓

*MS/MSD collected here

Signature of Samplers: [signature] — Date Completed: 11/13/08

Refusal @ 1.8' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Partly cloudy, 50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB20A — Sample Collection Time: 1439

Sampling Device: Hand Auger — Depth (top): 0-0.5ft — Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)	1	Physical Analysis:	
NG (8332)	1	PID Reading:	
Expl (8330)	1		
Metals (6010B/6020)	1		
	1		

Comments: 1.5 yr /3/2, silty w/organics, dry, loose, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13SB20B — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13SB20C — Sample Collection Time: 1449

Sampling Device: Hand Auger — Depth (top): 4.0-5.0 ft. — Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)	1	Physical Analysis:	
NG (8332)	1	PID Reading:	
Expl (8330)	1		
Metals (6010B/6020)	1		
TOC	1		

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: [signature] — Date Completed: 11/12/08

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11657347	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy 50°F	Sampling Team:	MF,BF,KH,HA

Sample ID:	13SB21A	Sample Collection Time:	1221
Sampling Device:	Hand Auger	Depth (top):	0
		Depth Interval:	0.5

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)	1	Physical Analysis:	
NG (8332)	1	PID Reading:	
Expl (8330)	1		
Metals (6010B/6020)	1		

Comments: 7.5YR 3/4 brown clayey silt, moist, slightly plastic, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID:	13SB21C	Sample Collection Time:	1226
Sampling Device:	Hand Auger	Depth (top):	1.5
		Depth Interval:	2

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)	✓	Physical Analysis:	
NG (8332)	✓	PID Reading:	
Expl (8330)	✓		
Metals (6010B/6020)	✓		

Comments: 7.5YR 3/4 brown, sandy silt, moist, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID:		Sample Collection Time:	
Sampling Device:	Hand Auger	Depth (top):	
		Depth Interval:	

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Signature of Samplers: [signature] Date Completed: 11/12/08

Refusal @ 2' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~32°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB32A Sample Collection Time: 1320

Sampling Device: Hand Auger Depth (top): 0
Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)	✓	Physical Analysis:	
NG (8332)	✓	PID Reading:	
Expl (8330)	✓		
Metals (6010B/6020)	✓		

Comments: 7.5YR3/4 brown sandy silt, w/ organics, moist, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB32C Sample Collection Time: 1325

Sampling Device: Hand Auger Depth (top): 4
Depth Interval: 5

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)	✓	Physical Analysis:	
NG (8332)	✓	PID Reading:	
Expl (8330)	✓		
Metals (6010B/6020)	✓		

Comments: 7.5YR3/4 Slime, wet

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/12/08

Refusal @ 5' bgs
H_2O @ ~ 4.8 ft bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11853637	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB23A — Sample Collection Time: 0912

Sampling Device: Hand Auger — Depth (top): 0 — Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 5YR3/4 brown silt with organics, no odor, slightly moist

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB23B — Sample Collection Time: 0918

Sampling Device: Hand Auger — Depth (top): 2 — Depth Interval: 3

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: Same as above, no organics

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB23C — Sample Collection Time: 0927

Sampling Device: Hand Auger — Depth (top): 5 — Depth Interval: 1'

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 2.5YR2.5/4 silty sand, moist, no odor, brown
4.5' change from silt to sand

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers: MF TH — Date Completed: 11/12/08

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy, 50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB24A — Sample Collection Time: 0912

Sampling Device: Hand Auger — Depth (top): — Depth Interval: 0-0.5 ft.

Sample Containers/Preservatives

Pb (6010B)	✓		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 2.5 YR 3/3, silty, Moist, w/ organics, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13SB24B — Sample Collection Time: 0919

Sampling Device: Hand Auger — Depth (top): 2-3 ft. — Depth Interval:

Sample Containers/Preservatives

Pb (6010B)	✓		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: same as above

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13SB24C — Sample Collection Time: 0925

Sampling Device: Hand Auger — Depth (top): 5-6 ft. — Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: silty-sandy, no odor, slightly moist, 5 YR 3/2

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: [signature] — Date Completed: 11/12/08

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~41657490~~ 11657490.3.01	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~50°F	Sampling Team:	MF,BF,KH,HA

Sample ID:	13SB325A	Sample Collection Time:	1000
Sampling Device:	Hand Auger	Depth (top):	0
		Depth Interval:	0.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: ~~dry~~ 5Y 5/3 brown silt, w/ organics, slightly moist, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID:	13SB325B	Sample Collection Time:	1005
Sampling Device:	Hand Auger	Depth (top):	2
		Depth Interval:	3

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: Same, with less organics

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID:	13SB325C	Sample Collection Time:	1015
Sampling Device:	Hand Auger	Depth (top):	5
		Depth Interval:	6

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: Same color, sandy silt, slightly moist

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Signature of Samplers: [signature] Date Completed: 11/12/08

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:		Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB26A Sample Collection Time: ~~0-0.5 ft.~~ 1214

Sampling Device: Hand Auger Depth (top): 0-0.5 ft.
Depth Interval:

Sample Containers/Preservatives
Pb (6010B) ✓
SVOC (8270C)
NG (8332)
Expl (8330)
Metals (6010B/6020)

Physical Analysis:
PID Reading:

Comments: 7.5yR 3/3, sandy w/ organics, low moisture, no odor

Field QC / Photo ID
Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB26B * DUP-1 Sample Collection Time: 1228

Sampling Device: Hand Auger Collected here Depth (top): 1-1.5 ft.
Depth Interval:

Sample Containers/Preservatives
Pb (6010B) ✓
SVOC (8270C)
NG (8332)
Expl (8330)
Metals (6010B/6020)

Physical Analysis:
PID Reading:

Comments: same as above sample

Field QC / Photo ID
Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB26C Sample Collection Time:

Sampling Device: ~~Hand Auger~~ Depth (top):
Depth Interval:

Sample Containers/Preservatives
Pb (6010B)
SVOC (8270C)
NG (8332)
Expl (8330)
Metals (6010B/6020)

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID
Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: MTC Date Completed: 11/12/08

Refusal @ 1.5 ft

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	cloudy, 53°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB27A Sample Collection Time: 1236

Sampling Device: Hand Auger Depth (top): 0-0.5ft.
Depth Interval:

Sample Containers/Preservatives

Pb (6010B) ✓
SVOC (8270C)
NG (8332)
Expl (8330)
Metals (6010B/6020)

Physical Analysis:
PID Reading:

Comments: sandy silt, no odor, low moisture, 7.5yr 3/3

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)
SVOC (8270C)
NG (8332)
Expl (8330)
Metals (6010B/6020)

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)
SVOC (8270C)
NG (8332)
Expl (8330)
Metals (6010B/6020)

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/12/08

Refusal @ 0.5 ft - 13SB27A

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490 11657367	Sampling Event:	SWMU 13 RFI
Weather Conditions:		Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB28A Sample Collection Time: 1245

Sampling Device: Hand Auger Depth (top): 0

Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: 7.5YR5/6 reddish brown sandy silt, w/organics, gravel

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):

Depth Interval:

Sample Containers/Preservatives

Pb (6010B):

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):

Depth Interval:

Sample Containers/Preservatives

Pb (6010B):

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Signature of Samplers: [signature]

Date Completed: 11/12/08

Refusal at 0.5' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11657490.07	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~30°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB21H — Sample Collection Time: 1335

Sampling Device: Hand Auger — Depth (top): 0 — Depth Interval: 0.3

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR 3/3 brown silt, W organics, organic, slightly moist

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13SB21B — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13SB21C — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: MTH — Date Completed: 11/12/08

Refusal at 0.3' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~41657400~~	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, 53°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB30A — Sample Collection Time: 1424

Sampling Device: Hand Auger — Depth (top): 0-0.5 ft — Depth Interval:

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5 yr 3/3, brown, silty w/organics, gravel, no odor, dry

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB30B — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB30C — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: MTR — Date Completed: 11/12/08

Resigned @ 0.5 ft

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Mostly Cloudy, 50 °F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB31A Sample Collection Time: 1428

Sampling Device: Hand Auger Depth (top): 0 - 0.5 ft.
Depth Interval:

Sample Containers/Preservatives

Pb (6010B) _____
SVOC (8270C) _____ Physical Analysis: _____
NG (8332) _____ PID Reading: _____
Expl (8330) _____
Metals (6010B/6020) _____

Comments: 7.5 yr/3/4, l. brown, silty w/organics, no odor, dry

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____
MS/MSD Samples Taken Here: _____

Sample ID: 13SB31B Sample Collection Time: _____

Sampling Device: Hand Auger Depth (top): _____
Depth Interval: _____

Sample Containers/Preservatives

Pb (6010B) _____
SVOC (8270C) _____ Physical Analysis: _____
NG (8332) _____ PID Reading: _____
Expl (8330) _____
Metals (6010B/6020) _____

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____
MS/MSD Samples Taken Here: _____

Sample ID: 13SB31C Sample Collection Time: _____

Sampling Device: Hand Auger Depth (top): _____
Depth Interval: _____

Sample Containers/Preservatives

Pb (6010B) _____
SVOC (8270C) _____ Physical Analysis: _____
NG (8332) _____ PID Reading: _____
Expl (8330) _____
Metals (6010B/6020) _____

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____
MS/MSD Samples Taken Here: _____

Signature of Samplers: MTL Date Completed: 11/12/08

Resigned @ .5 ft

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490 11657490.3267	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy, 45°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB32A Sample Collection Time: 1450

Sampling Device: Hand Auger Depth (top): 0

Depth Interval: 0.25

Sample Containers/Preservatives

Pb (6010B) 1

SVOC (8270C)

NG (8332)

Expl (8330)

Metals (6010B/6020)

Physical Analysis:

PID Reading:

Comments: 7.5YR 3/4 silt w/ some organics, slightly moist, loose

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):

Depth Interval:

Sample Containers/Preservatives

Pb (6010B)

SVOC (8270C)

NG (8332)

Expl (8330)

Metals (6010B/6020)

Physical Analysis:

PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):

Depth Interval:

Sample Containers/Preservatives

Pb (6010B)

SVOC (8270C)

NG (8332)

Expl (8330)

Metals (6010B/6020)

Physical Analysis:

PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Signature of Samplers: MTH Date Completed: 11/12/08

Refusal @ 0.25' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, ~50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB33A Sample Collection Time: 1608

Sampling Device: Hand Auger Depth (top): 0 ft
Depth Interval: .25 ft.

Sample Containers/Preservatives

Pb (6010B) _____
SVOC (8270C) _____
NG (8332) _____
Expl (8330) _____
Metals (6010B/6020) _____

Physical Analysis: _____
PID Reading: _____

Comments: 7.5 yr 3/2, silty, brown, dry, gravel, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____
MS/MSD Samples Taken Here: _____

*DUP-6 collected here

Sample ID: 13SB33B Sample Collection Time: _____

Sampling Device: Hand Auger Depth (top): _____
Depth Interval: _____

Sample Containers/Preservatives

Pb (6010B) _____
SVOC (8270C) _____
NG (8332) _____
Expl (8330) _____
Metals (6010B/6020) _____

Physical Analysis: _____
PID Reading: _____

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____
MS/MSD Samples Taken Here: _____

Sample ID: 13SB33C Sample Collection Time: _____

Sampling Device: Hand Auger Depth (top): _____
Depth Interval: _____

Sample Containers/Preservatives

Pb (6010B) _____
SVOC (8270C) _____
NG (8332) _____
Expl (8330) _____
Metals (6010B/6020) _____

Physical Analysis: _____
PID Reading: _____

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____
MS/MSD Samples Taken Here: _____

Signature of Samplers: _____ Date Completed: 11/12/08

Refusal @ .25 ft

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	rainy, 60°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13 SB 34 A Sample Collection Time: 1200

Sampling Device: Hand Auger Depth (top): 0 ft
Depth Interval: .5 ft

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 10 yr 2.5/1, dark brown, silty clay, low plasticity, no odor

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13 SB 34 B Sample Collection Time: 1204

Sampling Device: Hand Auger Depth (top): 1.5 ft
Depth Interval: 2 ft.

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 10 yr 3/4, brown, clayey-silt w/ low plasticity, no odor

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13 SB 34C Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers: Date Completed: 11/13/08

*Refusal @ 2' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11657603.67	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Rainy ~ 50°F	Sampling Team:	MF,BF,KH,HA

Sample ID:	13SB35A	Sample Collection Time:	1156
Sampling Device:	Hand Auger	Depth (top):	0
		Depth Interval:	0.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR 2.5/2 brown silt, w/ organics, slightly moist, loose

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID:	13SB35B	Sample Collection Time:	1205
Sampling Device:	Hand Auger	Depth (top):	2
		Depth Interval:	3

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: same

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID:	13SB35C	Sample Collection Time:	1212
Sampling Device:	Hand Auger	Depth (top):	5
		Depth Interval:	6

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR 3/4 clayey silt, moist, slightly plastic

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Signature of Samplers: [signature] Date Completed: 11/13/08

135SB36

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490 - 11851367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Rainy, 2 SOF	Sampling Team:	MF,BF,KH,HA

Sample ID: 135SB36/TH Sample Collection Time: 1237

Sampling Device: Hand Auger Depth (top): 0

Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1

SVOC (8270C): _____ Physical Analysis: _____

NG (8332): _____ PID Reading: _____

Expl (8330): _____

Metals (6010B/6020): _____

Comments: 10YR3/2 Brown silt, w/ organics, slightly moist

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID: 135SB36/TB Sample Collection Time: 1242

Sampling Device: Hand Auger Depth (top): 2

Depth Interval: 3

Sample Containers/Preservatives

Pb (6010B): 1

SVOC (8270C): _____ Physical Analysis: _____

NG (8332): _____ PID Reading: _____

Expl (8330): _____

Metals (6010B/6020): _____

Comments: Same

Field QC / Photo ID

Duplicate Sample Taken Here: ✓ Photo No: ~~ADUP-7~~ collected here

MS/MSD Samples Taken Here: _____

Sample ID: 135SB36/C Sample Collection Time: 1246

Sampling Device: Hand Auger Depth (top): 5

Depth Interval: to

Sample Containers/Preservatives

Pb (6010B): 1

SVOC (8270C): _____ Physical Analysis: _____

NG (8332): _____ PID Reading: _____

Expl (8330): _____

Metals (6010B/6020): _____

Comments: 7.5YR3/3 clayey silt, moist.

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Signature of Samplers: [signature] Date Completed: 11/13/08

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11657490.07	Sampling Event:	SWMU 13 RFI
Weather Conditions:	cloudy ~50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB37A Sample Collection Time: 1315

Sampling Device: Hand Auger Depth (top): 0
Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR3/3 brown silt, slightly moist, w/ organics, some gravel

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB37B Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB37C Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/13/08

Refusal @ 0.35' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657400~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	rainy, ~ 50°F	Sampling Team:	MF,BF,KH,HA

Sample ID:	13SB38A	Sample Collection Time:	1420
Sampling Device:	Hand Auger	Depth (top):	0 ft
		Depth Interval:	.5 ft.

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: ~~yr 7.5~~ 7.5 yr 3/4, silty clay, low plasticity, brown, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID:	13SB38B	Sample Collection Time:	1426
Sampling Device:	Hand Auger	Depth (top):	2 ft
		Depth Interval:	3 ft.

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5 yr 3/2, silty clay, ~~medium~~ low plasticity, no odor, brown,

Field QC / Photo ID

Duplicate Sample Taken Here: X Photo No: _____

MS/MSD Samples Taken Here: X

☆ DUP-8 collected here

☆ MS/MSD collected here

Sample ID:	13SB38C	Sample Collection Time:	1435
Sampling Device:	Hand Auger	Depth (top):	5 ft
		Depth Interval:	6 ft.

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5 yr 3/4, brown, silty clay, no odor, low moisture, ~~medium~~ low plasticity

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Signature of Samplers: [signature] Date Completed: 11/13/08

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11657347	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~ 30°F	Sampling Team:	MF,BF,KH,HA

Sample ID:	13SB39A	Sample Collection Time:	1430
Sampling Device:	Hand Auger	Depth (top):	0
		Depth Interval:	0.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR 3/2 brown silt, w/ Organics, moist

Field QC / Photo ID

Duplicate Sample Taken Here: ✓ Photo No:

MS/MSD Samples Taken Here:

* DUP-9 collected here

Sample ID:	13SB39B	Sample Collection Time:	1435
Sampling Device:	Hand Auger	Depth (top):	2
		Depth Interval:	3

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: None

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Sample ID:		Sample Collection Time:	1440
Sampling Device:	Hand Auger	Depth (top):	4
		Depth Interval:	4.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: Slime

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: [signature] Date Completed: 11/13/08

Refusal @ 4.5' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11657347	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy, 250°F	Sampling Team:	MF,BF,KH,HA

Sample ID:	135B40A	Sample Collection Time:	1450
Sampling Device:	Hand Auger	Depth (top):	0
		Depth Interval:	0.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR3/3 brown silt, moist, w/ organics,

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID:	135B40B	Sample Collection Time:	1456
Sampling Device:	Hand Auger	Depth (top):	2
		Depth Interval:	2.25

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: None

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID:		Sample Collection Time:	
Sampling Device:	Hand Auger	Depth (top):	
		Depth Interval:	

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Signature of Samplers: [signature] Date Completed: 11/13/08

Refusal @ 2.25' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Partly Cloudy, ~50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB41A Sample Collection Time: 1502

Sampling Device: Hand Auger Depth (top): 0
Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: ~~Duplicate~~ 7.5yr 2.5/1, silty ~~sand~~, brown, ~~non-plastic~~ loose, no odor,

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB41B Sample Collection Time: 1508

Sampling Device: Hand Auger Depth (top): 1.5
Depth Interval: 2

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5 yr 3/3 sandy-silt, brown, no odor; loose

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB41C Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/13/08

*Refusal @ 2' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~55° F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB42A | Sample Collection Time: 0840

Sampling Device: Hand Auger | Depth (top): 0 | Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: ~~7.5YR~~ 3/3 brown silt, w/ organics, slightly moist, loose

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB42B | Sample Collection Time: 0845

Sampling Device: Hand Auger | Depth (top): 1 | Depth Interval: 1.5

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: Same

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: | Sample Collection Time:

Sampling Device: Hand Auger | Depth (top): | Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers: [signature] | Date Completed: 11/14/08

Refusal @ 1.5' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~35°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB43A Sample Collection Time: 0858

Sampling Device: Hand Auger Depth (top): 0

Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: 7.5YR3/2 brown silt, moist, w/ organics, loose

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Sample ID: 13SB43B Sample Collection Time: 0901

Sampling Device: Hand Auger Depth (top): 2

Depth Interval: 3

Sample Containers/Preservatives

Pb (6010B): 1

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: Same

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Sample ID: 13SB43C Sample Collection Time: 0906

Sampling Device: Hand Auger Depth (top): 5

Depth Interval: 6

Sample Containers/Preservatives

Pb (6010B): 1

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: Same

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Signature of Samplers:

Date Completed: 11/14/08

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	foggy, partly cloudy, ~55°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B44A Sample Collection Time: 0952

Sampling Device: Hand Auger Depth (top): 0
Depth Interval: .5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	4
NG (8332)		PID Reading:	0
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR 3/4, silt w/organics, slightly moist, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____
MS/MSD Samples Taken Here: _____

Sample ID: 135B44B Sample Collection Time: 0959

Sampling Device: Hand Auger Depth (top): 2
Depth Interval: 3

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: same as above

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____
MS/MSD Samples Taken Here: _____

Sample ID: 135B44C Sample Collection Time: 1001

Sampling Device: Hand Auger Depth (top): 5
Depth Interval: 5.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR 3/2, silt, dry, w/organics, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____
MS/MSD Samples Taken Here: _____

Signature of Samplers: [signature] Date Completed: 11/14/08

* Refusal @ 5.5' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11656376 7	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~55°F	Sampling Team:	MF,BF,KH,HA

Sample ID:	13SB45A	Sample Collection Time:	0923
Sampling Device:	Hand Auger	Depth (top):	0
		Depth Interval:	0.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR3/4 brown silt, w/ organics & gravel, moist, loose

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID:	13SB45B	Sample Collection Time:	0930
Sampling Device:	Hand Auger	Depth (top):	2
		Depth Interval:	3

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: Same

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID:		Sample Collection Time:	
Sampling Device:	Hand Auger	Depth (top):	
		Depth Interval:	

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Signature of Samplers: [signature] Date Completed: 11/14/08

Refusal @ 3.2' bgs

135B46

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11657367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~ 55°F	Sampling Team:	MF,BF,KH,HA

Sample ID:	135SB48A	Sample Collection Time:	0948
Sampling Device:	Hand Auger	Depth (top):	0
		Depth Interval:	0.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR3.5/2 brown silt, w/ organics & gravel, moist, loose

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Sample ID:	135SB48B	Sample Collection Time:	0950
Sampling Device:	Hand Auger	Depth (top):	2
		Depth Interval:	3

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: None

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Sample ID:	135SB48C	Sample Collection Time:	0956
Sampling Device:	Hand Auger	Depth (top):	5
		Depth Interval:	6

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: None

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: [signature] Date Completed: 11/14/08

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, ~55°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB47A — Sample Collection Time: 1017

Sampling Device: Hand Auger — Depth (top): 0 — Depth Interval: .5

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR 4/2, silt, brown, dry, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB47B — Sample Collection Time: 1021

Sampling Device: Hand Auger — Depth (top): 1.5 — Depth Interval: 2.5

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR 3/3, brown silt w/ organics, slightly moist.

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB47C — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: [signature] — Date Completed: 11/14/08

* Refusal @ 2.5' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11054307	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~60°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB48A Sample Collection Time: 1216

Sampling Device: Hand Auger Depth (top): 0
Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)	1	Physical Analysis:	
SVOC (8270C)		PID Reading:	
NG (8332)			
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR3/3 brown silt, moist, w/ organics

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB48B Sample Collection Time: 1220

Sampling Device: Hand Auger Depth (top): 2
Depth Interval: 3

Sample Containers/Preservatives

Pb (6010B)	1	Physical Analysis:	
SVOC (8270C)		PID Reading:	
NG (8332)			
Expl (8330)			
Metals (6010B/6020)			

Comments: same

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: ~~BK~~ 13SB48C Sample Collection Time: 1225

Sampling Device: Hand Auger Depth (top): 5
Depth Interval: 6

Sample Containers/Preservatives

Pb (6010B)	1	Physical Analysis:	
SVOC (8270C)		PID Reading:	
NG (8332)			
Expl (8330)			
Metals (6010B/6020)			

Comments: same

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/14/08

4

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~41657490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, ~ 60°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B49A Sample Collection Time: 1230

Sampling Device: Hand Auger Depth (top): 0
Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)	1	Physical Analysis:	[redacted]
SVOC (8270C)		PID Reading:	0
NG (8332)			
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR 4/3, silty, brown, dry, has organics, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 135B49B Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)		Physical Analysis:	
SVOC (8270C)		PID Reading:	
NG (8332)			
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 135B49C Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)		Physical Analysis:	
SVOC (8270C)		PID Reading:	
NG (8332)			
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: [signature] Date Completed: 11/14/08

*Refusal @ 0.5' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~14657490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, ~60°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB50A Sample Collection Time: 1331

Sampling Device: Hand Auger Depth (top): 0 ft
Depth Interval: .5 ft

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	1
NG (8332)		PID Reading:	0
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5 YR 3/3, sandy silt, brown w/ organics, slightly moist, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____
MS/MSD Samples Taken Here: _____

Sample ID: 13SB50B Sample Collection Time: 1336

Sampling Device: Hand Auger Depth (top): 2 ft
Depth Interval: 3 ft

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5 YR 4/2, silty sand, dry, has organics, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____
MS/MSD Samples Taken Here: _____

Sample ID: 13SB50C Sample Collection Time: 1341

Sampling Device: Hand Auger Depth (top): 4.5 ft
Depth Interval: 5 ft.

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5 YR 3/2, silty sand, dry, no odor,

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____
MS/MSD Samples Taken Here: _____

Signature of Samplers: [signature] Date Completed: 11/14/08

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11052367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy, 40°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB51A Sample Collection Time: 1250

Sampling Device: Hand Auger Depth (top): 0

Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR3/4 brown silt, w/ organics, moist

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13SB51B Sample Collection Time: 1255

Sampling Device: Hand Auger Depth (top): 0.5

Depth Interval: 1

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: same

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):

Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/14/08

Refusal @ 1' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11626307	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~60°F	Sampling Team:	MF,BF,KH,HA

Sample ID:	135B52A	Sample Collection Time:	1325
Sampling Device:	Hand Auger	Depth (top):	0
		Depth Interval:	0.5

Sample Containers/Preservatives

Pb (6010B)	1	Physical Analysis:	
SVOC (8270C)		PID Reading:	
NG (8332)			
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR2.5/2 brown silt w/ organics, moist, loose

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID:	135B52B	Sample Collection Time:	1330
Sampling Device:	Hand Auger	Depth (top):	2
		Depth Interval:	2.25

Sample Containers/Preservatives

Pb (6010B)	1	Physical Analysis:	
SVOC (8270C)		PID Reading:	
NG (8332)			
Expl (8330)			
Metals (6010B/6020)			

Comments: 10YR4/4 silt, slightly moist, w/ organics & gravel

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID:		Sample Collection Time:	
Sampling Device:	Hand Auger	Depth (top):	
		Depth Interval:	

Sample Containers/Preservatives

Pb (6010B)		Physical Analysis:	
SVOC (8270C)		PID Reading:	
NG (8332)			
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Signature of Samplers: [signature] Date Completed: 11/14/08

Refusal @ 2.5' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~41657490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, ≈ 60°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB53A — Sample Collection Time: 1405

Sampling Device: Hand Auger — Depth (top): 0 ft; Depth Interval: 0.5 ft

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5 yR 2.5/2, silt, slightly moist, no odor, soft.

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13SB53B — Sample Collection Time: 1409

Sampling Device: Hand Auger — Depth (top): 0.5 ft; Depth Interval: 1 ft.

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: same as above

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here: X

★ MS/MSD collected here

Sample ID: 13SB53C — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: [signature] — Date Completed: 11/14/08

★ Refusal @ 1' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11657367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~ 65° F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB54A Sample Collection Time: 1350

Sampling Device: Hand Auger Depth (top): 0
Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR2.5/2 brown silt, w/organics, slightly moist, loose

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB54B Sample Collection Time: 1355

Sampling Device: Hand Auger Depth (top): 2
Depth Interval: 2.75

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: Same

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/14/08

Refusal @ 2.75' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11657367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~60°s	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB55A Sample Collection Time: 1405

Sampling Device: Hand Auger Depth (top): 0
Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here: ✓

* MS/MSD Collected here

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: [signature] Date Completed: 11/14/08

Refusal @ 0.75

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11657367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~60°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB56A | Sample Collection Time: 1335

Sampling Device: Hand Auger | Depth (top): 0 | Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR3/3 brown silt, w/ organics, loose, moist

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB56B | Sample Collection Time: 1340

Sampling Device: Hand Auger | Depth (top): 1 | Depth Interval: 1.25

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: Same

Field QC / Photo ID

Duplicate Sample Taken Here: ✓
MS/MSD Samples Taken Here:
Photo No:

* DUP-14 collected here

Sample ID: | Sample Collection Time:

Sampling Device: Hand Auger | Depth (top): | Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers: [signature] | Date Completed: 11/14/08

Refusal @ 1.25' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, ☆60°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB57A — Sample Collection Time: 1348

Sampling Device: Hand Auger — Depth (top): 0 ft; Depth Interval: 0-5 ft

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR 3/3, silt w/ organics, dry, no odor

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB57B — Sample Collection Time: 1352

Sampling Device: Hand Auger — Depth (top): 2 ft; Depth Interval: 3 ft.

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR 3/3, silty sand, slightly moist, no odor

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB57C — Sample Collection Time: 1356

Sampling Device: Hand Auger — Depth (top): 3.5 ft; Depth Interval: 4 ft

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR 3/2, silty clay, moist, low plasticity, no odor

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers: [signature] — Date Completed: 11/14/08

☆ Refusal @ 4' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657400~~ 11656307	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~ 40°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB5801 Sample Collection Time: 1240

Sampling Device: Hand Auger Depth (top): 0
Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5yR 3/3 brown silt, slightly moist, loose, w/ organics
*DUP - 12 collected here

Field QC / Photo ID

Duplicate Sample Taken Here: ✓ Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB5802 Sample Collection Time: 1245

Sampling Device: Hand Auger Depth (top): 2
Depth Interval: 3

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: same

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: [signature] Date Completed: 11/14/08

Refusal @ 3.25' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, ≈ 60°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B59A — Sample Collection Time: 1302

Sampling Device: Hand Auger — Depth (top): 0 ft — Depth Interval: 0.5 ft

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 10YR 2.5/2, brown silt w/ organics, slightly moist, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 135B59B — Sample Collection Time: 1323

Sampling Device: Hand Auger — Depth (top): 0.5 ft — Depth Interval: 1 ft

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: same as above

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 135B39C — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: [signature] — Date Completed: 11/14/08

* Refusal @ 1' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~41657490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, 60°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B60A — Sample Collection Time: 1219

Sampling Device: Hand Auger — Depth (top): 0 ft. — Depth Interval: 0.5 ft

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR3/2, silty-sand, fine w/organics, brown, slightly moist, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Sample ID: 135B60B — Sample Collection Time: 1223

Sampling Device: Hand Auger — Depth (top): 0.5 ft. — Depth Interval: 1 ft.

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: same as above

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Sample ID: 135B60C — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: [signature] — Date Completed: 11/14/08

* Refusal @ 1' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	foggy, partly cloudy, ~55°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B61A — Sample Collection Time: 1008

Sampling Device: Hand Auger — Depth (top): 0 — Depth Interval: .5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5 yR 4/3, silt w/organics, dry, no odor, loose

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 135B61B — Sample Collection Time: 1011

Sampling Device: Hand Auger — Depth (top): 1.5 — Depth Interval: 2.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5 yR 4/2, silty-sand, moist, w/organics, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 135B61C — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: [signature] — Date Completed: 11/14/08

* Refusal @ 2.5' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/05
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11657367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy, ~55°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B102A Sample Collection Time: 0945

Sampling Device: Hand Auger Depth (top): 0

Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: 7.5YR3/2 brown silt, w/ organics & gravel, moist

Field QC / Photo ID

Duplicate Sample Taken Here: ✓ Photo No:

MS/MSD Samples Taken Here:

*DUP-11 collected here

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):

Depth Interval:

Sample Containers/Preservatives

Pb (6010B):

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):

Depth Interval:

Sample Containers/Preservatives

Pb (6010B):

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/14/08

Refusal @ 0.75' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~14657490~~ 11465230.07	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~ 55°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB63A Sample Collection Time: 0915

Sampling Device: Hand Auger Depth (top): 0
Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR3/3 brown sandy, silt, moist, w/ organics + gravel

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers: mtl Date Completed: 11/14/08

Refusal @ 1' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~41657490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	foggy, partly cloudy, ± 65°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB64A Sample Collection Time: 0932

Sampling Device: Hand Auger Depth (top): 0 ft
Depth Interval: .5 ft

Sample Containers/Preservatives

Pb (6010B)	1
SVOC (8270C)	
NG (8332)	
Expl (8330)	
Metals (6010B/6020)	

Physical Analysis:
PID Reading:

Comments: 7.5YR2.5/2, silty clay, slightly moist, no odor

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB64B Sample Collection Time: 0936

Sampling Device: Hand Auger Depth (top): 0.5 ft
Depth Interval: 1 ft.

Sample Containers/Preservatives

Pb (6010B)	1
SVOC (8270C)	
NG (8332)	
Expl (8330)	
Metals (6010B/6020)	

Physical Analysis:
PID Reading:

Comments: 7.5YR3/3, silty-clay, moist, low plasticity, no odor

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB64C Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)	
SVOC (8270C)	
NG (8332)	
Expl (8330)	
Metals (6010B/6020)	

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers:

Date Completed: 11/14/08

* Refusal @ 1' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, ~60°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB65A Sample Collection Time: 1428

Sampling Device: Hand Auger Depth (top): 0 ft
Depth Interval: 0.5 ft

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5 yR 3/3, silty-clay, Moist, slightly plastic, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB65B Sample Collection Time: 1434

Sampling Device: Hand Auger Depth (top): 0.5 ft
Depth Interval: 1 ft

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: same as above

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB65C Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: MTC Date Completed: 11/14/08

* Refusal @ 1' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~41657490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~50's F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SBblolA Sample Collection Time: 1510

Sampling Device: Hand Auger Depth (top): 0 ft.
Depth Interval: 0.5 ft.

Sample Containers/Preservatives

Pb (6010B)	1	Physical Analysis:	[redacted]
SVOC (8270C)		PID Reading:	[redacted]
NG (8332)			
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR3/4 Olive gray silt, slightly plastic, w/ organics moist

Field QC / Photo ID
Duplicate Sample Taken Here: _____ Photo No: _____
MS/MSD Samples Taken Here: _____

Sample ID: 13SBblolB Sample Collection Time: 1516

Sampling Device: Hand Auger Depth (top): 2 ft.
Depth Interval: 3 ft.

Sample Containers/Preservatives

Pb (6010B)	1	Physical Analysis:	[redacted]
SVOC (8270C)		PID Reading:	[redacted]
NG (8332)			
Expl (8330)			
Metals (6010B/6020)			

Comments: 10YR4/2 grey Sandy silt moist

Field QC / Photo ID
Duplicate Sample Taken Here: _____ Photo No: _____ *MS/MSD Collected here
MS/MSD Samples Taken Here: ✓

Sample ID: _____ Sample Collection Time: _____

Sampling Device: Hand Auger Depth (top): _____
Depth Interval: _____

Sample Containers/Preservatives

Pb (6010B)		Physical Analysis:	
SVOC (8270C)		PID Reading:	
NG (8332)			
Expl (8330)			
Metals (6010B/6020)			

Comments: _____

Field QC / Photo ID
Duplicate Sample Taken Here: _____ Photo No: _____
MS/MSD Samples Taken Here: _____

Signature of Samplers: MTR Date Completed: 11/13/08

Water @ 3.1' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~41657~~490 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, ~50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13 SB 67 A Sample Collection Time: 1444

Sampling Device: Hand Auger Depth (top): 0 ft
Depth Interval: 0.5 ft.

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5yR 3/3, silty-clay, low plasticity, brown, slightly moist, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13 SB 67 B Sample Collection Time: 1448

Sampling Device: Hand Auger Depth (top): 2 ft
Depth Interval: 3.5 ft.

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5yR 3/2, silty-clay, low plasticity, slightly moist, soft, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13 SB 67 C Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/13/08

Refusal @ 3.5' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11657367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~ 50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB08A — Sample Collection Time: 1402

Sampling Device: Hand Auger — Depth (top): 0 — Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR4/3 brown sandy silt, w/ organics

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB08B — Sample Collection Time: 1409

Sampling Device: Hand Auger — Depth (top): 2 — Depth Interval: 3.75

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR3/1 grey silt, wet, some organics

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB08C — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: — Date Completed: 11/13/08

Refusal @ 2.75' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11151357	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~30F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB69A — Sample Collection Time: 1330

Sampling Device: Hand Auger — Depth (top): 0 — Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR 3/3 brown silt, slightly moist, w/ organics

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB69B — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB69C — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers: MTC — Date Completed: 11/13/08

Refusal @ 0.5' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11657347	Sampling Event:	SWMU 13 RFI
Weather Conditions:	cloudy ~50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B70A Sample Collection Time: 1256

Sampling Device: Hand Auger Depth (top): 0

Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: 5YR3/3 brown silt, w/ organics, moist, some gravel

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Sample ID: 135B70B Sample Collection Time: 1301

Sampling Device: Hand Auger Depth (top): 2

Depth Interval: 2.5

Sample Containers/Preservatives

Pb (6010B):

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: 5YR3/1 sandy silt, dgray, very moist

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Sample ID: 135B70C Sample Collection Time:

Sampling Device: Hand Auger Depth (top):

Depth Interval:

Sample Containers/Preservatives

Pb (6010B):

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Signature of Samplers:

Date Completed: 11/13/08

Refusal @ 2.5' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	rainy, ~50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13 SB 71A — Sample Collection Time: 1215

Sampling Device: Hand Auger — Depth (top): 0 ft — Depth Interval: .5 ft

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 10yr 3/3, silty clay w/ organics, low plasticity, brown, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13 SB 71B — Sample Collection Time: 1219

Sampling Device: Hand Auger — Depth (top): 2 ft — Depth Interval: 3 ft.

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 10 yr 3/3, silty clay, ~~medium~~ low plasticity, brown, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB 71C — Sample Collection Time: 1223

Sampling Device: Hand Auger — Depth (top): 5 ft — Depth Interval: 6 ft

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 10yr 2.5/2, silty-clay, ~~medium~~ low to high plasticity, brown, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: MRL — Date Completed: 11/13/08

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 116542307	Sampling Event:	SWMU 13 RFI
Weather Conditions:	rainy ~50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB72A — Sample Collection Time: 1145

Sampling Device: Hand Auger — Depth (top): 0 — Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 10YR3/2 brown silt, moist, loose, w/organics

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB72B — Sample Collection Time: 1148

Sampling Device: Hand Auger — Depth (top): 2 — Depth Interval: 3

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: Same

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB72C — Sample Collection Time: 1150

Sampling Device: Hand Auger — Depth (top): 5 — Depth Interval: 6

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR3/4 clayey silt, slightly plastic, moist

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers: MTL — Date Completed: 11/13/08

1215
1355
1430
1540

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	rainy, 50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13 SB 73 A Sample Collection Time: 1130

Sampling Device: Hand Auger Depth (top): 0 ft
Depth Interval: 0.5 ft

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 10yr 3/3, silty, dry, brown, no odor, organics

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13 SB 73 B Sample Collection Time: 1140

Sampling Device: Hand Auger Depth (top): 2 ft
Depth Interval: 3 ft

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 10YR 3/4, silty w/ organics, ~~fine~~, no odor, loose

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13 SB 73 C Sample Collection Time: 1150

Sampling Device: Hand Auger Depth (top): 5 ft
Depth Interval: 5.5 ft.

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 10YR 3/2, moist, silty-clay, brown, no odor, low plasticity

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/18/08

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490 11657490.13.0001	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~50°F	Sampling Team:	MF,BF,KH,HA

Sample ID:	13SB74A	Sample Collection Time:	1535
Sampling Device:	Hand Auger	Depth (top):	0
		Depth Interval:	0.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR 3/3 brown silt, loose, moist, w/ organics

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID:	13SB74B	Sample Collection Time:	1540
Sampling Device:	Hand Auger	Depth (top):	2
		Depth Interval:	3

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: Same

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID:	13SB74C	Sample Collection Time:	1550
Sampling Device:	Hand Auger	Depth (top):	3.5
		Depth Interval:	4.0

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: Same

* DUP-3 Collected here

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Signature of Samplers: [signature] Date Completed: 11/12/08

Refusal @ 4' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy 50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB75A — Sample Collection Time: 1425

Sampling Device: Hand Auger — Depth (top): 0 — Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5yR3/3 Sandy silt, w/organics, moist

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB75B — Sample Collection Time: 1430

Sampling Device: Hand Auger — Depth (top): 2 — Depth Interval: 3

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5yR3/3, clayey silt, slightly plastic, no odor

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

*DUP-4 collected here

Sample ID: 13SB75C — Sample Collection Time: 1440

Sampling Device: Hand Auger — Depth (top): 3.5 — Depth Interval: 4.6

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 5yR4/4 Sandy silt, wet,

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers: MTQ — Date Completed: 11/12/08

Refusal @ 4' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, 50°. .	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB76A — Sample Collection Time: 1350

Sampling Device: Hand Auger — Depth (top): 0-0.5 ft.
Depth Interval:

Sample Containers/Preservatives
Pb (6010B): ✓
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR 3/3, silty w/ organics, brown, loose, dry, no odor

Field QC / Photo ID
Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB76B — Sample Collection Time: 1355

Sampling Device: Hand Auger — Depth (top): 2-3 ft.
Depth Interval:

Sample Containers/Preservatives
Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR 4/3, silty-clay w/ organics, brown, dense, no odor

Field QC / Photo ID
Duplicate Sample Taken Here: X
MS/MSD Samples Taken Here:
Photo No:
* Dup-2 collected here

Sample ID: 13SB76C — Sample Collection Time: 1405

Sampling Device: Hand Auger — Depth (top): 4.5-5 ft.
Depth Interval:

Sample Containers/Preservatives
Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR 3/3 silty-clay slightly plastic, dense, moist, brown, no odor

Field QC / Photo ID
Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers: mtd — Date Completed: 11/12/08

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Slightly Cloudy, 59°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB77A — Sample Collection Time: 1332

Sampling Device: Hand Auger — Depth (top): 0-0.5 ft — Depth Interval:

Sample Containers/Preservatives

Pb (6010B) ____
SVOC (8270C) ____ — Physical Analysis: ____
NG (8332) ____ — PID Reading: ____
Expl (8330) ____
Metals (6010B/6020) ____

Comments: 7.5 YR 4/4, dry, loose, brown, no odor, silty & has organics

Field QC / Photo ID

Duplicate Sample Taken Here: ____ — Photo No: ____
MS/MSD Samples Taken Here: ____

Sample ID: 13SB77B — Sample Collection Time: 1335

Sampling Device: Hand Auger — Depth (top): 2-3 ft. — Depth Interval:

Sample Containers/Preservatives

Pb (6010B) ✓
SVOC (8270C) ____ — Physical Analysis: ____
NG (8332) ____ — PID Reading: ____
Expl (8330) ____
Metals (6010B/6020) ____

Comments: 7.5 YR 3/3, dry, very silty, loose, has organics, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: ____ — Photo No: ____
MS/MSD Samples Taken Here: ____

Sample ID: 13SB77C — Sample Collection Time: ____

Sampling Device: Hand Auger — Depth (top): ____ — Depth Interval: ____

Sample Containers/Preservatives

Pb (6010B) ✓
SVOC (8270C) ____ — Physical Analysis: ____
NG (8332) ____ — PID Reading: ____
Expl (8330) ____
Metals (6010B/6020) ____

Comments: ____

Field QC / Photo ID

Duplicate Sample Taken Here: ____ — Photo No: ____
MS/MSD Samples Taken Here: ____

Signature of Samplers: [signature] — Date Completed: 11/12/08

Refusal @ 3ft.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490 — 11 (SWMU 13)	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB78A — Sample Collection Time: 1309

Sampling Device: Hand Auger — Depth (top): 0 — Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR3/4 brown silt, slightly moist, w/ organics, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB78B — Sample Collection Time: 1311

Sampling Device: Hand Auger — Depth (top): 2 — Depth Interval: 2.5

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: Some w/ gravel

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Sample ID: — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: [signature] — Date Completed: 11/12/08

Refusal @ 2.5ft bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy, 58°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB79A — Sample Collection Time: 1300

Sampling Device: Hand Auger — Depth (top): 0-0.5 ft — Depth Interval:

Sample Containers/Preservatives

Pb (6010B): ✓
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: silt w/organics, no odor, ~~dkbrn~~ dry, loose, brown 7.5yr 4/2

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB79B — Sample Collection Time: 1305

Sampling Device: Hand Auger — Depth (top): 0.5 - 1 ft. — Depth Interval:

Sample Containers/Preservatives

Pb (6010B): ✓
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: same

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Sample ID: — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: [signature] — Date Completed: 11/12/08

Refusal @ 13SB79B @ 1 ft.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11657367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy 40's F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SBB0A Sample Collection Time: 1210

Sampling Device: Hand Auger Depth (top): 0
Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR3/6 brown clayey silt, moist, w/ organics, slightly plastic
No odor

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB80B Sample Collection Time: 1213

Sampling Device: Hand Auger Depth (top): 3
Depth Interval: 3

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: Same

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

* MS/MSD Collected here

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/12/08

Boring terminated @ 3.2' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11657367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B81A — Sample Collection Time: 0944

Sampling Device: Hand Auger — Depth (top): 0 — Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: ~~10YR~~ 10YR 3/3 brown silt, slightly moist, w/ organics, no odor

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 135B81B — Sample Collection Time: 0950

Sampling Device: Hand Auger — Depth (top): 2 — Depth Interval: 3

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 10YR 3/4 brown clayey silt, moist, w/ organics, no odor

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers: MTH — Date Completed: 11/12/08

Boring terminated @ 3.1' bgs - gravelly rock

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy, 60°F	Sampling Team:	MF,BF,KH,HA

Sample ID: SB82A — Sample Collection Time: 0934

Sampling Device: Hand Auger — Depth (top): 0-0.5 ft

Depth Interval:

Sample Containers/Preservatives

Pb (6010B): ✓

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: silty, sandy w/ organics, no odor, Moist, 7.5 YR 3/3

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: SB82B — Sample Collection Time: 0941

Sampling Device: Hand Auger — Depth (top): 2-3 ft.

Depth Interval:

Sample Containers/Preservatives

Pb (6010B): ✓

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: slightly plastic, silty-clay, Moist w/ organics, no odor 10 YR 3/3

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: SB82C — Sample Collection Time: 1951

Sampling Device: Hand Auger — Depth (top): 5-6 ft.

Depth Interval:

Sample Containers/Preservatives

Pb (6010B): ✓

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: silty clay, w/ organics Moist, dense, no odor, 10 YR 3/6

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: [signature] — Date Completed: 11/12/08

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11850 3107	Sampling Event:	SWMU 13 RFI
Weather Conditions:	cloudy 45°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB83A Sample Collection Time: 0930

Sampling Device: Hand Auger Depth (top): 0

Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR3/4 brown silt, with organics, slightly moist

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB83B Sample Collection Time: 0933

Sampling Device: Hand Auger Depth (top): 3

Depth Interval: 3

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: Same as above

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB83C Sample Collection Time:

Sampling Device: Hand Auger Depth (top):

Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers: MTR Date Completed: 11/12/08

Boring terminated at 3.5' bgs - tree root

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~41057490~~ 116563 67	Sampling Event:	SWMU 13 RFI
Weather Conditions:	foggy, partly cloudy, ~50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B84A Sample Collection Time: 0850

Sampling Device: Hand Auger Depth (top): 0 ft.
Depth Interval: 0.5 ft.

*DUP-10 was collected here

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5yR 3/2, silty-clay, dark brown, low plasticity, no odor, slightly moist

Field QC / Photo ID

Duplicate Sample Taken Here: X Photo No:
MS/MSD Samples Taken Here:

Sample ID: 135B84B Sample Collection Time: 0855

Sampling Device: Hand Auger Depth (top): 1.5 ft
Depth Interval: 2 ft.

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: Same as above

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 135B84C Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/14/08

* H_2O @ 2.0' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, 56°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB85A Sample Collection Time: 1310

Sampling Device: Hand Auger Depth (top): 0-0.5ft.
Depth Interval:

Sample Containers/Preservatives
Pb (6010B) ✓
SVOC (8270C)
NG (8332)
Expl (8330)
Metals (6010B/6020)

Physical Analysis:
PID Reading:

Comments: silty w/ organics, dry, brown, no odor, 7.5YR 4/4

Field QC / Photo ID
Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB85B Sample Collection Time: 1314

Sampling Device: Hand Auger Depth (top): 2-3 ft.
Depth Interval:

Sample Containers/Preservatives
Pb (6010B) ✓
SVOC (8270C)
NG (8332)
Expl (8330)
Metals (6010B/6020)

Physical Analysis:
PID Reading:

Comments: 7.5YR 3/3, brown, slight moisture, no odor, finely packed

Field QC / Photo ID
Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB85C Sample Collection Time: 1320

Sampling Device: Hand Auger Depth (top): 4.5-5 ft.
Depth Interval:

Sample Containers/Preservatives
Pb (6010B) ✓
SVOC (8270C)
NG (8332)
Expl (8330)
Metals (6010B/6020)

Physical Analysis:
PID Reading:

Comments: silty clay, brown, no odor 7.5YR 3/3, dense, moist

Field QC / Photo ID
Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: mtl Date Completed: 11/12/08

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490 ~~11657490~~	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~ 50's	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B86A | Sample Collection Time: 1345

Sampling Device: Hand Auger | Depth (top): 0 | Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 10YR3/3 silty sand, w/ gravel & organics, moist

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 135B86B | Sample Collection Time: 1350

Sampling Device: Hand Auger | Depth (top): 2 | Depth Interval: 2.5

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: Same, wet

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

* MS/MSD Collected here

Sample ID: 135B86C | Sample Collection Time:

Sampling Device: Hand Auger | Depth (top): | Depth Interval:

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers: MF BF | Date Completed: 11/12/08

Water @ 2.5' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490- 11657487	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~52°F	Sampling Team:	MF,BF,KH,HA

Sample ID: B3SB87A — Sample Collection Time: 1400

Sampling Device: Hand Auger — Depth (top): 0 — Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR 3/3 sandy silt, moist, w/ organics & gravel, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: B3SB87B — Sample Collection Time: 1405

Sampling Device: Hand Auger — Depth (top): 2 — Depth Interval: 3

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: Same

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: B3SB87C — Sample Collection Time: 1415

Sampling Device: Hand Auger — Depth (top): 3.5 — Depth Interval: 4.0

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: Same

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: [signature] — Date Completed: 11/12/08

Refusal @ 4' bgs - sandy gravel

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490 11657487	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB88A Sample Collection Time: 1508

Sampling Device: Hand Auger Depth (top): 0 ft.
Depth Interval: 0.5 ft.

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	B
NG (8332)		PID Reading:	0.0
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR2.5/2 Silty sand, w/ gravel & shells, & organics, moist

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB88B Sample Collection Time: 1515

Sampling Device: Hand Auger Depth (top): 2
Depth Interval: 2.75

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: Same

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/12/08

Water @ 2.75' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:		Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB89A — Sample Collection Time: 1517

Sampling Device: Hand Auger — Depth (top): 0 — Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: ~~7.5~~ 7.5YR/3/3, siltysand, dry, brown, no odor

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

* DUP-5 collected here

Sample ID: 13SB89B — Sample Collection Time: ~~11/12/08~~ 1521

Sampling Device: Hand Auger — Depth (top): 2ft — Depth Interval: 3ft

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR/3/3, ~~silty~~ sandy, brown, ~~dry~~, no odor, moist

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB89C — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers: mf

Date Completed: 11/12/08

Refusal @ 3ft.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Mostly Cloudy, ~50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13 SB 90 A — Sample Collection Time: 1542

Sampling Device: Hand Auger — Depth (top): 0 ft — Depth Interval: 0.5 ft.

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 1.5yR/4/2, brown, silty, dry, loose, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13 SB 90 B — Sample Collection Time: 1548

Sampling Device: Hand Auger — Depth (top): 2 — Depth Interval: 2.5ft

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 1.5 yR/4/2, brown, sandy silt, gravel, slightly moist, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13 SB 90 C — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: [signature] — Date Completed: 11/12/08

Refusal @ 2.5 ft. - due to water

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	12/17/08
Site Name:	SWMU 13	Client:	RFAAP
URS Project No.:	11656367	Sampling Event:	Additional Sampling SWMU 13
Weather Conditions:	overcast ~55°	Sampling Team:	MF, BF

Sample ID: 135B91 A — Sample Collection Time: 1630

Sampling Device: Hand Auger — Depth (top): — Depth Interval: 0-0.5'

Sample Containers/Preservatives

Pb (6010B): X
SVOC:
Pesticides:
PCBs:
Herbicides:
Metals:
Comments:

Physical Analysis:
PID Reading:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 135B91 B — Sample Collection Time: 1635

Sampling Device: Hand Auger — Depth (top): — Depth Interval: 2-3'

Sample Containers/Preservatives

Pb (6010B): X
SVOC:
Pesticides:
PCBs:
Herbicides:
Metals:
Comments:

Physical Analysis:
PID Reading:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 135B91 C — Sample Collection Time: 1640

Sampling Device: Hand Auger — Depth (top): — Depth Interval: 5-6'

Sample Containers/Preservatives

Pb (6010B): X
SVOC:
Pesticides:
PCBs:
Herbicides:
Metals:
Comments: DUP-15 collected here

Physical Analysis:
PID Reading:

Field QC / Photo ID

Duplicate Sample Taken Here: X
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers: [signature] — Date Completed: 12/17/08

Project Information

Project Name: RFAAP Sumu 13 RFI
Site Name: Sumu 13
URS Project No.: 11655.367
Weather Conditions: Cloudy ~ 55°

Date: 12/17/08
Client: RFAAP
Sampling Event: Additional Sampling Sumu 13
Sampling Team: MF, BF

Sample ID: 13SB92A
Sample Collection Time: 1650

Sampling Device:
Depth (top):
Depth Interval: 0-0.5'

Sample Containers/Preservatives

Pb (6010B): X
SVOC:
Pesticides:
PCBs:
Herbicides:
Metals:
Comments:

Physical Analysis:
PID Reading:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB92B
Sample Collection Time: 1655

Sampling Device:
Depth (top):
Depth Interval: 2-3'

Sample Containers/Preservatives

Pb (6010B): X
SVOC:
Pesticides:
PCBs:
Herbicides:
Metals:
Comments:

Physical Analysis:
PID Reading:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB92C
Sample Collection Time: 1700

Sampling Device:
Depth (top):
Depth Interval: 5-5.5'

Sample Containers/Preservatives

Pb (6010B): X
SVOC:
Pesticides:
PCBs:
Herbicides:
Metals:
Comments:

Physical Analysis:
PID Reading:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers:
Date Completed: 12/17/08

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11654307	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~60°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB48A | Sample Collection Time: 1216

Sampling Device: Hand Auger | Depth (top): 0 | Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR3/3 brown silt, moist, w/ organics

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB48B | Sample Collection Time: 1220

Sampling Device: Hand Auger | Depth (top): 2 | Depth Interval: 3

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: same

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: ~~BK~~ 13SB48C | Sample Collection Time: 1225

Sampling Device: Hand Auger | Depth (top): 5 | Depth Interval: 6

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: same

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers: | Date Completed:

4

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~41657490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, ~ 60°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B49A Sample Collection Time: 1230

Sampling Device: Hand Auger Depth (top): 0
Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	[redacted]
NG (8332)		PID Reading:	0
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR 4/3, silty, brown, dry, has organics, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____
MS/MSD Samples Taken Here: _____

Sample ID: 135B49B Sample Collection Time: _____

Sampling Device: Hand Auger Depth (top): _____
Depth Interval: _____

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____
MS/MSD Samples Taken Here: _____

Sample ID: 135B49C Sample Collection Time: _____

Sampling Device: Hand Auger Depth (top): _____
Depth Interval: _____

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____
MS/MSD Samples Taken Here: _____

Signature of Samplers: _____ Date Completed: 11/14/08

*Refusal @ 0.5' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11057490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Partly Cloudy, ~60°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB50A | Sample Collection Time: 1331

Sampling Device: Hand Auger | Depth (top): 0 ft | Depth Interval: .5 ft

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis: 2
PID Reading: 0

Comments: 7.5 YR 3/3, sandy silt, brown w/ organics, slightly moist, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: | Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB50B | Sample Collection Time: 1336

Sampling Device: Hand Auger | Depth (top): 2 ft | Depth Interval: 3 ft

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5 YR 4/2, silty sand, dry, has organics, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: | Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB50C | Sample Collection Time: 1341

Sampling Device: Hand Auger | Depth (top): 4.5 ft | Depth Interval: 5 ft.

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5 YR 3/2, silty sand, dry, no odor,

Field QC / Photo ID

Duplicate Sample Taken Here: | Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: | Date Completed: 11/14/08

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11652637	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy, 40°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB51A Sample Collection Time: 1250

Sampling Device: Hand Auger Depth (top): 0

Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: 7.5YR3/4 brown silt, w/ organics, moist

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Sample ID: 13SB51B Sample Collection Time: 1255

Sampling Device: Hand Auger Depth (top): 0.5

Depth Interval: 1

Sample Containers/Preservatives

Pb (6010B): 1

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: same

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):

Depth Interval:

Sample Containers/Preservatives

Pb (6010B):

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Signature of Samplers: Date Completed:

Refusal @ 1' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11652367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~40°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B52A Sample Collection Time: 1325

Sampling Device: Hand Auger Depth (top): 0

Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: 7.5YR2.5/2 brown silt w/ organics, moist, loose

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Sample ID: 135B52B Sample Collection Time: 1330

Sampling Device: Hand Auger Depth (top): 2

Depth Interval: 2.25

Sample Containers/Preservatives

Pb (6010B): 1

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: 10YR4/4 silt, slightly moist, w/ organics & gravel

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):

Depth Interval:

Sample Containers/Preservatives

Pb (6010B):

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Signature of Samplers: Date Completed:

Refusal @ 2.5' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~41657490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, ≈ 60°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B53A — Sample Collection Time: 1405

Sampling Device: Hand Auger — Depth (top): 0 ft; Depth Interval: 0.5 ft

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5 yR 2.5/2, silt, slightly moist, no odor, soft.

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 135B53B — Sample Collection Time: 1409

Sampling Device: Hand Auger — Depth (top): 0.5 ft; Depth Interval: 1 ft.

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: same as above

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here: X
Photo No:

★ MS/MSD collected here

Sample ID: 135B53C — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers: — Date Completed: 11/14/08

★ Refusal @ 1' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490 11657307	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~ 105° F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB54A Sample Collection Time: 1350

Sampling Device: Hand Auger Depth (top): 0
Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR 2.5/2 brown silt, w/ organics, slightly moist, loose

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB54B Sample Collection Time: 1355

Sampling Device: Hand Auger Depth (top): 2
Depth Interval: 2.75

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: Same

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed:

Refusal @ 2.75' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11657490.3101	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~40°s	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB55A Sample Collection Time: 1405

Sampling Device: Hand Auger Depth (top): 0
Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)	1
SVOC (8270C)	
NG (8332)	
Expl (8330)	
Metals (6010B/6020)	

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here: ✓

Photo No:

* MS/MSD Collected here

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)	
SVOC (8270C)	
NG (8332)	
Expl (8330)	
Metals (6010B/6020)	

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:

Photo No:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)	
SVOC (8270C)	
NG (8332)	
Expl (8330)	
Metals (6010B/6020)	

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:

Photo No:

Signature of Samplers: Date Completed:

Refusal @ 0.75

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11052610367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~60°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB356A | Sample Collection Time: 1335

Sampling Device: Hand Auger | Depth (top): 0 | Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR3/3 brown silt, w/ organics, loose, moist

Field QC / Photo ID

Duplicate Sample Taken Here: | Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13SB356B | Sample Collection Time: 1340

Sampling Device: Hand Auger | Depth (top): 1 | Depth Interval: 1.25

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: Same

Field QC / Photo ID

Duplicate Sample Taken Here: ✓ | Photo No:

MS/MSD Samples Taken Here:

* DUP-14 collected here

Sample ID: | Sample Collection Time:

Sampling Device: Hand Auger | Depth (top): | Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: | Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: | Date Completed:

Refusal @ 1.25' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 116563.07	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, ≈ 60°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B57A Sample Collection Time: 1348

Sampling Device: Hand Auger Depth (top): 0 ft

Depth Interval: 0 - 5 ft

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR 3/3, silt w/ organics, dry, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Sample ID: 135B57B Sample Collection Time: 1352

Sampling Device: Hand Auger Depth (top): 2 ft

Depth Interval: 3 ft.

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR 3/3, silty-sand, slightly moist, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Sample ID: 135B57C Sample Collection Time: 1356

Sampling Device: Hand Auger Depth (top): 3.5 ft

Depth Interval: 4 ft

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR 3/2, silty-clay, moist, low plasticity, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/14/08

☆ Refusal @ 4' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11656327	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~ 40°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB558A | Sample Collection Time: 1240

Sampling Device: Hand Auger | Depth (top): 0 | Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR3/3 brown silt, slightly moist, loose, w/ organics
A DUP - 12 collected here

Field QC / Photo ID

Duplicate Sample Taken Here: ✓ | Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13SB558B | Sample Collection Time: 1245

Sampling Device: Hand Auger | Depth (top): 2 | Depth Interval: 3

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: Same

Field QC / Photo ID

Duplicate Sample Taken Here: | Photo No:

MS/MSD Samples Taken Here:

Sample ID: | Sample Collection Time:

Sampling Device: Hand Auger | Depth (top): | Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: | Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: | Date Completed:

Refusal @ 3.25' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, ≈60°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B59A Sample Collection Time: 1302

Sampling Device: Hand Auger Depth (top): 0 ft
Depth Interval: 0.5 ft

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 10YR 2.5/2, brown silt w/ organics, slightly moist, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 135B59B Sample Collection Time: 1323

Sampling Device: Hand Auger Depth (top): 0.5 ft
Depth Interval: 1 ft

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: same as above

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 135B39C Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/14/08

* Refusal @ 1' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~41057490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, 60°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B60A Sample Collection Time: 1219

Sampling Device: Hand Auger Depth (top): 0 ft.
Depth Interval: 0.5 ft

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5yR3/2, silty sand, w/organics, brown, slightly moist, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 135B60B Sample Collection Time: 1223

Sampling Device: Hand Auger Depth (top): 0.5 ft.
Depth Interval: 1 ft.

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: same as above

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 135B60C Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/14/08

* Refusal @ 1' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	foggy, partly cloudy, ~55°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B61A Sample Collection Time: 1008

Sampling Device: Hand Auger Depth (top): 0
Depth Interval: .5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5 yR 4/3, silt w/organics, dry, no odor, loose

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 135B61B Sample Collection Time: 1011

Sampling Device: Hand Auger Depth (top): 1.5
Depth Interval: 2.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5 yR 4/2, silty-sand, moist, w/organics, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 135B61C Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/14/08

* Refusal @ 2.5' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11657307	Sampling Event:	SWMU 13 RFI
Weather Conditions:	cloudy ~55°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B102A Sample Collection Time: 0945

Sampling Device: Hand Auger Depth (top): 0
Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR3/2 brown silt, w/ organics & gravel, moist

Field QC / Photo ID

Duplicate Sample Taken Here: ✓ Photo No:
MS/MSD Samples Taken Here:

*DUP-11 collected here

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/14/08

Refusal @ 0.75' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~14657490~~ 14656307	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~55°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB637 Sample Collection Time: 0915

Sampling Device: Hand Auger Depth (top): 0

Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: 7.5YR3/3 brown sandy silt, moist, W organics + gravel

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):

Depth Interval:

Sample Containers/Preservatives

Pb (6010B):

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):

Depth Interval:

Sample Containers/Preservatives

Pb (6010B):

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Signature of Samplers: Date Completed:

Refusal @ 1' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~41657490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	foggy partly cloudy, ~ 65°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB64A Sample Collection Time: 0932

Sampling Device: Hand Auger Depth (top): 0 ft

Depth Interval: .5 ft

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR2.5/2, silty-clay, slightly moist, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13SB64B Sample Collection Time: 0936

Sampling Device: Hand Auger Depth (top): 0.5 ft

Depth Interval: 1 ft.

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR3/3, silty-clay, moist, low plasticity, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13SB64C Sample Collection Time:

Sampling Device: Hand Auger Depth (top):

Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/14/08

* Refusal @ 1' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, 460F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB65A Sample Collection Time: 1428

Sampling Device: Hand Auger Depth (top): 0 ft

Depth Interval: 0.5 ft

Sample Containers/Preservatives

Pb (6010B): 1

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: 7.5 yR 3/3, silty-clay, moist, slightly plastic, no odor

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Sample ID: 13SB65B Sample Collection Time: 1434

Sampling Device: Hand Auger Depth (top): 0.5 ft

Depth Interval: 1 ft

Sample Containers/Preservatives

Pb (6010B): 1

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: same as above

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Sample ID: 13SB65C Sample Collection Time:

Sampling Device: Hand Auger Depth (top):

Depth Interval:

Sample Containers/Preservatives

Pb (6010B):

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Signature of Samplers:

Date Completed: 11/14/08

* Refusal @ 1' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~41657490~~ 11056367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SBblank Sample Collection Time: 1510

Sampling Device: Hand Auger Depth (top): ____

Depth Interval: ____

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C): ____
NG (8332): ____
Expl (8330): ____
Metals (6010B/6020): ____

Physical Analysis: 0
PID Reading: 0.5

Comments: 7.5YR3/4 clayey silt, slightly plastic, w/ organics moist

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____
MS/MSD Samples Taken Here: ____

Sample ID: 13SBblank3 Sample Collection Time: 1516

Sampling Device: Hand Auger Depth (top): ____

Depth Interval: ____

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C): ____
NG (8332): ____
Expl (8330): ____
Metals (6010B/6020): ____

Physical Analysis: 2
PID Reading: 3

Comments: 10YR4/2 grey sandy silt moist

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____ *A MS/MSD Collected here
MS/MSD Samples Taken Here: ✓

Sample ID: ____ Sample Collection Time: ____

Sampling Device: Hand Auger Depth (top): ____

Depth Interval: ____

Sample Containers/Preservatives

Pb (6010B): ____
SVOC (8270C): ____
NG (8332): ____
Expl (8330): ____
Metals (6010B/6020): ____

Physical Analysis: ____
PID Reading: ____

Comments: ____

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____
MS/MSD Samples Taken Here: ____

Signature of Samplers: ____ Date Completed: ____

Water @ 3.1' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657~~490 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, ≈ 50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13 SB 67 A Sample Collection Time: 1444

Sampling Device: Hand Auger Depth (top): 8 ft
Depth Interval: 8.5 ft.

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR 3/3, silty-clay, low plasticity, brown, slightly moist, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13 SB 67 B Sample Collection Time: 1448

Sampling Device: Hand Auger Depth (top): 2 ft
Depth Interval: 3.5 ft.

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR 3/2, silty-clay, low plasticity, slightly moist, soft, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13 SB 67 C Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/13/08

Refusal @ 3.5' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~41657490~~ 11657367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~ 50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB18A Sample Collection Time: 1402

Sampling Device: Hand Auger Depth (top): 0

Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: 7.5YR4/3 brown sandy silt, w/ organics

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13SB18B Sample Collection Time: 1409

Sampling Device: Hand Auger Depth (top): 2

Depth Interval: 3.75

Sample Containers/Preservatives

Pb (6010B): 1

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: 7.5YR3/1 grey silt, wet, some organics

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13SB18C Sample Collection Time:

Sampling Device: Hand Auger Depth (top):

Depth Interval:

Sample Containers/Preservatives

Pb (6010B):

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed:

Refusal @ 2.75' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~14657490~~ 14657367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~50F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB69A — Sample Collection Time: 1330

Sampling Device: Hand Auger — Depth (top): 0 — Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR 3/3 brown silt, slightly moist, w/ organics

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB69B — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB69C — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: — Date Completed:

Refusal @ 0.5' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11657367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	cloudy ~50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B70A | Sample Collection Time: 1256

Sampling Device: Hand Auger | Depth (top): 0 | Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 5yR3/3 brown silt, w/ organics, moist, some gravel

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 135B70B | Sample Collection Time: 1301

Sampling Device: Hand Auger | Depth (top): 2 | Depth Interval: 2.5

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 5yR3/1 sandy silt, dgray, very moist

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 135B70C | Sample Collection Time:

Sampling Device: Hand Auger | Depth (top): | Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers: | Date Completed:

Refusal @ 2.5' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	rainy, ~50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB71A Sample Collection Time: 1215

Sampling Device: Hand Auger Depth (top): 0 ft
Depth Interval: .5 ft

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 10yr 3/3, silty clay w/ organics, low plasticity, brown, no odor

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB71B Sample Collection Time: 1219

Sampling Device: Hand Auger Depth (top): 2 ft
Depth Interval: 3 ft.

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 10yr 3/3, silty clay, ~~medium~~ low plasticity, brown, no odor

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB71C Sample Collection Time: 1223

Sampling Device: Hand Auger Depth (top): 5 ft
Depth Interval: 6 ft

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 10yr 2.5/2, silty-clay, ~~medium~~ low to high plasticity, brown, no odor

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers:

Date Completed: 11/13/08

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11657307	Sampling Event:	SWMU 13 RFI
Weather Conditions:	rainy ~50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B72A — Sample Collection Time: 1145

Sampling Device: Hand Auger — Depth (top): 0 — Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)	1	Physical Analysis:	
SVOC (8270C)		PID Reading:	
NG (8332)			
Expl (8330)			
Metals (6010B/6020)			

Comments: ~~10YR3/2~~ brown silt, moist, loose, w/organics

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 135B72B — Sample Collection Time: 1148

Sampling Device: Hand Auger — Depth (top): 2 — Depth Interval: 3

Sample Containers/Preservatives

Pb (6010B)	1	Physical Analysis:	
SVOC (8270C)		PID Reading:	
NG (8332)			
Expl (8330)			
Metals (6010B/6020)			

Comments: Same

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 135B72C — Sample Collection Time: 1150

Sampling Device: Hand Auger — Depth (top): 5 — Depth Interval: 6

Sample Containers/Preservatives

Pb (6010B)	1	Physical Analysis:	
SVOC (8270C)		PID Reading:	
NG (8332)			
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR3/4 clayey silt, slightly plastic, moist

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: — Date Completed:

12.1°C
1355 1430
1540

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/13/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	rainy, 50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13 SB 73 A Sample Collection Time: 1130

Sampling Device: Hand Auger Depth (top): 0 ft
Depth Interval: 0.5 ft

Sample Containers/Preservatives

Pb (6010B)	1
SVOC (8270C)	
NG (8332)	
Expl (8330)	
Metals (6010B/6020)	

Physical Analysis:
PID Reading:

Comments: 10yr3/3, silty, dry, brown, no odor, organics

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13 SB 73 B Sample Collection Time: 1140

Sampling Device: Hand Auger Depth (top): 2 ft
Depth Interval: 3 ft

Sample Containers/Preservatives

Pb (6010B)	1
SVOC (8270C)	
NG (8332)	
Expl (8330)	
Metals (6010B/6020)	

Physical Analysis:
PID Reading:

Comments: 10yr 3/4, silty w/ organics, fine, no odor, loose

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13 SB 73 C Sample Collection Time: 1150

Sampling Device: Hand Auger Depth (top): 5 ft
Depth Interval: 5.5 ft.

Sample Containers/Preservatives

Pb (6010B)	1
SVOC (8270C)	
NG (8332)	
Expl (8330)	
Metals (6010B/6020)	

Physical Analysis:
PID Reading:

Comments: 10yr 3/2, moist, silty-clay, brown, no odor, low plasticity

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers: Date Completed: 11/18/08

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490 - 11652307	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~55°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB74A Sample Collection Time: 1535

Sampling Device: Hand Auger Depth (top): 0

Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: 7.5YR 3/3 brown silty, loose, moist, w/ organics

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Sample ID: 13SB74B Sample Collection Time: 1540

Sampling Device: Hand Auger Depth (top): 2

Depth Interval: 3

Sample Containers/Preservatives

Pb (6010B): 1

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: Same

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Sample ID: 13SB74C Sample Collection Time: 1550

Sampling Device: Hand Auger Depth (top): 3.5

Depth Interval: 4.0

Sample Containers/Preservatives

Pb (6010B): 1

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: Same * DUP-3 Collected here

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Signature of Samplers:

Date Completed: 11/12/08

Refusal @ 4' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy 50's F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB75A — Sample Collection Time: 1425

Sampling Device: Hand Auger — Depth (top): 0 — Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)	1	Physical Analysis:	
SVOC (8270C)		PID Reading:	
NG (8332)			
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5yR3/3 Sandy silt, w/organics, moist

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13SB75B — Sample Collection Time: 1430

Sampling Device: Hand Auger — Depth (top): 2 — Depth Interval: 3

Sample Containers/Preservatives

Pb (6010B)	1	Physical Analysis:	
SVOC (8270C)		PID Reading:	
NG (8332)			
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5yR3/3, clayey silt, slightly plastic, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

* DUP-4 collected here

Sample ID: 13SB75C — Sample Collection Time: 1440

Sampling Device: Hand Auger — Depth (top): 3.5 — Depth Interval: 4.6

Sample Containers/Preservatives

Pb (6010B)	1	Physical Analysis:	
SVOC (8270C)		PID Reading:	
NG (8332)			
Expl (8330)			
Metals (6010B/6020)			

Comments: 5yR4/4 Sandy silt, wet,

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: — Date Completed: 11/12/08

Refusal @ 4' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, 50°	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB76A Sample Collection Time: 1350

Sampling Device: Hand Auger Depth (top): 0-0.5 ft.
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)	✓		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR 3/3, silty w/ organics, brown, loose, dry, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB76B Sample Collection Time: 1355

Sampling Device: Hand Auger Depth (top): 2-3 ft.
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR 4/3, silty-clay w/ organics, brown, dense, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: X Photo No: * DUP-2 collected here
MS/MSD Samples Taken Here:

Sample ID: 13SB76C Sample Collection Time: 1405

Sampling Device: Hand Auger Depth (top): 4.5-5 ft.
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR 3/3, silty-clay slightly plastic, dense, moist, brown, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/12/08

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Slightly Cloudy, 53°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB77A — Sample Collection Time: 1332

Sampling Device: Hand Auger — Depth (top): 0-0.5 ft — Depth Interval: ____

Sample Containers/Preservatives

Pb (6010B) ____ — Physical Analysis: ____

SVOC (8270C) ____ — PID Reading: ____

NG (8332) ____

Expl (8330) ____

Metals (6010B/6020) ____

Comments: 7.5 YR 4/4, dry, loose, brown, no odor, silty & has organics

Field QC / Photo ID

Duplicate Sample Taken Here: ____ — Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: 13SB77B — Sample Collection Time: 1335

Sampling Device: Hand Auger — Depth (top): 2-3 ft. — Depth Interval: ____

Sample Containers/Preservatives

Pb (6010B) ✓ — Physical Analysis: ____

SVOC (8270C) ____ — PID Reading: ____

NG (8332) ____

Expl (8330) ____

Metals (6010B/6020) ____

Comments: 7.5 YR 3/3, dry, very silty, loose, has organics, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: ____ — Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: 13SB77C — Sample Collection Time: ____

Sampling Device: Hand Auger — Depth (top): ____ — Depth Interval: ____

Sample Containers/Preservatives

Pb (6010B) ✓ — Physical Analysis: ____

SVOC (8270C) ____ — PID Reading: ____

NG (8332) ____

Expl (8330) ____

Metals (6010B/6020) ____

Comments: ____

Field QC / Photo ID

Duplicate Sample Taken Here: ____ — Photo No: ____

MS/MSD Samples Taken Here: ____

Signature of Samplers: ____ — Date Completed: 11/12/08

Refusal @ 3ft.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490 — 11657367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB78A Sample Collection Time: 1309

Sampling Device: Hand Auger Depth (top): 0

Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR3/4 brown silt, slightly moist, w/ organics, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13SB78B Sample Collection Time: 1311

Sampling Device: Hand Auger Depth (top): 2

Depth Interval: 2.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: Some w/ gravel

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):

Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed:

Refusal @ 2.5ft bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy, 58°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB79A Sample Collection Time: 1300

Sampling Device: Hand Auger Depth (top): 0-0.5 ft

Depth Interval:

Sample Containers/Preservatives

Pb (6010B) ✓

SVOC (8270C)

NG (8332)

Expl (8330)

Metals (6010B/6020)

Physical Analysis:

PID Reading:

Comments: silt w/organics no odor, ~~dusty~~ dry, loose, brown 7.5yr 4/2

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Sample ID: 13SB79B Sample Collection Time: 1305

Sampling Device: Hand Auger Depth (top): 0.5 - 1 ft.

Depth Interval:

Sample Containers/Preservatives

Pb (6010B) ✓

SVOC (8270C)

NG (8332)

Expl (8330)

Metals (6010B/6020)

Physical Analysis:

PID Reading:

Comments: sand

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):

Depth Interval:

Sample Containers/Preservatives

Pb (6010B)

SVOC (8270C)

NG (8332)

Expl (8330)

Metals (6010B/6020)

Physical Analysis:

PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed:

Refusal @ 13SB79B @ 1 ft.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~45°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB80A Sample Collection Time: 1210

Sampling Device: Hand Auger Depth (top): 0
Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR3/6 Brown Clayey Silt, moist, w/ organics, slightly plastic
No odor

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB80B Sample Collection Time: 1213

Sampling Device: Hand Auger Depth (top): 2
Depth Interval: 3

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: Same

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

* MS/MSD Collected here

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/12/08

Boring terminated @ 3.2' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~41657490~~ 116503467	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy 20s°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B81A Sample Collection Time: 0944

Sampling Device: Hand Auger Depth (top): 0

Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: ~~10yr~~ 3/3 brown silt, slightly moist, w/ organics, no odor

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Sample ID: 135B81B Sample Collection Time: 0950

Sampling Device: Hand Auger Depth (top): 3

Depth Interval: 3

Sample Containers/Preservatives

Pb (6010B):

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: 10yr 3/4 brown clayey silt, moist, w/ organics, no odor

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Sample ID: Sample Collection Time:

Sampling Device: Hand Auger Depth (top):

Depth Interval:

Sample Containers/Preservatives

Pb (6010B):

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:

MS/MSD Samples Taken Here:

Photo No:

Signature of Samplers: Date Completed:

Boring terminated @ 3.1 ' bgs - gravelly rock

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	cloudy, 60°F	Sampling Team:	MF,BF,KH,HA

Sample ID: SB82A — Sample Collection Time: 0934

Sampling Device: Hand Auger — Depth (top): 0-0.5 ft.
Depth Interval:

Sample Containers/Preservatives
Pb (6010B): ✓
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: silty, sandy w/ organics, no odor, moist, 7.5 YR 3/3

Field QC / Photo ID
Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Sample ID: SB82B — Sample Collection Time: 0941

Sampling Device: Hand Auger — Depth (top): 2-3 ft.
Depth Interval:

Sample Containers/Preservatives
Pb (6010B): ✓
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: slightly plastic, silty-clay, moist w/ organics, no odor 10YR 3/3

Field QC / Photo ID
Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Sample ID: SB82C — Sample Collection Time: 1951

Sampling Device: Hand Auger — Depth (top): 5-6 ft.
Depth Interval:

Sample Containers/Preservatives
Pb (6010B): ✓
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: silty clay, w/ organics, moist, dense, no odor, 10YR-3/6

Field QC / Photo ID
Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: — Date Completed:

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11658367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	cloudy ~30°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB83A Sample Collection Time: 0930

Sampling Device: Hand Auger Depth (top): 0
Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR3/4 brown silt, with organics, slightly moist

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB83B Sample Collection Time: 0933

Sampling Device: Hand Auger Depth (top): 3
Depth Interval: 3

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: Same as above

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB83C Sample Collection Time:

Sampling Device: Hand Auger Depth (top):
Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed:

Boring terminated at 3.5' bgs - tree root

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~41657490~~ 116563 67	Sampling Event:	SWMU 13 RFI
Weather Conditions:	foggy, partly cloudy, ~50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB84A — Sample Collection Time: 0850

Sampling Device: Hand Auger — Depth (top): 0 ft. — Depth Interval: 0.5 ft.

*DUP-10 was collected here

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR 3/2, silty-clay, dark brown, low plasticity, no odor, slightly moist

Field QC / Photo ID

Duplicate Sample Taken Here: X — Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB84B — Sample Collection Time: 0855

Sampling Device: Hand Auger — Depth (top): 1.5 ft — Depth Interval: 2 ft.

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: Same as above

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB84C — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: — Date Completed: 11/14/08

* H_2O @ 2.0' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy; 56°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B85A — Sample Collection Time: 1310

Sampling Device: Hand Auger — Depth (top): 0-0.5ft.

Depth Interval:

Sample Containers/Preservatives

Pb (6010B): ✓

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: silty w/ organics, dey, brown, no odor, 7.5yR 4/4

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 135B85B — Sample Collection Time: 1314

Sampling Device: Hand Auger — Depth (top): 2-3 ft.

Depth Interval:

Sample Containers/Preservatives

Pb (6010B): ✓

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: 7.5yR 3/3, brown, slight moisture, no odor, finely packed

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 135B85C — Sample Collection Time: 1320

Sampling Device: Hand Auger — Depth (top): 4.5-5 ft.

Depth Interval:

Sample Containers/Preservatives

Pb (6010B): ✓

SVOC (8270C):

NG (8332):

Expl (8330):

Metals (6010B/6020):

Physical Analysis:

PID Reading:

Comments: silty clay, brown, no odor 7.5yr 3/3, dense, moist

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: — Date Completed: 11/12/08

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/14/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~11657490~~ 11656367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	partly cloudy, foggy, ~55°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B86A — Sample Collection Time: 0910

Sampling Device: Hand Auger — Depth (top): 0.ft — Depth Interval: 0.5ft

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5 yR 3/3, Clayey-silt, slightly moist, no odor, low plasticity w organics

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 135B86B — Sample Collection Time: 0915

Sampling Device: Hand Auger — Depth (top): 0.5ft — Depth Interval: 1.0ft

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: SAME as above

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here: X * MS/MSD taken here

Sample ID: 135B86C — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: — Date Completed: 11/14/08

* Refusal @ 1' bgs.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	~~41657490~~ 11657363.07	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~ 50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 135B86A — Sample Collection Time: 1345

Sampling Device: Hand Auger — Depth (top): 0 — Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 10YR3/3 silty sand, w/ gravel & organics, moist

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Sample ID: 135B86B — Sample Collection Time: 1350

Sampling Device: Hand Auger — Depth (top): 2 — Depth Interval: 2.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: Same, wet

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

* MS/MSD Collected here

Sample ID: 135B86C — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here: — Photo No:

MS/MSD Samples Taken Here:

Signature of Samplers: — Date Completed:

Water @ 2.5' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490 11657307	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~55°	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB87A Sample Collection Time: 1400

Sampling Device: Hand Auger Depth (top): 0
Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: 7.5YR 3/3 sandy silt, moist, w/ organics & gravel, no odor

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB87B Sample Collection Time: 1405

Sampling Device: Hand Auger Depth (top): 2
Depth Interval: 3

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: Same

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Sample ID: 13SB87C Sample Collection Time: 1415

Sampling Device: Hand Auger Depth (top): 3.5
Depth Interval: 4.0

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: Same

Field QC / Photo ID

Duplicate Sample Taken Here: Photo No:
MS/MSD Samples Taken Here:

Signature of Samplers: Date Completed: 11/12/08

Refusal @ 4' bgs - sandy gravel

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490 11657367	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Cloudy ~60°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB88A Sample Collection Time: 1508

Sampling Device: Hand Auger Depth (top): _____ Depth Interval: _____

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	1
NG (8332)		PID Reading:	0.0
Expl (8330)			
Metals (6010B/6020)			

Comments: 2.5YR 2.5/2 Silty sand, w/ gravel & shells & organics, moist

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID: 13SB88B Sample Collection Time: 1515

Sampling Device: Hand Auger Depth (top): 3 Depth Interval: 3.75

Sample Containers/Preservatives

Pb (6010B)	1		
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: Same

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Sample ID: _____ Sample Collection Time: _____

Sampling Device: Hand Auger Depth (top): _____ Depth Interval: _____

Sample Containers/Preservatives

Pb (6010B)			
SVOC (8270C)		Physical Analysis:	
NG (8332)		PID Reading:	
Expl (8330)			
Metals (6010B/6020)			

Comments: _____

Field QC / Photo ID

Duplicate Sample Taken Here: _____ Photo No: _____

MS/MSD Samples Taken Here: _____

Signature of Samplers: _____ Date Completed: _____

Water @ 2.75' bgs

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:		Sampling Team:	MF,BF,KH,HA

Sample ID: 13SB89A — Sample Collection Time: 1517

Sampling Device: Hand Auger — Depth (top): 0 — Depth Interval: 0.5

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: ~~7.5~~ 7.5YR/3/3, silty sand, dry, brown, no odor

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

★DUP-5 collected here

Sample ID: 13SB89B — Sample Collection Time: ~~11/12/08~~ 1521

Sampling Device: Hand Auger — Depth (top): 2ft — Depth Interval: 3ft

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 7.5YR/3/3, ~~silty~~ sandy, brown, ~~dry~~, no odor, moist

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB89C — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers: — Date Completed: 11/12/08

Refusal @ 3ft.

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	11/12/08
Site Name:	RFAAP	Client:	RFAAP
URS Project No.:	11657490	Sampling Event:	SWMU 13 RFI
Weather Conditions:	Mostly Cloudy, ~50°F	Sampling Team:	MF,BF,KH,HA

Sample ID: 13 SB 90 A — Sample Collection Time: 1542

Sampling Device: Hand Auger — Depth (top): 0 ft — Depth Interval: 0.5 ft.

Sample Containers/Preservatives

Pb (6010B): 1
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 1.5yR/4/2, brown, silty, dry, loose, no odor

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13 SB 90 B — Sample Collection Time: 1548

Sampling Device: Hand Auger — Depth (top): 2 — Depth Interval: 2.5ft

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments: 1.5 yR/4/2, brown, sandy silt, gravel, slightly moist, no odor

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13 SB 90 C — Sample Collection Time:

Sampling Device: Hand Auger — Depth (top): — Depth Interval:

Sample Containers/Preservatives

Pb (6010B):
SVOC (8270C):
NG (8332):
Expl (8330):
Metals (6010B/6020):

Physical Analysis:
PID Reading:

Comments:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers: — Date Completed: 11/12/08

Refusal @ 2.5 ft. - due to water

Project Information

Project Name:	RFAAP SWMU 13 RFI	Date:	12/17/08
Site Name:	SWMU 13	Client:	RFAAP
URS Project No.:	11656367	Sampling Event:	Additional Sampling SWMU 13
Weather Conditions:	overcast ~55°	Sampling Team:	MF, BF

Sample ID: 135B91 A — Sample Collection Time: 1630

Sampling Device: Hand Auger — Depth (top): ____ Depth Interval: 0-0.5'

Sample Containers/Preservatives

Pb (6010B)	X		
SVOC		Physical Analysis:	
Pesticides		PID Reading:	
PCBs			
Herbicides			
Metals			
Comments:			

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: 135B91 B — Sample Collection Time: 1635

Sampling Device: Hand Auger — Depth (top): ____ Depth Interval: 2-3'

Sample Containers/Preservatives

Pb (6010B)	X		
SVOC		Physical Analysis:	
Pesticides		PID Reading:	
PCBs			
Herbicides			
Metals			
Comments:			

Field QC / Photo ID

Duplicate Sample Taken Here: ____ Photo No: ____

MS/MSD Samples Taken Here: ____

Sample ID: 135B91 C — Sample Collection Time: 1640

Sampling Device: Hand Auger — Depth (top): ____ Depth Interval: 5-6'

Sample Containers/Preservatives

Pb (6010B)	X		
SVOC		Physical Analysis:	
Pesticides		PID Reading:	
PCBs			
Herbicides			
Metals			
Comments:	DUP-15 collected here		

Field QC / Photo ID

Duplicate Sample Taken Here: X Photo No: ____

MS/MSD Samples Taken Here: ____

Signature of Samplers: [signature] Date Completed: 12/17/08

Project Information

Project Name: RFAAP Sumu 13 RFI
Site Name: Sumu 13
URS Project No.: 11655e3607
Weather Conditions: Cloudy ~ 65°

Date: 12/17/08
Client: RFAAP
Sampling Event: Additional Sampling Sumu 13
Sampling Team: MF, BF

Sample ID: 13SB92A
Sample Collection Time: 1650

Sampling Device:
Depth (top):
Depth Interval: 0-0.5'

Sample Containers/Preservatives

Pb (6010B): X
SVOC:
Pesticides:
PCBs:
Herbicides:
Metals:
Comments:

Physical Analysis:
PID Reading:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB92B
Sample Collection Time: 1655

Sampling Device:
Depth (top):
Depth Interval: 2-3'

Sample Containers/Preservatives

Pb (6010B): X
SVOC:
Pesticides:
PCBs:
Herbicides:
Metals:
Comments:

Physical Analysis:
PID Reading:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Sample ID: 13SB92C
Sample Collection Time: 1700

Sampling Device:
Depth (top):
Depth Interval: 5-5.5'

Sample Containers/Preservatives

Pb (6010B): X
SVOC:
Pesticides:
PCBs:
Herbicides:
Metals:
Comments:

Physical Analysis:
PID Reading:

Field QC / Photo ID

Duplicate Sample Taken Here:
MS/MSD Samples Taken Here:
Photo No:

Signature of Samplers:
Date Completed: 12/17/08

APPENDIX C.4

INVESTIGATION-DERIVED MATERIAL ANALYTICAL RESULTS

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ANALYTICAL REPORT

Client:	**URS Corporation**	Work Order:	**0811380**
Project:	RFAAP SWMU 13 RFI/CMS, WO 008	Description:	36440-63
Client Sample ID:	**IDM-1**	Sampled:	11/14/08 16:10
Lab Sample ID:	**0811380-01**	Sampled By:	M. Fisher; URS
Matrix:	Water	Received:	11/19/08 09:15

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	MDL	Unit	Dilution Factor	Method	Date Analyzed	By	QC Batch
Chemical Oxygen Demand	**440**	50	2.2	mg/L	1	SM 5220 D 20th	11/21/08	CKD	0813789
***pH**	**7.5**	0.1	0.1	pH Units	1	USEPA-9040B	11/21/08	CLD	0813784

*See Statement of Data Qualifications

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Individual sample results relate only to the sample tested.
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ANALYTICAL REPORT

Client:	**URS Corporation**	Work Order:	**0811380**
Project:	RFAAP SWMU 13 RFI/CMS, WO 008	Description:	36440-63
Client Sample ID:	**IDM-1**	Sampled:	11/14/08 16:10
Lab Sample ID:	**0811380-02**	Sampled By:	M. Fisher; URS
Matrix:	TCLP	Received:	11/19/08 09:15

TCLP Metals by EPA 1311/6000/7000 Series Methods

Analyte	Analytical Result		RL	MDL	Unit	Dilution Factor	Method	Date Analyzed	By	QC Batch
Arsenic	0.20	U	0.20	0.054	mg/L	1	USEPA-6010B	11/25/08	KLV	0813860
Barium	**0.13**	**J**	0.35	0.0021	mg/L	1	USEPA-6010B	11/25/08	KLV	0813860
Cadmium	**0.0045**	**J**	0.020	0.0030	mg/L	1	USEPA-6010B	11/25/08	KLV	0813860
Chromium	**0.011**	**J**	0.050	0.0091	mg/L	1	USEPA-6010B	11/25/08	KLV	0813860
***Copper**	**0.020**		0.010	0.0028	mg/L	1	USEPA-6010B	11/25/08	KLV	0813860
***Lead**	**0.044**	**J**	0.10	0.025	mg/L	1	USEPA-6010B	11/25/08	KLV	0813860
Mercury	0.00020	U	0.00020	0.000043	mg/L	1	USEPA-7470A	12/02/08	DSC	0814030
Nickel	0.010	U	0.010	0.0097	mg/L	1	USEPA-6010B	11/25/08	KLV	0813860
Selenium	**0.099**	**J**	0.20	0.040	mg/L	1	USEPA-6010B	11/25/08	KLV	0813860
Silver	0.010	U	0.010	0.0034	mg/L	1	USEPA-6010B	11/25/08	KLV	0813860
***Zinc**	**3.8**		0.25	0.0076	mg/L	1	USEPA-6010B	11/25/08	KLV	0813860

*See Statement of Data Qualifications

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STATEMENT OF DATA QUALIFICATIONS

Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Qualification: The referenced method requires analysis occur immediately after sample collection. Since the analysis was not performed in the field, the reported result is considered estimated. Analysis date, time and temperature were:
11-21-2008 12:30PM 23.8 C.

Analysis: USEPA-9040B

Sample/Analyte: 0811380-01 IDM-1 pH

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STATEMENT OF DATA QUALIFICATIONS

TCLP Metals by EPA 1311/6000/7000 Series Methods

Qualification: The post-digestion spike recovery for this sample was outside the control limit. Sample matrix interference is suspected and the reported result must be considered as estimated.

Analysis: USEPA-6010B

Sample/Analyte: 0811380-02 IDM-1 Lead

Qualification: This analyte was not present in this sample at a concentration greater than 100 times the MDL, therefore serial dilution is not required.

Analysis: USEPA-6010B

Sample/Analyte: 0811380-02 IDM-1 Copper

Qualification: The MS and/or MSD recovery was outside the control limit. The non-spiked sample concentration for the same analyte was greater than or equal to 4 times the spiked amount; the non-spiked sample result is not qualified.

Analysis: USEPA-6010B

Sample/Analyte: 0811380-02 IDM-1 Zinc

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APPENDIX C.5

SAMPLE LOCATION COORDINATES

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Table C.5
Sample Location Coordinates
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Survey Point	Easting	Northing
13SB7	10892506.020	3599910.880
13SB8	10892987.400	3599836.090
13SB9	10893299.430	3599867.760
13SB10	10893748.970	3599946.990
13SB11	10893985.660	3599970.740
13SB12	10894068.060	3600011.270
13SB13	10894132.499	3599995.656
13SB14	10893642.228	3599928.293
13SB15	10892807.598	3599844.348
13SB16	10892704.606	3599826.967
13SB17	10892911.063	3599828.452
13SB18	10893250.839	3599847.882
13SB19	10893503.567	3599875.118
13SB20	10893742.905	3599914.044
13SB21	10894036.389	3599954.269
13SB22	10893889.460	3599911.127
13SB23	10894232.244	3600024.772
13SB24	10894181.349	3600010.274
13SB25	10894083.889	3599983.343
13SB26	10894034.795	3599977.013
13SB27	10893987.965	3599975.619
13SB28	10893938.144	3599970.528
13SB29	10893890.327	3599962.970
13SB30	10893843.190	3599955.678
13SB31	10893790.820	3599949.476
13SB32	10893742.037	3599946.814
13SB33	10893692.524	3599936.131
13SB34	10893595.953	3599915.969
13SB35	10893548.597	3599901.625
13SB36	10893499.641	3599895.157
13SB37	10893449.785	3599886.130
13SB38	10893402.603	3599880.718
13SB39	10893354.147	3599871.259
13SB40	10893305.516	3599868.149
13SB41	10893251.081	3599866.667
13SB42	10893200.170	3599864.989
13SB43	10893152.515	3599861.453
13SB44	10893105.276	3599854.353
13SB45	10893052.551	3599849.758
13SB46	10893006.448	3599841.354
13SB47	10892957.663	3599841.045
13SB48	10892910.938	3599843.333
13SB49	10892857.132	3599842.737
13SB50	10892759.617	3599843.564
13SB51	10892707.535	3599847.974
13SB52	10892659.643	3599854.954
13SB53	10892580.398	3599892.047
13SB54	10892512.899	3599917.783
13SB55	10892512.595	3599901.578
13SB56	10892578.439	3599870.930
13SB57	10892654.504	3599840.352
13SB58	10892757.057	3599820.955
13SB59	10892807.593	3599821.777
13SB60	10892854.041	3599819.586
13SB61	10892958.867	3599821.505
13SB62	10893007.087	3599819.040
13SB63	10893056.096	3599830.410
13SB64	10893103.172	3599834.726

Table C.5
Sample Location Coordinates
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Survey Point	Easting	Northing
13SB65	10893151.395	3599839.454
13SB66	10893197.048	3599852.662
13SB67	10893292.914	3599847.196
13SB68	10893354.254	3599857.668
13SB69	10893391.880	3599862.200
13SB70	10893450.838	3599861.205
13SB71	10893553.007	3599885.622
13SB72	10893599.532	3599886.956
13SB73	10893650.959	3599898.659
13SB74	10893697.420	3599904.788
13SB75	10893791.855	3599918.890
13SB76	10893844.910	3599923.546
13SB77	10893889.087	3599935.392
13SB78	10893939.386	3599943.921
13SB79	10893989.253	3599957.806
13SB80	10894089.524	3599960.129
13SB81	10894136.513	3599966.927
13SB82	10894188.927	3599985.269
13SB83	10894237.697	3600000.235
13SB84	10893993.634	3599941.694
13SB85	10893941.551	3599934.235
13SB86	10893847.575	3599872.499
13SB87	10893798.341	3599873.430
13SB88	10893753.773	3599871.428
13SB89	10893707.426	3599861.626
13SB90	10893653.145	3599865.658
13SB91	10892469.615	3599934.761
13SB92	10892457.161	3599918.304

Notes:
These data points were downloaded from a Trimble GPS
Coordinate System is Virginia State Plane South. Units are in feet.
MSL = Mean Sea Level

APPENDIX C.6

SOIL LOSS CALCULATIONS

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Calculation #1 - Annual Soil Loss

Revised Universal Soil Loss Equation (RUSLE)

$A = R \cdot K \cdot LS \cdot C \cdot P$
$= 132 \cdot 0.24 \cdot 4.4 \cdot 0.004 \cdot 1 = 0.56$ tons/acre/year

A = Loss per acre per year (tons per acre per year)

R = Rainfall value = 132 (from Figure 2-1 - USDA 1997 – Pulaski County)

K = Soil Erodibility Factor = 0.24 (Wheeling Sandy Loam)

LS = factor for horizontal length of slope and slope gradient = $0.77 \cdot 5.7 = 4.4$

$L = (l/72.6)^m = 0.77$

l=slope length= 43 feet

m= slope length factor = 0.5 (slope > 5%)

$S = (16.8 \sin(\Theta))-0.5 = 5.7$

Θ= slope angle = 21.8 degrees

C = factor for planned cover = 0.004 (from Table 11 - USDA 1978 – 70-45% cover trees and undergrowth, 85-75% duff coverage)

P = factor for management options = 1 (default)

Site Soil Loss = A·Site Area = 0.56 tons/acre/year·1.6 acres = 0.9 tons/year

Total Lead In Soil = 0.9 tons · 314 mg/kg average lead in surface soil · 2000 lbs/ton · 1kg/2.2 lbs · 1E-06 kg/mg
= 0.26 kg of lead

Calculation #2 - Single Event Soil Loss

Modified Universal Soil Loss Equation (MUSLE)

$Y = 95(Q \cdot q)^{0.56}\ K \cdot LS \cdot C \cdot P$
$= 95(0.147 \cdot 4.35)^{0.56}\ 0.24 \cdot 4.4 \cdot 0.004 \cdot 1 = 0.3$ tons of soil

Y = single storm sediment yield in tons

Q = storm runoff volume = $[(P-0.2S)^2/(P+0.8S)]$ (inches)
= 1.1 inches = 0.092 ft = 0.092 ft · 1.6 acres = 0.147 acre-ft
P = Rainfall Depth = 3.63 inches (Virginia Department on Conservation and Recreation - 10 Year Storm 24 Hour for Pulaski County)
S = 1000/CN-10 = 1000/70-10 = 4.3
CN = SCS Curve Number = 70 (Soil Group C – Forest Good Condition)

q = peak flow = $C \cdot I \cdot A$
$= 0.4 \cdot 6.8 \cdot 1.6 = 4.35\ ft^3/sec$
C = Manning's Runoff Coefficient for Sheet Flow = 0.4 (for woods – light underbrush)
I = Rainfall Intensity = 6.8 in/hour (Roanoke County IDF Curve – Duration 5 min due length of overland flow and slope)
A = Drainage Area = 1.6 acres

K = Soil Erodibility Factor = 0.24 (Wheeling Sandy Loam)

LS = factor for horizontal length of slope and slope gradient = 0.77·5.7 = 4.4
L = $(l/72.6)^m$ = 0.77
l=slope length= 43 feet
m= slope length factor = 0.5 (slope > 5%)
S = $(16.8 \sin(\Theta))-0.5$ = 5.7
Θ= slope angle = 21.8 degrees

C = factor for planned cover = 0.004 (from Table 11 - USDA 1978 – 70-45% cover trees and undergrowth, 85-75% duff coverage)

P = factor for management options = 1 (default)

Lead In Soil = 0.3 tons · 314 mg/kg average lead in surface soil · 2000 lbs/ton · 1kg/2.2 lbs · 1E-06 kg/mg
= 0.09 kg of lead

References:

USDA 1978 Predicting Rainfall Erosion Losses: A Guide to Conservation Planning. Agriculture Handbook 537. December 1978.

USDA 1997 Predicting Soil Erosion by Water: A Guide to Conservation Planning with the Revised Universal Soil Loss Equation (RUSLE). Agricultural Handbook 703. January 1997.

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APPENDIX C.7

SITE-SPECIFIC SSL AND SESOIL CALCULATIONS

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Site-Specific SL for Benzo(a)anthracene (using C_w = T-RBC)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	2.9E-05	mg/L
C_w =	Target Leachate Conc =	2.9E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.09	--
H' =	Henry's Law Constant =	4.91E-04	--
P_b =	Dry Soil Bulk Density =	1.61	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	2.31E+05	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	2,310	L/kg
	Site-specific SSL =	**6.7E-01**	**mg/kg**

Site-Specific SL for Benzo(a)pyrene (using C_w = T-RBC)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	2.9E-06	mg/L
C_w =	Target Leachate Conc =	2.9E-05	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.09	--
H' =	Henry's Law Constant =	1.9E-05	--
P_b =	Dry Soil Bulk Density =	1.61	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	7.87E+05	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	7,870	L/kg
	Site-specific SSL =	**2.3E-01**	**mg/kg**

Site-Specific SL for Benzo(b)fluoranthene (using C_w = T-RBC)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	2.9E-05	mg/L
C_w =	Target Leachate Conc =	2.9E-04	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.09	--
H' =	Henry's Law Constant =	2.70E-05	--
P_b =	Dry Soil Bulk Density =	1.61	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	8.03E+05	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	8,030	L/kg
	Site-specific SSL =	**2.3E+00**	**mg/kg**

Site-Specific SL for Naphthalene (using C_w = T-RBC)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	1.40E-04	mg/L
C_w =	Target Leachate Conc =	1.40E-03	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.09	--
H' =	Henry's Law Constant =	1.8E-02	--
P_b =	Dry Soil Bulk Density =	1.61	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1.84E+03	L/kg
	SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$		
foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	18.4	L/kg
	Site-specific SSL =	**2.605E-02**	**mg/kg**

Site-Specific SL for Trichloroethene (using C_w = T-RBC)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	0.0017	mg/L
C_w =	Target Leachate Conc =	0.017	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.09	--
H' =	Henry's Law Constant =	4E-01	--
P_b =	Dry Soil Bulk Density =	1.61	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	67.7	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	0.677	L/kg
	Site-specific SSL =	**0.015**	**mg/kg**

Site-Specific SL for 2,4,6-TNT (using C_w = T-RBC)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	0.0022	mg/L
C_w =	Target Leachate Conc =	0.022	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.09	--
H' =	Henry's Law Constant =	1.9E-05	--
P_b =	Dry Soil Bulk Density =	1.61	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	1,834	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	18.34	L/kg
	Site-specific SSL =	**0.408**	**mg/kg**

Site-Specific SL for 2,6-DNT (using C_w = T-RBC)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	0.037	mg/L
C_w =	Target Leachate Conc =	0.37	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.09	--
H' =	Henry's Law Constant =	3.1E-05	--
P_b =	Dry Soil Bulk Density =	1.61	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	371	L/kg

SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	3.714	L/kg
	Site-specific SSL =	**1.5**	**mg/kg**

Site-Specific SL for Nitroglycerin (using C_w = T-RBC)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Input Parameters Averaged from All Soil-Sample Physical Test Results

			units
	Dilution Factor =	10	--
T-RBC	GW Concentration Source=	0.0037	mg/L
C_w =	Target Leachate Conc =	0.037	mg/L
θ_w =	Water-Filled Soil Porosity =	0.33	--
θ_a=	Air-Filled Soil Porosity =	0.09	--
H' =	Henry's Law Constant =	4.0E-06	--
P_b =	Dry Soil Bulk Density =	1.61	kg/L
Koc=	Soil Organic Carbon/Water Partition Coefficient =	131	L/kg

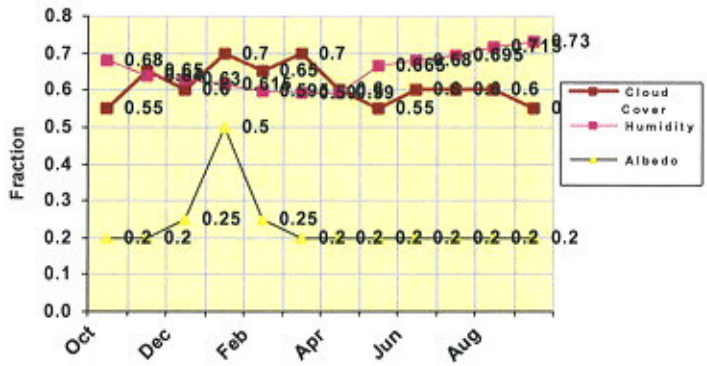
SSL (mg/kg) = $C_w [K_d + (\theta_w + \theta_a H')/Pb]$

foc =	Fraction Organic Carbon =	0.01	unitless
K_d =	Soil-Water Partition Coeff (K_{oc}*foc) =	1.31	L/kg
	Site-specific SSL =	**0.056**	**mg/kg**

Climate Report

Location Description: RADFORD
Climatic Input File: C:\SEVIEW63\RADFORD.CLM

Month	Temperature		Precipitation		Evapotranspiration Rate		Storms		Cloud Cover	Albedo	Humidity
Units	°C	°F	cm	Inches	cm	Inches	# per Month	Length Days	Fraction	Fraction	Fraction
October	13.61	56.50	8.280	3.26	0.00	0.00	3.97	0.550	0.550	0.200	0.680
November	8.61	47.50	7.137	2.81	0.00	0.00	4.58	0.500	0.650	0.200	0.640
December	3.50	38.30	6.655	2.62	0.00	0.00	4.52	0.550	0.600	0.250	0.630
January	1.39	34.50	6.502	2.56	0.00	0.00	5.11	0.530	0.700	0.500	0.615
February	2.94	37.29	6.833	2.69	0.00	0.00	4.97	0.530	0.650	0.250	0.595
March	8.22	46.80	7.544	2.97	0.00	0.00	5.94	0.560	0.700	0.200	0.590
April	13.11	55.60	7.772	3.06	0.00	0.00	5.05	0.510	0.600	0.200	0.590
May	17.83	64.09	8.509	3.35	0.00	0.00	6.22	0.450	0.550	0.200	0.665
June	21.94	71.49	7.874	3.10	0.00	0.00	5.94	0.380	0.600	0.200	0.680
July	24.22	75.60	9.982	3.93	0.00	0.00	6.82	0.290	0.600	0.200	0.695
August	23.67	74.61	8.458	3.33	0.00	0.00	6.47	0.290	0.600	0.200	0.715
September	19.83	67.69	7.214	2.84	0.00	0.00	4.61	0.490	0.550	0.200	0.730
Total			92.76	36.52	0.00	0.00					



SESOIL Profile and Load Report

Layer No.	Number of Sub-Layers	Thickness		Intrinsic Permeability	Organic Carbon Content	Adsorption Coefficient	Cation Exchange Capacity	Freundlich Exponent	Solid Phase Degradation Rate	Liquid Phase Degradation Rate	Soil pH
		cm	feet	cm^2	percent	$\frac{\mu g/g}{\mu g/mL}$	$\frac{mEq}{100\ g\ soil}$	unitless	1/day	1/day	pH
1	10	168.0	5.51	2.00E-09	1.00	900.00	5.80	1.00	0.00E+00	0.00E+00	6.90
2	1	30.0	0.98	2.00E-09	1.00	900.00	5.80	1.00	0.00E+00	0.00E+00	6.90
3		0.0	0.00	.0	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00
4		0.0	0.00	.0	0.00	0.00	0.00	0.00	0.00E+00	0.00E+00	0.00

Soil Parameters

Bulk Density (g/cm^3)	1.86
Effective Porosity (fraction)	0.25
Soil Pore Disconnectedness	8.00

Application Parameters

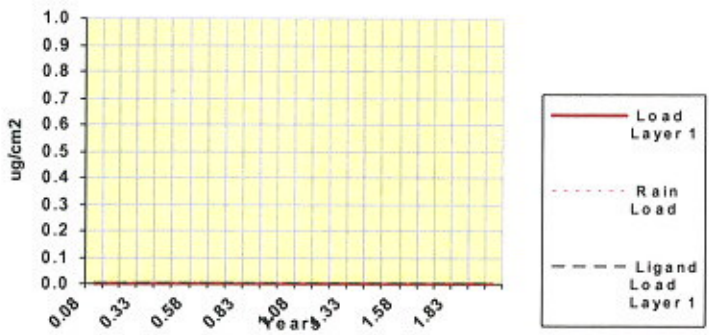
Area	cm^2	6.47E+7
	ft^2	6.96E+4
Latitude	degrees	43.0
Spill Index		1

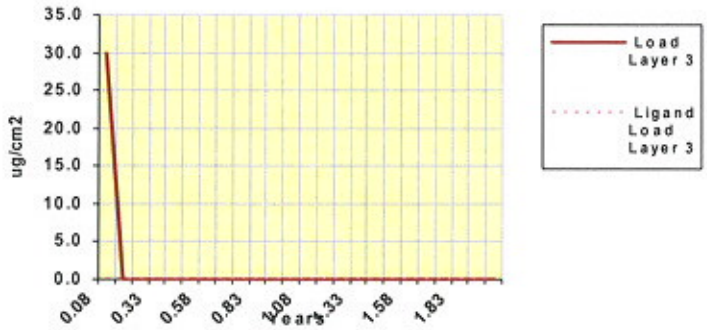
Chemical Parameters

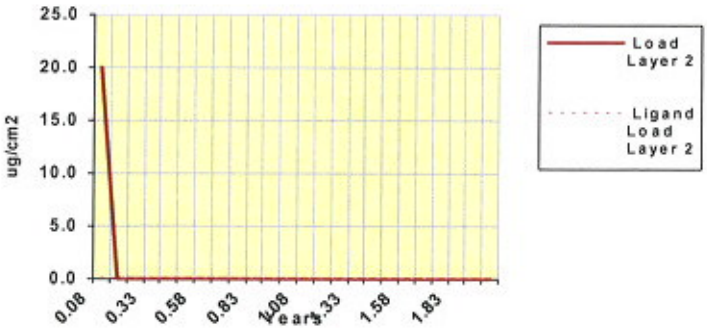
Water Solubility	(µg/mL)	9.58E+3	**Moles Ligand / Moles Chemical**	0.00
Henry's Law	(M^3atm/mol)	2.44E-2	**Ligand Molecular Weight** (g/mol)	0.00
K_{oc}	(µg/g)/(µg/mL)	0.00	**Base Hydrolysis Rate** (L/mol/day)	0.00
Valance	(g/mole)	0.00	**Ligand Dissociation Constant**	0.00
Air Diffusion Coefficient	(cm^2/sec)	.000	**Neutral Hydrolysis Rate** (L/mol/day)	0.00
Water Diffusion Coefficient	(cm^2/sec)	.000	**Acid Hydrolysis Rate** (L/mol/day)	0.00
Molecular Weight	(g/mol)	207.00		

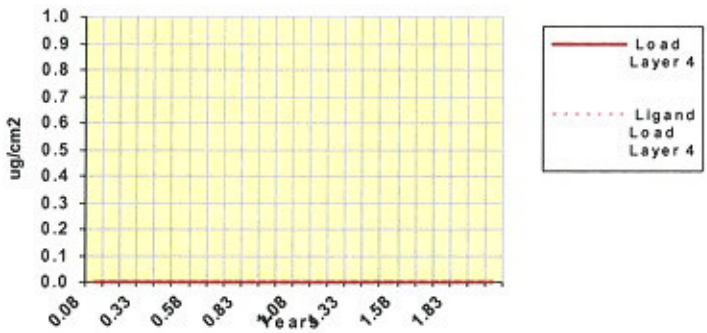
Output File:
C:\SEVIEW63\13PBRN23.OUT
Chemical File: Lead And Compounds (Kd)
C:\SEVIEW63\LEADANDC.CHM
Soil File: Silty Sand, Perm = 1.3-5 cm/sec
C:\SEVIEW63\RAAP13\RAPSM13.SOI
Application File: SEVIEW Default Application Parameters
C:\SEVIEW63\RAAP13\SWMU13V3.APL

Sublayer Loads	1	2	3	4	5	6	7	8	9	10
Layer 1 (ug/g)	4.14E+02	4.14E+02	4.14E+02	4.14E+02	4.14E+02	4.14E+02	4.14E+02	4.14E+02	4.14E+02	4.14E+02
Layer 2 (ug/g)										
Layer 3 (ug/g)										
Layer 4 (ug/g)										





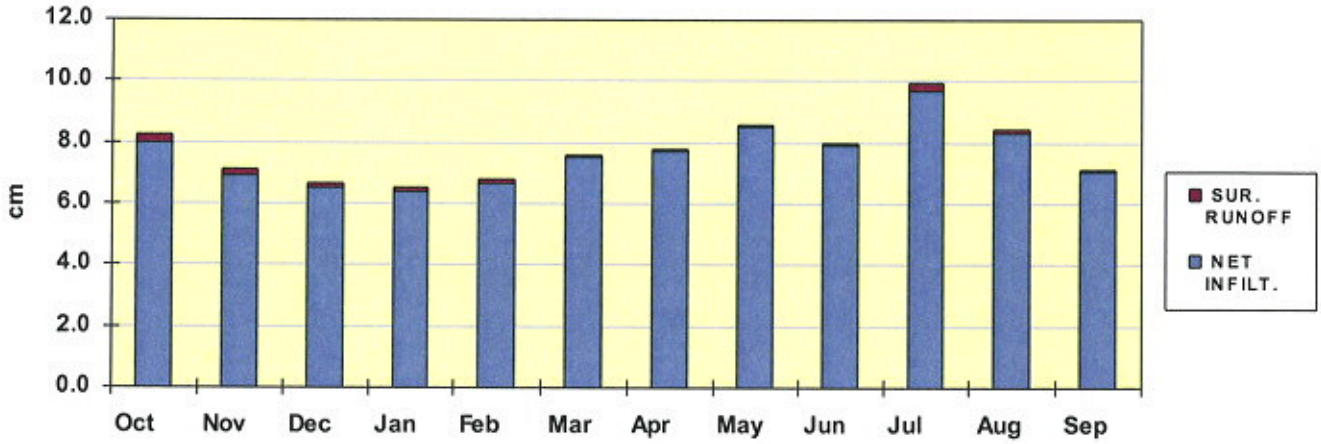


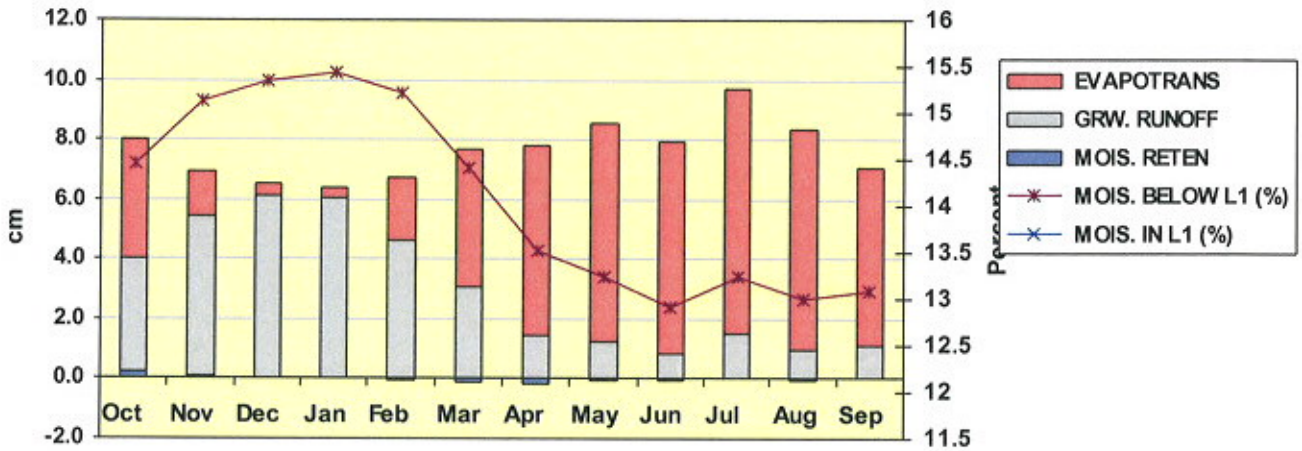


SESOIL Hydrologic Cycle Report

Scenario Description:

SESOIL Output File: C:\SEVIEW63\13PBRN23.OUT





	Surface Water Runoff		Net Infiltration		Evapotranspiration		Soil Moisture Retention		Groundwater Runoff (Recharge)		Soil Moisture	
											Layer 1	Below Layer 1
Units	cm	Inches	cm	Inches	cm	Inches	cm	Inches	cm	Inches	Percent	Percent
October	0.29	0.11	7.98	3.14	3.97	1.56	0.23	0.09	3.79	1.49	14.47	14.47
November	0.18	0.07	6.94	2.73	1.48	0.58	0.11	0.04	5.35	2.11	15.14	15.14
December	0.17	0.07	6.50	2.56	0.39	0.15	0.03	0.01	6.08	2.39	15.34	15.34
January	0.13	0.05	6.37	2.51	0.30	0.12	0.02	0.01	6.05	2.38	15.44	15.44
February	0.16	0.06	6.66	2.62	2.04	0.80	-0.04	-0.02	4.66	1.83	15.22	15.22
March	0.06	0.02	7.53	2.96	4.58	1.80	-0.13	-0.05	3.09	1.22	14.42	14.42
April	0.11	0.04	7.68	3.02	6.35	2.50	-0.15	-0.06	1.48	0.58	13.52	13.52
May	0.07	0.03	8.50	3.35	7.32	2.88	-0.05	-0.02	1.23	0.48	13.24	13.24
June	0.07	0.03	7.88	3.10	7.13	2.81	-0.05	-0.02	0.81	0.32	12.92	12.92
July	0.26	0.10	9.69	3.81	8.16	3.21	0.05	0.02	1.47	0.58	13.24	13.24
August	0.15	0.06	8.32	3.28	7.39	2.91	-0.04	-0.02	0.97	0.38	12.99	12.99
September	0.06	0.02	7.08	2.79	6.00	2.36	0.02	0.01	1.06	0.42	13.09	13.09
Total	1.71	0.67	91.12	35.88	55.09	21.69	0.00	0.00	36.03	14.18		

SESOIL Pollutant Cycle Report

Scenario Description:

SESOIL Output File: C:\SEVIEW63\13PBRN23.OUT

SESOIL Process	Pollutant Mass (µg)	Percent of Total
Volatilized	0.000E+00	0.00
In Soil Air	5.967E+08	0.01
Sur. Runoff	0.000E+00	0.00
In Washld	0.000E+00	0.00
Ads On Soil	8.359E+12	99.87
Hydrol Soil	0.000E+00	0.00
Degrad Soil	0.000E+00	0.00
Pure Phase	0.000E+00	0.00
Complexed	0.000E+00	0.00
Immobile CEC	0.000E+00	0.00
Hydrol CEC	0.000E+00	0.00
In Soil Moi	6.536E+08	0.01
Hydrol Mois	0.000E+00	0.00
Degrad Mois	0.000E+00	0.00
Other Trans	0.000E+00	0.00
Other Sinks	0.000E+00	0.00
Gwr. Runoff	0.000E+00	0.00
Total Output	8.360E+12	99.89
Total Input	8.370E+12	
Input - Output	9.349E+09	

Maximum leachate concentration: 0.000E+00 **mg/l**

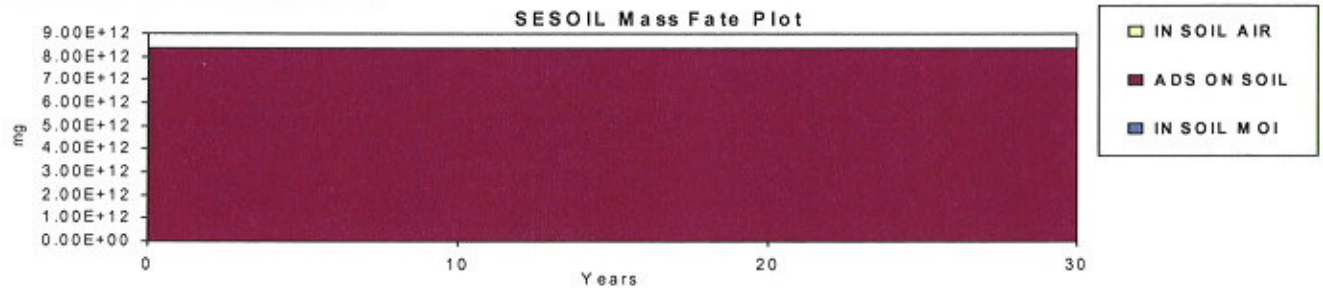
Climate File: RADFORD
C:\SEVIEW63\RADFORD.CLM

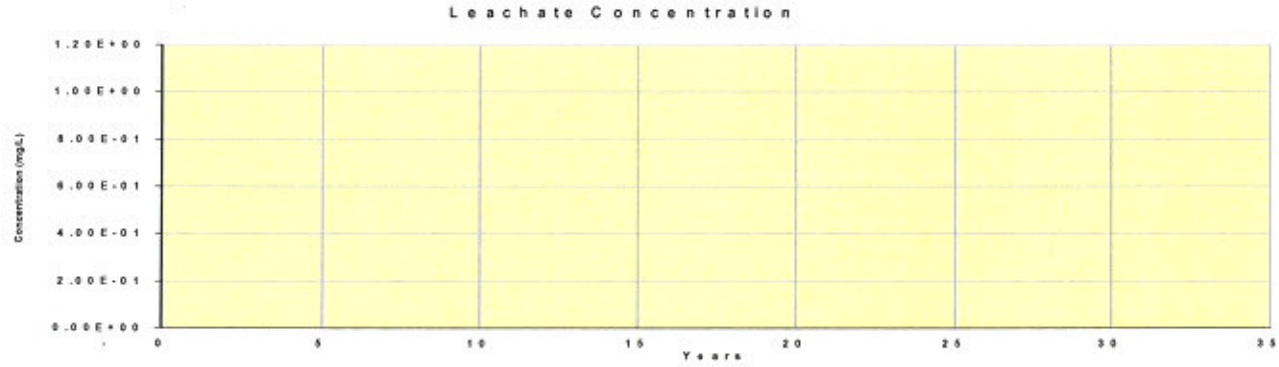
Chemical File: Lead And Compounds (Kd)
C:\SEVIEW63\LEADANDC.CHM

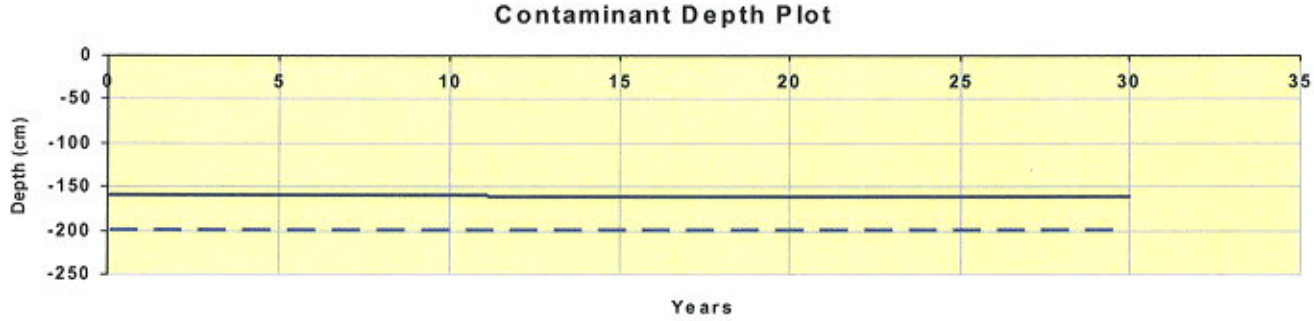
Soil File: Silty Sand, Perm = 1.3-5 cm/sec
C:\SEVIEW63\RAAP13\RAPSM13.SOI

Application File: SEVIEW Default Application Parameters
C:\SEVIEW63\RAAP13\SWMU13V3.APL

Starting Depth: 159.60 **cm**
Ending Depth: 160.80 **cm**
Total Depth: 198.00 **cm**







APPENDIX D

STATISTICAL CALCULATIONS

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APPENDIX D.1

EXPOSURE POINT CONCENTRATION CALCULATION RESULTS – PROUCL 4.0

Table D.1-1a EPC Calculation Results - SWMU 13 Surface Soil - ProUCL 4.0 for Full Data Sets

Table D.1-1b EPC Calculation Results - SWMU 13 Surface Soil - ProUCL 4.0 for Data Sets with Non-Detects

Table D.1-1c EPC Calculation Results - SWMU 13 Total Soil - ProUCL 4.0 for Full Data Sets

Table D.1-1d EPC Calculation Results - SWMU 13 Total Soil - ProUCL 4.0 for Data Sets with Non-Detects

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Table D.1-1a
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

General UCL Statistics for Full Data Sets

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum (mg/kg)

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	12

Raw Statistics		**Log-transformed Statistics**	
Minimum	10000	Minimum of Log Data	9.21
Maximum	35000	Maximum of Log Data	10.46
Mean	15410	Mean of log Data	9.565
Median	12000	SD of log Data	0.386
SD	7046		
Coefficient of Variation	0.457		
Skewness	1.743		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.771	Shapiro Wilk Test Statistic	0.848
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	18614	95% H-UCL	18800
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	22048
95% Adjusted-CLT UCL	19277	97.5% Chebyshev (MVUE) UCL	24974
95% Modified-t UCL	18751	99% Chebyshev (MVUE) UCL	30722

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	5.347	Data do not follow a Discernable Distribution (0.05)	
Theta Star	2882		
nu star	160.4		
Approximate Chi Square Value (.05)	132.1	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	18402
Adjusted Chi Square Value	129	95% Jackknife UCL	18614
		95% Standard Bootstrap UCL	18285
Anderson-Darling Test Statistic	1.046	95% Bootstrap-t UCL	20355
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	20172
Kolmogorov-Smirnov Test Statistic	0.244	95% Percentile Bootstrap UCL	18370
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	19053
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	23340
		97.5% Chebyshev(Mean, Sd) UCL	26771
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	33510
95% Approximate Gamma UCL	18708		
95% Adjusted Gamma UCL	19166		

Potential UCL to Use		Use 95% Student's-t UCL	18614
		or 95% Modified-t UCL	18751

Table D.1-1a
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Arsenic (mg/kg)

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	13

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.98	Minimum of Log Data	-0.0202
Maximum	5.6	Maximum of Log Data	1.723
Mean	2.315	Mean of log Data	0.767
Median	2.2	SD of log Data	0.383
SD	1.032		
Coefficient of Variation	0.446		
Skewness	2.375		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.748	Shapiro Wilk Test Statistic	0.912
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	2.785	95% H-UCL	2.83
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	3.317
95% Adjusted-CLT UCL	2.928	97.5% Chebyshev (MVUE) UCL	3.755
95% Modified-t UCL	2.812	99% Chebyshev (MVUE) UCL	4.616

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	5.672	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.408		
nu star	170.2		
Approximate Chi Square Value (.05)	141	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	2.754
Adjusted Chi Square Value	137.7	95% Jackknife UCL	2.785
		95% Standard Bootstrap UCL	2.751
Anderson-Darling Test Statistic	0.73	95% Bootstrap-t UCL	3.034
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	4.934
Kolmogorov-Smirnov Test Statistic	0.217	95% Percentile Bootstrap UCL	2.761
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	2.933
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.477
		97.5% Chebyshev(Mean, Sd) UCL	3.979
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.967
95% Approximate Gamma UCL	2.794		
95% Adjusted Gamma UCL	2.861		

Potential UCL to Use		Use 95% Approximate Gamma UCL	2.794

Table D.1-1a
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Calcium (mg/kg)

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	14

Raw Statistics		**Log-transformed Statistics**	
Minimum	1100	Minimum of Log Data	7.003
Maximum	110000	Maximum of Log Data	11.61
Mean	10043	Mean of log Data	8.122
Median	2290	SD of log Data	1.063
SD	27684		
Coefficient of Variation	2.756		
Skewness	3.858		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.325	Shapiro Wilk Test Statistic	0.685
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	22633	95% H-UCL	13309
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	13014
95% Adjusted-CLT UCL	29408	97.5% Chebyshev (MVUE) UCL	16214
95% Modified-t UCL	23820	99% Chebyshev (MVUE) UCL	22502

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.5	Data do not follow a Discernable Distribution (0.05)	
Theta Star	20075		
nu star	15.01		
Approximate Chi Square Value (.05)	7.268	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	21801
Adjusted Chi Square Value	6.614	95% Jackknife UCL	22633
		95% Standard Bootstrap UCL	21309
Anderson-Darling Test Statistic	3.24	95% Bootstrap-t UCL	204892
Anderson-Darling 5% Critical Value	0.788	95% Hall's Bootstrap UCL	96899
Kolmogorov-Smirnov Test Statistic	0.398	95% Percentile Bootstrap UCL	24193
Kolmogorov-Smirnov 5% Critical Value	0.233	95% BCA Bootstrap UCL	38279
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	41201
		97.5% Chebyshev(Mean, Sd) UCL	54683
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	81166
95% Approximate Gamma UCL	20741		
95% Adjusted Gamma UCL	22791		

Potential UCL to Use		Use 99% Chebyshev (Mean, Sd) UCL	81166

Table D.1-1a
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Chromium (mg/kg)

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	11
Raw Statistics		**Log-transformed Statistics**	
Minimum	18	Minimum of Log Data	2.89
Maximum	39	Maximum of Log Data	3.664
Mean	26.07	Mean of log Data	3.225
Median	26	SD of log Data	0.276
SD	7.294		
Coefficient of Variation	0.28		
Skewness	0.525		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.904	Shapiro Wilk Test Statistic	0.913
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	29.38	95% H-UCL	29.97
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	34.23
95% Adjusted-CLT UCL	29.44	97.5% Chebyshev (MVUE) UCL	37.76
95% Modified-t UCL	29.43	99% Chebyshev (MVUE) UCL	44.7
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	11.35	Data appear Normal at 5% Significance Level	
Theta Star	2.296		
nu star	340.6		
Approximate Chi Square Value (.05)	298.9	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	29.16
Adjusted Chi Square Value	294.1	95% Jackknife UCL	29.38
		95% Standard Bootstrap UCL	29.03
Anderson-Darling Test Statistic	0.453	95% Bootstrap-t UCL	29.73
Anderson-Darling 5% Critical Value	0.736	95% Hall's Bootstrap UCL	29.24
Kolmogorov-Smirnov Test Statistic	0.155	95% Percentile Bootstrap UCL	29.13
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	29.33
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	34.28
		97.5% Chebyshev(Mean, Sd) UCL	37.83
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	44.81
95% Approximate Gamma UCL	29.71		
95% Adjusted Gamma UCL	30.2		
Potential UCL to Use		Use 95% Student's-t UCL	29.38

Table D.1-1a
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Cobalt (mg/kg)

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	12
Raw Statistics		**Log-transformed Statistics**	
Minimum	7	Minimum of Log Data	1.946
Maximum	19	Maximum of Log Data	2.944
Mean	11.37	Mean of log Data	2.388
Median	11	SD of log Data	0.3
SD	3.518		
Coefficient of Variation	0.31		
Skewness	0.786		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.932	Shapiro Wilk Test Statistic	0.967
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	12.97	95% H-UCL	13.25
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	15.23
95% Adjusted-CLT UCL	13.06	97.5% Chebyshev (MVUE) UCL	16.91
95% Modified-t UCL	13	99% Chebyshev (MVUE) UCL	20.2
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	9.565	Data appear Normal at 5% Significance Level	
Theta Star	1.188		
nu star	286.9		
Approximate Chi Square Value (.05)	248.7	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	12.86
Adjusted Chi Square Value	244.3	95% Jackknife UCL	12.97
		95% Standard Bootstrap UCL	12.83
Anderson-Darling Test Statistic	0.247	95% Bootstrap-t UCL	13.22
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	13.13
Kolmogorov-Smirnov Test Statistic	0.111	95% Percentile Bootstrap UCL	12.89
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	13.09
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	15.33
		97.5% Chebyshev(Mean, Sd) UCL	17.04
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	20.41
95% Approximate Gamma UCL	13.11		
95% Adjusted Gamma UCL	13.35		
Potential UCL to Use		Use 95% Student's-t UCL	12.97

Table D.1-1a
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Copper (mg/kg)

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	12

Raw Statistics		**Log-transformed Statistics**	
Minimum	13	Minimum of Log Data	2.565
Maximum	260	Maximum of Log Data	5.561
Mean	36.4	Mean of log Data	3.15
Median	20	SD of log Data	0.723
SD	62.13		
Coefficient of Variation	1.707		
Skewness	3.815		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.366	Shapiro Wilk Test Statistic	0.654
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	64.65	95% H-UCL	47.57
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	55.17
95% Adjusted-CLT UCL	79.67	97.5% Chebyshev (MVUE) UCL	66.2
95% Modified-t UCL	67.29	99% Chebyshev (MVUE) UCL	87.87

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.057	Data do not follow a Discernable Distribution (0.05)	
Theta Star	34.44		
nu star	31.71		
Approximate Chi Square Value (.05)	19.84	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	62.79
Adjusted Chi Square Value	18.69	95% Jackknife UCL	64.65
		95% Standard Bootstrap UCL	60.82
Anderson-Darling Test Statistic	2.838	95% Bootstrap-t UCL	262.8
Anderson-Darling 5% Critical Value	0.758	95% Hall's Bootstrap UCL	181.1
Kolmogorov-Smirnov Test Statistic	0.383	95% Percentile Bootstrap UCL	67.53
Kolmogorov-Smirnov 5% Critical Value	0.227	95% BCA Bootstrap UCL	84.47
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	106.3
		97.5% Chebyshev(Mean, Sd) UCL	136.6
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	196
95% Approximate Gamma UCL	58.17		
95% Adjusted Gamma UCL	61.75		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	106.3

Table D.1-1a
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Iron (mg/kg)

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	13

Raw Statistics		**Log-transformed Statistics**	
Minimum	16000	Minimum of Log Data	9.68
Maximum	78000	Maximum of Log Data	11.26
Mean	31547	Mean of log Data	10.28
Median	29200	SD of log Data	0.395
SD	14723		
Coefficient of Variation	0.467		
Skewness	2.338		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.745	Shapiro Wilk Test Statistic	0.896
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	38242	95% H-UCL	38786
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	45557
95% Adjusted-CLT UCL	40252	97.5% Chebyshev (MVUE) UCL	51702
95% Modified-t UCL	38625	99% Chebyshev (MVUE) UCL	63773

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	5.268	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	5989		
nu star	158		
Approximate Chi Square Value (.05)	130	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	37799
Adjusted Chi Square Value	126.8	95% Jackknife UCL	38242
		95% Standard Bootstrap UCL	37796
Anderson-Darling Test Statistic	0.759	95% Bootstrap-t UCL	42554
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	69186
Kolmogorov-Smirnov Test Statistic	0.203	95% Percentile Bootstrap UCL	38720
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	40493
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	48117
		97.5% Chebyshev(Mean, Sd) UCL	55287
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	69371
95% Approximate Gamma UCL	38358		
95% Adjusted Gamma UCL	39305		

Potential UCL to Use		
	Use 95% Approximate Gamma UCL	38358

Table D.1-1a
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Lead (mg/kg)

General Statistics			
Number of Valid Observations	92	Number of Distinct Observations	53
Raw Statistics		**Log-transformed Statistics**	
Minimum	27	Minimum of Log Data	3.296
Maximum	8620	Maximum of Log Data	9.062
Mean	313.9	Mean of log Data	5.189
Median	170	SD of log Data	0.796
SD	897.5		
Coefficient of Variation	2.859		
Skewness	8.917		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.375	Lilliefors Test Statistic	0.0975
Lilliefors Critical Value	0.0924	Lilliefors Critical Value	0.0924
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	469.4	95% H-UCL	291.9
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	345.4
95% Adjusted-CLT UCL	560.8	97.5% Chebyshev (MVUE) UCL	388.8
95% Modified-t UCL	483.9	99% Chebyshev (MVUE) UCL	474.1
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.001	Data do not follow a Discernable Distribution (0.05)	
Theta Star	313.7		
nu star	184.2		
Approximate Chi Square Value (.05)	153.8	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0474	95% CLT UCL	467.9
Adjusted Chi Square Value	153.3	95% Jackknife UCL	469.4
		95% Standard Bootstrap UCL	465.2
Anderson-Darling Test Statistic	7.277	95% Bootstrap-t UCL	979.2
Anderson-Darling 5% Critical Value	0.782	95% Hall's Bootstrap UCL	1041
Kolmogorov-Smirnov Test Statistic	0.206	95% Percentile Bootstrap UCL	488.6
Kolmogorov-Smirnov 5% Critical Value	0.096	95% BCA Bootstrap UCL	675.5
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	721.8
		97.5% Chebyshev(Mean, Sd) UCL	898.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1245
95% Approximate Gamma UCL	376		
95% Adjusted Gamma UCL	377.1		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	721.8

Table D.1-1a
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Manganese (mg/kg)

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	14

Raw Statistics		**Log-transformed Statistics**	
Minimum	380	Minimum of Log Data	5.94
Maximum	2200	Maximum of Log Data	7.696
Mean	1036	Mean of log Data	6.849
Median	1040	SD of log Data	0.467
SD	447.7		
Coefficient of Variation	0.432		
Skewness	0.892		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.903	Shapiro Wilk Test Statistic	0.91
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	1239	95% H-UCL	1355
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1606
95% Adjusted-CLT UCL	1254	97.5% Chebyshev (MVUE) UCL	1849
95% Modified-t UCL	1244	99% Chebyshev (MVUE) UCL	2327

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	4.446	**Data appear Normal at 5% Significance Level**	
Theta Star	232.9		
nu star	133.4		
Approximate Chi Square Value (.05)	107.7	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	1226
Adjusted Chi Square Value	104.9	95% Jackknife UCL	1239
		95% Standard Bootstrap UCL	1216
Anderson-Darling Test Statistic	0.562	95% Bootstrap-t UCL	1277
Anderson-Darling 5% Critical Value	0.738	95% Hall's Bootstrap UCL	1344
Kolmogorov-Smirnov Test Statistic	0.168	95% Percentile Bootstrap UCL	1216
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	1231
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1539
		97.5% Chebyshev(Mean, Sd) UCL	1757
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2186
95% Approximate Gamma UCL	1282		
95% Adjusted Gamma UCL	1317		

Potential UCL to Use			
		Use 95% Student's-t UCL	1239

Table D.1-1a
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Mercury (mg/kg)

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	15

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.02	Minimum of Log Data	-3.912
Maximum	0.14	Maximum of Log Data	-1.966
Mean	0.0539	Mean of log Data	-3.057
Median	0.04	SD of log Data	0.518
SD	0.0327		
Coefficient of Variation	0.607		
Skewness	1.725		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.806	Shapiro Wilk Test Statistic	0.953
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.0688	95% H-UCL	0.0718
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.0853
95% Adjusted-CLT UCL	0.0718	97.5% Chebyshev (MVUE) UCL	0.0991
95% Modified-t UCL	0.0694	99% Chebyshev (MVUE) UCL	0.126

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.105	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.0174		
nu star	93.15		
Approximate Chi Square Value (.05)	71.89	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	0.0678
Adjusted Chi Square Value	69.59	95% Jackknife UCL	0.0688
		95% Standard Bootstrap UCL	0.0673
Anderson-Darling Test Statistic	0.593	95% Bootstrap-t UCL	0.0827
Anderson-Darling 5% Critical Value	0.741	95% Hall's Bootstrap UCL	0.135
Kolmogorov-Smirnov Test Statistic	0.199	95% Percentile Bootstrap UCL	0.0681
Kolmogorov-Smirnov 5% Critical Value	0.223	95% BCA Bootstrap UCL	0.0715
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.0907
		97.5% Chebyshev(Mean, Sd) UCL	0.107
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	0.138
95% Approximate Gamma UCL	0.0698		
95% Adjusted Gamma UCL	0.0721		

Potential UCL to Use		Use 95% Approximate Gamma UCL	0.0698

Potential UCL to Use		Use 95% Approximate Gamma UCL	1682

Table D.1-1a
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Selenium (mg/kg)

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	13

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.165	Minimum of Log Data	-1.802
Maximum	0.885	Maximum of Log Data	-0.122
Mean	0.475	Mean of log Data	-0.871
Median	0.48	SD of log Data	0.534
SD	0.235		
Coefficient of Variation	0.496		
Skewness	0.399		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.921	Shapiro Wilk Test Statistic	0.933
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.582	95% H-UCL	0.652
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.775
95% Adjusted-CLT UCL	0.581	97.5% Chebyshev (MVUE) UCL	0.903
95% Modified-t UCL	0.583	99% Chebyshev (MVUE) UCL	1.155

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.348	**Data appear Normal at 5% Significance Level**	
Theta Star	0.142		
nu star	100.4		
Approximate Chi Square Value (.05)	78.32	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	0.575
Adjusted Chi Square Value	75.92	95% Jackknife UCL	0.582
		95% Standard Bootstrap UCL	0.572
Anderson-Darling Test Statistic	0.434	95% Bootstrap-t UCL	0.601
Anderson-Darling 5% Critical Value	0.74	95% Hall's Bootstrap UCL	0.576
Kolmogorov-Smirnov Test Statistic	0.176	95% Percentile Bootstrap UCL	0.571
Kolmogorov-Smirnov 5% Critical Value	0.222	95% BCA Bootstrap UCL	0.577
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.74
		97.5% Chebyshev(Mean, Sd) UCL	0.854
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.079
95% Approximate Gamma UCL	0.609		
95% Adjusted Gamma UCL	0.628		

Potential UCL to Use		Use 95% Student's-t UCL	0.582

Table D.1-1a
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Thallium (mg/kg)

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	13

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.16	Minimum of Log Data	-1.833
Maximum	3.5	Maximum of Log Data	1.253
Mean	0.586	Mean of log Data	-0.915
Median	0.38	SD of log Data	0.748
SD	0.824		
Coefficient of Variation	1.406		
Skewness	3.597		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.461	Shapiro Wilk Test Statistic	0.83
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.961	95% H-UCL	0.85
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.979
95% Adjusted-CLT UCL	1.148	97.5% Chebyshev (MVUE) UCL	1.179
95% Modified-t UCL	0.994	99% Chebyshev (MVUE) UCL	1.572

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.209	Data do not follow a Discernable Distribution (0.05)	
Theta Star	0.485		
nu star	36.27		
Approximate Chi Square Value (.05)	23.48	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	0.936
Adjusted Chi Square Value	22.22	95% Jackknife UCL	0.961
		95% Standard Bootstrap UCL	0.927
Anderson-Darling Test Statistic	1.682	95% Bootstrap-t UCL	2.407
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	2.756
Kolmogorov-Smirnov Test Statistic	0.311	95% Percentile Bootstrap UCL	0.987
Kolmogorov-Smirnov 5% Critical Value	0.226	95% BCA Bootstrap UCL	1.244
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.514
		97.5% Chebyshev(Mean, Sd) UCL	1.915
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	2.704
95% Approximate Gamma UCL	0.905		
95% Adjusted Gamma UCL	0.957		

Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1.514

Table D.1-1a
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Vanadium (mg/kg)

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	12

Raw Statistics		**Log-transformed Statistics**	
Minimum	21	Minimum of Log Data	3.045
Maximum	59	Maximum of Log Data	4.078
Mean	29.3	Mean of log Data	3.331
Median	24	SD of log Data	0.3
SD	10.39		
Coefficient of Variation	0.355		
Skewness	1.883		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.764	Shapiro Wilk Test Statistic	0.841
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	34.02	95% H-UCL	34.02
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	39.13
95% Adjusted-CLT UCL	35.11	97.5% Chebyshev (MVUE) UCL	43.44
95% Modified-t UCL	34.24	99% Chebyshev (MVUE) UCL	51.91

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	8.736	Data do not follow a Discernable Distribution (0.05)	
Theta Star	3.354		
nu star	262.1		
Approximate Chi Square Value (.05)	225.6	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	33.71
Adjusted Chi Square Value	221.4	95% Jackknife UCL	34.02
		95% Standard Bootstrap UCL	33.63
Anderson-Darling Test Statistic	1.062	95% Bootstrap-t UCL	37.08
Anderson-Darling 5% Critical Value	0.737	95% Hall's Bootstrap UCL	36.92
Kolmogorov-Smirnov Test Statistic	0.237	95% Percentile Bootstrap UCL	34.13
Kolmogorov-Smirnov 5% Critical Value	0.221	95% BCA Bootstrap UCL	34.93
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	40.99
		97.5% Chebyshev(Mean, Sd) UCL	46.05
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	55.99
95% Approximate Gamma UCL	34.04		
95% Adjusted Gamma UCL	34.68		

Potential UCL to Use		Use 95% Student's-t UCL	34.02
		or 95% Modified-t UCL	34.24

Table D.1-1a
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Zinc (mg/kg)

General Statistics

Number of Valid Observations	15	Number of Distinct Observations	15

Raw Statistics		**Log-transformed Statistics**	
Minimum	260	Minimum of Log Data	5.561
Maximum	1600	Maximum of Log Data	7.378
Mean	510.6	Mean of log Data	6.089
Median	380	SD of log Data	0.508
SD	355.6		
Coefficient of Variation	0.696		
Skewness	2.45		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.68	Shapiro Wilk Test Statistic	0.86
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	672.4	95% H-UCL	665.1
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	789.8
95% Adjusted-CLT UCL	723.7	97.5% Chebyshev (MVUE) UCL	916.5
95% Modified-t UCL	682	99% Chebyshev (MVUE) UCL	1165

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.901	Data Follow Appr. Gamma Distribution at 5% Significance Level	
Theta Star	176		
nu star	87.03		
Approximate Chi Square Value (.05)	66.52	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	661.7
Adjusted Chi Square Value	64.32	95% Jackknife UCL	672.4
		95% Standard Bootstrap UCL	658.5
Anderson-Darling Test Statistic	1.076	95% Bootstrap-t UCL	944.2
Anderson-Darling 5% Critical Value	0.742	95% Hall's Bootstrap UCL	1355
Kolmogorov-Smirnov Test Statistic	0.216	95% Percentile Bootstrap UCL	684.4
Kolmogorov-Smirnov 5% Critical Value	0.223	95% BCA Bootstrap UCL	729.7
Data follow Appr. Gamma Distribution at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	910.9
		97.5% Chebyshev(Mean, Sd) UCL	1084
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1424
95% Approximate Gamma UCL	668		
95% Adjusted Gamma UCL	690.9		

Potential UCL to Use		
	Use 95% Approximate Gamma UCL	668

Table D.1-1b
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

General UCL Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony (mg/kg)

General Statistics

Number of Valid Data	15	Number of Detected Data	14
Number of Distinct Detected Data	12	Number of Non-Detect Data	1
		Percent Non-Detects	6.67%

Raw Statistics		Log-transformed Statistics	
Minimum Detected	0.069	Minimum Detected	-2.674
Maximum Detected	2.9	Maximum Detected	1.065
Mean of Detected	0.54	Mean of Detected	-1.044
SD of Detected	0.706	SD of Detected	0.894
Minimum Non-Detect	0.0518	Minimum Non-Detect	-2.96
Maximum Non-Detect	0.0518	Maximum Non-Detect	-2.96

UCL Statistics

Normal Distribution Test with Detected Values Only		Lognormal Distribution Test with Detected Values Only	
Shapiro Wilk Test Statistic	0.548	Shapiro Wilk Test Statistic	0.933
5% Shapiro Wilk Critical Value	0.874	5% Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		Assuming Lognormal Distribution	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.505	Mean	-1.218
SD	0.694	SD	1.094
95% DL/2 (t) UCL	0.821	95% H-Stat (DL/2) UCL	1.254
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.479	Mean in Log Scale	-1.184
SD	0.702	SD in Log Scale	1.018
95% MLE (t) UCL	0.798	Mean in Original Scale	0.507
95% MLE (Tiku) UCL	0.776	SD in Original Scale	0.693
		95% Percentile Bootstrap UCL	0.803
		95% BCA Bootstrap UCL	1.02

Table D.1-1b
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	1.079
Theta Star	0.5
nu star	30.21
A-D Test Statistic	0.89
5% A-D Critical Value	0.754
K-S Test Statistic	0.754
5% K-S Critical Value	0.234
Data follow Appr. Gamma Distribution at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0.000000001
Maximum	2.9
Mean	0.504
Median	0.32
SD	0.695
k star	0.36
Theta star	1.398
Nu star	10.81
AppChi2	4.454
95% Gamma Approximate UCL	1.223
95% Adjusted Gamma UCL	1.374

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data Follow Appr. Gamma Distribution at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	0.508
SD	0.668
SE of Mean	0.179
95% KM (t) UCL	0.824
95% KM (z) UCL	0.803
95% KM (jackknife) UCL	0.822
95% KM (bootstrap t) UCL	1.487
95% KM (BCA) UCL	0.868
95% KM (Percentile Bootstrap) UCL	0.838
95% KM (Chebyshev) UCL	1.289
97.5% KM (Chebyshev) UCL	1.626
99% KM (Chebyshev) UCL	2.289
Potential UCLs to Use	
95% KM (Chebyshev) UCL	1.289

Table D.1-1b
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Cadmium (mg/kg)

General Statistics

Number of Valid Data	15	Number of Detected Data	14
Number of Distinct Detected Data	13	Number of Non-Detect Data	1
		Percent Non-Detects	6.67%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.63	Minimum Detected	-0.462
Maximum Detected	2.6	Maximum Detected	0.956
Mean of Detected	1.194	Mean of Detected	0.091
SD of Detected	0.579	SD of Detected	0.41
Minimum Non-Detect	0.45	Minimum Non-Detect	-0.799
Maximum Non-Detect	0.45	Maximum Non-Detect	-0.799

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.792	Shapiro Wilk Test Statistic	0.918
5% Shapiro Wilk Critical Value	0.874	5% Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.13	Mean	-0.0145
SD	0.612	SD	0.568
95% DL/2 (t) UCL	1.408	95% H-Stat (DL/2) UCL	1.462
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	1.124	Mean in Log Scale	0.0252
SD	0.603	SD in Log Scale	0.47
95% MLE (t) UCL	1.399	Mean in Original Scale	1.142
95% MLE (Tiku) UCL	1.393	SD in Original Scale	0.594
		95% Percentile Bootstrap UCL	1.409
		95% BCA Bootstrap UCL	1.452

Table D.1-1b
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	4.715	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	0.253		
nu star	132		
A-D Test Statistic	0.668	**Nonparametric Statistics**	
5% A-D Critical Value	0.737	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.737	Mean	1.157
5% K-S Critical Value	0.229	SD	0.557
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	0.149
		95% KM (t) UCL	1.42
Assuming Gamma Distribution		95% KM (z) UCL	1.402
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	1.415
Minimum	0.186	95% KM (bootstrap t) UCL	1.632
Maximum	2.6	95% KM (BCA) UCL	1.401
Mean	1.127	95% KM (Percentile Bootstrap) UCL	1.405
Median	1	95% KM (Chebyshev) UCL	1.807
SD	0.616	97.5% KM (Chebyshev) UCL	2.089
k star	2.897	99% KM (Chebyshev) UCL	2.642
Theta star	0.389		
Nu star	86.9	**Potential UCLs to Use**	
AppChi2	66.41	95% KM (BCA) UCL	1.401
95% Gamma Approximate UCL	1.475		
95% Adjusted Gamma UCL	1.525		

Note: DL/2 is not a recommended method.

Table D.1-1b
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Benzo(a)anthracene (ug/kg)

General Statistics

Number of Valid Data	15	Number of Detected Data	14
Number of Distinct Detected Data	14	Number of Non-Detect Data	1
		Percent Non-Detects	6.67%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	2.8	Minimum Detected	1.03
Maximum Detected	170	Maximum Detected	5.136
Mean of Detected	69.77	Mean of Detected	3.663
SD of Detected	54.16	SD of Detected	1.39
Minimum Non-Detect	16	Minimum Non-Detect	2.773
Maximum Non-Detect	16	Maximum Non-Detect	2.773

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.923	Shapiro Wilk Test Statistic	0.848
5% Shapiro Wilk Critical Value	0.874	5% Shapiro Wilk Critical Value	0.874
Data appear Normal at 5% Significance Level		**Data not Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	65.65	Mean	3.557
SD	54.57	SD	1.4
95% DL/2 (t) UCL	90.47	95% H-Stat (DL/2) UCL	405.8
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	53.86	Mean in Log Scale	3.56
SD	69.6	SD in Log Scale	1.397
95% MLE (t) UCL	85.52	Mean in Original Scale	65.68
95% MLE (Tiku) UCL	88.53	SD in Original Scale	54.55
		95% Percentile Bootstrap UCL	87.73
		95% BCA Bootstrap UCL	91.21

Table D.1-1b
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.827
Theta Star	84.34
nu star	23.16
A-D Test Statistic	0.733
5% A-D Critical Value	0.76
K-S Test Statistic	0.76
5% K-S Critical Value	0.235
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	2.8
Maximum	170
Mean	65.85
Median	74
SD	54.35
k star	0.807
Theta star	81.58
Nu star	24.22
AppChi2	14.01
95% Gamma Approximate UCL	113.8
95% Adjusted Gamma UCL	122.1

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Normal at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	65.62
SD	52.78
SE of Mean	14.15
95% KM (t) UCL	90.53
95% KM (z) UCL	88.88
95% KM (jackknife) UCL	90.47
95% KM (bootstrap t) UCL	92.16
95% KM (BCA) UCL	91.49
95% KM (Percentile Bootstrap) UCL	88.62
95% KM (Chebyshev) UCL	127.3
97.5% KM (Chebyshev) UCL	154
99% KM (Chebyshev) UCL	206.4
Potential UCLs to Use	
95% KM (t) UCL	90.53
95% KM (Percentile Bootstrap) UCL	88.62

Table D.1-1b
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Benzo(a)pyrene (ug/kg)

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	15
Raw Statistics		**Log-transformed Statistics**	
Minimum	2.5	Minimum of Log Data	0.916
Maximum	130	Maximum of Log Data	4.868
Mean	54.99	Mean of log Data	3.505
Median	51	SD of log Data	1.261
SD	42.37		
Coefficient of Variation	0.771		
Skewness	0.345		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.931	Shapiro Wilk Test Statistic	0.883
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	74.26	95% H-UCL	215.3
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	175.6
95% Adjusted-CLT UCL	74.03	97.5% Chebyshev (MVUE) UCL	222.3
95% Modified-t UCL	74.43	99% Chebyshev (MVUE) UCL	314
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.951	Data appear Normal at 5% Significance Level	
Theta Star	57.84		
nu star	28.53		
Approximate Chi Square Value (.05)	17.34	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	72.99
Adjusted Chi Square Value	16.27	95% Jackknife UCL	74.26
		95% Standard Bootstrap UCL	72.34
Anderson-Darling Test Statistic	0.429	95% Bootstrap-t UCL	76.38
Anderson-Darling 5% Critical Value	0.761	95% Hall's Bootstrap UCL	73.11
Kolmogorov-Smirnov Test Statistic	0.18	95% Percentile Bootstrap UCL	72.37
Kolmogorov-Smirnov 5% Critical Value	0.227	95% BCA Bootstrap UCL	73.1
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	102.7
		97.5% Chebyshev(Mean, Sd) UCL	123.3
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	163.9
95% Approximate Gamma UCL	90.48		
95% Adjusted Gamma UCL	96.42		
Potential UCL to Use		Use 95% Student's-t UCL	74.26

Table D.1-1b
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Benzo(b)fluoranthene (ug/kg)

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	13
Raw Statistics		**Log-transformed Statistics**	
Minimum	3.5	Minimum of Log Data	1.253
Maximum	205	Maximum of Log Data	5.323
Mean	97.27	Mean of log Data	4.013
Median	78	SD of log Data	1.357
SD	76.39		
Coefficient of Variation	0.785		
Skewness	0.133		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.872	Shapiro Wilk Test Statistic	0.857
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	132	95% H-UCL	468.7
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	341.9
95% Adjusted-CLT UCL	130.4	97.5% Chebyshev (MVUE) UCL	435.6
95% Modified-t UCL	132.1	99% Chebyshev (MVUE) UCL	619.7
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.86	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	113.1		
nu star	25.8		
Approximate Chi Square Value (.05)	15.22	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	129.7
Adjusted Chi Square Value	14.23	95% Jackknife UCL	132
		95% Standard Bootstrap UCL	129.5
Anderson-Darling Test Statistic	0.646	95% Bootstrap-t UCL	134.2
Anderson-Darling 5% Critical Value	0.763	95% Hall's Bootstrap UCL	127.4
Kolmogorov-Smirnov Test Statistic	0.177	95% Percentile Bootstrap UCL	128.4
Kolmogorov-Smirnov 5% Critical Value	0.228	95% BCA Bootstrap UCL	129.4
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	183.2
		97.5% Chebyshev(Mean, Sd) UCL	220.4
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	293.5
95% Approximate Gamma UCL	164.8		
95% Adjusted Gamma UCL	176.3		
Potential UCL to Use		Use 95% Approximate Gamma UCL	164.8

Table D.1-1b
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Benzo(g,h,i)perylene (ug/kg)

General Statistics			
Number of Valid Observations	15	Number of Distinct Observations	15
Raw Statistics		**Log-transformed Statistics**	
Minimum	2.5	Minimum of Log Data	0.916
Maximum	83	Maximum of Log Data	4.419
Mean	33.99	Mean of log Data	3.115
Median	25	SD of log Data	1.057
SD	26.63		
Coefficient of Variation	0.783		
Skewness	0.503		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.911	Shapiro Wilk Test Statistic	0.936
Shapiro Wilk Critical Value	0.881	Shapiro Wilk Critical Value	0.881
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	46.1	95% H-UCL	87.87
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	86.31
95% Adjusted-CLT UCL	46.25	97.5% Chebyshev (MVUE) UCL	107.5
95% Modified-t UCL	46.25	99% Chebyshev (MVUE) UCL	149.1
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.132	Data appear Normal at 5% Significance Level	
Theta Star	30.02		
nu star	33.97		
Approximate Chi Square Value (.05)	21.64	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0324	95% CLT UCL	45.3
Adjusted Chi Square Value	20.43	95% Jackknife UCL	46.1
		95% Standard Bootstrap UCL	44.75
Anderson-Darling Test Statistic	0.304	95% Bootstrap-t UCL	47.05
Anderson-Darling 5% Critical Value	0.756	95% Hall's Bootstrap UCL	44.6
Kolmogorov-Smirnov Test Statistic	0.152	95% Percentile Bootstrap UCL	45.41
Kolmogorov-Smirnov 5% Critical Value	0.226	95% BCA Bootstrap UCL	45.18
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	63.96
		97.5% Chebyshev(Mean, Sd) UCL	76.93
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	102.4
95% Approximate Gamma UCL	53.36		
95% Adjusted Gamma UCL	56.51		
Potential UCL to Use		Use 95% Student's-t UCL	46.1

Table D.1-1b
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Dibenz(a,h)anthracene (ug/kg)

General Statistics

Number of Valid Data	15	Number of Detected Data	8
Number of Distinct Detected Data	8	Number of Non-Detect Data	7
		Percent Non-Detects	46.67%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	8.2	Minimum Detected	2.104
Maximum Detected	35	Maximum Detected	3.555
Mean of Detected	17.71	Mean of Detected	2.776
SD of Detected	8.616	SD of Detected	0.472
Minimum Non-Detect	3.9	Minimum Non-Detect	1.361
Maximum Non-Detect	8.26	Maximum Non-Detect	2.111

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	8
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	7
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	53.33%

Warning: There are only 8 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough tp draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.92	Shapiro Wilk Test Statistic	0.985
5% Shapiro Wilk Critical Value	0.818	5% Shapiro Wilk Critical Value	0.818
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	10.8	Mean	1.956
SD	9.8	SD	0.991
95% DL/2 (t) UCL	15.25	95% H-Stat (DL/2) UCL	18.83
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	7.301	Mean in Log Scale	2.177
SD	13.66	SD in Log Scale	0.748
95% MLE (t) UCL	13.51	Mean in Original Scale	11.54
95% MLE (Tiku) UCL	15.25	SD in Original Scale	9.162
		95% Percentile Bootstrap UCL	15.41
		95% BCA Bootstrap UCL	16.12

Table D.1-1b
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	3.37	Data appear Normal at 5% Significance Level	
Theta Star	5.256		
nu star	53.91		
A-D Test Statistic	0.169	**Nonparametric Statistics**	
5% A-D Critical Value	0.719	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.719	Mean	13.27
5% K-S Critical Value	0.295	SD	7.561
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	2.087
		95% KM (t) UCL	16.95
Assuming Gamma Distribution		95% KM (z) UCL	16.71
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	16.53
Minimum	8.2	95% KM (bootstrap t) UCL	18.2
Maximum	35	95% KM (BCA) UCL	19.23
Mean	17.24	95% KM (Percentile Bootstrap) UCL	17.93
Median	16.58	95% KM (Chebyshev) UCL	22.37
SD	6.236	97.5% KM (Chebyshev) UCL	26.31
k star	7.394	99% KM (Chebyshev) UCL	34.04
Theta star	2.331		
Nu star	221.8	**Potential UCLs to Use**	
AppChi2	188.4	95% KM (t) UCL	16.95
95% Gamma Approximate UCL	20.3	95% KM (Percentile Bootstrap) UCL	17.93
95% Adjusted Gamma UCL	20.72		

Note: DL/2 is not a recommended method.

Table D.1-1b
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Dibenzofuran (ug/kg)

General Statistics

Number of Valid Data	15	Number of Detected Data	6
Number of Distinct Detected Data	6	Number of Non-Detect Data	9
		Percent Non-Detects	60.00%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	2.2	Minimum Detected	0.788
Maximum Detected	13	Maximum Detected	2.565
Mean of Detected	5.4	Mean of Detected	1.516
SD of Detected	3.918	SD of Detected	0.605
Minimum Non-Detect	1.6	Minimum Non-Detect	0.47
Maximum Non-Detect	4.11	Maximum Non-Detect	1.413

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	13
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	2
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	86.67%

Warning: There are only 6 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough tp draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.76	Shapiro Wilk Test Statistic	0.911
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	2.93	Mean	0.711
SD	3.164	SD	0.827
95% DL/2 (t) UCL	4.369	95% H-Stat (DL/2) UCL	4.309

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE method failed to converge properly		Mean in Log Scale	0.698
		SD in Log Scale	0.817
		Mean in Original Scale	2.894
		SD in Original Scale	3.176
		95% Percentile Bootstrap UCL	4.277
		95% BCA Bootstrap UCL	5.065

Table D.1-1b
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	1.656
Theta Star	3.261
nu star	19.87
A-D Test Statistic	0.521
5% A-D Critical Value	0.701
K-S Test Statistic	0.701
5% K-S Critical Value	0.334
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	2.2
Maximum	13
Mean	5.449
Median	5.403
SD	2.346
k star	6.014
Theta star	0.906
Nu star	180.4
AppChi2	150.3
95% Gamma Approximate UCL	6.538
95% Adjusted Gamma UCL	6.689

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Gamma Distributed at 5% Significance Level	

Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	3.561
SD	2.735
SE of Mean	0.78
95% KM (t) UCL	4.934
95% KM (z) UCL	4.843
95% KM (jackknife) UCL	4.796
95% KM (bootstrap t) UCL	6.369
95% KM (BCA) UCL	6.035
95% KM (Percentile Bootstrap) UCL	5.393
95% KM (Chebyshev) UCL	6.959
97.5% KM (Chebyshev) UCL	8.43
99% KM (Chebyshev) UCL	11.32
Potential UCLs to Use	
95% KM (t) UCL	4.934

Table D.1-1b
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Dimethylphthalate (ug/kg)

General Statistics

Number of Valid Data	15	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	11
		Percent Non-Detects	73.33%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	9.993	Minimum Detected	2.302
Maximum Detected	500	Maximum Detected	6.215
Mean of Detected	165.9	Mean of Detected	4.019
SD of Detected	230.8	SD of Detected	1.878
Minimum Non-Detect	0.82	Minimum Non-Detect	-0.198
Maximum Non-Detect	4.3	Maximum Non-Detect	1.459

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	11
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	4
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	73.33%

Warning: There are only 4 Distinct Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough tp draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.802	Shapiro Wilk Test Statistic	0.895
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	44.92	Mean	0.823
SD	130.8	SD	2.254
95% DL/2 (t) UCL	104.4	95% H-Stat (DL/2) UCL	111.4

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-1.724
		SD in Log Scale	3.856
		Mean in Original Scale	44.28
		SD in Original Scale	131.1
		95% Percentile Bootstrap UCL	106.3
		95% BCA Bootstrap UCL	144.9

Table D.1-1b
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only		**Data Distribution Test with Detected Values Only**	
k star (bias corrected)	0.309	**Data appear Normal at 5% Significance Level**	
Theta Star	536.7		
nu star	2.473		
A-D Test Statistic	0.369	**Nonparametric Statistics**	
5% A-D Critical Value	0.678	Kaplan-Meier (KM) Method	
K-S Test Statistic	0.678	Mean	51.57
5% K-S Critical Value	0.409	SD	124.1
Data appear Gamma Distributed at 5% Significance Level		SE of Mean	37.01
		95% KM (t) UCL	116.8
Assuming Gamma Distribution		95% KM (z) UCL	112.4
Gamma ROS Statistics using Extrapolated Data		95% KM (jackknife) UCL	107.9
Minimum	9.993	95% KM (bootstrap t) UCL	180.9
Maximum	500	95% KM (BCA) UCL	500
Mean	166.3	95% KM (Percentile Bootstrap) UCL	188
Median	160.7	95% KM (Chebyshev) UCL	212.9
SD	108.7	97.5% KM (Chebyshev) UCL	282.7
k star	1.507	99% KM (Chebyshev) UCL	419.8
Theta star	110.4		
Nu star	45.2	**Potential UCLs to Use**	
AppChi2	30.78	95% KM (t) UCL	116.8
95% Gamma Approximate UCL	244.2	95% KM (Percentile Bootstrap) UCL	188
95% Adjusted Gamma UCL	N/A		

Note: DL/2 is not a recommended method.

Table D.1-1b
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

2,4,6-Trinitrotoluene (mg/kg)

General Statistics

Number of Valid Data	15	Number of Detected Data	4
Number of Distinct Detected Data	4	Number of Non-Detect Data	11
		Percent Non-Detects	73.33%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.23	Minimum Detected	-1.47
Maximum Detected	3	Maximum Detected	1.099
Mean of Detected	0.981	Mean of Detected	-0.638
SD of Detected	1.349	SD of Detected	1.189
Minimum Non-Detect	0.15	Minimum Non-Detect	-1.897
Maximum Non-Detect	0.167	Maximum Non-Detect	-1.79

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	11
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	4
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	73.33%

Warning: There are only 4 Distinct Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough tp draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.683	Shapiro Wilk Test Statistic	0.805
5% Shapiro Wilk Critical Value	0.748	5% Shapiro Wilk Critical Value	0.748
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.319	Mean	-2.041
SD	0.749	SD	1.035
95% DL/2 (t) UCL	0.659	95% H-Stat (DL/2) UCL	0.283

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-4.268
		SD in Log Scale	2.758
		Mean in Original Scale	0.269
		SD in Original Scale	0.766
		95% Percentile Bootstrap UCL	0.654
		95% BCA Bootstrap UCL	0.852

Table D.1-1b
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.402
Theta Star	2.441
nu star	3.213
A-D Test Statistic	0.651
5% A-D Critical Value	0.667
K-S Test Statistic	0.667
5% K-S Critical Value	0.403
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0.000000001
Maximum	11.45
Mean	3.125
Median	1.414
SD	3.672
k star	0.29
Theta star	10.79
Nu star	8.691
AppChi2	3.142
95% Gamma Approximate UCL	8.645
95% Adjusted Gamma UCL	N/A

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Gamma Distributed at 5% Significance Level	

Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	0.43
SD	0.689
SE of Mean	0.205
95% KM (t) UCL	0.792
95% KM (z) UCL	0.768
95% KM (jackknife) UCL	0.736
95% KM (bootstrap t) UCL	3.082
95% KM (BCA) UCL	3
95% KM (Percentile Bootstrap) UCL	0.982
95% KM (Chebyshev) UCL	1.325
97.5% KM (Chebyshev) UCL	1.712
99% KM (Chebyshev) UCL	2.473
Potential UCLs to Use	
95% KM (t) UCL	0.792

Table D.1-1b
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

2,4-Dinitrotoluene (mg/kg)

General Statistics

Number of Valid Data	15	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	14
		Percent Non-Detects	93.33%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable 2,4-Dinitrotoluene (mg/kg) was not processed!

Table D.1-1b
EPC Calculation Results - SWMU 13 Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

2,6-Dinitrotoluene (mg/kg)

General Statistics

Number of Valid Data	15	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	14
		Percent Non-Detects	93.33%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable 2,6-Dinitrotoluene (mg/kg) was not processed!

Table D.1-2a
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

General UCL Statistics for Full Data Sets

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Aluminum (mg/kg)

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	28

Raw Statistics		**Log-transformed Statistics**	
Minimum	4250	Minimum of Log Data	8.355
Maximum	35000	Maximum of Log Data	10.46
Mean	14273	Mean of log Data	9.473
Median	12800	SD of log Data	0.451
SD	6288		
Coefficient of Variation	0.441		
Skewness	1.11		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.925	Shapiro Wilk Test Statistic	0.97
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	16158	95% H-UCL	16763
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	19501
95% Adjusted-CLT UCL	16335	97.5% Chebyshev (MVUE) UCL	21735
95% Modified-t UCL	16194	99% Chebyshev (MVUE) UCL	26123

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	5.008	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	2850		
nu star	320.5		
Approximate Chi Square Value (.05)	280	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0416	95% CLT UCL	16102
Adjusted Chi Square Value	278	95% Jackknife UCL	16158
		95% Standard Bootstrap UCL	16055
Anderson-Darling Test Statistic	0.336	95% Bootstrap-t UCL	16416
Anderson-Darling 5% Critical Value	0.748	95% Hall's Bootstrap UCL	16599
Kolmogorov-Smirnov Test Statistic	0.104	95% Percentile Bootstrap UCL	16309
Kolmogorov-Smirnov 5% Critical Value	0.156	95% BCA Bootstrap UCL	16295
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	19118
		97.5% Chebyshev(Mean, Sd) UCL	21215
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	25333
95% Approximate Gamma UCL	16337		
95% Adjusted Gamma UCL	16455		

Potential UCL to Use		Use 95% Approximate Gamma UCL	16337

Table D.1-2a
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Arsenic (mg/kg)

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	26

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.12	Minimum of Log Data	-2.12
Maximum	5.6	Maximum of Log Data	1.723
Mean	2.408	Mean of log Data	0.671
Median	2.35	SD of log Data	0.771
SD	1.325		
Coefficient of Variation	0.55		
Skewness	0.515		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.969	Shapiro Wilk Test Statistic	0.877
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	2.806	95% H-UCL	3.553
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	4.3
95% Adjusted-CLT UCL	2.816	97.5% Chebyshev (MVUE) UCL	5.035
95% Modified-t UCL	2.809	99% Chebyshev (MVUE) UCL	6.478

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.343	Data appear Normal at 5% Significance Level	
Theta Star	1.028		
nu star	150		
Approximate Chi Square Value (.05)	122.7	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0416	95% CLT UCL	2.794
Adjusted Chi Square Value	121.3	95% Jackknife UCL	2.806
		95% Standard Bootstrap UCL	2.786
Anderson-Darling Test Statistic	0.391	95% Bootstrap-t UCL	2.833
Anderson-Darling 5% Critical Value	0.756	95% Hall's Bootstrap UCL	2.825
Kolmogorov-Smirnov Test Statistic	0.121	95% Percentile Bootstrap UCL	2.82
Kolmogorov-Smirnov 5% Critical Value	0.157	95% BCA Bootstrap UCL	2.816
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	3.429
		97.5% Chebyshev(Mean, Sd) UCL	3.871
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	4.739
95% Approximate Gamma UCL	2.945		
95% Adjusted Gamma UCL	2.977		

Potential UCL to Use		Use 95% Student's-t UCL	2.806

Table D.1-2a
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Cobalt (mg/kg)

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	22

Raw Statistics		**Log-transformed Statistics**	
Minimum	3.9	Minimum of Log Data	1.361
Maximum	24	Maximum of Log Data	3.178
Mean	11.33	Mean of log Data	2.347
Median	11	SD of log Data	0.416
SD	4.502		
Coefficient of Variation	0.398		
Skewness	0.697		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.965	Shapiro Wilk Test Statistic	0.982
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data appear Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	12.67	95% H-UCL	13.11
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	15.13
95% Adjusted-CLT UCL	12.74	97.5% Chebyshev (MVUE) UCL	16.76
95% Modified-t UCL	12.69	99% Chebyshev (MVUE) UCL	19.96

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	5.86	Data appear Normal at 5% Significance Level	
Theta Star	1.933		
nu star	375		
Approximate Chi Square Value (.05)	331.2	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0416	95% CLT UCL	12.63
Adjusted Chi Square Value	328.9	95% Jackknife UCL	12.67
		95% Standard Bootstrap UCL	12.64
Anderson-Darling Test Statistic	0.14	95% Bootstrap-t UCL	12.84
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	12.79
Kolmogorov-Smirnov Test Statistic	0.0739	95% Percentile Bootstrap UCL	12.58
Kolmogorov-Smirnov 5% Critical Value	0.156	95% BCA Bootstrap UCL	12.7
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	14.79
		97.5% Chebyshev(Mean, Sd) UCL	16.29
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	19.24
95% Approximate Gamma UCL	12.83		
95% Adjusted Gamma UCL	12.91		

Potential UCL to Use		Use 95% Student's-t UCL	12.67

Table D.1-2a
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Copper (mg/kg)

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	24

Raw Statistics		**Log-transformed Statistics**	
Minimum	2.5	Minimum of Log Data	0.916
Maximum	260	Maximum of Log Data	5.561
Mean	32.01	Mean of log Data	3.054
Median	20	SD of log Data	0.838
SD	45.71		
Coefficient of Variation	1.428		
Skewness	4.356		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.48	Shapiro Wilk Test Statistic	0.935
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	45.71	95% H-UCL	42.15
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	51.03
95% Adjusted-CLT UCL	51.95	97.5% Chebyshev (MVUE) UCL	60.27
95% Modified-t UCL	46.75	99% Chebyshev (MVUE) UCL	78.42

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.249	Data appear Lognormal at 5% Significance Level	
Theta Star	25.63		
nu star	79.93		
Approximate Chi Square Value (.05)	60.33	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0416	95% CLT UCL	45.3
Adjusted Chi Square Value	59.42	95% Jackknife UCL	45.71
		95% Standard Bootstrap UCL	45.1
Anderson-Darling Test Statistic	1.943	95% Bootstrap-t UCL	72.49
Anderson-Darling 5% Critical Value	0.768	95% Hall's Bootstrap UCL	95.55
Kolmogorov-Smirnov Test Statistic	0.204	95% Percentile Bootstrap UCL	46.29
Kolmogorov-Smirnov 5% Critical Value	0.159	95% BCA Bootstrap UCL	53.04
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	67.24
		97.5% Chebyshev(Mean, Sd) UCL	82.48
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	112.4
95% Approximate Gamma UCL	42.41		
95% Adjusted Gamma UCL	43.06		

Potential UCL to Use		Use 95% H-UCL	42.15

Table D.1-2a
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Iron (mg/kg)

General Statistics			
Number of Valid Observations	32	Number of Distinct Observations	29
Raw Statistics		**Log-transformed Statistics**	
Minimum	5330	Minimum of Log Data	8.581
Maximum	87000	Maximum of Log Data	11.37
Mean	32010	Mean of log Data	10.23
Median	31800	SD of log Data	0.577
SD	17254		
Coefficient of Variation	0.539		
Skewness	1.423		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.884	Shapiro Wilk Test Statistic	0.948
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	37182	95% H-UCL	40214
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	47855
95% Adjusted-CLT UCL	37847	97.5% Chebyshev (MVUE) UCL	54483
95% Modified-t UCL	37310	99% Chebyshev (MVUE) UCL	67502
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	3.307	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	9679		
nu star	211.6		
Approximate Chi Square Value (.05)	179	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0416	95% CLT UCL	37027
Adjusted Chi Square Value	177.4	95% Jackknife UCL	37182
		95% Standard Bootstrap UCL	36956
Anderson-Darling Test Statistic	0.502	95% Bootstrap-t UCL	38482
Anderson-Darling 5% Critical Value	0.752	95% Hall's Bootstrap UCL	39778
Kolmogorov-Smirnov Test Statistic	0.114	95% Percentile Bootstrap UCL	37334
Kolmogorov-Smirnov 5% Critical Value	0.156	95% BCA Bootstrap UCL	37963
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	45305
		97.5% Chebyshev(Mean, Sd) UCL	51058
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	62359
95% Approximate Gamma UCL	37853		
95% Adjusted Gamma UCL	38195		
Potential UCL to Use		Use 95% Approximate Gamma UCL	37853

Table D.1-2a
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Lead (mg/kg)

General Statistics			
Number of Valid Observations	183	Number of Distinct Observations	81
Raw Statistics		**Log-transformed Statistics**	
Minimum	12	Minimum of Log Data	2.485
Maximum	26500	Maximum of Log Data	10.18
Mean	414.9	Mean of log Data	5.228
Median	190	SD of log Data	0.822
SD	2044		
Coefficient of Variation	4.927		
Skewness	11.9		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Lilliefors Test Statistic	0.422	Lilliefors Test Statistic	0.117
Lilliefors Critical Value	0.0655	Lilliefors Critical Value	0.0655
Data not Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	664.8	95% H-UCL	295.6
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	340.2
95% Adjusted-CLT UCL	805.5	97.5% Chebyshev (MVUE) UCL	374.5
95% Modified-t UCL	686.9	99% Chebyshev (MVUE) UCL	441.9
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	0.74	Data do not follow a Discernable Distribution (0.05)	
Theta Star	560.7		
nu star	270.8		
Approximate Chi Square Value (.05)	233.7	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0487	95% CLT UCL	663.5
Adjusted Chi Square Value	233.5	95% Jackknife UCL	664.8
		95% Standard Bootstrap UCL	662.4
Anderson-Darling Test Statistic	5.464E+28	95% Bootstrap-t UCL	2561
Anderson-Darling 5% Critical Value	0.796	95% Hall's Bootstrap UCL	1703
Kolmogorov-Smirnov Test Statistic	0.278	95% Percentile Bootstrap UCL	684.7
Kolmogorov-Smirnov 5% Critical Value	0.0708	95% BCA Bootstrap UCL	899.7
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1074
		97.5% Chebyshev(Mean, Sd) UCL	1359
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1919
95% Approximate Gamma UCL	480.8		
95% Adjusted Gamma UCL	481.4		
Potential UCL to Use		Use 95% Chebyshev (Mean, Sd) UCL	1074

Table D.1-2a
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Manganese (mg/kg)

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	29

Raw Statistics		**Log-transformed Statistics**	
Minimum	59	Minimum of Log Data	4.078
Maximum	2200	Maximum of Log Data	7.696
Mean	1003	Mean of log Data	6.706
Median	1090	SD of log Data	0.783
SD	500.1		
Coefficient of Variation	0.499		
Skewness	-0.0263		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.974	Shapiro Wilk Test Statistic	0.829
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data appear Normal at 5% Significance Level		Data not Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	1152	95% H-UCL	1509
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	1826
95% Adjusted-CLT UCL	1148	97.5% Chebyshev (MVUE) UCL	2142
95% Modified-t UCL	1152	99% Chebyshev (MVUE) UCL	2761

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.38	Data appear Normal at 5% Significance Level	
Theta Star	421.2		
nu star	152.3		
Approximate Chi Square Value (.05)	124.8	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0416	95% CLT UCL	1148
Adjusted Chi Square Value	123.5	95% Jackknife UCL	1152
		95% Standard Bootstrap UCL	1152
Anderson-Darling Test Statistic	1.193	95% Bootstrap-t UCL	1153
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	1152
Kolmogorov-Smirnov Test Statistic	0.167	95% Percentile Bootstrap UCL	1150
Kolmogorov-Smirnov 5% Critical Value	0.157	95% BCA Bootstrap UCL	1146
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1388
		97.5% Chebyshev(Mean, Sd) UCL	1555
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1882
95% Approximate Gamma UCL	1224		
95% Adjusted Gamma UCL	1237		

Potential UCL to Use		Use 95% Student's-t UCL	1152

Table D.1-2a
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Selenium (mg/kg)

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	27

Raw Statistics		**Log-transformed Statistics**	
Minimum	0.043	Minimum of Log Data	-3.147
Maximum	1.5	Maximum of Log Data	0.405
Mean	0.516	Mean of log Data	-0.885
Median	0.495	SD of log Data	0.748
SD	0.319		
Coefficient of Variation	0.617		
Skewness	0.876		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.93	Shapiro Wilk Test Statistic	0.936
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.612	95% H-UCL	0.729
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.881
95% Adjusted-CLT UCL	0.618	97.5% Chebyshev (MVUE) UCL	1.029
95% Modified-t UCL	0.613	99% Chebyshev (MVUE) UCL	1.318

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.185	**Data appear Normal at 5% Significance Level**	
Theta Star	0.236		
nu star	139.8		
Approximate Chi Square Value (.05)	113.5	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0416	95% CLT UCL	0.609
Adjusted Chi Square Value	112.2	95% Jackknife UCL	0.612
		95% Standard Bootstrap UCL	0.607
Anderson-Darling Test Statistic	0.467	95% Bootstrap-t UCL	0.62
Anderson-Darling 5% Critical Value	0.757	95% Hall's Bootstrap UCL	0.634
Kolmogorov-Smirnov Test Statistic	0.135	95% Percentile Bootstrap UCL	0.608
Kolmogorov-Smirnov 5% Critical Value	0.157	95% BCA Bootstrap UCL	0.616
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	0.762
		97.5% Chebyshev(Mean, Sd) UCL	0.868
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.077
95% Approximate Gamma UCL	0.636		
95% Adjusted Gamma UCL	0.643		

Potential UCL to Use		Use 95% Student's-t UCL	0.612

Table D.1-2a
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Thallium (mg/kg)

General Statistics			
Number of Valid Observations	32	Number of Distinct Observations	26
Raw Statistics		**Log-transformed Statistics**	
Minimum	0.047	Minimum of Log Data	-3.058
Maximum	3.5	Maximum of Log Data	1.253
Mean	0.529	Mean of log Data	-0.967
Median	0.42	SD of log Data	0.786
SD	0.614		
Coefficient of Variation	1.16		
Skewness	4.012		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.549	Shapiro Wilk Test Statistic	0.954
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	0.714	95% H-UCL	0.705
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	0.854
95% Adjusted-CLT UCL	0.79	97.5% Chebyshev (MVUE) UCL	1.002
95% Modified-t UCL	0.726	99% Chebyshev (MVUE) UCL	1.293
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	1.525	Data appear Lognormal at 5% Significance Level	
Theta Star	0.347		
nu star	97.59		
Approximate Chi Square Value (.05)	75.8	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0416	95% CLT UCL	0.708
Adjusted Chi Square Value	74.78	95% Jackknife UCL	0.714
		95% Standard Bootstrap UCL	0.7
Anderson-Darling Test Statistic	1.269	95% Bootstrap-t UCL	1.009
Anderson-Darling 5% Critical Value	0.763	95% Hall's Bootstrap UCL	1.531
Kolmogorov-Smirnov Test Statistic	0.191	95% Percentile Bootstrap UCL	0.723
Kolmogorov-Smirnov 5% Critical Value	0.158	95% BCA Bootstrap UCL	0.836
Data not Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	1.003
		97.5% Chebyshev(Mean, Sd) UCL	1.208
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1.61
95% Approximate Gamma UCL	0.682		
95% Adjusted Gamma UCL	0.691		
Potential UCL to Use		Use 95% H-UCL	0.705

Table D.1-2a
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Vanadium (mg/kg)

General Statistics

Number of Valid Observations	32	Number of Distinct Observations	21

Raw Statistics		**Log-transformed Statistics**	
Minimum	11	Minimum of Log Data	2.398
Maximum	59	Maximum of Log Data	4.078
Mean	27.02	Mean of log Data	3.237
Median	24.5	SD of log Data	0.355
SD	9.612		
Coefficient of Variation	0.356		
Skewness	1.054		

Relevant UCL Statistics

Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.931	Shapiro Wilk Test Statistic	0.977
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	29.9	95% H-UCL	30.45
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	34.62
95% Adjusted-CLT UCL	30.15	97.5% Chebyshev (MVUE) UCL	37.89
95% Modified-t UCL	29.95	99% Chebyshev (MVUE) UCL	44.33

Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	7.753	**Data appear Normal at 5% Significance Level**	
Theta Star	3.485		
nu star	496.2		
Approximate Chi Square Value (.05)	445.5	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0416	95% CLT UCL	29.81
Adjusted Chi Square Value	443	95% Jackknife UCL	29.9
		95% Standard Bootstrap UCL	29.74
Anderson-Darling Test Statistic	0.331	95% Bootstrap-t UCL	30.3
Anderson-Darling 5% Critical Value	0.747	95% Hall's Bootstrap UCL	30.64
Kolmogorov-Smirnov Test Statistic	0.104	95% Percentile Bootstrap UCL	29.92
Kolmogorov-Smirnov 5% Critical Value	0.156	95% BCA Bootstrap UCL	30.17
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	34.42
		97.5% Chebyshev(Mean, Sd) UCL	37.63
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	43.92
95% Approximate Gamma UCL	30.09		
95% Adjusted Gamma UCL	30.26		

Potential UCL to Use		Use 95% Student's-t UCL	29.9

Table D.1-2a
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Zinc (mg/kg)

General Statistics			
Number of Valid Observations	32	Number of Distinct Observations	32
Raw Statistics		**Log-transformed Statistics**	
Minimum	46	Minimum of Log Data	3.829
Maximum	1600	Maximum of Log Data	7.378
Mean	505	Mean of log Data	6.026
Median	420	SD of log Data	0.682
SD	326.3		
Coefficient of Variation	0.646		
Skewness	1.561		
Relevant UCL Statistics			
Normal Distribution Test		**Lognormal Distribution Test**	
Shapiro Wilk Test Statistic	0.875	Shapiro Wilk Test Statistic	0.955
Shapiro Wilk Critical Value	0.93	Shapiro Wilk Critical Value	0.93
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	
Assuming Normal Distribution		**Assuming Lognormal Distribution**	
95% Student's-t UCL	602.8	95% H-UCL	673.8
95% UCLs (Adjusted for Skewness)		95% Chebyshev (MVUE) UCL	811.5
95% Adjusted-CLT UCL	616.9	97.5% Chebyshev (MVUE) UCL	938.6
95% Modified-t UCL	605.4	99% Chebyshev (MVUE) UCL	1188
Gamma Distribution Test		**Data Distribution**	
k star (bias corrected)	2.446	Data appear Gamma Distributed at 5% Significance Level	
Theta Star	206.4		
nu star	156.6		
Approximate Chi Square Value (.05)	128.6	**Nonparametric Statistics**	
Adjusted Level of Significance	0.0416	95% CLT UCL	599.8
Adjusted Chi Square Value	127.3	95% Jackknife UCL	602.8
		95% Standard Bootstrap UCL	597.5
Anderson-Darling Test Statistic	0.308	95% Bootstrap-t UCL	616.3
Anderson-Darling 5% Critical Value	0.755	95% Hall's Bootstrap UCL	639.9
Kolmogorov-Smirnov Test Statistic	0.0976	95% Percentile Bootstrap UCL	597.1
Kolmogorov-Smirnov 5% Critical Value	0.157	95% BCA Bootstrap UCL	615.9
Data appear Gamma Distributed at 5% Significance Level		95% Chebyshev(Mean, Sd) UCL	756.4
		97.5% Chebyshev(Mean, Sd) UCL	865.2
Assuming Gamma Distribution		99% Chebyshev(Mean, Sd) UCL	1079
95% Approximate Gamma UCL	614.6		
95% Adjusted Gamma UCL	621.1		
Potential UCL to Use		Use 95% Approximate Gamma UCL	614.6

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

General UCL Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Antimony (mg/kg)

General Statistics

Number of Valid Data	32	Number of Detected Data	27
Number of Distinct Detected Data	25	Number of Non-Detect Data	5
		Percent Non-Detects	15.63%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.069	Minimum Detected	-2.674
Maximum Detected	4.7	Maximum Detected	1.548
Mean of Detected	0.78	Mean of Detected	-0.912
SD of Detected	1.128	SD of Detected	1.099
Minimum Non-Detect	0.026	Minimum Non-Detect	-3.65
Maximum Non-Detect	0.0518	Maximum Non-Detect	-2.96

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	5
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	27
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	15.63%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.609	Shapiro Wilk Test Statistic	0.936
5% Shapiro Wilk Critical Value	0.923	5% Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.662	Mean	-1.362
SD	1.07	SD	1.467
95% DL/2 (t) UCL	0.982	95% H-Stat (DL/2) UCL	1.461
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	0.544	Mean in Log Scale	-1.302
SD	1.182	SD in Log Scale	1.371
95% MLE (t) UCL	0.898	Mean in Original Scale	0.664
95% MLE (Tiku) UCL	0.884	SD in Original Scale	1.069
		95% Percentile Bootstrap UCL	1.017
		95% BCA Bootstrap UCL	1.067

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.81
Theta Star	0.963
nu star	43.73
A-D Test Statistic	1.735
5% A-D Critical Value	0.778
K-S Test Statistic	0.778
5% K-S Critical Value	0.174
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0.000000001
Maximum	4.7
Mean	0.658
Median	0.32
SD	1.072
k star	0.206
Theta star	3.194
Nu star	13.19
AppChi2	6.018
95% Gamma Approximate UCL	1.442
95% Adjusted Gamma UCL	1.507

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Lognormal at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	0.669
SD	1.049
SE of Mean	0.189
95% KM (t) UCL	0.989
95% KM (z) UCL	0.98
95% KM (jackknife) UCL	0.986
95% KM (bootstrap t) UCL	1.161
95% KM (BCA) UCL	0.984
95% KM (Percentile Bootstrap) UCL	1.001
95% KM (Chebyshev) UCL	1.492
97.5% KM (Chebyshev) UCL	1.849
99% KM (Chebyshev) UCL	2.549
Potential UCLs to Use	
97.5% KM (Chebyshev) UCL	1.849

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Cadmium (mg/kg)

General Statistics

Number of Valid Data	32	Number of Detected Data	30
Number of Distinct Detected Data	21	Number of Non-Detect Data	2
		Percent Non-Detects	6.25%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.51	Minimum Detected	-0.673
Maximum Detected	2.8	Maximum Detected	1.03
Mean of Detected	1.247	Mean of Detected	0.115
SD of Detected	0.624	SD of Detected	0.458
Minimum Non-Detect	0.45	Minimum Non-Detect	-0.799
Maximum Non-Detect	0.45	Maximum Non-Detect	-0.799

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.849	Shapiro Wilk Test Statistic	0.958
5% Shapiro Wilk Critical Value	0.927	5% Shapiro Wilk Critical Value	0.927
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.183	Mean	0.0147
SD	0.654	SD	0.594
95% DL/2 (t) UCL	1.379	95% H-Stat (DL/2) UCL	1.378
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	1.176	Mean in Log Scale	0.0468
SD	0.658	SD in Log Scale	0.519
95% MLE (t) UCL	1.374	Mean in Original Scale	1.193
95% MLE (Tiku) UCL	1.369	SD in Original Scale	0.641
		95% Percentile Bootstrap UCL	1.375
		95% BCA Bootstrap UCL	1.406

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	4.429
Theta Star	0.282
nu star	265.7
A-D Test Statistic	0.609
5% A-D Critical Value	0.747
K-S Test Statistic	0.747
5% K-S Critical Value	0.16
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0.000000001
Maximum	2.8
Mean	1.174
Median	1.1
SD	0.668
k star	0.734
Theta star	1.6
Nu star	46.98
AppChi2	32.25
95% Gamma Approximate UCL	1.711
95% Adjusted Gamma UCL	1.746

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Gamma Distributed at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	1.201
SD	0.621
SE of Mean	0.112
95% KM (t) UCL	1.39
95% KM (z) UCL	1.384
95% KM (jackknife) UCL	1.39
95% KM (bootstrap t) UCL	1.443
95% KM (BCA) UCL	1.397
95% KM (Percentile Bootstrap) UCL	1.392
95% KM (Chebyshev) UCL	1.687
97.5% KM (Chebyshev) UCL	1.898
99% KM (Chebyshev) UCL	2.311
Potential UCLs to Use	
95% KM (BCA) UCL	1.397

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Benzo(a)anthracene (ug/kg)

General Statistics

Number of Valid Data	32	Number of Detected Data	25
Number of Distinct Detected Data	24	Number of Non-Detect Data	7
		Percent Non-Detects	21.88%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	1.8	Minimum Detected	0.588
Maximum Detected	480	Maximum Detected	6.174
Mean of Detected	69.52	Mean of Detected	3.443
SD of Detected	97.77	SD of Detected	1.423
Minimum Non-Detect	14.6	Minimum Non-Detect	2.681
Maximum Non-Detect	17.3	Maximum Non-Detect	2.851

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	17
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	15
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	53.13%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.632	Shapiro Wilk Test Statistic	0.964
5% Shapiro Wilk Critical Value	0.918	5% Shapiro Wilk Critical Value	0.918
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	56.12	Mean	3.152
SD	89.79	SD	1.372
95% DL/2 (t) UCL	83.03	95% H-Stat (DL/2) UCL	153.9

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	3.123
		SD in Log Scale	1.416
		Mean in Original Scale	56.11
		SD in Original Scale	89.82
		95% Percentile Bootstrap UCL	83.09
		95% BCA Bootstrap UCL	97.05

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.687
Theta Star	101.2
nu star	34.33
A-D Test Statistic	0.365
5% A-D Critical Value	0.783
K-S Test Statistic	0.783
5% K-S Critical Value	0.181
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0.000000001
Maximum	480
Mean	59.44
Median	30.79
SD	88.89
k star	0.305
Theta star	194.9
Nu star	19.52
AppChi2	10.5
95% Gamma Approximate UCL	110.5
95% Adjusted Gamma UCL	114.4

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Gamma Distributed at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	56.08
SD	88.43
SE of Mean	15.96
95% KM (t) UCL	83.14
95% KM (z) UCL	82.34
95% KM (jackknife) UCL	83.03
95% KM (bootstrap t) UCL	105.7
95% KM (BCA) UCL	86.96
95% KM (Percentile Bootstrap) UCL	84.54
95% KM (Chebyshev) UCL	125.7
97.5% KM (Chebyshev) UCL	155.8
99% KM (Chebyshev) UCL	214.9
Potential UCLs to Use	
95% KM (Chebyshev) UCL	125.7

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Benzo(a)pyrene (ug/kg)

General Statistics

Number of Valid Data	32	Number of Detected Data	29
Number of Distinct Detected Data	29	Number of Non-Detect Data	3
		Percent Non-Detects	9.38%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	2.5	Minimum Detected	0.916
Maximum Detected	290	Maximum Detected	5.67
Mean of Detected	51.96	Mean of Detected	3.371
SD of Detected	59.22	SD of Detected	1.167
Minimum Non-Detect	1.5	Minimum Non-Detect	0.405
Maximum Non-Detect	7.42	Maximum Non-Detect	2.004

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	6
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	26
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	18.75%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.741	Shapiro Wilk Test Statistic	0.972
5% Shapiro Wilk Critical Value	0.926	5% Shapiro Wilk Critical Value	0.926
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	47.34	Mean	3.128
SD	58.14	SD	1.369
95% DL/2 (t) UCL	64.77	95% H-Stat (DL/2) UCL	104.5

Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	40.13	Mean in Log Scale	3.147
SD	65.96	SD in Log Scale	1.324
95% MLE (t) UCL	59.9	Mean in Original Scale	47.36
95% MLE (Tiku) UCL	59.65	SD in Original Scale	58.12
		95% Percentile Bootstrap UCL	64.97
		95% BCA Bootstrap UCL	67.62

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.917
Theta Star	56.66
nu star	53.18
A-D Test Statistic	0.427
5% A-D Critical Value	0.774
K-S Test Statistic	0.774
5% K-S Critical Value	0.167
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0.000000001
Maximum	290
Mean	47.08
Median	22.5
SD	58.35
k star	0.255
Theta star	184.9
Nu star	16.3
AppChi2	8.171
95% Gamma Approximate UCL	93.9
95% Adjusted Gamma UCL	97.58

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Gamma Distributed at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	47.4
SD	57.18
SE of Mean	10.29
95% KM (t) UCL	64.85
95% KM (z) UCL	64.33
95% KM (jackknife) UCL	64.78
95% KM (bootstrap t) UCL	75.57
95% KM (BCA) UCL	65.84
95% KM (Percentile Bootstrap) UCL	65.33
95% KM (Chebyshev) UCL	92.24
97.5% KM (Chebyshev) UCL	111.6
99% KM (Chebyshev) UCL	149.8
Potential UCLs to Use	
95% KM (Chebyshev) UCL	92.24

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Benzo(b)fluoranthene (ug/kg)

General Statistics

Number of Valid Data	32	Number of Detected Data	29
Number of Distinct Detected Data	23	Number of Non-Detect Data	3
		Percent Non-Detects	9.38%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	3.5	Minimum Detected	1.253
Maximum Detected	630	Maximum Detected	6.446
Mean of Detected	94.59	Mean of Detected	3.858
SD of Detected	123.2	SD of Detected	1.275
Minimum Non-Detect	1.3	Minimum Non-Detect	0.262
Maximum Non-Detect	12.7	Maximum Non-Detect	2.542

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	6
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	26
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	18.75%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.661	Shapiro Wilk Test Statistic	0.962
5% Shapiro Wilk Critical Value	0.926	5% Shapiro Wilk Critical Value	0.926
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	86.14	Mean	3.598
SD	120.1	SD	1.501
95% DL/2 (t) UCL	122.1	95% H-Stat (DL/2) UCL	224.8

Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	70.68	Mean in Log Scale	3.615
SD	136	SD in Log Scale	1.444
95% MLE (t) UCL	111.4	Mean in Original Scale	86.1
95% MLE (Tiku) UCL	110.7	SD in Original Scale	120.2
		95% Percentile Bootstrap UCL	125.5
		95% BCA Bootstrap UCL	142.5

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.786
Theta Star	120.3
nu star	45.61
A-D Test Statistic	0.635
5% A-D Critical Value	0.78
K-S Test Statistic	0.78
5% K-S Critical Value	0.168
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0.000000001
Maximum	630
Mean	85.72
Median	37
SD	120.4
k star	0.244
Theta star	351.9
Nu star	15.59
AppChi2	7.674
95% Gamma Approximate UCL	174.2
95% Adjusted Gamma UCL	181.2

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Gamma Distributed at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	86.17
SD	118.2
SE of Mean	21.27
95% KM (t) UCL	122.2
95% KM (z) UCL	121.2
95% KM (jackknife) UCL	122.1
95% KM (bootstrap t) UCL	149.1
95% KM (BCA) UCL	123.2
95% KM (Percentile Bootstrap) UCL	124.7
95% KM (Chebyshev) UCL	178.9
97.5% KM (Chebyshev) UCL	219
99% KM (Chebyshev) UCL	297.8
Potential UCLs to Use	
95% KM (Chebyshev) UCL	178.9

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Benzo(g,h,i)perylene (ug/kg)

General Statistics

Number of Valid Data	32	Number of Detected Data	27
Number of Distinct Detected Data	26	Number of Non-Detect Data	5
		Percent Non-Detects	15.63%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	2.5	Minimum Detected	0.916
Maximum Detected	170	Maximum Detected	5.136
Mean of Detected	35.21	Mean of Detected	3.123
SD of Detected	35.41	SD of Detected	0.997
Minimum Non-Detect	1.2	Minimum Non-Detect	0.182
Maximum Non-Detect	11.3	Maximum Non-Detect	2.425

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	12
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	20
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	37.50%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.772	Shapiro Wilk Test Statistic	0.983
5% Shapiro Wilk Critical Value	0.923	5% Shapiro Wilk Critical Value	0.923
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	30.39	Mean	2.828
SD	34.37	SD	1.201
95% DL/2 (t) UCL	40.69	95% H-Stat (DL/2) UCL	57.98

Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	19.75	Mean in Log Scale	2.869
SD	45.91	SD in Log Scale	1.113
95% MLE (t) UCL	33.51	Mean in Original Scale	30.49
95% MLE (Tiku) UCL	34.91	SD in Original Scale	34.29
		95% Percentile Bootstrap UCL	41.03
		95% BCA Bootstrap UCL	43.62

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	1.165
Theta Star	30.23
nu star	62.9
A-D Test Statistic	0.323
5% A-D Critical Value	0.767
K-S Test Statistic	0.767
5% K-S Critical Value	0.172
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0.000000001
Maximum	170
Mean	30.51
Median	16.22
SD	34.35
k star	0.342
Theta star	89.1
Nu star	21.91
AppChi2	12.27
95% Gamma Approximate UCL	54.47
95% Adjusted Gamma UCL	56.24

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Gamma Distributed at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	30.55
SD	33.72
SE of Mean	6.078
95% KM (t) UCL	40.86
95% KM (z) UCL	40.55
95% KM (jackknife) UCL	40.72
95% KM (bootstrap t) UCL	45.83
95% KM (BCA) UCL	42.67
95% KM (Percentile Bootstrap) UCL	40.61
95% KM (Chebyshev) UCL	57.04
97.5% KM (Chebyshev) UCL	68.51
99% KM (Chebyshev) UCL	91.02
Potential UCLs to Use	
95% KM (BCA) UCL	42.67

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Dibenz(a,h)anthracene (ug/kg)

General Statistics

Number of Valid Data	32	Number of Detected Data	14
Number of Distinct Detected Data	13	Number of Non-Detect Data	18
		Percent Non-Detects	56.25%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	7.1	Minimum Detected	1.96
Maximum Detected	41	Maximum Detected	3.714
Mean of Detected	17.09	Mean of Detected	2.699
SD of Detected	10.09	SD of Detected	0.534
Minimum Non-Detect	3.9	Minimum Non-Detect	1.361
Maximum Non-Detect	8.26	Maximum Non-Detect	2.111

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	21
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	11
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	65.63%

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.845	Shapiro Wilk Test Statistic	0.957
5% Shapiro Wilk Critical Value	0.874	5% Shapiro Wilk Critical Value	0.874
Data not Normal at 5% Significance Level		Data appear Lognormal at 5% Significance Level	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	9.213	Mean	1.795
SD	9.634	SD	0.906
95% DL/2 (t) UCL	12.1	95% H-Stat (DL/2) UCL	11.44

Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	1.229	Mean in Log Scale	1.854
SD	17.31	SD in Log Scale	0.872
95% MLE (t) UCL	6.416	Mean in Original Scale	9.446
95% MLE (Tiku) UCL	9.376	SD in Original Scale	9.506
		95% Percentile Bootstrap UCL	12.36
		95% BCA Bootstrap UCL	12.85

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	2.995
Theta Star	5.705
nu star	83.86
A-D Test Statistic	0.355
5% A-D Critical Value	0.741
K-S Test Statistic	0.741
5% K-S Critical Value	0.23
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	7.1
Maximum	41
Mean	17.05
Median	16.96
SD	6.569
k star	7.514
Theta star	2.27
Nu star	480.9
AppChi2	431
95% Gamma Approximate UCL	19.03
95% Adjusted Gamma UCL	19.14

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Gamma Distributed at 5% Significance Level	

Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	11.48
SD	8.112
SE of Mean	1.488
95% KM (t) UCL	14
95% KM (z) UCL	13.93
95% KM (jackknife) UCL	13.83
95% KM (bootstrap t) UCL	15.12
95% KM (BCA) UCL	15.2
95% KM (Percentile Bootstrap) UCL	14.21
95% KM (Chebyshev) UCL	17.96
97.5% KM (Chebyshev) UCL	20.77
99% KM (Chebyshev) UCL	26.29
Potential UCLs to Use	
95% KM (t) UCL	14

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Dibenzofuran (ug/kg)

General Statistics

Number of Valid Data	32	Number of Detected Data	9
Number of Distinct Detected Data	9	Number of Non-Detect Data	23
		Percent Non-Detects	71.88%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	2	Minimum Detected	0.693
Maximum Detected	24	Maximum Detected	3.178
Mean of Detected	6.856	Mean of Detected	1.573
SD of Detected	7.242	SD of Detected	0.817
Minimum Non-Detect	1.6	Minimum Non-Detect	0.47
Maximum Non-Detect	4.42	Maximum Non-Detect	1.486

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	29
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	3
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	90.63%

Warning: There are only 9 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough tp draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.69	Shapiro Wilk Test Statistic	0.878
5% Shapiro Wilk Critical Value	0.829	5% Shapiro Wilk Critical Value	0.829
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	3.009	Mean	0.681
SD	4.443	SD	0.782
95% DL/2 (t) UCL	4.341	95% H-Stat (DL/2) UCL	3.616
Maximum Likelihood Estimate(MLE) Method		Log ROS Method	
Mean	16.6	Mean in Log Scale	0.2
SD	7.409	SD in Log Scale	1.123
95% MLE (t) UCL	18.82	Mean in Original Scale	2.579
95% MLE (Tiku) UCL	23.69	SD in Original Scale	4.617
		95% Percentile Bootstrap UCL	4.065
		95% BCA Bootstrap UCL	4.579

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	1.119
Theta Star	6.125
nu star	20.15
A-D Test Statistic	0.811
5% A-D Critical Value	0.734
K-S Test Statistic	0.734
5% K-S Critical Value	0.284
Data not Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	2
Maximum	24
Mean	6.474
Median	6.231
SD	3.78
k star	4.33
Theta star	1.495
Nu star	277.1
AppChi2	239.6
95% Gamma Approximate UCL	7.489
95% Adjusted Gamma UCL	7.548

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only			
Data appear Lognormal at 5% Significance Level			
Nonparametric Statistics			
Kaplan-Meier (KM) Method			
Mean	3.491		
SD	4.209		
SE of Mean	0.795		
95% KM (t) UCL	4.838		
95% KM (z) UCL	4.798		
95% KM (jackknife) UCL	4.691		
95% KM (bootstrap t) UCL	7.74		
95% KM (BCA) UCL	5.738		
95% KM (Percentile Bootstrap) UCL	5.119		
95% KM (Chebyshev) UCL	6.955		
97.5% KM (Chebyshev) UCL	8.454		
99% KM (Chebyshev) UCL	11.4		
Potential UCLs to Use			
95% KM (t) UCL	4.838		
95% KM (% Bootstrap) UCL	5.119		

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Dimethylphthalate (ug/kg)

General Statistics

Number of Valid Data	32	Number of Detected Data	7
Number of Distinct Detected Data	7	Number of Non-Detect Data	25
		Percent Non-Detects	78.13%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	1.2	Minimum Detected	0.182
Maximum Detected	550	Maximum Detected	6.31
Mean of Detected	178	Mean of Detected	3.715
SD of Detected	242.1	SD of Detected	2.245
Minimum Non-Detect	0.82	Minimum Non-Detect	-0.198
Maximum Non-Detect	4.63	Maximum Non-Detect	1.533

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	26
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	6
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	81.25%

Warning: There are only 7 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough tp draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.735	Shapiro Wilk Test Statistic	0.94
5% Shapiro Wilk Critical Value	0.803	5% Shapiro Wilk Critical Value	0.803
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	39.89	Mean	0.758
SD	129.8	SD	1.987
95% DL/2 (t) UCL	78.8	95% H-Stat (DL/2) UCL	27.18

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-3.246
		SD in Log Scale	4.46
		Mean in Original Scale	38.97
		SD in Original Scale	130.1
		95% Percentile Bootstrap UCL	82.64
		95% BCA Bootstrap UCL	105.1

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.348
Theta Star	512.2
nu star	4.865
A-D Test Statistic	0.367
5% A-D Critical Value	0.761
K-S Test Statistic	0.761
5% K-S Critical Value	0.33
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	1.2
Maximum	685
Mean	202.2
Median	148.8
SD	178.2
k star	0.978
Theta star	206.7
Nu star	62.6
AppChi2	45.4
95% Gamma Approximate UCL	278.8
95% Adjusted Gamma UCL	283.7

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Gamma Distributed at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	39.87
SD	127.8
SE of Mean	24.4
95% KM (t) UCL	81.24
95% KM (z) UCL	80
95% KM (jackknife) UCL	74.22
95% KM (bootstrap t) UCL	204.6
95% KM (BCA) UCL	110.8
95% KM (Percentile Bootstrap) UCL	90.94
95% KM (Chebyshev) UCL	146.2
97.5% KM (Chebyshev) UCL	192.2
99% KM (Chebyshev) UCL	282.6
Potential UCLs to Use	
95% KM (t) UCL	81.24

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

2,4,6-Trinitrotoluene (mg/kg)

General Statistics

Number of Valid Data	32	Number of Detected Data	5
Number of Distinct Detected Data	5	Number of Non-Detect Data	27
		Percent Non-Detects	84.38%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.23	Minimum Detected	-1.47
Maximum Detected	3	Maximum Detected	1.099
Mean of Detected	1.045	Mean of Detected	-0.458
SD of Detected	1.177	SD of Detected	1.105
Minimum Non-Detect	0.15	Minimum Non-Detect	-1.897
Maximum Non-Detect	0.167	Maximum Non-Detect	-1.79

Note: Data have multiple DLs - Use of KM Method is recommended	Number treated as Non-Detect	27
For all methods (except KM, DL/2, and ROS Methods),	Number treated as Detected	5
Observations < Largest ND are treated as NDs	Single DL Non-Detect Percentage	84.38%

Warning: There are only 5 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough tp draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.789	Shapiro Wilk Test Statistic	0.896
5% Shapiro Wilk Critical Value	0.762	5% Shapiro Wilk Critical Value	0.762
Data appear Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	0.23	Mean	-2.213
SD	0.553	SD	0.866
95% DL/2 (t) UCL	0.396	95% H-Stat (DL/2) UCL	0.175

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-5.401
		SD in Log Scale	3.073
		Mean in Original Scale	0.172
		SD in Original Scale	0.57
		95% Percentile Bootstrap UCL	0.355
		95% BCA Bootstrap UCL	0.472

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.587
Theta Star	1.779
nu star	5.871
A-D Test Statistic	0.429
5% A-D Critical Value	0.69
K-S Test Statistic	0.69
5% K-S Critical Value	0.364
Data appear Gamma Distributed at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0.000000001
Maximum	16.7
Mean	5.713
Median	3.919
SD	5.4
k star	0.336
Theta star	16.98
Nu star	21.53
AppChi2	11.99
95% Gamma Approximate UCL	10.26
95% Adjusted Gamma UCL	10.6

Note: DL/2 is not a recommended method.

Data Distribution Test with Detected Values Only	
Data appear Normal at 5% Significance Level	

Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	0.357
SD	0.511
SE of Mean	0.101
95% KM (t) UCL	0.528
95% KM (z) UCL	0.523
95% KM (jackknife) UCL	0.494
95% KM (bootstrap t) UCL	1.517
95% KM (BCA) UCL	1.406
95% KM (Percentile Bootstrap) UCL	0.698
95% KM (Chebyshev) UCL	0.797
97.5% KM (Chebyshev) UCL	0.987
99% KM (Chebyshev) UCL	1.361
Potential UCLs to Use	
95% KM (t) UCL	0.528
95% KM (Percentile Bootstrap) UCL	0.698

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

2,4-Dinitrotoluene (mg/kg)

General Statistics

Number of Valid Data	32	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	31
		Percent Non-Detects	96.88%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable 2,4-Dinitrotoluene (mg/kg) was not processed!

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

2,6-Dinitrotoluene (mg/kg)

General Statistics

Number of Valid Data	32	Number of Detected Data	1
Number of Distinct Detected Data	1	Number of Non-Detect Data	31
		Percent Non-Detects	96.88%

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!

It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable 2,6-Dinitrotoluene (mg/kg) was not processed!

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Nitroglycerin (mg/kg)

General Statistics

Number of Valid Data	32	Number of Detected Data	6
Number of Distinct Detected Data	6	Number of Non-Detect Data	26
		Percent Non-Detects	81.25%

Raw Statistics		**Log-transformed Statistics**	
Minimum Detected	0.452	Minimum Detected	-0.795
Maximum Detected	21	Maximum Detected	3.045
Mean of Detected	4.921	Mean of Detected	0.798
SD of Detected	7.922	SD of Detected	1.291
Minimum Non-Detect	0.195	Minimum Non-Detect	-1.635
Maximum Non-Detect	0.39	Maximum Non-Detect	-0.942

Note: Data have multiple DLs - Use of KM Method is recommended		Number treated as Non-Detect	26
For all methods (except KM, DL/2, and ROS Methods),		Number treated as Detected	6
Observations < Largest ND are treated as NDs		Single DL Non-Detect Percentage	81.25%

Warning: There are only 6 Detected Values in this data
Note: It should be noted that even though bootstrap may be performed on this data set
the resulting calculations may not be reliable enough tp draw conclusions

It is recommended to have 10-15 or more distinct observations for accurate and meaningful results.

UCL Statistics

Normal Distribution Test with Detected Values Only		**Lognormal Distribution Test with Detected Values Only**	
Shapiro Wilk Test Statistic	0.597	Shapiro Wilk Test Statistic	0.913
5% Shapiro Wilk Critical Value	0.788	5% Shapiro Wilk Critical Value	0.788
Data not Normal at 5% Significance Level		**Data appear Lognormal at 5% Significance Level**	

Assuming Normal Distribution		**Assuming Lognormal Distribution**	
DL/2 Substitution Method		DL/2 Substitution Method	
Mean	1.057	Mean	-1.343
SD	3.699	SD	1.195
95% DL/2 (t) UCL	2.166	95% H-Stat (DL/2) UCL	0.616

Maximum Likelihood Estimate(MLE) Method	N/A	Log ROS Method	
MLE yields a negative mean		Mean in Log Scale	-3.982
		SD in Log Scale	2.976
		Mean in Original Scale	0.944
		SD in Original Scale	3.727
		95% Percentile Bootstrap UCL	2.212
		95% BCA Bootstrap UCL	2.947

Table D.1-2b
EPC Calculation Results - SWMU 13 Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test with Detected Values Only	
k star (bias corrected)	0.487
Theta Star	10.1
nu star	5.845
A-D Test Statistic	0.676
5% A-D Critical Value	0.721
K-S Test Statistic	0.721
5% K-S Critical Value	0.343
Data follow Appr. Gamma Distribution at 5% Significance Level	
Assuming Gamma Distribution	
Gamma ROS Statistics using Extrapolated Data	
Minimum	0.452
Maximum	21
Mean	4.921
Median	4.921
SD	3.182
k star	3.2
Theta star	1.538
Nu star	204.8
AppChi2	172.7
95% Gamma Approximate UCL	5.836
95% Adjusted Gamma UCL	5.89
Note: DL/2 is not a recommended method.	

Data Distribution Test with Detected Values Only	
Data Follow Appr. Gamma Distribution at 5% Significance Level	
Nonparametric Statistics	
Kaplan-Meier (KM) Method	
Mean	1.29
SD	3.585
SE of Mean	0.694
95% KM (t) UCL	2.467
95% KM (z) UCL	2.432
95% KM (jackknife) UCL	2.198
95% KM (bootstrap t) UCL	6.249
95% KM (BCA) UCL	3.906
95% KM (Percentile Bootstrap) UCL	3.216
95% KM (Chebyshev) UCL	4.316
97.5% KM (Chebyshev) UCL	5.625
99% KM (Chebyshev) UCL	8.197
Potential UCLs to Use	
95% KM (t) UCL	2.467

APPENDIX D.2

BACKGROUND MEANS COMPARISON SUMMARY/RESULTS – PROUCL 4.0

Table D.2-1a	ProUCL 4.0 - Summary of Background vs. Site Means Comparison - SWMU 13 Surface Soil
Table D.2-1b	ProUCL 4.0 - Summary of Background vs. Site Means Comparison - SWMU 13 Total Soil
Table D.2-2a	Background Data Goodness of Fit - Surface Soil - ProUCL 4.0 for Full Data Sets
Table D.2-2b	Background Goodness of Fit - Surface Soil - ProUCL 4.0 for Data Sets with Non-Detects
Table D.2-2c	Background Data Goodness of Fit - Total Soil - ProUCL 4.0 for Full Data Sets
Table D.2-2d	Background Goodness of Fit - Total Soil - ProUCL 4.0 for Data Sets with Non-Detects
Table D.2-3a	Goodness of Fit - Surface Soil - ProUCL 4.0 for Full Data Sets
Table D.2-3b	Goodness of Fit - Surface Soil - ProUCL 4.0 for Data Sets with Non-Detects
Table D.2-3c	Goodness of Fit - Total Soil - ProUCL 4.0 for Full Data Sets
Table D.2-3d	Goodness of Fit - Total Soil - ProUCL 4.0 for Data Sets with Non-Detects
Table D.2-4a	Background versus Site Means Comparison - Surface Soil - ProUCL 4.0
Table D.2-4b	Background versus Site Means Comparison - Total Soil - ProUCL 4.0

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Table D.2-1a
PROUCL 4.0 - Summary of Background vs Site Means Comparison - Surface Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	Is Site Data Distribution Normal?	Is Background Data Distibution Normal?	Means Test for Comparison	Background Comparison Results (Y/N)
Aluminum	No	No	Mann-Whitney	**Y**
Antimony	--	--	--	--
Arsenic	No	No	Mann-Whitney	N
Barium	Yes	Yes	Mann-Whitney**	**Y**
Beryllium	Yes	No	Mann-Whitney	N
Cadmium	--	--	--	--
Calcium	No	No	Mann-Whitney	**Y**
Chromium	Yes	No	Mann-Whitney	N
Cobalt	Yes	No	Mann-Whitney	N
Copper	No	No	Mann-Whitney	**Y**
Iron	No	No	Mann-Whitney	**Y**
Lead	No	No	Mann-Whitney	**Y**
Magnesium	No	No	Mann-Whitney	**Y**
Manganese	Yes	No	Mann-Whitney	N
Mercury	--	--	--	--
Nickel	Yes	No	Mann-Whitney	**Y**
Potassium	Yes	No	Mann-Whitney	**Y**
Selenium	--	--	--	--
Silver	--	--	--	--
Sodium	--	--	--	--
Thallium	--	--	--	--
Vanadium	No	No	Mann-Whitney	N
Zinc	No	No	Mann-Whitney	**Y**

Notes:
** Data set(s) included non-detects therefore Mann-Whitney test used
-- = Insufficient Detections to Conduct Background Comparison (i.e., < 8 detections in site and/or background data set)
N = Site <= Background
Y = Site > Background

Table D.2-1b
PROUCL 4.0 - Summary of Background vs Site Means Comparison - Total Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	Is Site Data Distribution Normal?	Is Background Data Distibution Normal?	Means Test for Comparison	Background Comparison Results (Y/N)
Aluminum	No	No	Mann-Whitney	N
Antimony	--	--	--	--
Arsenic	Yes	No	Mann-Whitney	N
Barium	Yes	No	Mann-Whitney	**Y**
Beryllium	Yes	No	Mann-Whitney	N
Cadmium	No	No	Mann-Whitney	**Y**
Calcium	No	No	Mann-Whitney	**Y**
Chromium	Yes	Yes	T-test	N
Cobalt	Yes	No	Mann-Whitney	N
Copper	No	No	Mann-Whitney	**Y**
Iron	No	Yes	Mann-Whitney	N
Lead	No	No	Mann-Whitney	**Y**
Magnesium	No	No	Mann-Whitney	**Y**
Manganese	Yes	No	Mann-Whitney	**Y**
Mercury	No	No	Mann-Whitney	N
Nickel	Yes	No	Mann-Whitney	**Y**
Potassium	Yes	No	Mann-Whitney	**Y**
Selenium	--	--	--	--
Silver	--	--	--	--
Sodium	--	--	--	--
Thallium	No	Yes	Mann-Whitney	N
Vanadium	Yes	Yes	T-Test	N
Zinc	No	No	Mann-Whitney	**Y**

Notes:

-- = Insufficient Detections to Conduct Background Comparison (i.e., < 8 detections in site and/or background data set)

N = Site <= Background

Y = Site > Background

Table D.2-2a
Background Data Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95

Chromium

Raw Statistics

Number of Valid Samples	28
Number of Unique Samples	27
Minimum	6.3
Maximum	53.3
Mean of Raw Data	21.09
Standard Deviation of Raw Data	10.5
Kstar	3.695
Mean of Log Transformed Data	2.922
Standard Deviation of Log Transformed Data	0.529

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.92
Shapiro Wilk Critical (0.95) Value	0.924
Lilliefors Test Statistic	0.11
Lilliefors Critical (0.95) Value	0.167

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.612
A-D Critical (0.95) Value	0.75
K-S Test Statistic	0.145
K-S Critical(0.95) Value	0.166

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.946
Shapiro Wilk Critical (0.95) Value	0.924
Lilliefors Test Statistic	0.17
Lilliefors Critical (0.95) Value	0.167

Data appear Lognormal at (0.05) Significance Level

Table D.2-2a
Background Data Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Iron

Raw Statistics

Number of Valid Samples	28
Number of Unique Samples	26
Minimum	7250
Maximum	63000
Mean of Raw Data	20108
Standard Deviation of Raw Data	11869
Kstar	3.069
Mean of Log Transformed Data	9.755
Standard Deviation of Log Transformed Data	0.57

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.846
Shapiro Wilk Critical (0.95) Value	0.924
Lilliefors Test Statistic	0.139
Lilliefors Critical (0.95) Value	0.167

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.612
A-D Critical (0.95) Value	0.752
K-S Test Statistic	0.151
K-S Critical(0.95) Value	0.166

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.932
Shapiro Wilk Critical (0.95) Value	0.924
Lilliefors Test Statistic	0.153
Lilliefors Critical (0.95) Value	0.167

Data appear Lognormal at (0.05) Significance Level

Table D.2-2a
Background Data Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Lead

Raw Statistics

Number of Valid Samples	28
Number of Unique Samples	26
Minimum	8.9
Maximum	225
Mean of Raw Data	26.96
Standard Deviation of Raw Data	41.34
Kstar	1.324
Mean of Log Transformed Data	2.913
Standard Deviation of Log Transformed Data	0.702

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.416
Shapiro Wilk Critical (0.95) Value	0.924
Lilliefors Test Statistic	0.375
Lilliefors Critical (0.95) Value	0.167

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	3.163
A-D Critical (0.95) Value	0.764
K-S Test Statistic	0.253
K-S Critical(0.95) Value	0.169

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.798
Shapiro Wilk Critical (0.95) Value	0.924
Lilliefors Test Statistic	0.192
Lilliefors Critical (0.95) Value	0.167

Data not Lognormal at (0.05) Significance Level

Table D.2-2a
Background Data Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Vanadium

Raw Statistics

Number of Valid Samples	28
Number of Unique Samples	27
Minimum	12.2
Maximum	101
Mean of Raw Data	33.89
Standard Deviation of Raw Data	17.78
Kstar	3.946
Mean of Log Transformed Data	3.405
Standard Deviation of Log Transformed Data	0.497

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.832
Shapiro Wilk Critical (0.95) Value	0.924
Lilliefors Test Statistic	0.141
Lilliefors Critical (0.95) Value	0.167

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.622
A-D Critical (0.95) Value	0.749
K-S Test Statistic	0.111
K-S Critical(0.95) Value	0.166

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical (0.95) Value	0.924
Lilliefors Test Statistic	0.138
Lilliefors Critical (0.95) Value	0.167

Data appear Lognormal at (0.05) Significance Level

Table D.2-2a
Background Data Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Zinc

Raw Statistics

Number of Valid Samples	28
Number of Unique Samples	28
Minimum	7.1
Maximum	216
Mean of Raw Data	41.21
Standard Deviation of Raw Data	40.24
Kstar	1.654
Mean of Log Transformed Data	3.421
Standard Deviation of Log Transformed Data	0.761

Normal Distribution Test Results

Shapiro Wilk Test Statistic	0.665
Shapiro Wilk Critical (0.95) Value	0.924
Lilliefors Test Statistic	0.203
Lilliefors Critical (0.95) Value	0.167

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.54
A-D Critical (0.95) Value	0.76
K-S Test Statistic	0.105
K-S Critical(0.95) Value	0.168

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Shapiro Wilk Test Statistic	0.975
Shapiro Wilk Critical (0.95) Value	0.924
Lilliefors Test Statistic	0.1
Lilliefors Critical (0.95) Value	0.167

Data appear Lognormal at (0.05) Significance Level

Table D.2-2b
Background Goodness of Fit - Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95

Calcium

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Calcium Data	28	0	28	23	5	17.86%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	5	4.6	6.6	5.12	4.8	0.844
Statistics (Detects Only)	23	116	7340	1197	885	1440
Statistics (All: NDs treated as DL value)	28	4.6	7340	983.9	761.5	1380
Statistics (All: NDs treated as DL/2 value)	28	2.3	7340	983.5	761.5	1380
Statistics (Normal ROS Estimated Data)	28	-1605	7340	751.5	761.5	1625
Statistics (Gamma ROS Estimated Data)	28	0	7340	984.5	761.5	1380
Statistics (Lognormal ROS Estimated Data)	28	104.3	7340	1007	761.5	1364

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	1.506	1.368	794.6	6.72	0.84	0.125
Statistics (NDs = DL)	0.575	0.537	1712	5.81	2.128	0.366
Statistics (NDs = DL/2)	0.523	0.491	1879	5.686	2.383	0.419
Statistics (Gamma ROS Estimates)	0.178	0.183	5519	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	6.391	1.047	0.164

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.553	0.914	Data Not Normal
Lilliefors (Detects Only)	0.275	0.185	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.587	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.244	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.587	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.244	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.761	0.924	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.207	0.167	Data Not Normal

Table D.2-2b
Background Goodness of Fit - Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.694	0.76	
Kolmogorov-Smirnov (Detects Only)	0.152	0.185	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.232	0.803	
Kolmogorov-Smirnov (NDs = DL)	0.192	0.174	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.47	0.808	
Kolmogorov-Smirnov (NDs = DL/2)	0.211	0.175	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	6.572	0.907	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.417	0.184	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.967	0.914	Data Appear Lognormal
Lilliefors (Detects Only)	0.0979	0.185	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.779	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.279	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.75	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.296	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.949	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.114	0.167	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table D.2-2b
Background Goodness of Fit - Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Cobalt

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Cobalt Data	28	0	28	20	8	28.57%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	8	0.11	0.75	0.501	0.72	0.319
Statistics (Detects Only)	20	5.9	45.4	15.95	12.1	10.07
Statistics (All: NDs treated as DL value)	28	0.11	45.4	11.53	10.15	11.04
Statistics (All: NDs treated as DL/2 value)	28	0.055	45.4	11.46	10.15	11.11
Statistics (Normal ROS Estimated Data)	28	-10.02	45.4	9.494	10.15	13.45
Statistics (Gamma ROS Estimated Data)	28	3.774	45.4	13.39	10.15	9.473
Statistics (Lognormal ROS Estimated Data)	28	3.134	45.4	12.48	10.15	10.13

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	3.439	3.095	4.636	2.617	0.545	0.208
Statistics (NDs = DL)	0.701	0.65	16.45	1.583	1.793	1.132
Statistics (NDs = DL/2)	0.588	0.549	19.49	1.385	2.092	1.51
Statistics (Gamma ROS Estimates)	2.851	2.569	4.697	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.25	0.749	0.333

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.819	0.905	Data Not Normal
Lilliefors (Detects Only)	0.236	0.198	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.867	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.158	0.167	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.867	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.156	0.167	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.936	0.924	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.128	0.167	Data Appear Normal

Table D.2-2b
Background Goodness of Fit - Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.596	0.747	
Kolmogorov-Smirnov (Detects Only)	0.167	0.195	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.122	0.79	
Kolmogorov-Smirnov (NDs = DL)	0.195	0.172	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.507	0.801	
Kolmogorov-Smirnov (NDs = DL/2)	0.221	0.174	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.785	0.754	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.155	0.167	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.96	0.905	Data Appear Lognormal
Lilliefors (Detects Only)	0.132	0.198	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.831	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.257	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.802	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.288	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.954	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.126	0.167	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table D.2-2b
Background Goodness of Fit - Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Magnesium

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Magnesium Data	28	0	28	25	3	10.71%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	3	4.7	5	4.833	4.8	0.153
Statistics (Detects Only)	25	158	20400	2498	913	4334
Statistics (All: NDs treated as DL value)	28	4.7	20400	2231	741	4161
Statistics (All: NDs treated as DL/2 value)	28	2.35	20400	2230	741	4161
Statistics (Normal ROS Estimated Data)	28	-5148	20400	1678	741	4743
Statistics (Gamma ROS Estimated Data)	28	0	20400	2230	741	4161
Statistics (Lognormal ROS Estimated Data)	28	56.13	20400	2236	741	4158

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	0.694	0.643	3600	6.951	1.272	0.183
Statistics (NDs = DL)	0.479	0.451	4657	6.375	2.075	0.325
Statistics (NDs = DL/2)	0.457	0.432	4879	6.301	2.257	0.358
Statistics (Gamma ROS Estimates)	0.198	0.201	11267	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	6.638	1.512	0.228

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.558	0.918	Data Not Normal
Lilliefors (Detects Only)	0.303	0.177	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.546	0.924	Data Not Normal
Lilliefors (NDs = DL)	0.299	0.167	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.546	0.924	Data Not Normal
Lilliefors (NDs = DL/2)	0.299	0.167	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.729	0.924	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.267	0.167	Data Not Normal

Table D.2-2b
Background Goodness of Fit - Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.247	0.789	
Kolmogorov-Smirnov (Detects Only)	0.183	0.182	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	0.674	0.815	
Kolmogorov-Smirnov (NDs = DL)	0.131	0.175	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.681	0.82	
Kolmogorov-Smirnov (NDs = DL/2)	0.141	0.176	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	3.847	0.898	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.366	0.183	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.95	0.918	Data Appear Lognormal
Lilliefors (Detects Only)	0.107	0.177	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.889	0.924	Data Not Lognormal
Lilliefors (NDs = DL)	0.195	0.167	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.856	0.924	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.22	0.167	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.973	0.924	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0849	0.167	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table D.2-2c
Background Data Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95

Aluminum

Raw Statistics

Number of Valid Samples	79
Number of Unique Samples	75
Minimum	3620
Maximum	47900
Mean of Raw Data	14204
Standard Deviation of Raw Data	9433
Kstar	2.689
Mean of Log Transformed Data	9.371
Standard Deviation of Log Transformed Data	0.618

Normal Distribution Test Results

Lilliefors Test Statistic	0.15
Lilliefors Critical (0.95) Value	0.0997

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.604
A-D Critical (0.95) Value	0.76
K-S Test Statistic	0.0772
K-S Critical(0.95) Value	0.101

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.0626
Lilliefors Critical (0.95) Value	0.0997

Data appear Lognormal at (0.05) Significance Level

Table D.2-2c
Background Data Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Chromium

Raw Statistics

Number of Valid Samples	79
Number of Unique Samples	70
Minimum	6.3
Maximum	75.8
Mean of Raw Data	26.86
Standard Deviation of Raw Data	12.51
Kstar	4.382
Mean of Log Transformed Data	3.177
Standard Deviation of Log Transformed Data	0.501

Normal Distribution Test Results

Lilliefors Test Statistic	0.0734
Lilliefors Critical (0.95) Value	0.0997

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.591
A-D Critical (0.95) Value	0.755
K-S Test Statistic	0.0909
K-S Critical(0.95) Value	0.101

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.122
Lilliefors Critical (0.95) Value	0.0997

Data not Lognormal at (0.05) Significance Level

Table D.2-2c
Background Data Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Iron

Raw Statistics

Number of Valid Samples	79
Number of Unique Samples	72
Minimum	7250
Maximum	67700
Mean of Raw Data	26963
Standard Deviation of Raw Data	11990
Kstar	4.441
Mean of Log Transformed Data	10.09
Standard Deviation of Log Transformed Data	0.508

Normal Distribution Test Results

Lilliefors Test Statistic	0.0648
Lilliefors Critical (0.95) Value	0.0997

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.831
A-D Critical (0.95) Value	0.755
K-S Test Statistic	0.082
K-S Critical(0.95) Value	0.101

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.115
Lilliefors Critical (0.95) Value	0.0997

Data not Lognormal at (0.05) Significance Level

Table D.2-2c
Background Data Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Lead

Raw Statistics

Number of Valid Samples	79
Number of Unique Samples	70
Minimum	2.1
Maximum	256
Mean of Raw Data	22.04
Standard Deviation of Raw Data	39.85
Kstar	1.149
Mean of Log Transformed Data	2.615
Standard Deviation of Log Transformed Data	0.783

Normal Distribution Test Results

Lilliefors Test Statistic	0.344
Lilliefors Critical (0.95) Value	0.0997

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	7.671
A-D Critical (0.95) Value	0.777
K-S Test Statistic	0.245
K-S Critical(0.95) Value	0.103

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.147
Lilliefors Critical (0.95) Value	0.0997

Data not Lognormal at (0.05) Significance Level

Table D.2-2c
Background Data Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Manganese

Raw Statistics

Number of Valid Samples	79
Number of Unique Samples	78
Minimum	16.7
Maximum	2040
Mean of Raw Data	471.4
Standard Deviation of Raw Data	467.1
Kstar	1.087
Mean of Log Transformed Data	5.647
Standard Deviation of Log Transformed Data	1.118

Normal Distribution Test Results

Lilliefors Test Statistic	0.165
Lilliefors Critical (0.95) Value	0.0997

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.359
A-D Critical (0.95) Value	0.779
K-S Test Statistic	0.0515
K-S Critical(0.95) Value	0.103

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.093
Lilliefors Critical (0.95) Value	0.0997

Data appear Lognormal at (0.05) Significance Level

Table D.2-2c
Background Data Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Vanadium

Raw Statistics

Number of Valid Samples	78
Number of Unique Samples	75
Minimum	12.2
Maximum	101
Mean of Raw Data	44.97
Standard Deviation of Raw Data	18.97
Kstar	5.086
Mean of Log Transformed Data	3.708
Standard Deviation of Log Transformed Data	0.466

Normal Distribution Test Results

Lilliefors Test Statistic	0.0902
Lilliefors Critical (0.95) Value	0.1

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	0.29
A-D Critical (0.95) Value	0.754
K-S Test Statistic	0.059
K-S Critical(0.95) Value	0.101

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.0891
Lilliefors Critical (0.95) Value	0.1

Data appear Lognormal at (0.05) Significance Level

Table D.2-2c
Background Data Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Zinc

Raw Statistics

Number of Valid Samples	79
Number of Unique Samples	76
Minimum	4.7
Maximum	598
Mean of Raw Data	54.94
Standard Deviation of Raw Data	87.15
Kstar	1.05
Mean of Log Transformed Data	3.478
Standard Deviation of Log Transformed Data	0.93

Normal Distribution Test Results

Lilliefors Test Statistic	0.291
Lilliefors Critical (0.95) Value	0.0997

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

A-D Test Statistic	3.363
A-D Critical (0.95) Value	0.78
K-S Test Statistic	0.145
K-S Critical(0.95) Value	0.103

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Lilliefors Test Statistic	0.0696
Lilliefors Critical (0.95) Value	0.0997

Data appear Lognormal at (0.05) Significance Level

Table D.2-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95

Arsenic

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Arsenic Data	79	0	79	76	3	3.80%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	3	0.09	0.12	0.103	0.1	0.0153
Statistics (Detects Only)	76	1.2	35.9	4.989	3.2	5.36
Statistics (All: NDs treated as DL value)	79	0.09	35.9	4.804	3.1	5.339
Statistics (All: NDs treated as DL/2 value)	79	0.045	35.9	4.802	3.1	5.341
Statistics (Normal ROS Estimated Data)	79	-5.169	35.9	4.604	3.1	5.608
Statistics (Gamma ROS Estimated Data)	79	0	35.9	4.8	3.1	5.343
Statistics (Lognormal ROS Estimated Data)	79	0.728	35.9	4.828	3.1	5.32

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	1.819	1.759	2.742	1.308	0.692	0.529
Statistics (NDs = DL)	1.401	1.356	3.429	1.172	0.968	0.826
Statistics (NDs = DL/2)	1.323	1.281	3.631	1.146	1.067	0.932
Statistics (Gamma ROS Estimates)	0.568	0.555	8.454	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	1.246	0.748	0.6

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.282	0.102	Data Not Normal
Lilliefors (NDs = DL)	0.279	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.279	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.263	0.0997	Data Not Normal

Table D.2-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	4.409	0.766	
Kolmogorov-Smirnov (Detects Only)	0.213	0.104	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	3.469	0.772	
Kolmogorov-Smirnov (NDs = DL)	0.182	0.102	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.587	0.774	
Kolmogorov-Smirnov (NDs = DL/2)	0.176	0.103	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	10.23	0.812	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.332	0.106	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.151	0.102	Data Not Lognormal
Lilliefors (NDs = DL)	0.159	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.187	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.134	0.0997	Data Not Lognormal

Note: DL/2 is not a recommended method.

Table D.2-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Beryllium

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Beryllium Data	71	0	71	32	39	54.93%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	39	0.022	0.03	0.0286	0.03	0.00265
Statistics (Detects Only)	32	0.61	1.6	1.017	0.975	0.272
Statistics (All: NDs treated as DL value)	71	0.022	1.6	0.474	0.03	0.527
Statistics (All: NDs treated as DL/2 value)	71	0.011	1.6	0.466	0.015	0.534
Statistics (Normal ROS Estimated Data)	71	-0.475	1.6	0.59	0.557	0.472
Statistics (Gamma ROS Estimated Data)	71	0.61	1.6	1.031	1.052	0.198
Statistics (Lognormal ROS Estimated Data)	71	0.233	1.6	0.721	0.617	0.335

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	14.61	14	0.0696	-0.0179	0.268	-15
Statistics (NDs = DL)	0.519	0.507	0.913	-1.962	1.784	-0.909
Statistics (NDs = DL/2)	0.414	0.406	1.125	-2.343	2.13	-0.909
Statistics (Gamma ROS Estimates)	26.7	25.58	0.0386	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.429	0.456	-1.063

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.953	0.93	Data Appear Normal
Lilliefors (Detects Only)	0.118	0.157	Data Appear Normal
Lilliefors (NDs = DL)	0.349	0.105	Data Not Normal
Lilliefors (NDs = DL/2)	0.35	0.105	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0495	0.105	Data Appear Normal

Table D.2-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.268	0.746	
Kolmogorov-Smirnov (Detects Only)	0.0843	0.155	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	8.979	0.815	
Kolmogorov-Smirnov (NDs = DL)	0.36	0.112	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	9.326	0.838	
Kolmogorov-Smirnov (NDs = DL/2)	0.361	0.113	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.819	0.749	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0939	0.105	Data appear Approximate Gamma Distribution

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.967	0.93	Data Appear Lognormal
Lilliefors (Detects Only)	0.0849	0.157	Data Appear Lognormal
Lilliefors (NDs = DL)	0.356	0.105	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.358	0.105	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0725	0.105	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table D.2-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Cadmium

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Cadmium Data	79	0	79	13	66	83.54%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	66	0.02	0.05	0.0256	0.02	0.00861
Statistics (Detects Only)	13	0.57	2.5	1.152	1.1	0.585
Statistics (All: NDs treated as DL value)	79	0.02	2.5	0.211	0.02	0.479
Statistics (All: NDs treated as DL/2 value)	79	0.01	2.5	0.2	0.01	0.483
Statistics (Normal ROS Estimated Data)	79	-4.148	2.5	-1.016	-1.143	1.342
Statistics (Gamma ROS Estimated Data)	79	0.197	2.987	1.943	2.175	0.717
Statistics (Lognormal ROS Estimated Data)	79	0.0167	2.5	0.338	0.174	0.444

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	5.194	5.005	0.222	0.0424	0.448	10.55
Statistics (NDs = DL)	0.424	0.416	0.498	-3.093	1.437	-0.465
Statistics (NDs = DL/2)	0.329	0.325	0.609	-3.672	1.69	-0.46
Statistics (Gamma ROS Estimates)	5.206	5.016	0.373	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.649	1.046	-0.634

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.82	0.866	Data Not Normal
Lilliefors (Detects Only)	0.246	0.246	Data Not Normal
Lilliefors (NDs = DL)	0.467	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.477	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0689	0.0997	Data Appear Normal

Table D.2-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.512	0.736	
Kolmogorov-Smirnov (Detects Only)	0.181	0.237	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	17.17	0.836	
Kolmogorov-Smirnov (NDs = DL)	0.422	0.107	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	18.08	0.858	
Kolmogorov-Smirnov (NDs = DL/2)	0.448	0.109	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.804	0.754	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.164	0.101	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.934	0.866	Data Appear Lognormal
Lilliefors (Detects Only)	0.158	0.246	Data Appear Lognormal
Lilliefors (NDs = DL)	0.327	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.348	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0689	0.0997	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table D.2-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Calcium

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Calcium Data	79	0	79	63	16	20.25%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	16	4.6	6.7	5.563	5.4	0.796
Statistics (Detects Only)	63	116	25700	1392	717	3322
Statistics (All: NDs treated as DL value)	79	4.6	25700	1111	534	3014
Statistics (All: NDs treated as DL/2 value)	79	2.3	25700	1111	534	3014
Statistics (Normal ROS Estimated Data)	79	-3726	25700	537.2	534	3423
Statistics (Gamma ROS Estimated Data)	79	0	25700	1110	534	3014
Statistics (Lognormal ROS Estimated Data)	79	60.37	25700	1129	534	3007

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	0.899	0.873	1548	6.588	0.949	0.144
Statistics (NDs = DL)	0.456	0.447	2437	5.599	2.149	0.384
Statistics (NDs = DL/2)	0.42	0.413	2643	5.459	2.409	0.441
Statistics (Gamma ROS Estimates)	0.131	0.135	8441	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	6.173	1.189	0.193

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.359	0.112	Data Not Normal
Lilliefors (NDs = DL)	0.357	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.357	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.289	0.0997	Data Not Normal

Table D.2-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	4.055	0.785	
Kolmogorov-Smirnov (Detects Only)	0.223	0.116	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	2.78	0.829	
Kolmogorov-Smirnov (NDs = DL)	0.146	0.107	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	3.129	0.837	
Kolmogorov-Smirnov (NDs = DL/2)	0.149	0.107	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	17.18	0.972	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.418	0.114	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.108	0.112	Data Appear Lognormal
Lilliefors (NDs = DL)	0.224	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.251	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0933	0.0997	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table D.2-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Cobalt

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Cobalt Data	79	0	79	56	23	29.11%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	23	0.11	0.84	0.587	0.73	0.286
Statistics (Detects Only)	56	5.9	130	22.23	13.3	23.94
Statistics (All: NDs treated as DL value)	79	0.11	130	15.93	11.4	22.41
Statistics (All: NDs treated as DL/2 value)	79	0.055	130	15.84	11.4	22.47
Statistics (Normal ROS Estimated Data)	79	-40.83	130	8.784	11.4	29.44
Statistics (Gamma ROS Estimated Data)	79	0	130	17.57	11.9	21.54
Statistics (Lognormal ROS Estimated Data)	79	1.86	130	16.76	11.4	21.87

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	1.78	1.721	12.49	2.795	0.701	0.251
Statistics (NDs = DL)	0.61	0.595	26.11	1.758	1.787	1.017
Statistics (NDs = DL/2)	0.523	0.511	30.31	1.556	2.08	1.337
Statistics (Gamma ROS Estimates)	0.504	0.494	34.83	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	2.331	0.947	0.406

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.263	0.118	Data Not Normal
Lilliefors (NDs = DL)	0.24	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.241	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.17	0.0997	Data Not Normal

Table D.2-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	3.203	0.765	
Kolmogorov-Smirnov (Detects Only)	0.162	0.121	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	2.127	0.807	
Kolmogorov-Smirnov (NDs = DL)	0.155	0.105	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.851	0.816	
Kolmogorov-Smirnov (NDs = DL/2)	0.171	0.106	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	9.036	0.818	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.36	0.106	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.13	0.118	Data Not Lognormal
Lilliefors (NDs = DL)	0.213	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.251	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0915	0.0997	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table D.2-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Magnesium

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Magnesium Data	79	0	79	72	7	8.86%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	7	3.8	5	4.686	4.8	0.402
Statistics (Detects Only)	72	139	58100	6394	1270	12925
Statistics (All: NDs treated as DL value)	79	3.8	58100	5828	1080	12466
Statistics (All: NDs treated as DL/2 value)	79	1.9	58100	5827	1080	12466
Statistics (Normal ROS Estimated Data)	79	-1911	58100	4438	1080	13862
Statistics (Gamma ROS Estimated Data)	79	0	58100	5827	1080	12466
Statistics (Lognormal ROS Estimated Data)	79	28.2	58100	5832	1080	12464

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	0.484	0.474	13216	7.443	1.571	0.211
Statistics (NDs = DL)	0.379	0.373	15366	6.92	2.257	0.326
Statistics (NDs = DL/2)	0.368	0.363	15828	6.859	2.409	0.351
Statistics (Gamma ROS Estimates)	0.198	0.199	29431	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	7.129	1.812	0.254

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.323	0.104	Data Not Normal
Lilliefors (NDs = DL)	0.321	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.321	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.29	0.0997	Data Not Normal

Table D.2-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	4.255	0.821	
Kolmogorov-Smirnov (Detects Only)	0.17	0.111	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	2.668	0.847	
Kolmogorov-Smirnov (NDs = DL)	0.136	0.108	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.542	0.849	
Kolmogorov-Smirnov (NDs = DL/2)	0.129	0.108	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	7.068	0.912	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.298	0.111	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.0868	0.104	Data Appear Lognormal
Lilliefors (NDs = DL)	0.135	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.157	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0546	0.0997	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table D.2-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Mercury

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Mercury Data	79	0	79	18	61	77.22%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	61	0.019	0.06	0.0484	0.06	0.0158
Statistics (Detects Only)	18	0.038	1.2	0.187	0.125	0.259
Statistics (All: NDs treated as DL value)	79	0.019	1.2	0.0799	0.06	0.135
Statistics (All: NDs treated as DL/2 value)	79	0.0095	1.2	0.0612	0.03	0.139
Statistics (Normal ROS Estimated Data)	79	-1.214	1.2	-0.361	-0.372	0.403
Statistics (Gamma ROS Estimated Data)	79	0.038	1.2	0.173	0.156	0.138
Statistics (Lognormal ROS Estimated Data)	79	0.0007952	1.2	0.0541	0.0171	0.141

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	1.552	1.501	0.12	-2.035	0.727	-0.358
Statistics (NDs = DL)	1.645	1.591	0.0485	-2.861	0.681	-0.238
Statistics (NDs = DL/2)	0.962	0.934	0.0636	-3.396	0.902	-0.266
Statistics (Gamma ROS Estimates)	3.073	2.965	0.0563	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-4.029	1.44	-0.357

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.442	0.897	Data Not Normal
Lilliefors (Detects Only)	0.384	0.209	Data Not Normal
Lilliefors (NDs = DL)	0.356	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.361	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.067	0.0997	Data Appear Normal

Table D.2-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.702	0.756	
Kolmogorov-Smirnov (Detects Only)	0.274	0.207	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	6.715	0.768	
Kolmogorov-Smirnov (NDs = DL)	0.33	0.102	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	8.44	0.784	
Kolmogorov-Smirnov (NDs = DL/2)	0.377	0.104	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.725	0.759	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0728	0.101	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.871	0.897	Data Not Lognormal
Lilliefors (Detects Only)	0.193	0.209	Data Appear Lognormal
Lilliefors (NDs = DL)	0.269	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.321	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.062	0.0997	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table D.2-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Potassium

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Potassium Data	79	0	79	67	12	15.19%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	12	201	271	223.1	217	20.78
Statistics (Detects Only)	67	123	10900	1690	694	2232
Statistics (All: NDs treated as DL value)	79	123	10900	1467	618	2120
Statistics (All: NDs treated as DL/2 value)	79	100.5	10900	1450	618	2131
Statistics (Normal ROS Estimated Data)	79	-1878	10900	1235	618	2322
Statistics (Gamma ROS Estimated Data)	79	0	10900	1433	618	2142
Statistics (Lognormal ROS Estimated Data)	79	104.7	10900	1456	618	2127

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	0.92	0.893	1837	6.798	1.115	0.164
Statistics (NDs = DL)	0.837	0.814	1752	6.586	1.143	0.174
Statistics (NDs = DL/2)	0.75	0.73	1933	6.481	1.273	0.196
Statistics (Gamma ROS Estimates)	0.163	0.165	8778	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	6.525	1.216	0.186

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.247	0.108	Data Not Normal
Lilliefors (NDs = DL)	0.263	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.263	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.21	0.0997	Data Not Normal

Table D.2-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.945	0.784	
Kolmogorov-Smirnov (Detects Only)	0.153	0.112	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	3.288	0.789	
Kolmogorov-Smirnov (NDs = DL)	0.171	0.104	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.192	0.793	
Kolmogorov-Smirnov (NDs = DL/2)	0.147	0.104	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	14.88	0.944	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.392	0.113	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Lilliefors (Detects Only)	0.0982	0.108	Data Appear Lognormal
Lilliefors (NDs = DL)	0.106	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.0732	0.0997	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0941	0.0997	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table D.2-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Thallium

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Thallium Data	79	0	79	15	64	81.01%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	64	0.13	0.45	0.189	0.15	0.0931
Statistics (Detects Only)	15	1.3	5	2.527	2.2	0.932
Statistics (All: NDs treated as DL value)	79	0.13	5	0.633	0.16	1.007
Statistics (All: NDs treated as DL/2 value)	79	0.065	5	0.556	0.08	1.039
Statistics (Normal ROS Estimated Data)	79	-4.787	5	-0.573	-0.722	1.972
Statistics (Gamma ROS Estimated Data)	79	1.3	5	2.489	2.468	0.399
Statistics (Lognormal ROS Estimated Data)	79	0.155	5	0.998	0.707	0.884

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log C.V.
Statistics (Detects Only)	8.698	8.377	0.29	0.868	0.352	0.405
Statistics (NDs = DL)	0.753	0.733	0.841	-1.253	1.097	-0.876
Statistics (NDs = DL/2)	0.515	0.504	1.08	-1.814	1.358	-0.748
Statistics (Gamma ROS Estimates)	44.1	42.44	0.0564	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.291	0.738	-2.538

Normal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.893	0.881	Data Appear Normal
Lilliefors (Detects Only)	0.17	0.229	Data Appear Normal
Lilliefors (NDs = DL)	0.382	0.0997	Data Not Normal
Lilliefors (NDs = DL/2)	0.435	0.0997	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.0779	0.0997	Data Appear Normal

Table D.2-2d
Background Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.367	0.738	
Kolmogorov-Smirnov (Detects Only)	0.145	0.222	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	12.86	0.793	
Kolmogorov-Smirnov (NDs = DL)	0.361	0.104	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	14.62	0.817	
Kolmogorov-Smirnov (NDs = DL/2)	0.371	0.106	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	10.13	0.749	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.319	0.1	Data Not Gamma Distributed

Lognormal Distribution Test Results

	Test value	Crit. (0.95)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.959	0.881	Data Appear Lognormal
Lilliefors (Detects Only)	0.134	0.229	Data Appear Lognormal
Lilliefors (NDs = DL)	0.334	0.0997	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.34	0.0997	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0779	0.0997	Data Appear Lognormal

Note: DL/2 is not a recommended method.

Table D.2-3a
Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95

Aluminum

Raw Statistics

Number of Valid Observations	15
Number of Distinct Observations	12
Minimum	10000
Maximum	35000
Mean of Raw Data	15410
Standard Deviation of Raw Data	7046
Kstar	5.347
Mean of Log Transformed Data	9.565
Standard Deviation of Log Transformed Data	0.386

Normal Distribution Test Results

Correlation Coefficient R	0.874
Shapiro Wilk Test Statistic	0.771
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.255
Lilliefors Critical (0.95) Value	0.229

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.938
A-D Test Statistic	1.046
A-D Critical (0.95) Value	0.738
K-S Test Statistic	0.244
K-S Critical(0.95) Value	0.222

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.924
Shapiro Wilk Test Statistic	0.848
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.226
Lilliefors Critical (0.95) Value	0.229

Data not Lognormal at (0.05) Significance Level

Table D.2-3a
Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Arsenic

Raw Statistics

Number of Valid Observations	15
Number of Distinct Observations	13
Minimum	0.98
Maximum	5.6
Mean of Raw Data	2.315
Standard Deviation of Raw Data	1.032
Kstar	5.672
Mean of Log Transformed Data	0.767
Standard Deviation of Log Transformed Data	0.383

Normal Distribution Test Results

Correlation Coefficient R	0.846
Shapiro Wilk Test Statistic	0.748
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.277
Lilliefors Critical (0.95) Value	0.229

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.891
A-D Test Statistic	0.73
A-D Critical (0.95) Value	0.738
K-S Test Statistic	0.217
K-S Critical(0.95) Value	0.222

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.94
Shapiro Wilk Test Statistic	0.912
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.196
Lilliefors Critical (0.95) Value	0.229

Data appear Lognormal at (0.05) Significance Level

Table D.2-3a
Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Barium

Raw Statistics

Number of Valid Observations	15
Number of Distinct Observations	15
Minimum	87
Maximum	290
Mean of Raw Data	146.9
Standard Deviation of Raw Data	54.27
Kstar	7.298
Mean of Log Transformed Data	4.934
Standard Deviation of Log Transformed Data	0.339

Normal Distribution Test Results

Correlation Coefficient R	0.937
Shapiro Wilk Test Statistic	0.884
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.156
Lilliefors Critical (0.95) Value	0.229

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.972
A-D Test Statistic	0.34
A-D Critical (0.95) Value	0.738
K-S Test Statistic	0.132
K-S Critical(0.95) Value	0.222

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.98
Shapiro Wilk Test Statistic	0.957
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.124
Lilliefors Critical (0.95) Value	0.229

Data appear Lognormal at (0.05) Significance Level

Table D.2-3a
Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Calcium

Raw Statistics

Number of Valid Observations	15
Number of Distinct Observations	14
Minimum	1100
Maximum	110000
Mean of Raw Data	10043
Standard Deviation of Raw Data	27684
Kstar	0.5
Mean of Log Transformed Data	8.122
Standard Deviation of Log Transformed Data	1.063

Normal Distribution Test Results

Correlation Coefficient R	0.542
Shapiro Wilk Test Statistic	0.325
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.493
Lilliefors Critical (0.95) Value	0.229

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.811
A-D Test Statistic	3.24
A-D Critical (0.95) Value	0.788
K-S Test Statistic	0.398
K-S Critical(0.95) Value	0.233

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.809
Shapiro Wilk Test Statistic	0.685
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.251
Lilliefors Critical (0.95) Value	0.229

Data not Lognormal at (0.05) Significance Level

Table D.2-3a
Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Chromium

Raw Statistics

Number of Valid Observations	15
Number of Distinct Observations	11
Minimum	18
Maximum	39
Mean of Raw Data	26.07
Standard Deviation of Raw Data	7.294
Kstar	11.35
Mean of Log Transformed Data	3.225
Standard Deviation of Log Transformed Data	0.276

Normal Distribution Test Results

Correlation Coefficient R	0.962
Shapiro Wilk Test Statistic	0.904
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.134
Lilliefors Critical (0.95) Value	0.229

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.973
A-D Test Statistic	0.453
A-D Critical (0.95) Value	0.736
K-S Test Statistic	0.155
K-S Critical(0.95) Value	0.221

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.968
Shapiro Wilk Test Statistic	0.913
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.154
Lilliefors Critical (0.95) Value	0.229

Data appear Lognormal at (0.05) Significance Level

Table D.2-3a
Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Cobalt

Raw Statistics

Number of Valid Observations	15
Number of Distinct Observations	12
Minimum	7
Maximum	19
Mean of Raw Data	11.37
Standard Deviation of Raw Data	3.518
Kstar	9.565
Mean of Log Transformed Data	2.388
Standard Deviation of Log Transformed Data	0.3

Normal Distribution Test Results

Correlation Coefficient R	0.969
Shapiro Wilk Test Statistic	0.932
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.142
Lilliefors Critical (0.95) Value	0.229

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.987
A-D Test Statistic	0.247
A-D Critical (0.95) Value	0.737
K-S Test Statistic	0.111
K-S Critical(0.95) Value	0.221

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.989
Shapiro Wilk Test Statistic	0.967
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.1
Lilliefors Critical (0.95) Value	0.229

Data appear Lognormal at (0.05) Significance Level

Table D.2-3a
Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Copper

Raw Statistics

Number of Valid Observations	15
Number of Distinct Observations	12
Minimum	13
Maximum	260
Mean of Raw Data	36.4
Standard Deviation of Raw Data	62.13
Kstar	1.057
Mean of Log Transformed Data	3.15
Standard Deviation of Log Transformed Data	0.723

Normal Distribution Test Results

Correlation Coefficient R	0.579
Shapiro Wilk Test Statistic	0.366
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.468
Lilliefors Critical (0.95) Value	0.229

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.772
A-D Test Statistic	2.838
A-D Critical (0.95) Value	0.758
K-S Test Statistic	0.383
K-S Critical(0.95) Value	0.227

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.791
Shapiro Wilk Test Statistic	0.654
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.281
Lilliefors Critical (0.95) Value	0.229

Data not Lognormal at (0.05) Significance Level

Table D.2-3a
Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Iron

Raw Statistics

Number of Valid Observations	15
Number of Distinct Observations	13
Minimum	16000
Maximum	78000
Mean of Raw Data	31547
Standard Deviation of Raw Data	14723
Kstar	5.268
Mean of Log Transformed Data	10.28
Standard Deviation of Log Transformed Data	0.395

Normal Distribution Test Results

Correlation Coefficient R	0.847
Shapiro Wilk Test Statistic	0.745
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.261
Lilliefors Critical (0.95) Value	0.229

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.9
A-D Test Statistic	0.759
A-D Critical (0.95) Value	0.738
K-S Test Statistic	0.203
K-S Critical(0.95) Value	0.222

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.939
Shapiro Wilk Test Statistic	0.896
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.177
Lilliefors Critical (0.95) Value	0.229

Data appear Lognormal at (0.05) Significance Level

Table D.2-3a
Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Lead (mg/kg)

Raw Statistics

Number of Valid Observations	91
Number of Distinct Observations	53
Minimum	27
Maximum	8620
Mean of Raw Data	315.8
Standard Deviation of Raw Data	902.3
Kstar	0.995
Mean of Log Transformed Data	5.192
Standard Deviation of Log Transformed Data	0.8

Normal Distribution Test Results

Correlation Coefficient R	0.431
Lilliefors Test Statistic	0.374
Lilliefors Critical (0.95) Value	0.0929

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.631
A-D Test Statistic	7.143
A-D Critical (0.95) Value	0.782
K-S Test Statistic	0.205
K-S Critical(0.95) Value	0.0965

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.949
Lilliefors Test Statistic	0.0953
Lilliefors Critical (0.95) Value	0.0929

Data not Lognormal at (0.05) Significance Level

Table D.2-3a
Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Magnesium

Raw Statistics

Number of Valid Observations	15
Number of Distinct Observations	15
Minimum	2200
Maximum	25000
Mean of Raw Data	4953
Standard Deviation of Raw Data	5597
Kstar	1.884
Mean of Log Transformed Data	8.275
Standard Deviation of Log Transformed Data	0.558

Normal Distribution Test Results

Correlation Coefficient R	0.615
Shapiro Wilk Test Statistic	0.41
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.444
Lilliefors Critical (0.95) Value	0.229

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.758
A-D Test Statistic	2.478
A-D Critical (0.95) Value	0.746
K-S Test Statistic	0.364
K-S Critical(0.95) Value	0.224

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.803
Shapiro Wilk Test Statistic	0.677
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.292
Lilliefors Critical (0.95) Value	0.229

Data not Lognormal at (0.05) Significance Level

Table D.2-3a
Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Manganese

Raw Statistics

Number of Valid Observations	15
Number of Distinct Observations	14
Minimum	380
Maximum	2200
Mean of Raw Data	1036
Standard Deviation of Raw Data	447.7
Kstar	4.446
Mean of Log Transformed Data	6.849
Standard Deviation of Log Transformed Data	0.467

Normal Distribution Test Results

Correlation Coefficient R	0.942
Shapiro Wilk Test Statistic	0.903
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.2
Lilliefors Critical (0.95) Value	0.229

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.955
A-D Test Statistic	0.562
A-D Critical (0.95) Value	0.738
K-S Test Statistic	0.168
K-S Critical(0.95) Value	0.222

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.951
Shapiro Wilk Test Statistic	0.91
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.192
Lilliefors Critical (0.95) Value	0.229

Data appear Lognormal at (0.05) Significance Level

Table D.2-3a
Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Mercury

Raw Statistics

Number of Valid Observations	15
Number of Distinct Observations	15
Minimum	0.02
Maximum	0.14
Mean of Raw Data	0.0539
Standard Deviation of Raw Data	0.0327
Kstar	3.105
Mean of Log Transformed Data	-3.057
Standard Deviation of Log Transformed Data	0.518

Normal Distribution Test Results

Correlation Coefficient R	0.892
Shapiro Wilk Test Statistic	0.806
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.232
Lilliefors Critical (0.95) Value	0.229

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.962
A-D Test Statistic	0.593
A-D Critical (0.95) Value	0.741
K-S Test Statistic	0.199
K-S Critical(0.95) Value	0.223

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.975
Shapiro Wilk Test Statistic	0.953
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.169
Lilliefors Critical (0.95) Value	0.229

Data appear Lognormal at (0.05) Significance Level

Table D.2-3a
Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Nickel

Raw Statistics

Number of Valid Observations	15
Number of Distinct Observations	9
Minimum	9.5
Maximum	22
Mean of Raw Data	14.4
Standard Deviation of Raw Data	3.526
Kstar	15
Mean of Log Transformed Data	2.64
Standard Deviation of Log Transformed Data	0.239

Normal Distribution Test Results

Correlation Coefficient R	0.971
Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.212
Lilliefors Critical (0.95) Value	0.229

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.984
A-D Test Statistic	0.352
A-D Critical (0.95) Value	0.735
K-S Test Statistic	0.184
K-S Critical(0.95) Value	0.221

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.985
Shapiro Wilk Test Statistic	0.964
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.169
Lilliefors Critical (0.95) Value	0.229

Data appear Lognormal at (0.05) Significance Level

Table D.2-3a
Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Potassium

Raw Statistics

Number of Valid Observations	15
Number of Distinct Observations	15
Minimum	1100
Maximum	2900
Mean of Raw Data	1861
Standard Deviation of Raw Data	549.4
Kstar	10.19
Mean of Log Transformed Data	7.489
Standard Deviation of Log Transformed Data	0.292

Normal Distribution Test Results

Correlation Coefficient R	0.975
Shapiro Wilk Test Statistic	0.94
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.169
Lilliefors Critical (0.95) Value	0.229

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.986
A-D Test Statistic	0.29
A-D Critical (0.95) Value	0.737
K-S Test Statistic	0.145
K-S Critical(0.95) Value	0.221

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.989
Shapiro Wilk Test Statistic	0.966
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.126
Lilliefors Critical (0.95) Value	0.229

Data appear Lognormal at (0.05) Significance Level

Table D.2-3a
Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Selenium

Raw Statistics

Number of Valid Observations	15
Number of Distinct Observations	13
Minimum	0.165
Maximum	0.885
Mean of Raw Data	0.475
Standard Deviation of Raw Data	0.235
Kstar	3.348
Mean of Log Transformed Data	-0.871
Standard Deviation of Log Transformed Data	0.534

Normal Distribution Test Results

Correlation Coefficient R	0.968
Shapiro Wilk Test Statistic	0.921
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.163
Lilliefors Critical (0.95) Value	0.229

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.971
A-D Test Statistic	0.434
A-D Critical (0.95) Value	0.74
K-S Test Statistic	0.176
K-S Critical(0.95) Value	0.222

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.974
Shapiro Wilk Test Statistic	0.933
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.166
Lilliefors Critical (0.95) Value	0.229

Data appear Lognormal at (0.05) Significance Level

Table D.2-3a
Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Silver

Raw Statistics

Number of Valid Observations	15
Number of Distinct Observations	14
Minimum	0.04
Maximum	0.16
Mean of Raw Data	0.0979
Standard Deviation of Raw Data	0.0325
Kstar	6.925
Mean of Log Transformed Data	-2.383
Standard Deviation of Log Transformed Data	0.373

Normal Distribution Test Results

Correlation Coefficient R	0.991
Shapiro Wilk Test Statistic	0.982
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.134
Lilliefors Critical (0.95) Value	0.229

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.983
A-D Test Statistic	0.304
A-D Critical (0.95) Value	0.738
K-S Test Statistic	0.173
K-S Critical(0.95) Value	0.222

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.968
Shapiro Wilk Test Statistic	0.939
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.2
Lilliefors Critical (0.95) Value	0.229

Data appear Lognormal at (0.05) Significance Level

Table D.2-3a
Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sodium

Raw Statistics

Number of Valid Observations	15
Number of Distinct Observations	12
Minimum	35
Maximum	100
Mean of Raw Data	48.7
Standard Deviation of Raw Data	16.68
Kstar	9.916
Mean of Log Transformed Data	3.845
Standard Deviation of Log Transformed Data	0.278

Normal Distribution Test Results

Correlation Coefficient R	0.843
Shapiro Wilk Test Statistic	0.73
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.266
Lilliefors Critical (0.95) Value	0.229

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.899
A-D Test Statistic	0.993
A-D Critical (0.95) Value	0.737
K-S Test Statistic	0.252
K-S Critical(0.95) Value	0.221

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.914
Shapiro Wilk Test Statistic	0.846
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.237
Lilliefors Critical (0.95) Value	0.229

Data not Lognormal at (0.05) Significance Level

Table D.2-3a
Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Thallium

Raw Statistics

Number of Valid Observations	15
Number of Distinct Observations	13
Minimum	0.16
Maximum	3.5
Mean of Raw Data	0.586
Standard Deviation of Raw Data	0.824
Kstar	1.209
Mean of Log Transformed Data	-0.915
Standard Deviation of Log Transformed Data	0.748

Normal Distribution Test Results

Correlation Coefficient R	0.655
Shapiro Wilk Test Statistic	0.461
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.399
Lilliefors Critical (0.95) Value	0.229

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.825
A-D Test Statistic	1.682
A-D Critical (0.95) Value	0.755
K-S Test Statistic	0.311
K-S Critical(0.95) Value	0.226

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.9
Shapiro Wilk Test Statistic	0.83
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.23
Lilliefors Critical (0.95) Value	0.229

Data not Lognormal at (0.05) Significance Level

Table D.2-3a
Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Vanadium

Raw Statistics

Number of Valid Observations	15
Number of Distinct Observations	12
Minimum	21
Maximum	59
Mean of Raw Data	29.3
Standard Deviation of Raw Data	10.39
Kstar	8.736
Mean of Log Transformed Data	3.331
Standard Deviation of Log Transformed Data	0.3

Normal Distribution Test Results

Correlation Coefficient R	0.869
Shapiro Wilk Test Statistic	0.764
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.254
Lilliefors Critical (0.95) Value	0.229

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.922
A-D Test Statistic	1.062
A-D Critical (0.95) Value	0.737
K-S Test Statistic	0.237
K-S Critical(0.95) Value	0.221

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.917
Shapiro Wilk Test Statistic	0.841
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.228
Lilliefors Critical (0.95) Value	0.229

Data not Lognormal at (0.05) Significance Level

Table D.2-3a
Goodness of Fit - Surface Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Zinc

Raw Statistics

Number of Valid Observations	15
Number of Distinct Observations	15
Minimum	260
Maximum	1600
Mean of Raw Data	510.6
Standard Deviation of Raw Data	355.6
Kstar	2.901
Mean of Log Transformed Data	6.089
Standard Deviation of Log Transformed Data	0.508

Normal Distribution Test Results

Correlation Coefficient R	0.814
Shapiro Wilk Test Statistic	0.68
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.289
Lilliefors Critical (0.95) Value	0.229

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.916
A-D Test Statistic	1.076
A-D Critical (0.95) Value	0.742
K-S Test Statistic	0.216
K-S Critical(0.95) Value	0.223

Data follow Appr. Gamma Distribution at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.926
Shapiro Wilk Test Statistic	0.86
Shapiro Wilk Critical (0.95) Value	0.881
Lilliefors Test Statistic	0.173
Lilliefors Critical (0.95) Value	0.229

Data not Lognormal at (0.05) Significance Level

Table D.2-3b
Goodness of Fit - Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95

Antimony

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	0	15	14	1	6.67%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	14	0.069	2.9	0.54	0.345	0.706
Statistics (All: NDs treated as DL value)	15	0.0518	2.9	0.507	0.32	0.692
Statistics (All: NDs treated as DL/2 value)	15	0.0259	2.9	0.505	0.32	0.694
Statistics (Normal ROS Estimated Data)	15	-0.738	2.9	0.455	0.32	0.756
Statistics (Gamma ROS Estimated Data)	15	1E-09	2.9	0.504	0.32	0.695
Statistics (Lognormal ROS Estimated Data)	15	0.043	2.9	0.507	0.32	0.693

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	1.313	1.095	0.411	-1.044	0.894	-0.856
Statistics (NDs = DL)	1.153	0.967	0.44	-1.171	0.993	-0.848
Statistics (NDs = DL/2)	1.07	0.9	0.473	-1.218	1.094	-0.898
Statistics (Gamma ROS Estimates)	0.395	0.36	1.276	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.184	1.018	-0.86

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.719	0.722	0.726	0.797

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.548	0.874	Data Not Normal
Lilliefors (Detects Only)	0.34	0.237	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.553	0.881	Data Not Normal
Lilliefors (NDs = DL)	0.331	0.229	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.558	0.881	Data Not Normal
Lilliefors (NDs = DL/2)	0.33	0.229	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.679	0.881	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.306	0.229	Data Not Normal

Table D.2-3b
Goodness of Fit - Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.877	0.885	0.89	0.938

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.89	0.754	
Kolmogorov-Smirnov (Detects Only)	0.218	0.234	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	0.757	0.76	
Kolmogorov-Smirnov (NDs = DL)	0.197	0.227	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.701	0.762	
Kolmogorov-Smirnov (NDs = DL/2)	0.193	0.228	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	2.112	0.815	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.31	0.237	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.955	0.963	0.958	0.964

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.933	0.874	Data Appear Lognormal
Lilliefors (Detects Only)	0.169	0.237	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.941	0.881	Data Appear Lognormal
Lilliefors (NDs = DL)	0.178	0.229	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.938	0.881	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.2	0.229	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.944	0.881	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.184	0.229	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Table D.2-3b
Goodness of Fit - Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Beryllium

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	0	15	5	10	66.67%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	10	0.061	0.061	0.061	0.061	1.463E-17
Statistics (Detects Only)	5	0.66	1.15	0.932	1	0.185
Statistics (All: NDs treated as DL value)	15	0.061	1.15	0.351	0.061	0.436
Statistics (All: NDs treated as DL/2 value)	15	0.0305	1.15	0.331	0.0305	0.451
Statistics (Normal ROS Estimated Data)	15	-0.199	1.15	0.484	0.464	0.399
Statistics (Gamma ROS Estimated Data)	15	0.66	1.393	1.054	1.054	0.23
Statistics (Lognormal ROS Estimated Data)	15	0.26	1.15	0.61	0.545	0.273

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	29.18	23.39	0.0319	-0.0877	0.212	-2.421
Statistics (NDs = DL)	0.711	0.613	0.494	-1.894	1.327	-0.701
Statistics (NDs = DL/2)	0.507	0.45	0.653	-2.356	1.664	-0.706
Statistics (Gamma ROS Estimates)	20.69	16.6	0.0509	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.586	0.445	-0.759

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.972	0.827	0.826	0.994

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.952	0.762	Data Appear Normal
Lilliefors (Detects Only)	0.243	0.396	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.668	0.881	Data Not Normal
Lilliefors (NDs = DL)	0.414	0.229	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.667	0.881	Data Not Normal
Lilliefors (NDs = DL/2)	0.414	0.229	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.977	0.881	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.102	0.229	Data Appear Normal

Table D.2-3b
Goodness of Fit - Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.958	0.896	0.882	0.973

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.32	0.679	
Kolmogorov-Smirnov (Detects Only)	0.272	0.357	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	2.719	0.778	
Kolmogorov-Smirnov (NDs = DL)	0.431	0.231	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.728	0.792	
Kolmogorov-Smirnov (NDs = DL/2)	0.432	0.234	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.32	0.735	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.119	0.221	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.958	0.808	0.805	0.992

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.925	0.762	Data Appear Lognormal
Lilliefors (Detects Only)	0.26	0.396	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.634	0.881	Data Not Lognormal
Lilliefors (NDs = DL)	0.419	0.229	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.628	0.881	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.419	0.229	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.972	0.881	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.106	0.229	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Table D.2-3b
Goodness of Fit - Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Cadmium

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	15	0	15	14	1	6.67%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Detects Only)	14	0.63	2.6	1.194	1.05	0.579
Statistics (All: NDs treated as DL value)	15	0.45	2.6	1.145	1	0.59
Statistics (All: NDs treated as DL/2 value)	15	0.225	2.6	1.13	1	0.612
Statistics (Normal ROS Estimated Data)	15	-0.105	2.6	1.108	1	0.651
Statistics (Gamma ROS Estimated Data)	15	0.186	2.6	1.127	1	0.616
Statistics (Lognormal ROS Estimated Data)	15	0.408	2.6	1.142	1	0.594

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	5.941	4.797	0.201	0.091	0.41	4.505
Statistics (NDs = DL)	4.997	4.042	0.229	0.0317	0.457	14.41
Statistics (NDs = DL/2)	3.824	3.104	0.295	-0.0145	0.568	-39.25
Statistics (Gamma ROS Estimates)	3.565	2.897	0.316	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	0.0252	0.47	18.69

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.887	0.906	0.922	0.932

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.792	0.874	Data Not Normal
Lilliefors (Detects Only)	0.218	0.237	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.828	0.881	Data Not Normal
Lilliefors (NDs = DL)	0.199	0.229	Data Appear Normal
Shapiro-Wilks (NDs = DL/2)	0.862	0.881	Data Not Normal
Lilliefors (NDs = DL/2)	0.196	0.229	Data Appear Normal
Shapiro-Wilks (Normal ROS Estimates)	0.887	0.881	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.193	0.229	Data Appear Normal

Table D.2-3b
Goodness of Fit - Surface Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.944	0.957	0.964	0.964

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.668	0.737	
Kolmogorov-Smirnov (Detects Only)	0.167	0.229	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.477	0.739	
Kolmogorov-Smirnov (NDs = DL)	0.142	0.222	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.478	0.741	
Kolmogorov-Smirnov (NDs = DL/2)	0.14	0.223	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.516	0.742	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.147	0.223	Data Appear Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.959	0.978	0.945	0.977

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.918	0.874	Data Appear Lognormal
Lilliefors (Detects Only)	0.139	0.237	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.961	0.881	Data Appear Lognormal
Lilliefors (NDs = DL)	0.119	0.229	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.914	0.881	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.165	0.229	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.964	0.881	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.121	0.229	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Table D.2-3c
Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95

Aluminum

Raw Statistics

Number of Valid Observations	32
Number of Distinct Observations	28
Minimum	4250
Maximum	35000
Mean of Raw Data	14273
Standard Deviation of Raw Data	6288
Kstar	5.008
Mean of Log Transformed Data	9.473
Standard Deviation of Log Transformed Data	0.451

Normal Distribution Test Results

Correlation Coefficient R	0.956
Shapiro Wilk Test Statistic	0.925
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.136
Lilliefors Critical (0.95) Value	0.157

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.98
A-D Test Statistic	0.336
A-D Critical (0.95) Value	0.748
K-S Test Statistic	0.104
K-S Critical(0.95) Value	0.156

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.982
Shapiro Wilk Test Statistic	0.97
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.124
Lilliefors Critical (0.95) Value	0.157

Data appear Lognormal at (0.05) Significance Level

Table D.2-3c
Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Arsenic

Raw Statistics

Number of Valid Observations	32
Number of Distinct Observations	26
Minimum	0.12
Maximum	5.6
Mean of Raw Data	2.408
Standard Deviation of Raw Data	1.325
Kstar	2.343
Mean of Log Transformed Data	0.671
Standard Deviation of Log Transformed Data	0.771

Normal Distribution Test Results

Correlation Coefficient R	0.987
Shapiro Wilk Test Statistic	0.969
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.114
Lilliefors Critical (0.95) Value	0.157

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.985
A-D Test Statistic	0.391
A-D Critical (0.95) Value	0.756
K-S Test Statistic	0.121
K-S Critical(0.95) Value	0.157

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.928
Shapiro Wilk Test Statistic	0.877
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.154
Lilliefors Critical (0.95) Value	0.157

Data not Lognormal at (0.05) Significance Level

Table D.2-3c
Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Barium

Raw Statistics

Number of Valid Observations	32
Number of Distinct Observations	29
Minimum	29
Maximum	290
Mean of Raw Data	139.2
Standard Deviation of Raw Data	55.05
Kstar	5.144
Mean of Log Transformed Data	4.845
Standard Deviation of Log Transformed Data	0.467

Normal Distribution Test Results

Correlation Coefficient R	0.989
Shapiro Wilk Test Statistic	0.984
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.0663
Lilliefors Critical (0.95) Value	0.157

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.985
A-D Test Statistic	0.323
A-D Critical (0.95) Value	0.748
K-S Test Statistic	0.09
K-S Critical(0.95) Value	0.156

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.96
Shapiro Wilk Test Statistic	0.934
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.108
Lilliefors Critical (0.95) Value	0.157

Data appear Lognormal at (0.05) Significance Level

Table D.2-3c
Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Calcium

Raw Statistics

Number of Valid Observations	32
Number of Distinct Observations	28
Minimum	1100
Maximum	110000
Mean of Raw Data	5875
Standard Deviation of Raw Data	19050
Kstar	0.669
Mean of Log Transformed Data	7.837
Standard Deviation of Log Transformed Data	0.828

Normal Distribution Test Results

Correlation Coefficient R	0.444
Shapiro Wilk Test Statistic	0.231
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.445
Lilliefors Critical (0.95) Value	0.157

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.691
A-D Test Statistic	6.319
A-D Critical (0.95) Value	0.791
K-S Test Statistic	0.327
K-S Critical(0.95) Value	0.162

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.816
Shapiro Wilk Test Statistic	0.697
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.213
Lilliefors Critical (0.95) Value	0.157

Data not Lognormal at (0.05) Significance Level

Table D.2-3c
Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Chromium

Raw Statistics

Number of Valid Observations	32
Number of Distinct Observations	21
Minimum	10
Maximum	39
Mean of Raw Data	25.28
Standard Deviation of Raw Data	8.259
Kstar	7.981
Mean of Log Transformed Data	3.172
Standard Deviation of Log Transformed Data	0.359

Normal Distribution Test Results

Correlation Coefficient R	0.988
Shapiro Wilk Test Statistic	0.958
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.0991
Lilliefors Critical (0.95) Value	0.157

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.975
A-D Test Statistic	0.334
A-D Critical (0.95) Value	0.747
K-S Test Statistic	0.0893
K-S Critical(0.95) Value	0.156

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.976
Shapiro Wilk Test Statistic	0.943
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.0946
Lilliefors Critical (0.95) Value	0.157

Data appear Lognormal at (0.05) Significance Level

Table D.2-3c
Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Cobalt

Raw Statistics

Number of Valid Observations	32
Number of Distinct Observations	22
Minimum	3.9
Maximum	24
Mean of Raw Data	11.33
Standard Deviation of Raw Data	4.502
Kstar	5.86
Mean of Log Transformed Data	2.347
Standard Deviation of Log Transformed Data	0.416

Normal Distribution Test Results

Correlation Coefficient R	0.981
Shapiro Wilk Test Statistic	0.965
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.105
Lilliefors Critical (0.95) Value	0.157

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.995
A-D Test Statistic	0.14
A-D Critical (0.95) Value	0.747
K-S Test Statistic	0.0739
K-S Critical(0.95) Value	0.156

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.992
Shapiro Wilk Test Statistic	0.982
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.0795
Lilliefors Critical (0.95) Value	0.157

Data appear Lognormal at (0.05) Significance Level

Table D.2-3c
Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Copper

Raw Statistics

Number of Valid Observations	32
Number of Distinct Observations	24
Minimum	2.5
Maximum	260
Mean of Raw Data	32.01
Standard Deviation of Raw Data	45.71
Kstar	1.249
Mean of Log Transformed Data	3.054
Standard Deviation of Log Transformed Data	0.838

Normal Distribution Test Results

Correlation Coefficient R	0.667
Shapiro Wilk Test Statistic	0.48
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.326
Lilliefors Critical (0.95) Value	0.157

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.842
A-D Test Statistic	1.943
A-D Critical (0.95) Value	0.768
K-S Test Statistic	0.204
K-S Critical(0.95) Value	0.159

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.954
Shapiro Wilk Test Statistic	0.935
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.155
Lilliefors Critical (0.95) Value	0.157

Data appear Lognormal at (0.05) Significance Level

Table D.2-3c
Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Iron

Raw Statistics

Number of Valid Observations	32
Number of Distinct Observations	29
Minimum	5330
Maximum	87000
Mean of Raw Data	32010
Standard Deviation of Raw Data	17254
Kstar	3.307
Mean of Log Transformed Data	10.23
Standard Deviation of Log Transformed Data	0.577

Normal Distribution Test Results

Correlation Coefficient R	0.935
Shapiro Wilk Test Statistic	0.884
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.158
Lilliefors Critical (0.95) Value	0.157

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.968
A-D Test Statistic	0.502
A-D Critical (0.95) Value	0.752
K-S Test Statistic	0.114
K-S Critical(0.95) Value	0.156

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.968
Shapiro Wilk Test Statistic	0.948
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.138
Lilliefors Critical (0.95) Value	0.157

Data appear Lognormal at (0.05) Significance Level

Table D.2-3c
Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Lead (mg/kg)

Raw Statistics

Number of Valid Observations	182
Number of Distinct Observations	81
Minimum	12
Maximum	26500
Mean of Raw Data	416.4
Standard Deviation of Raw Data	2050
Kstar	0.738
Mean of Log Transformed Data	5.23
Standard Deviation of Log Transformed Data	0.824

Normal Distribution Test Results

Correlation Coefficient R	0.319
Lilliefors Test Statistic	0.422
Lilliefors Critical (0.95) Value	0.0657

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.541
A-D Test Statistic	5.495E+28
A-D Critical (0.95) Value	0.796
K-S Test Statistic	0.278
K-S Critical(0.95) Value	0.071

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.932
Lilliefors Test Statistic	0.117
Lilliefors Critical (0.95) Value	0.0657

Data not Lognormal at (0.05) Significance Level

Table D.2-3c
Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Magnesium

Raw Statistics

Number of Valid Observations	32
Number of Distinct Observations	29
Minimum	1210
Maximum	25000
Mean of Raw Data	3844
Standard Deviation of Raw Data	3994
Kstar	2.632
Mean of Log Transformed Data	8.071
Standard Deviation of Log Transformed Data	0.505

Normal Distribution Test Results

Correlation Coefficient R	0.604
Shapiro Wilk Test Statistic	0.404
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.343
Lilliefors Critical (0.95) Value	0.157

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.724
A-D Test Statistic	2.643
A-D Critical (0.95) Value	0.754
K-S Test Statistic	0.249
K-S Critical(0.95) Value	0.157

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.896
Shapiro Wilk Test Statistic	0.839
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.184
Lilliefors Critical (0.95) Value	0.157

Data not Lognormal at (0.05) Significance Level

Table D.2-3c
Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Manganese

Raw Statistics

Number of Valid Observations	32
Number of Distinct Observations	29
Minimum	59
Maximum	2200
Mean of Raw Data	1003
Standard Deviation of Raw Data	500.1
Kstar	2.38
Mean of Log Transformed Data	6.706
Standard Deviation of Log Transformed Data	0.783

Normal Distribution Test Results

Correlation Coefficient R	0.988
Shapiro Wilk Test Statistic	0.974
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.108
Lilliefors Critical (0.95) Value	0.157

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.95
A-D Test Statistic	1.193
A-D Critical (0.95) Value	0.755
K-S Test Statistic	0.167
K-S Critical(0.95) Value	0.157

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.905
Shapiro Wilk Test Statistic	0.829
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.196
Lilliefors Critical (0.95) Value	0.157

Data not Lognormal at (0.05) Significance Level

Table D.2-3c
Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Nickel

Raw Statistics

Number of Valid Observations	32
Number of Distinct Observations	17
Minimum	3.8
Maximum	22
Mean of Raw Data	13.93
Standard Deviation of Raw Data	4.427
Kstar	7.835
Mean of Log Transformed Data	2.575
Standard Deviation of Log Transformed Data	0.373

Normal Distribution Test Results

Correlation Coefficient R	0.993
Shapiro Wilk Test Statistic	0.979
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.087
Lilliefors Critical (0.95) Value	0.157

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.977
A-D Test Statistic	0.38
A-D Critical (0.95) Value	0.747
K-S Test Statistic	0.114
K-S Critical(0.95) Value	0.156

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.954
Shapiro Wilk Test Statistic	0.918
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.131
Lilliefors Critical (0.95) Value	0.157

Data not Lognormal at (0.05) Significance Level

Table D.2-3c
Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Potassium

Raw Statistics

Number of Valid Observations	32
Number of Distinct Observations	25
Minimum	548
Maximum	2900
Mean of Raw Data	1535
Standard Deviation of Raw Data	548.3
Kstar	7.246
Mean of Log Transformed Data	7.273
Standard Deviation of Log Transformed Data	0.374

Normal Distribution Test Results

Correlation Coefficient R	0.975
Shapiro Wilk Test Statistic	0.95
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.141
Lilliefors Critical (0.95) Value	0.157

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.989
A-D Test Statistic	0.345
A-D Critical (0.95) Value	0.747
K-S Test Statistic	0.0955
K-S Critical(0.95) Value	0.156

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.978
Shapiro Wilk Test Statistic	0.959
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.111
Lilliefors Critical (0.95) Value	0.157

Data appear Lognormal at (0.05) Significance Level

Table D.2-3c
Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Selenium

Raw Statistics

Number of Valid Observations	32
Number of Distinct Observations	27
Minimum	0.043
Maximum	1.5
Mean of Raw Data	0.516
Standard Deviation of Raw Data	0.319
Kstar	2.185
Mean of Log Transformed Data	-0.885
Standard Deviation of Log Transformed Data	0.748

Normal Distribution Test Results

Correlation Coefficient R	0.962
Shapiro Wilk Test Statistic	0.93
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.124
Lilliefors Critical (0.95) Value	0.157

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.979
A-D Test Statistic	0.467
A-D Critical (0.95) Value	0.757
K-S Test Statistic	0.135
K-S Critical(0.95) Value	0.157

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.963
Shapiro Wilk Test Statistic	0.936
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.142
Lilliefors Critical (0.95) Value	0.157

Data appear Lognormal at (0.05) Significance Level

Table D.2-3c
Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Silver

Raw Statistics

Number of Valid Observations	32
Number of Distinct Observations	26
Minimum	0.023
Maximum	0.45
Mean of Raw Data	0.115
Standard Deviation of Raw Data	0.0797
Kstar	2.678
Mean of Log Transformed Data	-2.343
Standard Deviation of Log Transformed Data	0.609

Normal Distribution Test Results

Correlation Coefficient R	0.863
Shapiro Wilk Test Statistic	0.771
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.194
Lilliefors Critical (0.95) Value	0.157

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.941
A-D Test Statistic	0.46
A-D Critical (0.95) Value	0.753
K-S Test Statistic	0.113
K-S Critical(0.95) Value	0.157

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.984
Shapiro Wilk Test Statistic	0.978
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.132
Lilliefors Critical (0.95) Value	0.157

Data appear Lognormal at (0.05) Significance Level

Table D.2-3c
Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sodium

Raw Statistics

Number of Valid Observations	32
Number of Distinct Observations	24
Minimum	27
Maximum	100
Mean of Raw Data	49.64
Standard Deviation of Raw Data	13.86
Kstar	13.8
Mean of Log Transformed Data	3.872
Standard Deviation of Log Transformed Data	0.257

Normal Distribution Test Results

Correlation Coefficient R	0.935
Shapiro Wilk Test Statistic	0.894
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.127
Lilliefors Critical (0.95) Value	0.157

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.962
A-D Test Statistic	0.404
A-D Critical (0.95) Value	0.746
K-S Test Statistic	0.0989
K-S Critical(0.95) Value	0.155

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.982
Shapiro Wilk Test Statistic	0.977
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.0853
Lilliefors Critical (0.95) Value	0.157

Data appear Lognormal at (0.05) Significance Level

Table D.2-3c
Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Thallium

Raw Statistics

Number of Valid Observations	32
Number of Distinct Observations	26
Minimum	0.047
Maximum	3.5
Mean of Raw Data	0.529
Standard Deviation of Raw Data	0.614
Kstar	1.525
Mean of Log Transformed Data	-0.967
Standard Deviation of Log Transformed Data	0.786

Normal Distribution Test Results

Correlation Coefficient R	0.718
Shapiro Wilk Test Statistic	0.549
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.299
Lilliefors Critical (0.95) Value	0.157

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.862
A-D Test Statistic	1.269
A-D Critical (0.95) Value	0.763
K-S Test Statistic	0.191
K-S Critical(0.95) Value	0.158

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.965
Shapiro Wilk Test Statistic	0.954
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.146
Lilliefors Critical (0.95) Value	0.157

Data appear Lognormal at (0.05) Significance Level

Table D.2-3c
Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Vanadium

Raw Statistics

Number of Valid Observations	32
Number of Distinct Observations	21
Minimum	11
Maximum	59
Mean of Raw Data	27.02
Standard Deviation of Raw Data	9.612
Kstar	7.753
Mean of Log Transformed Data	3.237
Standard Deviation of Log Transformed Data	0.355

Normal Distribution Test Results

Correlation Coefficient R	0.958
Shapiro Wilk Test Statistic	0.931
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.123
Lilliefors Critical (0.95) Value	0.157

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.976
A-D Test Statistic	0.331
A-D Critical (0.95) Value	0.747
K-S Test Statistic	0.104
K-S Critical(0.95) Value	0.156

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.985
Shapiro Wilk Test Statistic	0.977
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.107
Lilliefors Critical (0.95) Value	0.157

Data appear Lognormal at (0.05) Significance Level

Table D.2-3c
Goodness of Fit - Total Soil
ProUCL 4.0 for Full Data Sets
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Zinc

Raw Statistics

Number of Valid Observations	32
Number of Distinct Observations	32
Minimum	46
Maximum	1600
Mean of Raw Data	505
Standard Deviation of Raw Data	326.3
Kstar	2.446
Mean of Log Transformed Data	6.026
Standard Deviation of Log Transformed Data	0.682

Normal Distribution Test Results

Correlation Coefficient R	0.929
Shapiro Wilk Test Statistic	0.875
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.161
Lilliefors Critical (0.95) Value	0.157

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.987
A-D Test Statistic	0.308
A-D Critical (0.95) Value	0.755
K-S Test Statistic	0.0976
K-S Critical(0.95) Value	0.157

Data appear Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.969
Shapiro Wilk Test Statistic	0.955
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.122
Lilliefors Critical (0.95) Value	0.157

Data appear Lognormal at (0.05) Significance Level

Table D.2-3d
Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Goodness-of-Fit Test Statistics for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95

Antimony

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	32	0	32	27	5	15.63%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	5	0.026	0.0518	0.0466	0.0518	0.0115
Statistics (Detects Only)	27	0.069	4.7	0.78	0.37	1.128
Statistics (All: NDs treated as DL value)	32	0.026	4.7	0.665	0.32	1.068
Statistics (All: NDs treated as DL/2 value)	32	0.013	4.7	0.662	0.32	1.07
Statistics (Normal ROS Estimated Data)	32	-1.864	4.7	0.446	0.32	1.305
Statistics (Gamma ROS Estimated Data)	32	1E-09	4.7	0.658	0.32	1.072
Statistics (Lognormal ROS Estimated Data)	32	0.0183	4.7	0.664	0.32	1.069

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	0.883	0.821	0.883	-0.912	1.099	-1.205
Statistics (NDs = DL)	0.712	0.667	0.934	-1.253	1.294	-1.033
Statistics (NDs = DL/2)	0.644	0.605	1.027	-1.362	1.467	-1.078
Statistics (Gamma ROS Estimates)	0.204	0.206	3.221	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-1.302	1.371	-1.053

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.773	0.757	0.76	0.895

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.609	0.923	Data Not Normal
Lilliefors (Detects Only)	0.334	0.171	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.588	0.93	Data Not Normal
Lilliefors (NDs = DL)	0.329	0.157	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.593	0.93	Data Not Normal
Lilliefors (NDs = DL/2)	0.328	0.157	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.82	0.93	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.259	0.157	Data Not Normal

Table D.2-3d
Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.946	0.949	0.954	0.971

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	1.735	0.778	
Kolmogorov-Smirnov (Detects Only)	0.221	0.174	Data Not Gamma Distributed
Anderson-Darling (NDs = DL)	1.487	0.791	
Kolmogorov-Smirnov (NDs = DL)	0.192	0.162	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.144	0.797	
Kolmogorov-Smirnov (NDs = DL/2)	0.176	0.163	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.471	0.896	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.339	0.172	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.971	0.982	0.982	0.987

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.936	0.923	Data Appear Lognormal
Lilliefors (Detects Only)	0.142	0.171	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.958	0.93	Data Appear Lognormal
Lilliefors (NDs = DL)	0.0946	0.157	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.957	0.93	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.114	0.157	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.968	0.93	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.101	0.157	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Table D.2-3d
Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Beryllium

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	32	0	32	11	21	65.63%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	21	0.0391	0.061	0.0579	0.061	0.00785
Statistics (Detects Only)	11	0.65	1.3	0.968	0.98	0.204
Statistics (All: NDs treated as DL value)	32	0.0391	1.3	0.371	0.061	0.454
Statistics (All: NDs treated as DL/2 value)	32	0.0196	1.3	0.352	0.0305	0.468
Statistics (Normal ROS Estimated Data)	32	-0.273	1.3	0.523	0.506	0.402
Statistics (Gamma ROS Estimated Data)	32	0.65	1.3	0.971	0.974	0.116
Statistics (Lognormal ROS Estimated Data)	32	0.258	1.3	0.649	0.584	0.279

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	23.48	21.3	0.0412	-0.0538	0.221	-4.113
Statistics (NDs = DL)	0.673	0.63	0.551	-1.896	1.366	-0.721
Statistics (NDs = DL/2)	0.488	0.463	0.721	-2.351	1.698	-0.723
Statistics (Gamma ROS Estimates)	67.86	61.52	0.0143	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-0.519	0.422	-0.813

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.979	0.836	0.833	0.994

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.952	0.85	Data Appear Normal
Lilliefors (Detects Only)	0.165	0.267	Data Appear Normal
Shapiro-Wilks (NDs = DL)	0.684	0.93	Data Not Normal
Lilliefors (NDs = DL)	0.409	0.157	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.678	0.93	Data Not Normal
Lilliefors (NDs = DL/2)	0.41	0.157	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.978	0.93	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0858	0.157	Data Appear Normal

Table D.2-3d
Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.974	0.89	0.87	0.828

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.352	0.729	
Kolmogorov-Smirnov (Detects Only)	0.167	0.255	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	5.008	0.795	
Kolmogorov-Smirnov (NDs = DL)	0.415	0.162	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	5.17	0.813	
Kolmogorov-Smirnov (NDs = DL/2)	0.419	0.165	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.823	0.745	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.344	0.155	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.967	0.841	0.831	0.991

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.927	0.85	Data Appear Lognormal
Lilliefors (Detects Only)	0.178	0.267	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.688	0.93	Data Not Lognormal
Lilliefors (NDs = DL)	0.402	0.157	Data Not Lognormal
Shapiro-Wilks (NDs = DL/2)	0.671	0.93	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.405	0.157	Data Not Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.971	0.93	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0952	0.157	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Table D.2-3d
Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Cadmium

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	32	0	32	30	2	6.25%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	2	0.45	0.45	0.45	0.45	0
Statistics (Detects Only)	30	0.51	2.8	1.247	1.1	0.624
Statistics (All: NDs treated as DL value)	32	0.45	2.8	1.197	1.1	0.635
Statistics (All: NDs treated as DL/2 value)	32	0.225	2.8	1.183	1.1	0.654
Statistics (Normal ROS Estimated Data)	32	-0.281	2.8	1.158	1.1	0.698
Statistics (Gamma ROS Estimated Data)	32	1E-09	2.8	1.174	1.1	0.668
Statistics (Lognormal ROS Estimated Data)	32	0.346	2.8	1.193	1.1	0.641

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	4.896	4.458	0.255	0.115	0.458	3.978
Statistics (NDs = DL)	4.261	3.882	0.281	0.0581	0.497	8.557
Statistics (NDs = DL/2)	3.417	3.117	0.346	0.0147	0.594	40.29
Statistics (Gamma ROS Estimates)	0.787	0.734	1.492	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	0.0468	0.519	11.08

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.925	0.931	0.946	0.958

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.849	0.927	Data Not Normal
Lilliefors (Detects Only)	0.2	0.162	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.858	0.93	Data Not Normal
Lilliefors (NDs = DL)	0.186	0.157	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.889	0.93	Data Not Normal
Lilliefors (NDs = DL/2)	0.179	0.157	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.921	0.93	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.17	0.157	Data Not Normal

Table D.2-3d
Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.968	0.973	0.977	0.948

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.609	0.747	
Kolmogorov-Smirnov (Detects Only)	0.137	0.16	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.496	0.75	
Kolmogorov-Smirnov (NDs = DL)	0.119	0.156	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.442	0.752	
Kolmogorov-Smirnov (NDs = DL/2)	0.111	0.156	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.773	0.786	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.338	0.161	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.985	0.987	0.97	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.958	0.927	Data Appear Lognormal
Lilliefors (Detects Only)	0.107	0.162	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.961	0.93	Data Appear Lognormal
Lilliefors (NDs = DL)	0.0905	0.157	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.939	0.93	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.099	0.157	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.974	0.93	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0889	0.157	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Table D.2-3d
Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Mercury

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	32	0	32	30	2	6.25%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	2	0.0077	0.0093	0.0085	0.0085	0.00113
Statistics (Detects Only)	30	0.0087	0.27	0.0672	0.044	0.0571
Statistics (All: NDs treated as DL value)	32	0.0077	0.27	0.0635	0.0415	0.0571
Statistics (All: NDs treated as DL/2 value)	32	0.00385	0.27	0.0633	0.0415	0.0574
Statistics (Normal ROS Estimated Data)	32	-0.0571	0.27	0.06	0.0415	0.0621
Statistics (Gamma ROS Estimated Data)	32	1E-09	0.27	0.063	0.0415	0.0577
Statistics (Lognormal ROS Estimated Data)	32	0.0087	0.27	0.0636	0.0415	0.057

	K Hat	K Star	Theta Hat	Log Mean	Log Stdv	Log CV
Statistics (Detects Only)	2.087	1.912	0.0322	-2.958	0.716	-0.242
Statistics (NDs = DL)	1.733	1.591	0.0367	-3.072	0.824	-0.268
Statistics (NDs = DL/2)	1.556	1.431	0.0407	-3.115	0.928	-0.298
Statistics (Gamma ROS Estimates)	0.489	0.464	0.129	--	--	--
Statistics (Lognormal ROS Estimates)	--	--	--	-3.06	0.801	-0.262

Normal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.854	0.862	0.867	0.906

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.743	0.927	Data Not Normal
Lilliefors (Detects Only)	0.193	0.162	Data Not Normal
Shapiro-Wilks (NDs = DL)	0.756	0.93	Data Not Normal
Lilliefors (NDs = DL)	0.191	0.157	Data Not Normal
Shapiro-Wilks (NDs = DL/2)	0.765	0.93	Data Not Normal
Lilliefors (NDs = DL/2)	0.189	0.157	Data Not Normal
Shapiro-Wilks (Normal ROS Estimates)	0.843	0.93	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.167	0.157	Data Not Normal

Table D.2-3d
Goodness of Fit - Total Soil
ProUCL 4.0 for Data Sets with Non-Detects
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Gamma Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.957	0.966	0.97	0.982

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.78	0.758	
Kolmogorov-Smirnov (Detects Only)	0.153	0.162	Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	0.565	0.762	
Kolmogorov-Smirnov (NDs = DL)	0.129	0.158	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.563	0.764	
Kolmogorov-Smirnov (NDs = DL/2)	0.113	0.158	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	4.519	0.813	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.338	0.165	Data Not Gamma Distributed

Lognormal Distribution Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.982	0.983	0.964	0.986

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilks (Detects Only)	0.974	0.927	Data Appear Lognormal
Lilliefors (Detects Only)	0.112	0.162	Data Appear Lognormal
Shapiro-Wilks (NDs = DL)	0.964	0.93	Data Appear Lognormal
Lilliefors (NDs = DL)	0.108	0.157	Data Appear Lognormal
Shapiro-Wilks (NDs = DL/2)	0.935	0.93	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.143	0.157	Data Appear Lognormal
Shapiro-Wilks (Lognormal ROS Estimates)	0.971	0.93	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0981	0.157	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Table D.2-4a
Background Versus Site Means Comparison - Surface Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	P:\11656367 RFAAP SWMU 13 RFI\05_Calcs-data-etc\Stats\SWMU 13 Metals data for EPCs.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Aluminum(site)

Background Data: Aluminum(bkd)

Raw Statistics

	Site	Background
Number of Valid Observations	15	28
Number of Distinct Observations	12	28
Minimum	10000	3620
Maximum	35000	20100
Mean	15410	8300
Median	12000	6705
SD	7046	4279
SE of Mean	1819	808.6

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	472
WMW Test U-Stat	352
WMW Critical Value (0.050)	319
Approximate P-Value	0.00015562

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

Table D.2-4a
Background Versus Site Means Comparison - Surface Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	P:\11656367 RFAAP SWMU 13 RFI\05_Calcs-data-etc\Stats\SWMU 13 Metals data for EPCs.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Arsenic(site)

Background Data: Arsenic(bkd)

Raw Statistics

	Site	Background
Number of Valid Observations	15	28
Number of Distinct Observations	13	24
Minimum	0.98	1.5
Maximum	5.6	10.2
Mean	2.315	3.732
Median	2.2	2.75
SD	1.032	2.33
SE of Mean	0.266	0.44

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	235.5
WMW Test U-Stat	115.5
WMW Critical Value (0.050)	319
Approximate P-Value	0.992

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Table D.2-4a
Background Versus Site Means Comparison - Surface Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Barium(site)

Background Data: Barium(bkd)

Raw Statistics

	Site	Background
Number of Valid Data	15	28
Number of Non-Detect Data	0	4
Number of Detect Data	15	24
Minimum Non-Detect	N/A	0.36
Maximum Non-Detect	N/A	1
Percent Non detects	0.00%	14.29%
Minimum Detected	87	23.4
Maximum Detected	290	174
Mean of Detected Data	146.9	75.55
Median of Detected Data	130	61.85
SD of Detected Data	54.27	43.2

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 1 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	488.5
WMW Test U-Stat	368.5
WMW Critical Value (0.050)	319
Approximate P-Value	2.8341E-05

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

Table D.2-4a
Background Versus Site Means Comparison - Surface Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	P:\11656367 RFAAP SWMU 13 RFI\05_Calcs-data-etc\Stats\SWMU 13 Metals data for EPCs.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Beryllium(site)

Background Data: Beryllium(bkd)

Raw Statistics

	Site	Background
Number of Valid Data	15	28
Number of Non-Detect Data	10	13
Number of Detect Data	5	15
Minimum Non-Detect	0.061	0.022
Maximum Non-Detect	0.061	0.03
Percent Non detects	66.67%	46.43%
Minimum Detected	0.66	0.61
Maximum Detected	1.15	1.5
Mean of Detected Data	0.932	0.887
Median of Detected Data	1	0.87
SD of Detected Data	0.185	0.246

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.061 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	296
WMW Test U-Stat	176
WMW Critical Value (0.050)	319
Approximate P-Value	0.81

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Table D.2-4a
Background Versus Site Means Comparison - Surface Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Calcium(site)

Background Data: Calcium(bkd)

Raw Statistics

	Site	Background
Number of Valid Data	15	28
Number of Non-Detect Data	0	5
Number of Detect Data	15	23
Minimum Non-Detect	N/A	4.6
Maximum Non-Detect	N/A	6.6
Percent Non detects	0.00%	17.86%
Minimum Detected	1100	116
Maximum Detected	110000	7340
Mean of Detected Data	10043	1197
Median of Detected Data	2290	885
SD of Detected Data	27684	1440

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 6.6 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	511.5
WMW Test U-Stat	391.5
WMW Critical Value (0.050)	319
Approximate P-Value	1.9911E-06

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

Table D.2-4a
Background Versus Site Means Comparison - Surface Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	P:\11656367 RFAAP SWMU 13 RFI\05_Calcs-data-etc\Stats\SWMU 13 Metals data for EPCs.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Chromium(site)

Background Data: Chromium(bkd)

Raw Statistics

	Site	Background
Number of Valid Observations	15	28
Number of Distinct Observations	11	27
Minimum	18	6.3
Maximum	39	53.3
Mean	26.07	21.09
Median	26	22.4
SD	7.294	10.5
SE of Mean	1.883	1.985

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	395
WMW Test U-Stat	275
WMW Critical Value (0.050)	319
Approximate P-Value	0.0501

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Table D.2-4a
Background Versus Site Means Comparison - Surface Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Cobalt(site)

Background Data: Cobalt(bkd)

Raw Statistics

	Site	Background
Number of Valid Data	15	28
Number of Non-Detect Data	0	8
Number of Detect Data	15	20
Minimum Non-Detect	N/A	0.11
Maximum Non-Detect	N/A	0.75
Percent Non detects	0.00%	28.57%
Minimum Detected	7	5.9
Maximum Detected	19	45.4
Mean of Detected Data	11.37	15.95
Median of Detected Data	11	12.1
SD of Detected Data	3.518	10.07

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.75 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	352
WMW Test U-Stat	232
WMW Critical Value (0.050)	319
Approximate P-Value	0.292

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Table D.2-4a
Background Versus Site Means Comparison - Surface Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Copper(site)

Background Data: Copper(bkd)

Raw Statistics

	Site	Background
Number of Valid Data	15	28
Number of Non-Detect Data	0	2
Number of Detect Data	15	26
Minimum Non-Detect	N/A	0.17
Maximum Non-Detect	N/A	0.17
Percent Non detects	0.00%	7.14%
Minimum Detected	13	2.2
Maximum Detected	260	13.6
Mean of Detected Data	36.4	6.919
Median of Detected Data	20	5.35
SD of Detected Data	62.13	3.696

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	534
WMW Test U-Stat	414
WMW Critical Value (0.050)	319
Approximate P-Value	1.0763E-07

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

Table D.2-4a
Background Versus Site Means Comparison - Surface Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	P:\11656367 RFAAP SWMU 13 RFI\05_Calcs-data-etc\Stats\SWMU 13 Metals data for EPCs.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Iron(site)

Background Data: Iron(bkd)

Raw Statistics

	Site	Background
Number of Valid Observations	15	28
Number of Distinct Observations	13	26
Minimum	16000	7250
Maximum	78000	63000
Mean	31547	20108
Median	29200	19750
SD	14723	11869
SE of Mean	3801	2243

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	450.5
WMW Test U-Stat	330.5
WMW Critical Value (0.050)	319
Approximate P-Value	0.00111

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

Table D.2-4a
Background Versus Site Means Comparison - Surface Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	P:\11656367 RFAAP SWMU 13 RFI\05_Calcs-data-etc\Stats\SWMU 13 Metals data for EPCs.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Lead (mg/kg)(site)

Background Data: Lead (mg/kg)(bkd)

Raw Statistics

	Site	Background
Number of Valid Observations	91	28
Number of Distinct Observations	53	26
Minimum	27	8.9
Maximum	8620	225
Mean	315.8	26.96
Median	170	15.15
SD	902.3	41.34
SE of Mean	94.59	7.813

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	6663
WMW Test U-Stat	7.53
WMW Critical Value (0.050)	1.645
P-Value	2.534E-14

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Table D.2-4a
Background Versus Site Means Comparison - Surface Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Magnesium(site)

Background Data: Magnesium(bkd)

Raw Statistics

	Site	Background
Number of Valid Data	15	28
Number of Non-Detect Data	0	3
Number of Detect Data	15	25
Minimum Non-Detect	N/A	4.7
Maximum Non-Detect	N/A	5
Percent Non detects	0.00%	10.71%
Minimum Detected	2200	158
Maximum Detected	25000	20400
Mean of Detected Data	4953	2498
Median of Detected Data	3600	913
SD of Detected Data	5597	4334

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 5 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	478
WMW Test U-Stat	358
WMW Critical Value (0.050)	319
Approximate P-Value	8.5417E-05

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

Table D.2-4a
Background Versus Site Means Comparison - Surface Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	P:\11656367 RFAAP SWMU 13 RFI\05_Calcs-data-etc\Stats\SWMU 13 Metals data for EPCs.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Manganese(site)

Background Data: Manganese(bkd)

Raw Statistics

	Site	Background
Number of Valid Observations	15	28
Number of Distinct Observations	14	28
Minimum	380	43
Maximum	2200	2040
Mean	1036	695.9
Median	1040	490
SD	447.7	591.5
SE of Mean	115.6	111.8

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	428
WMW Test U-Stat	308
WMW Critical Value (0.050)	319
Approximate P-Value	0.00649

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Table D.2-4a
Background Versus Site Means Comparison - Surface Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Nickel(site)

Background Data: Nickel(bkd)

Raw Statistics

	Site	Background
Number of Valid Data	15	28
Number of Non-Detect Data	0	11
Number of Detect Data	15	17
Minimum Non-Detect	N/A	0.21
Maximum Non-Detect	N/A	1.3
Percent Non detects	0.00%	39.29%
Minimum Detected	9.5	4.6
Maximum Detected	22	18.1
Mean of Detected Data	14.4	9.935
Median of Detected Data	14	9.4
SD of Detected Data	3.526	4.294

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 1.3 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	488.5
WMW Test U-Stat	368.5
WMW Critical Value (0.050)	319
Approximate P-Value	2.8341E-05

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

Table D.2-4a
Background Versus Site Means Comparison - Surface Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	P:\11656367 RFAAP SWMU 13 RFI\05_Calcs-data-etc\Stats\SWMU 13 Metals data for EPCs.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Potassium(site)

Background Data: Potassium(bkd)

Raw Statistics

	Site	Background
Number of Valid Observations	15	28
Number of Distinct Observations	15	27
Minimum	1100	166
Maximum	2900	2350
Mean	1861	625
Median	1670	317.5
SD	549.4	598.1
SE of Mean	141.9	113

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	508
WMW Test U-Stat	388
WMW Critical Value (0.050)	319
Approximate P-Value	3.0468E-06

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

WMW Critical Value (0.050)	319
Approximate P-Value	0.00162

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

Table D.2-4a
Background Versus Site Means Comparison - Surface Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	P:\11656367 RFAAP SWMU 13 RFI\05_Calcs-data-etc\Stats\SWMU 13 Metals data for EPCs.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Vanadium(site)

Background Data: Vanadium(bkd)

Raw Statistics

	Site	Background
Number of Valid Observations	15	28
Number of Distinct Observations	12	27
Minimum	21	12.2
Maximum	59	101
Mean	29.3	33.89
Median	24	33.8
SD	10.39	17.78
SE of Mean	2.682	3.36

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	299
WMW Test U-Stat	179
WMW Critical Value (0.050)	319
Approximate P-Value	0.789

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

Table D.2-4a
Background Versus Site Means Comparison - Surface Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	P:\11656367 RFAAP SWMU 13 RFI\05_Calcs-data-etc\Stats\SWMU 13 Metals data for EPCs.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Zinc(site)

Background Data: Zinc(bkd)

Raw Statistics

	Site	Background
Number of Valid Observations	15	28
Number of Distinct Observations	15	28
Minimum	260	7.1
Maximum	1600	216
Mean	510.6	41.21
Median	380	29.7
SD	355.6	40.24
SE of Mean	91.82	7.605

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	540
WMW Test U-Stat	420
WMW Critical Value (0.050)	319
Approximate P-Value	4.6845E-08

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

Table D.2-4b
Background Versus Site Means Comparison - Total Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Aluminum(site)

Background Data: Aluminum(bkd)

Raw Statistics

	Site	Background
Number of Valid Observations	32	79
Number of Distinct Observations	28	75
Minimum	4250	3620
Maximum	35000	47900
Mean	14273	14204
Median	12800	12100
SD	6288	9433
SE of Mean	1112	1061

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1925
WMW Test U-Stat	0.863
WMW Critical Value (0.050)	1.645
P-Value	0.194

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Table D.2-4b
Background Versus Site Means Comparison - Total Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Arsenic(site)

Background Data: Arsenic(bkd)

Raw Statistics

	Site	Background
Number of Valid Observations	32	79
Number of Distinct Observations	26	49
Minimum	0.12	0.09
Maximum	5.6	35.9
Mean	2.408	4.804
Median	2.35	3.1
SD	1.325	5.339
SE of Mean	0.234	0.601

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1323
WMW Test U-Stat	-3.06
WMW Critical Value (0.050)	1.645
P-Value	0.999

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

P-Value	0.978

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Table D.2-4b
Background Versus Site Means Comparison - Total Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Barium(site)

Background Data: Barium(bkd)

Raw Statistics

	Site	Background
Number of Valid Data	32	79
Number of Non-Detect Data	0	16
Number of Detect Data	32	63
Minimum Non-Detect	N/A	0.36
Maximum Non-Detect	N/A	1.1
Percent Non detects	0.00%	20.25%
Minimum Detected	29	23.4
Maximum Detected	290	174
Mean of Detected Data	139.2	68.4
Median of Detected Data	135	56.7
SD of Detected Data	55.05	40.39

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 1.1 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	2757
WMW Test U-Stat	6.276
WMW Critical Value (0.050)	1.645
P-Value	1.739E-10

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Table D.2-4b
Background Versus Site Means Comparison - Total Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Beryllium(site)

Background Data: Beryllium(bkd)

Raw Statistics

	Site	Background
Number of Valid Data	32	79
Number of Non-Detect Data	21	39
Number of Detect Data	11	40
Minimum Non-Detect	0.0391	0.022
Maximum Non-Detect	0.061	0.03
Percent Non detects	65.63%	49.37%
Minimum Detected	0.65	0.61
Maximum Detected	1.3	5.4
Mean of Detected Data	0.968	1.449
Median of Detected Data	0.98	1.1
SD of Detected Data	0.204	1.086

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.061 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1533
WMW Test U-Stat	-1.689
WMW Critical Value (0.050)	1.645
P-Value	0.954

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Table D.2-4b
Background Versus Site Means Comparison - Total Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Cadmium(site)

Background Data: Cadmium(bkd)

Raw Statistics

	Site	Background
Number of Valid Data	32	79
Number of Non-Detect Data	2	66
Number of Detect Data	30	13
Minimum Non-Detect	0.45	0.02
Maximum Non-Detect	0.45	0.05
Percent Non detects	6.25%	83.54%
Minimum Detected	0.51	0.57
Maximum Detected	2.8	2.5
Mean of Detected Data	1.247	1.152
Median of Detected Data	1.1	1.1
SD of Detected Data	0.624	0.585

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.45 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	2794
WMW Test U-Stat	6.52
WMW Critical Value (0.050)	1.645
P-Value	3.517E-11

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Table D.2-4b
Background Versus Site Means Comparison - Total Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Calcium(site)

Background Data: Calcium(bkd)

Raw Statistics

	Site	Background
Number of Valid Data	32	79
Number of Non-Detect Data	0	16
Number of Detect Data	32	63
Minimum Non-Detect	N/A	4.6
Maximum Non-Detect	N/A	6.7
Percent Non detects	0.00%	20.25%
Minimum Detected	1100	116
Maximum Detected	110000	25700
Mean of Detected Data	5875	1392
Median of Detected Data	2110	717
SD of Detected Data	19050	3322

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 6.7 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	2848
WMW Test U-Stat	6.871
WMW Critical Value (0.050)	1.645
P-Value	3.177E-12

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Table D.2-4b
Background Versus Site Means Comparison - Total Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

t-Test Site vs Background Comparison for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean Less Than or Equal to Background Mean (Form 1)
Alternative Hypothesis	Site or AOC Mean Greater Than the Background Mean

Area of Concern Data: Chromium(site)

Background Data: Chromium(bkd)

Raw Statistics

	Site	Background
Number of Valid Observations	32	79
Number of Distinct Observations	21	70
Minimum	10	6.3
Maximum	39	75.8
Mean	25.28	26.86
Median	25	26
SD	8.259	12.51
SE of Mean	1.46	1.408

Site vs Background Two-Sample t-Test

H0: Mu of Site - Mu of Background <= 0

Method	DF	t-Test Value	Critical t (0.050)	P-Value
Pooled (Equal Variance)	109	-0.659	1.659	0.744
Satterthwaite (Unequal Variance)	85.9	-0.781	1.663	0.781

Pooled SD 11.466

Conclusion with Alpha = 0.050

* Student t (Pooled) Test: Do Not Reject H0, Conclude Site <= Background
* Satterthwaite Test: Do Not Reject H0, Conclude Site <= Background

Test of Equality of Variances

Numerator DF	Denominator DF	F-Test Value	P-Value
78	31	2.296	0.011

Conclusion with Alpha = 0.05

* Two variances are not equal

Table D.2-4b
Background Versus Site Means Comparison - Total Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Cobalt(site)

Background Data: Cobalt(bkd)

Raw Statistics

	Site	Background
Number of Valid Data	32	79
Number of Non-Detect Data	0	23
Number of Detect Data	32	56
Minimum Non-Detect	N/A	0.11
Maximum Non-Detect	N/A	0.84
Percent Non detects	0.00%	29.11%
Minimum Detected	3.9	5.9
Maximum Detected	24	130
Mean of Detected Data	11.33	22.23
Median of Detected Data	11	13.3
SD of Detected Data	4.502	23.94

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.84 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1822
WMW Test U-Stat	0.189
WMW Critical Value (0.050)	1.645
P-Value	0.425

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Table D.2-4b
Background Versus Site Means Comparison - Total Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Copper(site)

Background Data: Copper(bkd)

Raw Statistics

	Site	Background
Number of Valid Data	32	79
Number of Non-Detect Data	0	2
Number of Detect Data	32	77
Minimum Non-Detect	N/A	0.17
Maximum Non-Detect	N/A	0.17
Percent Non detects	0.00%	2.53%
Minimum Detected	2.5	1.6
Maximum Detected	260	38.7
Mean of Detected Data	32.01	12.25
Median of Detected Data	20	9.1
SD of Detected Data	45.71	9.397

Wilcoxon-Mann-Whitney Site vs Background Test

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	2470
WMW Test U-Stat	4.407
WMW Critical Value (0.050)	1.645
P-Value	5.2311E-06

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Table D.2-4b
Background Versus Site Means Comparison - Total Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Iron(site)

Background Data: Iron(bkd)

Raw Statistics

	Site	Background
Number of Valid Observations	32	79
Number of Distinct Observations	29	72
Minimum	5330	7250
Maximum	87000	67700
Mean	32010	26963
Median	31800	25200
SD	17254	11990
SE of Mean	3050	1349

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	2014
WMW Test U-Stat	1.439
WMW Critical Value (0.050)	1.645
P-Value	0.0751

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Table D.2-4b
Background Versus Site Means Comparison - Total Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Lead (mg/kg)(site)

Background Data: Lead (mg/kg)(bkd)

Raw Statistics

	Site	Background
Number of Valid Observations	182	79
Number of Distinct Observations	81	70
Minimum	12	2.1
Maximum	26500	256
Mean	416.4	22.04
Median	190	12
SD	2050	39.85
SE of Mean	152	4.483

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	30645
WMW Test U-Stat	12.14
WMW Critical Value (0.050)	1.645
P-Value	3.232E-34

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

P-Value	0.00293

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Table D.2-4b
Background Versus Site Means Comparison - Total Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Magnesium(site)

Background Data: Magnesium(bkd)

Raw Statistics

	Site	Background
Number of Valid Data	32	79
Number of Non-Detect Data	0	7
Number of Detect Data	32	72
Minimum Non-Detect	N/A	3.8
Maximum Non-Detect	N/A	5
Percent Non detects	0.00%	8.86%
Minimum Detected	1210	139
Maximum Detected	25000	58100
Mean of Detected Data	3844	6394
Median of Detected Data	3185	1270
SD of Detected Data	3994	12925

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 5 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	2278
WMW Test U-Stat	3.161
WMW Critical Value (0.050)	1.645
P-Value	0.00078697

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Table D.2-4b
Background Versus Site Means Comparison - Total Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Manganese(site)

Background Data: Manganese(bkd)

Raw Statistics

	Site	Background
Number of Valid Observations	32	79
Number of Distinct Observations	29	78
Minimum	59	16.7
Maximum	2200	2040
Mean	1003	471.4
Median	1090	359
SD	500.1	467.1
SE of Mean	88.4	52.55

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	2550
WMW Test U-Stat	4.931
WMW Critical Value (0.050)	1.645
P-Value	4.0808E-07

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Table D.2-4b
Background Versus Site Means Comparison - Total Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Mercury(site)

Background Data: Mercury(bkd)

Raw Statistics

	Site	Background
Number of Valid Data	32	79
Number of Non-Detect Data	2	61
Number of Detect Data	30	18
Minimum Non-Detect	0.0077	0.019
Maximum Non-Detect	0.0093	0.06
Percent Non detects	6.25%	77.22%
Minimum Detected	0.0087	0.038
Maximum Detected	0.27	1.2
Mean of Detected Data	0.0672	0.187
Median of Detected Data	0.044	0.125
SD of Detected Data	0.0571	0.259

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.06 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1967
WMW Test U-Stat	1.136
WMW Critical Value (0.050)	1.645
P-Value	0.128

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Table D.2-4b
Background Versus Site Means Comparison - Total Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Nickel(site)

Background Data: Nickel(bkd)

Raw Statistics

	Site	Background
Number of Valid Data	32	79
Number of Non-Detect Data	0	18
Number of Detect Data	32	61
Minimum Non-Detect	N/A	0.21
Maximum Non-Detect	N/A	1.4
Percent Non detects	0.00%	22.78%
Minimum Detected	3.8	4.6
Maximum Detected	22	94.2
Mean of Detected Data	13.93	17.95
Median of Detected Data	14	13.2
SD of Detected Data	4.427	15.68

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 1.4 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	2087
WMW Test U-Stat	1.914
WMW Critical Value (0.050)	1.645
P-Value	0.0278

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Table D.2-4b
Background Versus Site Means Comparison - Total Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Potassium(site)

Background Data: Potassium(bkd)

Raw Statistics

	Site	Background
Number of Valid Observations	32	79
Number of Distinct Observations	25	73
Minimum	548	123
Maximum	2900	10900
Mean	1535	1467
Median	1485	618
SD	548.3	2120
SE of Mean	96.92	238.5

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	2336
WMW Test U-Stat	3.538
WMW Critical Value (0.050)	1.645
P-Value	0.00020137

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

P-Value 0.0052

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

Table D.2-4b
Background Versus Site Means Comparison - Total Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Data Sets with Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Thallium(site)

Background Data: Thallium(bkd)

Raw Statistics

	Site	Background
Number of Valid Data	32	79
Number of Non-Detect Data	0	64
Number of Detect Data	32	15
Minimum Non-Detect	N/A	0.13
Maximum Non-Detect	N/A	0.45
Percent Non detects	0.00%	81.01%
Minimum Detected	0.047	1.3
Maximum Detected	3.5	5
Mean of Detected Data	0.529	2.527
Median of Detected Data	0.42	2.2
SD of Detected Data	0.614	0.932

Wilcoxon-Mann-Whitney Site vs Background Test

All observations <= 0.45 (Max DL) are ranked the same

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1920
WMW Test U-Stat	0.83
WMW Critical Value (0.050)	1.645
P-Value	0.203

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

Table D.2-4b
Background Versus Site Means Comparison - Total Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

t-Test Site vs Background Comparison for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference (S)	0
Selected Null Hypothesis	Site or AOC Mean Less Than or Equal to Background Mean (Form 1)
Alternative Hypothesis	Site or AOC Mean Greater Than the Background Mean

Area of Concern Data: Vanadium(site)

Background Data: Vanadium(bkd)

Raw Statistics

	Site	Background
Number of Valid Observations	32	79
Number of Distinct Observations	21	76
Minimum	11	12.2
Maximum	59	114
Mean	27.02	45.84
Median	24.5	41.4
SD	9.612	20.38
SE of Mean	1.699	2.293

Site vs Background Two-Sample t-Test

H0: Mu of Site - Mu of Background <= 0

Method	DF	t-Test Value	Critical t (0.050)	P-Value
Pooled (Equal Variance)	109	-4.994	1.659	1
Satterthwaite (Unequal Variance)	106.4	-6.595	1.659	1

Pooled SD 17.988

Conclusion with Alpha = 0.050

* Student t (Pooled) Test: Do Not Reject H0, Conclude Site <= Background
* Satterthwaite Test: Do Not Reject H0, Conclude Site <= Background

Test of Equality of Variances

Numerator DF	Denominator DF	F-Test Value	P-Value
78	31	4.496	0

Conclusion with Alpha = 0.05

* Two variances are not equal

Table D.2-4b
Background Versus Site Means Comparison - Total Soil
ProUCL 4.0
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Zinc(site)

Background Data: Zinc(bkd)

Raw Statistics

	Site	Background
Number of Valid Observations	32	79
Number of Distinct Observations	32	76
Minimum	46	4.7
Maximum	1600	598
Mean	505	54.94
Median	420	30.2
SD	326.3	87.15
SE of Mean	57.69	9.805

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	2978
WMW Test U-Stat	7.718
WMW Critical Value (0.050)	1.645
P-Value	5.917E-15

Conclusion with Alpha = 0.05

Reject H0, Conclude Site > Background

P-Value < alpha (0.05)

APPENDIX D.3

ADDITIONAL BACKGROUND COMPARISON

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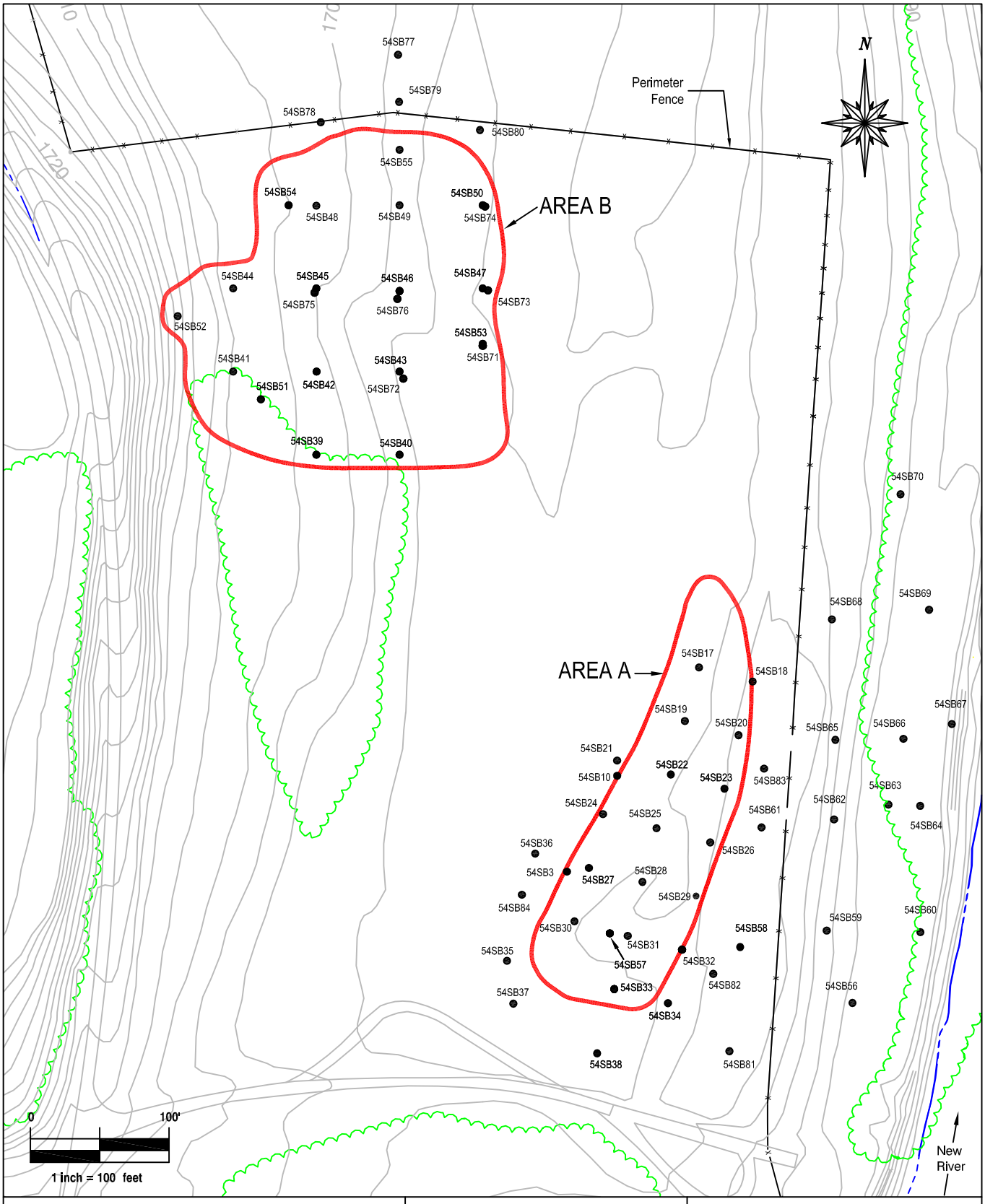
Table D.3-1
Data Summary for Manganese - SWMU 54 Total Soil Data Outside Fence
From SWMU 54 RFI/CMS Report (URS 2008b)
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID	Manganese (mg/kg)
54SB56A	1,520
54SB59A	515
54SB60A	1,300
54SB62A	418
54SB63A DUP AVG	2,500
54SB64A	1,280
54SB65A	268
54SB66A	2,150
54SB67A	1,170
54SB68A	651
54SB69A	1,860
54SB70A	334
54SB56B	342
54SB56C	344
54SB59B	224
54SB59C DUP AVG	376
54SB60B	1,680
54SB60C	1,350
54SB62B DUP AVG	372
54SB62C	451
54SB63B	403
54SB63C	527
54SB64B	1,350
54SB64C	827
54SB65B	360
54SB65C	473
54SB66B	911
54SB66C	900
54SB67B	3,250
54SB67C	3,710
54SB68B	424
54SB68C	629
54SB69B DUP AVG	904
54SB69C	936
54SB70B	387
54SB70C	226

Notes:
See attached Figure 3-1 from SWMU 54 RFI/CMS Report (URS 2008b)
mg/kg = milligram per kilogram



Legend

- SWMU Boundary
- Soil Boring Location

FIGURE 3-1

RFI Sample Soil Locations

Date: July 2007	URS Project #: 21355035
Prepared by: DBC	Approved by: JOS
Scale: 1 inch = 100 feet	File Name: Fig.3-1 RFILocs

SWMU 54

RCRA Facility Investigation
Radford Army Ammunition Plant
Radford, Virginia

URS Group, Inc.
5540 Falmouth Street
Suite 201
Richmond, Virginia 23230

Table D.3-2
Goodness of Fit Test - Manganese - Site Data Total Soil and SWMU 54 Outside Fence Data Total Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Goodness-of-Fit Test Statistics for Full Data Sets without Non-Detects

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	0.95

Manganese (Site data - Total Soil)

Raw Statistics

Number of Valid Observations	32
Number of Distinct Observations	29
Minimum	59
Maximum	2200
Mean of Raw Data	1003
Standard Deviation of Raw Data	500.1
Kstar	2.38
Mean of Log Transformed Data	6.706
Standard Deviation of Log Transformed Data	0.783

Normal Distribution Test Results

Correlation Coefficient R	0.988
Shapiro Wilk Test Statistic	0.974
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.108
Lilliefors Critical (0.95) Value	0.157

Data appear Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.95
A-D Test Statistic	1.193
A-D Critical (0.95) Value	0.755
K-S Test Statistic	0.167
K-S Critical(0.95) Value	0.157

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.905
Shapiro Wilk Test Statistic	0.829
Shapiro Wilk Critical (0.95) Value	0.93
Lilliefors Test Statistic	0.196
Lilliefors Critical (0.95) Value	0.157

Data not Lognormal at (0.05) Significance Level

Table D.3-2
Goodness of Fit Test - Manganese - Site Data Total Soil and SWMU 54 Outside Fence Data Total Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Manganese (SWMU 54 data outside fence - Total Soil)

Raw Statistics

Number of Valid Observations	36
Number of Distinct Observations	35
Minimum	224
Maximum	3710
Mean of Raw Data	981.2
Standard Deviation of Raw Data	843.1
Kstar	1.693
Mean of Log Transformed Data	6.591
Standard Deviation of Log Transformed Data	0.765

Normal Distribution Test Results

Correlation Coefficient R	0.89
Shapiro Wilk Test Statistic	0.794
Shapiro Wilk Critical (0.95) Value	0.935
Lilliefors Test Statistic	0.188
Lilliefors Critical (0.95) Value	0.148

Data not Normal at (0.05) Significance Level

Gamma Distribution Test Results

Correlation Coefficient R	0.985
A-D Test Statistic	1.011
A-D Critical (0.95) Value	0.762
K-S Test Statistic	0.164
K-S Critical(0.95) Value	0.149

Data not Gamma Distributed at (0.05) Significance Level

Lognormal Distribution Test Results

Correlation Coefficient R	0.979
Shapiro Wilk Test Statistic	0.944
Shapiro Wilk Critical (0.95) Value	0.935
Lilliefors Test Statistic	0.136
Lilliefors Critical (0.95) Value	0.148

Data appear Lognormal at (0.05) Significance Level

Table D.3-3
Means Comparison - Manganese Site Data Total Soil and SWMU 54 Outside Fence Data Total Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Wilcoxon-Mann-Whitney Site vs Background Comparison Test for Full Data Sets without NDs

User Selected Options

From File	WorkSheet.wst
Full Precision	OFF
Confidence Coefficient	95%
Substantial Difference	0
Selected Null Hypothesis	Site or AOC Mean/Median Less Than or Equal to Background Mean/Median (Form 1)
Alternative Hypothesis	Site or AOC Mean/Median Greater Than Background Mean/Median

Area of Concern Data: Manganese(study area)

Background Data: Manganese(swmu 54 outside fence)

Raw Statistics

	Site	Background
Number of Valid Observations	32	36
Number of Distinct Observations	29	35
Minimum	59	224
Maximum	2200	3710
Mean	1003	981.2
Median	1090	640
SD	500.1	843.1
SE of Mean	88.4	140.5

Wilcoxon-Mann-Whitney (WMW) Test

H0: Mean/Median of Site or AOC <= Mean/Median of Background

Site Rank Sum W-Stat	1199
WMW Test U-Stat	1.155
WMW Critical Value (0.050)	1.645
P-Value	0.124

Conclusion with Alpha = 0.05

Do Not Reject H0, Conclude Site <= Background

P-Value >= alpha (0.05)

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APPENDIX E

HUMAN HEALTH RISK ASSESSMENT

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APPENDIX E.1

SWMU 13 HHRA RAGS D TABLES

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Table E.1-1
Selection of Exposure Pathways
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Current	Surface Soil	Surface Soil	Surface Soil	Maintenance Worker	Adult	Ingestion	Quant	Receptor could ingest surface soil from the site while conducting routine maintenance activities (i.e., mowing lawns).
						Dermal Absorption	Quant	Receptor could come into contact with surface soil from the site while conducting routine maintenance activities (i.e., mowing lawns).
				Adolescent Trespasser	Adolescent	Ingestion	Quant	Receptor could contact surface soil while trespassing on site.
						Dermal Absorption	Quant	Receptor could come into contact with surface soil while trespassing on site.
		Air	Ambient Air Above Surface Soil (Particulates)[1]	Maintenance Worker	Adult	Inhalation	Quant	Receptor could inhale particulates from ambient air above the surface soil.
				Adolescent Trespasser	Adolescent	Inhalation	Quant	Receptor could inhale particulates from ambient air above the surface soil.
	Subsurface Soil	Subsurface Soil	Subsurface Soil	Maintenance Worker	Adult	Ingestion	None	Receptor is not likely to ingest subsurface soil from the site since maintenance does not include excavation.
						Dermal Absorption	None	Receptor is not likely to come in contact with subsurface soil from the site since maintenance does not include excavation.
				Adolescent Trespasser	Adolescent	Ingestion	None	Receptor is unlikely to ingest subsurface soil while trespassing on site.
						Dermal Absorption	None	Receptor is unlikely come into contact with subsurface soil while trespassing on site.
		Air	Ambient Air Above Subsurface Soil (Particulates)[1]	Maintenance Worker	Adult	Inhalation	None	Receptor is not likely to inhale particulates from ambient air above the subsurface soil since maintenance activities do not include excavation.
				Adolescent Trespasser	Adolescent	Inhalation	None	Receptor is not likely to ingest subsurface soil from the site.
Future	Surface Soil	Surface Soil	Surface Soil	Maintenance Worker	Adult	Ingestion	Quant	Receptor could ingest surface soil from the site while conducting routine maintenance activities (i.e., mowing lawns).
						Dermal Absorption	Quant	Receptor could come into contact with surface soil from the site while conducting routine maintenance activities (i.e., mowing lawns).
				Adolescent Trespasser	Adolescent	Ingestion	Quant	Receptor could contact surface soil while trespassing on site.
						Dermal Absorption	Quant	Receptor could come into contact with surface soil while trespassing on site.
				Commerical/Industrial Worker	Adult	Ingestion	Quant	Receptor could ingest surface soil while working on site.
						Dermal Absorption	Quant	Receptor could contact surface soil while working on site.
				Construction Worker	Adult	Ingestion	Quant	Receptor could ingest surface soil from the site during construction activities.
						Dermal Absorption	Quant	Receptor could come into contact with surface soil from the site during construction activities.
				Resident	Child	Ingestion	Quant	Receptor could ingest surface soil while living on site.
						Dermal Absorption	Quant	Receptor could come into contact with surface soil while living on site.
					Adult	Ingestion	Quant	Receptor could ingest surface soil while living on site.
						Dermal Absorption	Quant	Receptor could come into contact with surface soil while living on site.
					Child/Adult	Ingestion	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to surface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
						Dermal Absorption	Quant	
		Air	Ambient Air Above Surface Soil (Particulates)[1]	Maintenance Worker	Adult	Inhalation	Quant	Receptor could inhale particulates from ambient air above the surface soil.
				Adolescent Trespasser	Adolescent	Inhalation	Quant	Receptor could inhale particulates from ambient air above the surface soil.
				Commerical/Industrial Worker	Adult	Inhalation	Quant	Receptor could inhale particulates from ambient air above the surface soil while working on site.
				Construction Worker	Adult	Inhalation	Quant	Receptor could inhale particulates from ambient air above the surface soil.
				Resident	Child	Inhalation	Quant	Receptor could inhale particulates from ambient air above the surface soil while living on site.
					Adult	Inhalation	Quant	Receptor could inhale particulates from ambient air above the surface soil while living on site.
					Child/Adult	Inhalation	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to surface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.

Table E.1-1
Selection of Exposure Pathways
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future Cont.	Surface Soil Cont.	Air Cont.	Upward Migration of Vapors from Soil (Indoors)[1]	Maintenance Worker	Adult	Inhalation	None	Receptor is assumed to be outdoors.
				Adolescent Trespasser	Adolescent	Inhalation	None	Receptor is assumed to be outdoors.
				Commercial/Industrial Worker	Adult	Inhalation	None	Receptor is unlikely to inhale VOCs from soil via vapor intrusion into building.
				Construction Worker	Adult	Inhalation	None	Receptor is assumed to be outdoors.
				Resident	Adult	Inhalation	None	Receptor is not likely to inhale VOCs from soil via vapor intrusion into residence.
					Child	Inhalation	None	Receptor is not likely to inhale VOCs from soil via vapor intrusion into residence.
					Child/Adult	Inhalation	None	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to surface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
	Subsurface Soil	Subsurface Soil	Subsurface Soil	Maintenance Worker	Adult	Ingestion	Quant	Receptor could ingest subsurface soil when mixed with surface soil from construction activities while conducting routine maintenance activities.
						Dermal Absorption	Quant	Receptor could come in contact with subsurface soil when mixed with surface soil from construction activities while conducting routine maintenance activities.
				Adolescent Trespasser	Adolescent	Ingestion	Quant	Receptor could ingest subsurface soil when mixed with surface soil from construction activities while trespassing.
						Dermal Absorption	Quant	Receptor could come in contact with subsurface soil when mixed with surface soil from construction activities while trespassing.
				Commerical/Industrial Worker	Adult	Ingestion	Quant	Receptor could ingest subsurface soil when mixed with surface soil from construction of a commercial/industrial facility.
						Dermal Absorption	Quant	Receptor could contact subsurface soil when mixed with surface soil from construction of a commercial/industrial facility.
				Construction Worker	Adult	Ingestion	Quant	Receptor could ingest subsurface soil from the site while during construction activities.
						Dermal Absorption	Quant	Receptor could come into contact with subsurface soil from the site during construction activities.
				Resident	Child	Ingestion	Quant	Receptor could ingest subsurface soil when mixed with surface soil from construction of a residence.
						Dermal Absorption	Quant	Receptor could come in contact with subsurface soil when mixed with surface soil from construction of a residence.
					Adult	Ingestion	Quant	Receptor could ingest subsurface soil when mixed with surface soil from construction of a residence.
						Dermal Absorption	Quant	Receptor could come in contact with subsurface soil when mixed with surface soil from construction of a residence.
					Child/Adult	Ingestion	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to subsurface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
						Dermal Absorption	Quant	
		Air	Ambient Air Above Subsurface Soil (Particulates)[1]	Maintenance Worker	Adult	Inhalation	Quant	Receptor could inhale particulates from ambient air above the subsurface soil when mixed with surface soil from construction activities while conducting routine maintenance activities.
				Adolescent Trespasser	Adolescent	Inhalation	Quant	Receptor could inhale particulates from ambient air above the subsurface soil when mixed with surface soil from construction activities while trespassing.
				Commerical/Industrial Worker	Adult	Inhalation	Quant	Receptor could inhale particulates from ambient air above the subsurface soil when mixed with surface soil from construction of a commercial/industrial facility.
				Construction Worker	Adult	Inhalation	Quant	Receptor could inhale particulates from ambient air above the subsurface soil during construction activities.

Table E.1-1
Selection of Exposure Pathways
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe	Medium	Exposure Medium	Exposure Point	Receptor Population	Receptor Age	Exposure Route	Type of Analysis	Rationale for Selection or Exclusion of Exposure Pathway
Future Cont.	Subsurface Soil Cont.	Air Cont.	Ambient Air Above Subsurface Soil (Particulates)[1] Cont.	Resident	Child	Inhalation	Quant	Receptor could inhale particulates from ambient air above the subsurface soil when mixed with surface soil from construction of a residence.
					Adult	Inhalation	Quant	Receptor could inhale particulates from ambient air above the subsurface soil when mixed with surface soil from constuction of a residence.
					Child/Adult	Inhalation	Quant	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to subsurface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.
			Upward Migration of Vapors from Soil (Indoors)[1]	Maintenance Worker	Adult	Inhalation	None	Receptor is assumed to be outdoors.
				Adolescent Trespasser	Adolescent	Inhalation	None	Receptor is assumed to be outdoors.
				Commercial/Industrial Worker	Adult	Inhalation	None	Receptor is not likely to inhale VOCs from soil via vapor intrusion into building.
				Construction Worker	Adult	Inhalation	None	Receptor is assumed to be outdoors.
				Resident	Adult	Inhalation	None	Receptor is not likely to inhale VOCs from soil via vapor intrusion into residence.
					Child	Inhalation	None	Receptor is not likely to inhale VOCs from soil via vapor intrusion into residence.
					Child/Adult	Inhalation	None	The cancer risk estimates for the adult resident (24 years) and child resident (6 years) are added together (30 years) to address lifetime exposure to subsurface soil. The non-cancer hazard evaluations are treated separately for child and adult resident.

Notes:
[1] VOCs are not chemicals of interest for the site; therefore, the vapors pathway is not assessed.

Table E.1-2.1
COPC Determination - Surface Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening Toxicity Value	Key	Potential ARAR/TBC Value	Key	Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
Surface Soil		**TAL Metals**														
	7429-90-5	Aluminum	10,000	35,000	mg/kg	13SB21A	15/15	1.83 - 2	35,000	7,700	n	99,000	nm	IND	Y	**ARES**
	7440-36-0	Antimony	0.069	2.9	mg/kg	13SB21A	14/15	0.026 - 0.0518	2.9	3.1	n	41	n	IND	N	BSL
	7440-38-2	Arsenic	0.98	5.6	mg/kg	13SB19A	15/15	0.0232 - 0.026	5.6	0.39	c*	1.6	c	IND	Y	***ARES/IND***
	7440-39-3	Barium	87	290	mg/kg	13SB19A	15/15	0.106 - 0.33	290	1,500	n	19,000	nm	IND	N	BSL
	7440-41-7	Beryllium	0.66	1.15	mg/kg	13SB9A DUP AVG	5/15	0.0333 - 0.167	1.15	16	n	200	n	IND	N	BSL
	7440-43-9	Cadmium	0.63	2.6	mg/kg	13SB19A	14/15	0.182 - 0.45	2.6	7	n	81	n	IND	N	BSL
	7440-70-2	Calcium	1,100	110,000	mg/kg	13SB14A	15/15	9.8 - 980	110,000	--	--	1,100,000	--	RDA	N	BSL
	7440-47-3	Chromium	18	39	mg/kg	13SB21A	15/15	0.8 - 0.912	39	280	c	1,400	c	IND	N	BSL
	7440-48-4	Cobalt	7	19	mg/kg	13SB21A	15/15	0.208 - 0.53	19	2.3	n	30	n	IND	Y	**ARES**
	7440-50-8	Copper	13	260	mg/kg	13SB18A	15/15	0.027 - 0.368	260	310	n	4,100	n	IND	N	BSL
	7439-89-6	Iron	16,000	78,000	mg/kg	13SB19A	15/15	0.98 - 98	78,000	5,500	n	72,000	nm	IND	Y	***ARES/IND***
	7439-92-1	Lead	65	8,620	mg/kg	13SB8A	92/92	0.047 - 21.8	8,620	400	n	800	n	IND	Y	***ARES/IND***
	7439-95-4	Magnesium	2,200	25,000	mg/kg	13SB14A	15/15	2.8 - 3.21	25,000	--	--	160,000	--	RDA	N	BSL
	7439-96-5	Manganese	380	2,200	mg/kg	13SB19A	15/15	0.18 - 1.32	2,200	180	n	2,300	n	IND	Y	**ARES**
	7439-97-6	Mercury[1]	0.02	0.14	mg/kg	13SB21A	15/15	0.0077 - 0.0093	0.14	2.3	n	31	n	IND	N	BSL
	7440-02-0	Nickel	9.5	22	mg/kg	13SB21A	15/15	0.035 - 0.0356	22	160	n	2,000	n	IND	N	BSL
	7440-09-7	Potassium	1,100	2,900	mg/kg	13SB14A	15/15	5 - 14	2,900	--	--	2,600,000	--	RDA	N	BSL
	7782-49-2	Selenium	0.165	0.885	mg/kg	13SB9A DUP AVG	15/15	0.028 - 0.0502	0.885	39	n	510	n	IND	N	BSL
	7440-22-4	Silver	0.04	0.16	mg/kg	13SB19A	15/15	0.0044 - 0.0093	0.16	39	n	510	n	IND	N	BSL
	7440-23-5	Sodium	35	100	mg/kg	13SB14A	15/15	18 - 18.1	100	--	--	630,000	--	RDA	N	BSL
	7440-28-0	Thallium	0.16	3.5	mg/kg	13SB19A	15/15	0.0068 - 0.027	3.5	0.51	n	6.6	n	IND	Y	**ARES**
	7440-62-2	Vanadium	21	59	mg/kg	13SB21A	15/15	0.032 - 0.207	59	55	n	720	n	IND	Y	**ARES**
	7440-66-6	Zinc	260	1,600	mg/kg	13SB19A	15/15	0.49 - 12.9	1,600	2,300	n	31,000	nm	IND	N	BSL
		TCL VOCs														
	120-82-1	1,2,4-Trichlorobenzene	9.6E-04	9.6E-04	mg/kg	13SB10A	1/5	0.000492 - 0.000574	9.6E-04	8.7E+00	n	4.0E+01	ns	IND	N	BSL
	78-93-3	2-Butanone	3.0E-02	4.5E-02	mg/kg	13SB11A	5/5	0.006 - 0.007	4.5E-02	2.8E+03	ns	1.9E+04	nms	IND	N	BSL
	67-64-1	Acetone	1.2E-01	3.2E-01	mg/kg	13SB10A	5/5	0.006 - 0.007	3.2E-01	6.1E+03	n	6.1E+04	nms	IND	N	BSL
	71-43-2	Benzene	9.1E-04	9.1E-04	mg/kg	13SB11A	1/5	0.000632 - 0.000738	9.1E-04	1.1E+00	c*	5.6E+00	c*	IND	N	BSL
	75-09-2	Methylene chloride	4.1E-03	1.1E-02	mg/kg	13SB10A	5/5	0.00337 - 0.00393	1.1E-02	1.1E+01	c	5.4E+01	c	IND	N	BSL
	108-88-3	Toluene	6.6E-04	3.5E-03	mg/kg	13SB10A	4/5	0.000557 - 0.00065	3.5E-03	5.0E+02	ns	4.6E+03	ns	IND	N	BSL
	79-01-6	Trichloroethene	9.6E-03	9.6E-03	mg/kg	13SB11A	1/5	0.000812 - 0.000948	9.6E-03	2.8E+00	c	1.4E+01	c	IND	N	BSL
		TCL SVOCs														
	92-52-4	1,1'-Biphenyl	1.6E-03	2.0E-03	mg/kg	13SB16A	3/15	0.00095 - 0.00344	2.0E-03	3.9E+02	ns	5.1E+03	ns	IND	N	BSL
	120-83-2	2,4-Dichlorophenol	6.8E-03	6.8E-03	mg/kg	13SB13A	1/15	0.0023 - 0.00493	6.8E-03	1.8E+01	n	1.8E+02	n	IND	N	BSL
	121-14-2	2,4-Dinitrotoluene	6.9E-03	3.8E+00	mg/kg	13SB15A DUP AVG	6/15	0.00378 - 0.09	3.8E+00	1.2E+01	n	1.2E+02	n	IND	N	BSL
	606-20-2	2,6-Dinitrotoluene	2.7E-02	3.0E-01	mg/kg	13SB15A DUP AVG	2/15	0.0024 - 0.0388	3.0E-01	6.1E+00	n	6.2E+01	n	IND	N	BSL
	91-57-6	2-Methylnaphthalene	1.1E-03	2.2E-02	mg/kg	13SB8A	10/15	0.00079 - 0.00384	2.2E-02	3.1E+01	n	4.1E+02	ns	IND	N	BSL
	59-50-7	4-Chloro-3-Methylphenol[2]	9.0E-03	1.9E-02	mg/kg	13SB7A	4/15	0.0022 - 0.00729	1.9E-02	3.1E+05	n	3.1E+06	n	IND	N	BSL
	83-32-9	Acenaphthene	3.1E-03	1.9E-02	mg/kg	13SB8A	8/15	0.0017 - 0.00241	1.9E-02	3.4E+02	n	3.3E+03	n	IND	N	BSL
	208-96-8	Acenaphthylene[3]	1.5E-03	1.8E-02	mg/kg	13SB18A	12/15	0.0011 - 0.0021	1.8E-02	1.7E+02	n	1.7E+03	n	IND	N	BSL
	98-86-2	Acetophenone	3.5E-03	3.9E-03	mg/kg	13SB20A	4/15	0.00228 - 0.0041	3.9E-03	7.8E+02	ns	1.0E+04	nms	IND	N	BSL
	120-12-7	Anthracene	6.5E-03	3.7E-02	mg/kg	13SB8A	10/15	0.0027 - 0.00647	3.7E-02	1.7E+03	n	1.7E+04	nm	IND	N	BSL
	56-55-3	Benzo(a)anthracene	2.8E-03	1.7E-01	mg/kg	13SB9A DUP AVG	14/15	0.001 - 0.0186	1.7E-01	1.5E-01	c	2.1E+00	c	IND	Y	**ARES**
	50-32-8	Benzo(a)pyrene	2.5E-03	1.3E-01	mg/kg	13SB9A DUP AVG	15/15	0.0012 - 0.00799	1.3E-01	1.5E-02	c	2.1E-01	c	IND	Y	**ARES**
	205-99-2	Benzo(b)fluoranthene	3.5E-03	2.1E-01	mg/kg	13SB9A DUP AVG	15/15	0.001 - 0.0137	2.1E-01	1.5E-01	c	2.1E+00	c	IND	Y	**ARES**
	191-24-2	Benzo(g,h,i)perylene[3]	2.5E-03	8.3E-02	mg/kg	13SB20A	15/15	0.00095 - 0.0122	8.3E-02	1.7E+02	n	1.7E+03	n	IND	N	BSL
	207-08-9	Benzo(k)fluoranthene	2.1E-03	8.9E-02	mg/kg	13SB9A DUP AVG	13/15	0.0014 - 0.0188	8.9E-02	1.5E+00	c	2.1E+01	c	IND	N	BSL
	117-81-7	Bis(2-ethylhexyl)phthalate	1.5E-02	4.5E-01	mg/kg	13SB10A	15/15	0.0021 - 0.0029	4.5E-01	3.5E+01	c*	1.2E+02	c*	IND	N	BSL
	85-68-7	Butylbenzylphthalate	3.9E-03	3.8E-02	mg/kg	13SB10A	13/15	0.0011 - 0.00627	3.8E-02	2.6E+02	c*	9.1E+02	c	IND	N	BSL
	86-74-8	Carbazole	2.7E-03	2.0E-02	mg/kg	13SB9A DUP AVG	10/15	0.00053 - 0.00854	2.0E-02	--	--	--	--	--	Y	NSV
	218-01-9	Chrysene	3.0E-03	1.9E-01	mg/kg	13SB9A DUP AVG	15/15	0.00077 - 0.0143	1.9E-01	1.5E+01	c	2.1E+02	c	IND	N	BSL
	84-74-2	Di-n-butylphthalate	6.2E-02	6.2E+00	mg/kg	13SB15A DUP AVG	15/15	0.0025 - 0.053	6.2E+00	6.1E+02	n	6.2E+03	n	IND	N	BSL
	53-70-3	Dibenz(a,h)anthracene	8.2E-03	3.5E-02	mg/kg	13SB20A	8/15	0.0039 - 0.00826	3.5E-02	1.5E-02	c	2.1E-01	c	IND	Y	**ARES**
	132-64-9	Dibenzofuran	2.2E-03	1.3E-02	mg/kg	13SB8A	6/15	0.0016 - 0.00442	1.3E-02	--	--	--	--	--	Y	NSV
	84-66-2	Diethylphthalate	1.2E-03	1.7E+00	mg/kg	13SB15A DUP AVG	15/15	0.00039 - 0.0083	1.7E+00	4.9E+03	n	4.9E+04	nm	IND	N	BSL
	131-11-3	Dimethylphthalate	1.0E-02	5.0E-01	mg/kg	13SB13A	4/15	0.00082 - 0.00463	5.0E-01	--	--	--	--	--	Y	NSV
	206-44-0	Fluoranthene	3.9E-03	3.7E-01	mg/kg	13SB8A	15/15	0.0016 - 0.00329	3.7E-01	2.3E+02	n	2.2E+03	n	IND	N	BSL
	86-73-7	Fluorene	2.5E-03	2.0E-02	mg/kg	13SB8A	9/15	0.0017 - 0.0024	2.0E-02	2.3E+02	n	2.2E+03	n	IND	N	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	3.0E-03	7.4E-02	mg/kg	13SB20A	14/15	0.0024 - 0.00549	7.4E-02	1.5E-01	c	2.1E+00	c	IND	N	BSL
	78-59-1	Isophorone	2.5E-03	4.9E-03	mg/kg	13SB19A	9/15	0.00089 - 0.00242	4.9E-03	5.1E+02	c*	1.8E+03	c*	IND	N	BSL
	86-30-6	N-Nitrosodiphenylamine	1.7E-02	6.1E-01	mg/kg	13SB15A DUP AVG	11/15	0.00078 - 0.016	6.1E-01	9.9E+01	c	3.5E+02	c	IND	N	BSL
	91-20-3	Naphthalene	3.1E-03	1.0E-02	mg/kg	13SB8A	6/15	0.002 - 0.00385	1.0E-02	3.9E+00	c*	2.0E+01	c*	IND	N	BSL
	85-01-8	Phenanthrene[3]	4.0E-03	1.7E-01	mg/kg	13SB10A	13/15	0.0024 - 0.0033	1.7E-01	1.7E+02	n	1.7E+03	n	IND	N	BSL
	129-00-0	Pyrene	3.0E-03	2.6E-01	mg/kg	13SB8A	15/15	0.00059 - 0.00207	2.6E-01	1.7E+02	n	1.7E+03	n	IND	N	BSL

Table E.1-2.1
COPC Determination - Surface Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening Toxicity Value	Key	Potential ARAR/TBC Value	Key	Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
		Explosives														
	99-35-4	1,3,5-Trinitrobenzene	2.0E-01	2.0E-01	mg/kg	13SB15A DUP AVG	1/15	0.074 - 0.14	2.0E-01	2.2E+02	n	2.7E+03	n	IND	N	BSL
	118-96-7	2,4,6-Trinitrotoluene [4]	2.3E-01	3.0E+00	mg/kg	13SB13A	4/15	0.15 - 0.167	3.0E+00	3.6E+00	n	4.2E+01	n	IND	N	BSL
	121-14-2	2,4-Dinitrotoluene	1.7E-01	1.7E-01	mg/kg	13SB13A	1/15	0.1 - 0.142	1.7E-01	1.2E+01	n	1.2E+02	n	IND	N	BSL
	606-20-2	2,6-Dinitrotoluene	3.9E-01	3.9E-01	mg/kg	13SB15A DUP AVG	1/15	0.2 - 0.25	3.9E-01	6.1E+00	n	6.2E+01	n	IND	N	BSL
	25321-14-6	Dinitrotoluene Mixture, 2,4/2,6	3.7E-01	5.9E-01	mg/kg	13SB15A DUP AVG	2/16	--	5.9E-01	7.1E-01	c	2.5E+00	c	IND	N	BSL
	2691-41-0	HMX	1.4E-01	7.2E-01	mg/kg	13SB13A	2/15	0.066 - 0.229	7.2E-01	3.8E+02	n	4.9E+03	n	IND	N	BSL
		Nitroglycerin/PETN														
	55-63-0	Nitroglycerin	4.5E-01	2.1E+00	mg/kg	13SB11A	2/15	0.195 - 0.39	2.1E+00	6.1E-01	n	6.2E+00	n	IND	Y	**ARES**
		Cyanide														
	57-12-5	Cyanide	7.0E-02	3.1E-01	mg/kg	13SB9A DUP AVG	5/5	0.0356 - 0.0356	3.1E-01	1.6E+02	n	2.0E+03	n	IND	N	BSL
		Dioxin/Furans														
	35822-39-4	1,2,3,4,6,7,8-HpCDD	4.5E-05	4.5E-05	mg/kg	13SB9A DUP AVG	1/1	0.000000474 - 0.000000474	4.5E-05	--	--	--	--	--	Y	NSV
	67562-39-4	1,2,3,4,6,7,8-HpCDF	3.6E-06	3.6E-06	mg/kg	13SB9A DUP AVG	1/1	0.000000549 - 0.000000549	3.6E-06	--	--	--	--	--	Y	NSV
	55673-89-7	1,2,3,4,7,8,9-HpCDF	3.5E-07	3.5E-07	mg/kg	13SB9A DUP AVG	1/1	0.000000489 - 0.000000489	3.5E-07	--	--	--	--	--	Y	NSV
	39227-28-6	1,2,3,4,7,8-HxCDD	6.1E-07	6.1E-07	mg/kg	13SB9A DUP AVG	1/1	0.000000301 - 0.000000301	6.1E-07	--	--	--	--	--	Y	NSV
	70648-26-9	1,2,3,4,7,8-HxCDF	4.8E-07	4.8E-07	mg/kg	13SB9A DUP AVG	1/1	0.000000257 - 0.000000257	4.8E-07	--	--	--	--	--	Y	NSV
	57653-85-7	1,2,3,6,7,8-HxCDD	1.6E-06	1.6E-06	mg/kg	13SB9A DUP AVG	1/1	0.000000512 - 0.000000512	1.6E-06	--	--	--	--	--	Y	NSV
	57117-44-9	1,2,3,6,7,8-HxCDF	3.9E-07	3.9E-07	mg/kg	13SB9A DUP AVG	1/1	0.00000013 - 0.00000013	3.9E-07	--	--	--	--	--	Y	NSV
	19408-74-3	1,2,3,7,8,9-HxCDD	1.9E-06	1.9E-06	mg/kg	13SB9A DUP AVG	1/1	0.000000628 - 0.000000628	1.9E-06	--	--	--	--	--	Y	NSV
	40321-76-4	1,2,3,7,8-PeCDD	4.2E-07	4.2E-07	mg/kg	13SB9A DUP AVG	1/1	0.000000373 - 0.000000373	4.2E-07	--	--	--	--	--	Y	NSV
	57117-41-6	1,2,3,7,8-PeCDF	2.8E-07	2.8E-07	mg/kg	13SB9A DUP AVG	1/1	0.000000217 - 0.000000217	2.8E-07	1.2E-04	c	4.4E-04	c	IND	N	BSL
	60851-34-5	2,3,4,6,7,8-HxCDF	3.7E-07	3.7E-07	mg/kg	13SB9A DUP AVG	1/1	0.000000507 - 0.000000507	3.7E-07	--	--	--	--	--	Y	NSV
	57117-31-4	2,3,4,7,8-PeCDF	3.5E-07	3.5E-07	mg/kg	13SB9A DUP AVG	1/1	0.000000261 - 0.000000261	3.5E-07	1.2E-05	c	4.4E-05	c	IND	N	BSL
	51207-31-9	2,3,7,8-TCDF	4.9E-07	4.9E-07	mg/kg	13SB9A DUP AVG	1/1	0.000000132 - 0.000000132	4.9E-07	3.7E-05	c	1.3E-04	c	IND	N	BSL
	3268-87-9	OCDD	2.2E-03	2.2E-03	mg/kg	13SB9A DUP AVG	1/1	0.00000126 - 0.00000126	2.2E-03	1.5E-02	c	6.1E-02	c	IND	N	BSL
	39001-02-0	OCDF	7.8E-06	7.8E-06	mg/kg	13SB9A DUP AVG	1/1	0.000000796 - 0.000000796	7.8E-06	1.2E-02	c	4.4E-02	c	IND	N	BSL
	37871-00-4	Total HpCDDs	9.5E-05	9.5E-05	mg/kg	13SB9A DUP AVG	1/1	0.000000474 - 0.000000474	9.5E-05	4.5E-04	c	1.8E-03	c	IND	N	BSL
	38998-75-3	Total HpCDFs	8.9E-06	8.9E-06	mg/kg	13SB9A DUP AVG	1/1	0.000000489 - 0.000000489	8.9E-06	3.7E-04	c	1.3E-03	c	IND	N	BSL
	34465-46-8	Total HxCDDs	1.6E-05	1.6E-05	mg/kg	13SB9A DUP AVG	1/1	0.000000301 - 0.000000301	1.6E-05	4.5E-05	c	1.8E-04	c	IND	N	BSL
	55684-94-1	Total HxCDFs	5.2E-06	5.2E-06	mg/kg	13SB9A DUP AVG	1/1	0.00000013 - 0.00000013	5.2E-06	3.7E-05	c	1.3E-04	c	IND	N	BSL
	36088-22-9	Total PeCDDs	3.2E-06	3.2E-06	mg/kg	13SB9A DUP AVG	1/1	0.000000373 - 0.000000373	3.2E-06	4.5E-06	c	1.8E-05	c	IND	N	BSL
	30402-15-4	Total PeCDFs	2.9E-06	2.9E-06	mg/kg	13SB9A DUP AVG	1/1	0.000000217 - 0.000000217	2.9E-06	--	--	--	--	--	Y	NSV
	41903-57-5	Total TCDDs	6.1E-07	6.1E-07	mg/kg	13SB9A DUP AVG	1/1	0.000000132 - 0.000000132	6.1E-07	--	--	--	--	--	Y	NSV
	55722-27-5	Total TCDFs	4.1E-06	4.1E-06	mg/kg	13SB9A DUP AVG	1/1	0.000000172 - 0.000000172	4.1E-06	--	--	--	--	--	Y	NSV
	--	2,3,7,8-TCDD TEQ [5]	2.3E-06	2.3E-06	mg/kg	13SB9A DUP AVG	1/1	--	2.1E-06	4.5E-06	c*	1.8E-05	c*	--	N	BSL

Notes:

COPC = Chemical of Potential Concern
mg/kg = Milligram Per Kilogram
CAS = Chemical Abstracts Service
TAL = Target Analyte List
TCL = Target Compound List
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PETN = Pentaerythritol Tetranitrate

RSL = Regional Screening Level (RSL) from October 2008 RSL Table
Adjusted RSLs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
-- = No Value Available

Key per October 2008 Regional RSL Table:
c = cancer
n = noncancer
c* = cancer where n SL < 100X c SL
c** = cancer where n SL <10X c SL
m = concentration may exceed ceiling
s = concentration may exceed Csat

ARAR = Applicable, Relevant, and Appropriate Requirement
TBC = To-Be-Considered
IND = Adjusted Industrial RSL
RDA = Recommended Daily Allowance

[1] = Mercuric chloride soil RSL value used
[2] = 3-Methylphenol RSLs used
[3] = Pyrene RSLs used
[4] = Noncarcinogenic Residential RSL value for 2,4,6-Trinitrotoluene was used for screening
[5] = 2,3,7,8-TCDD TEQ based on relative toxicity to 2,3,7,8-TCDD (see Table E.1-2.4)

ARES = Above Residential RSL
ARES/IND = Above Residential RSL/Industrial RSL
BSL = Below Residential/Industrial RSLs
NSV = No Screening Value Available

Table E.1-2.2
COPC Determination - Total Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening Toxicity Value	Key	Potential ARAR/TBC Value	Key	Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
Total Soil		**TAL Metals**														
	7429-90-5	Aluminum	4,250	35,000	mg/kg	13SB21A	32/32	1.83 - 200	35,000	7,700	n	99,000	nm	IND	Y	**ARES**
	7440-36-0	Antimony	0.069	4.7	mg/kg	13SB11B	27/32	0.026 - 0.0518	4.7	3.1	n	41	n	IND	Y	**ARES**
	7440-38-2	Arsenic	0.12	5.6	mg/kg	13SB19A	32/32	0.0232 - 0.026	5.6	0.39	c*	1.6	c	IND	Y	***ARES/IND***
	7440-39-3	Barium	29	290	mg/kg	13SB19A	32/32	0.106 - 0.33	290	1,500	n	19,000	nm	IND	N	BSL
	7440-41-7	Beryllium	0.65	1.3	mg/kg	13SB7C	11/32	0.0333 - 0.167	1.3	16	n	200	n	IND	N	BSL
	7440-43-9	Cadmium	0.51	2.8	mg/kg	13SB21C	30/32	0.182 - 0.45	2.8	7	n	81	n	IND	N	BSL
	7440-70-2	Calcium	1,100	110,000	mg/kg	13SB14A	32/32	9.8 - 980	110,000	--	--	1,100,000	--	RDA	N	BSL
	7440-47-3	Chromium	10	39	mg/kg	13SB11C	32/32	0.8 - 0.912	39	280	c	1,400	c	IND	N	BSL
	7440-48-4	Cobalt	3.9	24	mg/kg	13SB21C	32/32	0.208 - 0.53	24	2.3	n	30	n	IND	Y	**ARES**
	7440-50-8	Copper	2.5	260	mg/kg	13SB18A	32/32	0.027 - 1.84	260	310	n	4,100	n	IND	N	BSL
	7439-89-6	Iron	5,330	87,000	mg/kg	13SB21C	32/32	0.98 - 490	87,000	5,500	n	72,000	nm	IND	Y	***ARES/IND***
	7439-92-1	Lead	12	26,500	mg/kg	13SB11B	183/183	0.0218 - 109	26,500	400	n	800	n	IND	Y	***ARES/IND***
	7439-95-4	Magnesium	1,210	25,000	mg/kg	13SB14A	32/32	2.8 - 3.21	25,000	--	--	160,000	--	RDA	N	BSL
	7439-96-5	Manganese	59	2,200	mg/kg	13SB19A	32/32	0.18 - 6.6	2,200	180	n	2,300	n	IND	Y	**ARES**
	7439-97-6	Mercury [1]	0.0087	0.27	mg/kg	13SB17C	30/32	0.0077 - 0.0093	0.27	2.3	n	31	n	IND	N	BSL
	7440-02-0	Nickel	3.8	22	mg/kg	13SB21A	32/32	0.035 - 0.0356	22	160	n	2,000	n	IND	N	BSL
	7440-09-7	Potassium	548	2,900	mg/kg	13SB14A	32/32	5 - 14	2,900	--	--	2,600,000	--	RDA	N	BSL
	7782-49-2	Selenium	0.043	1.5	mg/kg	13SB11C	32/32	0.028 - 0.0502	1.5	39	n	510	n	IND	N	BSL
	7440-22-4	Silver	0.023	0.45	mg/kg	13SB8B	32/32	0.0044 - 0.0093	0.45	39	n	510	n	IND	N	BSL
	7440-23-5	Sodium	27	100	mg/kg	13SB14A	32/32	18 - 18.1	100	--	--	630,000	--	RDA	N	BSL
	7440-28-0	Thallium	0.047	3.5	mg/kg	13SB19A	32/32	0.0068 - 0.027	3.5	0.51	n	6.6	n	IND	Y	**ARES**
	7440-62-2	Vanadium	11	59	mg/kg	13SB21A	32/32	0.032 - 0.207	59	55	n	720	n	IND	Y	**ARES**
	7440-66-6	Zinc	46	1,600	mg/kg	13SB19A	32/32	0.49 - 12.9	1,600	2,300	n	31,000	nm	IND	N	BSL
		TCL VOCs														
	120-82-1	1,2,4-Trichlorobenzene	9.6E-04	9.6E-04	mg/kg	13SB10A	1/14	0.000451 - 0.000574	9.6E-04	8.7E+00	n	4.0E+01	ns	IND	N	BSL
	78-93-3	2-Butanone	2.4E-02	4.0E-01	mg/kg	13SB9B	14/14	0.0055 - 0.007	4.0E-01	2.8E+03	ns	1.9E+04	nms	IND	N	BSL
	67-64-1	Acetone	3.1E-02	3.2E-01	mg/kg	13SB10A	14/14	0.0055 - 0.007	3.2E-01	6.1E+03	n	6.1E+04	nms	IND	N	BSL
	71-43-2	Benzene	9.1E-04	1.5E-03	mg/kg	13SB11B	3/14	0.00058 - 0.000738	1.5E-03	1.1E+00	c*	5.6E+00	c*	IND	N	BSL
	156-59-2	cis-1,2-Dichloroethene	1.9E-03	4.2E-03	mg/kg	13SB11C	2/14	0.000781 - 0.000994	4.2E-03	7.8E+01	n	1.0E+03	ns	IND	N	BSL
	75-09-2	Methylene chloride	4.1E-03	1.1E-02	mg/kg	13SB10A	14/14	0.00309 - 0.00393	1.1E-02	1.1E+01	c	5.4E+01	c	IND	N	BSL
	108-88-3	Toluene	6.6E-04	3.5E-03	mg/kg	13SB10A	7/14	0.00051 - 0.00065	3.5E-03	5.0E+02	ns	4.6E+03	ns	IND	N	BSL
	79-01-6	Trichloroethene	9.6E-03	5.7E-02	mg/kg	13SB11C	3/14	0.000745 - 0.000948	5.7E-02	2.8E+00	c	1.4E+01	c	IND	N	BSL
		TCL SVOCs														
	92-52-4	1,1'-Biphenyl	1.6E-03	8.8E-03	mg/kg	13SB22C	5/32	0.00095 - 0.00344	8.8E-03	3.9E+02	ns	5.1E+03	ns	IND	N	BSL
	120-83-2	2,4-Dichlorophenol	6.8E-03	6.8E-03	mg/kg	13SB13A	1/32	0.0023 - 0.00493	6.8E-03	1.8E+01	n	1.8E+02	n	IND	N	BSL
	121-14-2	2,4-Dinitrotoluene	6.9E-03	3.8E+00	mg/kg	13SB15A DUP AVG	11/32	0.00347 - 0.09	3.8E+00	1.2E+01	n	1.2E+02	n	IND	N	BSL
	606-20-2	2,6-Dinitrotoluene	1.6E-02	3.0E-01	mg/kg	13SB15A DUP AVG	4/32	0.0024 - 0.0388	3.0E-01	6.1E+00	n	6.2E+01	n	IND	N	BSL
	91-57-6	2-Methylnaphthalene	1.1E-03	2.2E-02	mg/kg	13SB8A	16/32	0.00079 - 0.00384	2.2E-02	3.1E+01	n	4.1E+02	ns	IND	N	BSL
	59-50-7	4-Chloro-3-Methylphenol [2]	8.0E-03	2.4E-02	mg/kg	13SB8B	8/32	0.0022 - 0.00729	2.4E-02	3.1E+05	n	3.1E+06	n	IND	N	BSL
	83-32-9	Acenaphthene	2.5E-03	1.9E-02	mg/kg	13SB8A	12/32	0.0017 - 0.00241	1.9E-02	3.4E+02	n	3.3E+03	n	IND	N	BSL
	208-96-8	Acenaphthylene [3]	1.5E-03	2.1E-02	mg/kg	13SB22C	19/32	0.0011 - 0.0021	2.1E-02	1.7E+02	n	1.7E+03	n	IND	N	BSL
	98-86-2	Acetophenone	3.5E-03	4.5E-03	mg/kg	13SB16C	8/32	0.00209 - 0.0041	4.5E-03	7.8E+02	ns	1.0E+04	nms	IND	N	BSL
	120-12-7	Anthracene	6.5E-03	1.8E-01	mg/kg	13SB22C	15/32	0.0027 - 0.00647	1.8E-01	1.7E+03	n	1.7E+04	nm	IND	N	BSL
	56-55-3	Benzo(a)anthracene	1.8E-03	4.8E-01	mg/kg	13SB22C	25/32	0.001 - 0.0186	4.8E-01	1.5E-01	c	2.1E+00	c	IND	Y	**ARES**
	50-32-8	Benzo(a)pyrene	2.5E-03	2.9E-01	mg/kg	13SB22C	29/32	0.0012 - 0.00799	2.9E-01	1.5E-02	c	2.1E-01	c	IND	Y	***ARES/IND***
	205-99-2	Benzo(b)fluoranthene	3.5E-03	6.3E-01	mg/kg	13SB22C	29/32	0.001 - 0.0137	6.3E-01	1.5E-01	c	2.1E+00	c	IND	Y	**ARES**
	191-24-2	Benzo(g,h,i)perylene [3]	2.5E-03	1.7E-01	mg/kg	13SB22C	27/32	0.00095 - 0.0122	1.7E-01	1.7E+02	n	1.7E+03	n	IND	N	BSL
	207-08-9	Benzo(k)fluoranthene	2.1E-03	1.6E-01	mg/kg	13SB22C	22/32	0.0014 - 0.0188	1.6E-01	1.5E+00	c	2.1E+01	c	IND	N	BSL
	117-81-7	Bis(2-ethylhexyl)phthalate	1.5E-02	5.4E-01	mg/kg	13SB11C	32/32	0.0021 - 0.0029	5.4E-01	3.5E+01	c*	1.2E+02	c*	IND	N	BSL
	85-68-7	Butylbenzylphthalate	3.3E-03	4.0E-02	mg/kg	13SB11C	25/32	0.0011 - 0.00627	4.0E-02	2.6E+02	c*	9.1E+02	c	IND	N	BSL
	86-74-8	Carbazole	2.7E-03	2.0E-02	mg/kg	13SB9A DUP AVG	15/32	0.00053 - 0.00854	2.0E-02	--	--	--	--	--	Y	NSV
	218-01-9	Chrysene	1.3E-03	5.7E-01	mg/kg	13SB22C	29/32	0.00077 - 0.0143	5.7E-01	1.5E+01	c	2.1E+02	c	IND	N	BSL
	84-74-2	Di-n-butylphthalate	3.2E-02	6.2E+00	mg/kg	13SB15A DUP AVG	32/32	0.0025 - 0.053	6.2E+00	6.1E+02	n	6.2E+03	n	IND	N	BSL
	53-70-3	Dibenz(a,h)anthracene	7.1E-03	4.1E-02	mg/kg	13SB22C	14/32	0.0039 - 0.00826	4.1E-02	1.5E-02	c	2.1E-01	c	IND	Y	**ARES**
	132-64-9	Dibenzofuran	2.0E-03	2.4E-02	mg/kg	13SB22C	9/32	0.0016 - 0.00442	2.4E-02	--	--	--	--	--	Y	NSV
	84-66-2	Diethylphthalate	1.2E-03	1.7E+00	mg/kg	13SB15A DUP AVG	32/32	0.00039 - 0.0083	1.7E+00	4.9E+03	n	4.9E+04	nm	IND	N	BSL
	131-11-3	Dimethylphthalate	1.2E-03	5.5E-01	mg/kg	13SB11B	7/32	0.00082 - 0.00463	5.5E-01	--	--	--	--	--	Y	NSV
	206-44-0	Fluoranthene	3.9E-03	3.7E-01	mg/kg	13SB8A	28/32	0.0016 - 0.00329	3.7E-01	2.3E+02	n	2.2E+03	n	IND	N	BSL
	86-73-7	Fluorene	2.5E-03	3.3E-02	mg/kg	13SB22C	13/32	0.0017 - 0.0024	3.3E-02	2.3E+02	n	2.2E+03	n	IND	N	BSL
	193-39-5	Indeno(1,2,3-cd)pyrene	3.0E-03	1.3E-01	mg/kg	13SB22C	27/32	0.0024 - 0.00549	1.3E-01	1.5E-01	c	2.1E+00	c	IND	N	BSL
	78-59-1	Isophorone	2.5E-03	5.1E-03	mg/kg	13SB17C	17/32	0.00089 - 0.00242	5.1E-03	5.1E+02	c*	1.8E+03	c*	IND	N	BSL
	86-30-6	N-Nitrosodiphenylamine	1.6E-02	9.5E-01	mg/kg	13SB11B	18/32	0.00078 - 0.016	9.5E-01	9.9E+01	c	3.5E+02	c	IND	N	BSL
	91-20-3	Naphthalene	2.4E-03	2.2E-02	mg/kg	13SB22C	10/32	0.002 - 0.00385	2.2E-02	3.9E+00	c*	2.0E+01	c*	IND	N	BSL

Table E.1-2.2
COPC Determination - Total Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Exposure point	CAS #	Chemical	Minimum Concentration	Maximum Concentration	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening	Screening Toxicity Value	Key	Potential ARAR/TBC Value	Key	Potential ARAR/TBC Source	COPC Flag (Y/N)	Rationale for Selection or Deletion
	85-01-8	Phenanthrene [3]	3.5E-03	1.7E-01	mg/kg	13SB10A	26/32	0.0024 - 0.0033	1.7E-01	1.7E+02	n	1.7E+03	n	IND	N	BSL
	129-00-0	Pyrene	1.3E-03	2.6E-01	mg/kg	13SB8A	30/32	0.00059 - 0.00207	2.6E-01	1.7E+02	n	1.7E+03	n	IND	N	BSL
		Explosives														
	99-35-4	1,3,5-Trinitrobenzene	2.0E-01	2.0E-01	mg/kg	13SB15A DUP AVG	1/32	0.074 - 0.14	2.0E-01	2.2E+02	n	2.7E+03	n	IND	N	BSL
	118-96-7	2,4,6-Trinitrotoluene [4]	2.3E-01	3.0E+00	mg/kg	13SB13A	5/32	0.15 - 0.167	3.0E+00	3.6E+00	n	4.2E+01	n	IND	N	BSL
	121-14-2	2,4-Dinitrotoluene	1.7E-01	1.7E-01	mg/kg	13SB13A	1/32	0.1 - 0.142	1.7E-01	1.2E+01	n	1.2E+02	n	IND	N	BSL
	606-20-2	2,6-Dinitrotoluene	3.9E-01	3.9E-01	mg/kg	13SB15A DUP AVG	1/32	0.2 - 0.25	3.9E-01	6.1E+00	n	6.2E+01	n	IND	N	BSL
	25321-14-6	Dinitrotoluene Mixture, 2,4/2,6	3.7E-01	5.9E-01	mg/kg	13SB15A DUP AVG	2/32	--	5.9E-01	7.1E-01	c	2.5E+00	c	IND	N	BSL
	2691-41-0	HMX	1.4E-01	7.9E-01	mg/kg	13SB13C	3/32	0.066 - 0.229	7.9E-01	3.8E+02	n	4.9E+03	n	IND	N	BSL
		Nitroglycerin/PETN														
	55-63-0	Nitroglycerin	4.5E-01	2.1E+01	mg/kg	13SB13C	6/32	0.195 - 0.39	2.1E+01	6.1E-01	n	6.2E+00	n	IND	Y	***ARES/IND***
		Cyanide														
	57-12-5	Cyanide	7.0E-02	3.5E-01	mg/kg	13SB11B	11/14	0.0356 - 0.0356	3.5E-01	1.6E+02	n	2.0E+03	n	IND	N	BSL
		Dioxin/Furans														
	35822-39-4	1,2,3,4,6,7,8-HpCDD	4.5E-05	4.5E-05	mg/kg	13SB9A DUP AVG	1/1	0.000000474 - 0.000000474	4.5E-05	--	--	--	--	--	Y	NSV
	67562-39-4	1,2,3,4,6,7,8-HpCDF	3.6E-06	3.6E-06	mg/kg	13SB9A DUP AVG	1/1	0.000000549 - 0.000000549	3.6E-06	--	--	--	--	--	Y	NSV
	55673-89-7	1,2,3,4,7,8,9-HpCDF	3.5E-07	3.5E-07	mg/kg	13SB9A DUP AVG	1/1	0.000000489 - 0.000000489	3.5E-07	--	--	--	--	--	Y	NSV
	39227-28-6	1,2,3,4,7,8-HxCDD	6.1E-07	6.1E-07	mg/kg	13SB9A DUP AVG	1/1	0.000000301 - 0.000000301	6.1E-07	--	--	--	--	--	Y	NSV
	70648-26-9	1,2,3,4,7,8-HxCDF	4.8E-07	4.8E-07	mg/kg	13SB9A DUP AVG	1/1	0.000000257 - 0.000000257	4.8E-07	--	--	--	--	--	Y	NSV
	57653-85-7	1,2,3,6,7,8-HxCDD	1.6E-06	1.6E-06	mg/kg	13SB9A DUP AVG	1/1	0.000000512 - 0.000000512	1.6E-06	--	--	--	--	--	Y	NSV
	57117-44-9	1,2,3,6,7,8-HxCDF	3.9E-07	3.9E-07	mg/kg	13SB9A DUP AVG	1/1	0.00000013 - 0.00000013	3.9E-07	--	--	--	--	--	Y	NSV
	19408-74-3	1,2,3,7,8,9-HxCDD	1.9E-06	1.9E-06	mg/kg	13SB9A DUP AVG	1/1	0.000000628 - 0.000000628	1.9E-06	--	--	--	--	--	Y	NSV
	40321-76-4	1,2,3,7,8-PeCDD	4.2E-07	4.2E-07	mg/kg	13SB9A DUP AVG	1/1	0.000000373 - 0.000000373	4.2E-07	--	--	--	--	--	Y	NSV
	57117-41-6	1,2,3,7,8-PeCDF	2.8E-07	2.8E-07	mg/kg	13SB9A DUP AVG	1/1	0.000000217 - 0.000000217	2.8E-07	1.2E-04	c	4.4E-04	c	IND	N	BSL
	60851-34-5	2,3,4,6,7,8-HxCDF	3.7E-07	3.7E-07	mg/kg	13SB9A DUP AVG	1/1	0.000000507 - 0.000000507	3.7E-07	--	--	--	--	--	Y	NSV
	57117-31-4	2,3,4,7,8-PeCDF	3.5E-07	3.5E-07	mg/kg	13SB9A DUP AVG	1/1	0.000000261 - 0.000000261	3.5E-07	1.2E-05	c	4.4E-05	c	IND	N	BSL
	51207-31-9	2,3,7,8-TCDF	4.9E-07	4.9E-07	mg/kg	13SB9A DUP AVG	1/1	0.000000132 - 0.000000132	4.9E-07	3.7E-05	c	1.3E-04	c	IND	N	BSL
	3268-87-9	OCDD	2.2E-03	2.2E-03	mg/kg	13SB9A DUP AVG	1/1	0.00000126 - 0.00000126	2.2E-03	1.5E-02	c	6.1E-02	c	IND	N	BSL
	39001-02-0	OCDF	7.8E-06	7.8E-06	mg/kg	13SB9A DUP AVG	1/1	0.000000796 - 0.000000796	7.8E-06	1.2E-02	c	4.4E-02	c	IND	N	BSL
	37871-00-4	Total HpCDDs	9.5E-05	9.5E-05	mg/kg	13SB9A DUP AVG	1/1	0.000000474 - 0.000000474	9.5E-05	4.5E-04	c	1.8E-03	c	IND	N	BSL
	38998-75-3	Total HpCDFs	8.9E-06	8.9E-06	mg/kg	13SB9A DUP AVG	1/1	0.000000489 - 0.000000489	8.9E-06	3.7E-04	c	1.3E-03	c	IND	N	BSL
	34465-46-8	Total HxCDDs	1.6E-05	1.6E-05	mg/kg	13SB9A DUP AVG	1/1	0.000000301 - 0.000000301	1.6E-05	4.5E-05	c	1.8E-04	c	IND	N	BSL
	55684-94-1	Total HxCDFs	5.2E-06	5.2E-06	mg/kg	13SB9A DUP AVG	1/1	0.00000013 - 0.00000013	5.2E-06	3.7E-05	c	1.3E-04	c	IND	N	BSL
	36088-22-9	Total PeCDDs	3.2E-06	3.2E-06	mg/kg	13SB9A DUP AVG	1/1	0.000000373 - 0.000000373	3.2E-06	4.5E-06	c	1.8E-05	c	IND	N	BSL
	30402-15-4	Total PeCDFs	2.9E-06	2.9E-06	mg/kg	13SB9A DUP AVG	1/1	0.000000217 - 0.000000217	2.9E-06	--	--	--	--	--	Y	NSV
	41903-57-5	Total TCDDs	6.1E-07	6.1E-07	mg/kg	13SB9A DUP AVG	1/1	0.000000132 - 0.000000132	6.1E-07	--	--	--	--	--	Y	NSV
	55722-27-5	Total TCDFs	4.1E-06	4.1E-06	mg/kg	13SB9A DUP AVG	1/1	0.000000172 - 0.000000172	4.1E-06	--	--	--	--	--	Y	NSV
	--	2,3,7,8-TCDD TEQ [5]	2.3E-06	2.3E-06	mg/kg	13SB9A DUP AVG	1/1	--	2.1E-06	4.5E-06	c*	1.8E-05	c*	IND	N	BSL

Notes:

COPC = Chemical of Potential Concern
mg/kg = Milligram Per Kilogram
CAS = Chemical Abstracts Service
TAL = Target Analyte List
TCL = Target Compound List
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PETN = Pentaerythritol Tetranitrate

RSL = Regional Screening Level (RSL) from October 2008 RSL Table
Adjusted RSLs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
-- = No Value Available

Key per October 2008 Regional RSL Table:
c = cancer
n = noncancer
c* = cancer where n SL < 100X c SL
c** = cancer where n SL <10X c SL
m = concentration may exceed ceiling
s = concentration may exceed Csat

ARAR = Applicable, Relevant, and Appropriate Requirement
TBC = To-Be-Considered
IND = Adjusted Industrial RSL
RDA = Recommended Daily Allowance

[1] = Mercuric chloride soil RSL value used
[2] = 3-Methylphenol RSLs used
[3] = Pyrene RSLs used
[4] = Noncarcinogenic Residential RSL value for 2,4,6-Trinitrotoluene was used
[5] = 2,3,7,8-TCDD TEQ based on relative toxicity to 2,3,7,8-TCDD (see Table E.1-2.4)

ARES = Above Residential RSL
ARES/IND = Above Residential RSL/Industrial RSL
BSL = Below Residential/Industrial RSLs
NSV = No Screening Value Available

Table E.1-2.3
Non-detected Chemicals MDL Screening - Total Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Adjusted Residential RSL	Maximum MDL Exceeds RSL
TAL Metals								
Antimony	7440-43-9	mg/kg	5	32	0.026	0.0518	7	N
Beryllium	7440-41-7	mg/kg	21	32	0.0391	0.061	16	N
Cadmium	7440-43-9	mg/kg	2	32	0.45	0.45	7	N
Mercury [1]	7439-97-6	mg/kg	2	32	0.0077	0.0093	2.3	N
Pesticides/PCBs								
4,4'-DDD	72-54-8	ug/kg	1	1	0.309	0.309	2.0E+03	N
4,4'-DDE	72-55-9	ug/kg	1	1	0.228	0.228	1.4E+03	N
4,4'-DDT	50-29-3	ug/kg	1	1	0.234	0.234	1.7E+03	N
Aldrin	309-00-2	ug/kg	1	1	0.395	0.395	2.9E+01	N
alpha-BHC	319-84-6	ug/kg	1	1	0.394	0.394	7.7E+01	N
alpha-Chlordane [2]	5103-71-9	ug/kg	1	1	0.564	0.564	1.6E+03	N
beta-BHC	319-85-7	ug/kg	1	1	1.47	1.47	2.7E+02	N
delta-BHC [3]	319-86-8	ug/kg	1	1	1.06	1.06	7.7E+01	N
Dieldrin	60-57-1	ug/kg	1	1	0.402	0.402	3.0E+01	N
Endosulfan I	959-98-8	ug/kg	1	1	1.18	1.18	3.7E+04	N
Endosulfan II	33213-65-9	ug/kg	1	1	0.278	0.278	3.7E+04	N
Endosulfan Sulfate [4]	1031-07-8	ug/kg	1	1	0.654	0.654	3.7E+04	N
Endrin	72-20-8	ug/kg	1	1	0.387	0.387	1.8E+03	N
Endrin aldehyde [5]	7421-93-4	ug/kg	1	1	1.44	1.44	1.8E+03	N
Endrin ketone [5]	53494-70-5	ug/kg	1	1	0.358	0.358	1.8E+03	N
gamma-BHC (Lindane)	58-89-9	ug/kg	1	1	0.252	0.252	5.2E+02	N
gamma-Chlordane [2]	5103-74-2	ug/kg	1	1	0.914	0.914	1.6E+03	N
Heptachlor	76-44-8	ug/kg	1	1	0.917	0.917	1.1E+02	N
Heptachlor epoxide	1024-57-3	ug/kg	1	1	0.592	0.592	5.3E+01	N
Methoxychlor	72-43-5	ug/kg	1	1	0.364	0.364	3.1E+04	N
Toxaphene	8001-35-2	ug/kg	1	1	30.3	30.3	4.4E+02	N
Aroclor 1016	12674-11-2	ug/kg	1	1	20.8	20.8	3.9E+02	N
Aroclor 1221	11104-28-2	ug/kg	1	1	2.6	2.6	1.7E+02	N
Aroclor 1232	11141-16-5	ug/kg	1	1	6.5	6.5	1.7E+02	N
Aroclor 1242	53469-21-9	ug/kg	1	1	3.9	3.9	2.2E+02	N
Aroclor 1248	12672-29-6	ug/kg	1	1	6.5	6.5	2.2E+02	N
Aroclor 1254 [6]	11097-69-1	ug/kg	1	1	3.9	3.9	1.1E+02	N
Aroclor 1260	11096-82-5	ug/kg	1	1	9.1	9.1	2.2E+02	N
Herbicides								
2,4,5-T	93-76-5	ug/kg	1	1	2.6	2.6	6.1E+04	N
2,4,5-TP (Silvex)	93-72-1	ug/kg	1	1	5.2	5.2	4.9E+04	N
2,4-D	94-75-7	ug/kg	1	1	20.8	20.8	6.9E+04	N
2,4-DB	94-82-6	ug/kg	1	1	80.6	80.6	4.9E+04	N
Dalapon	75-99-0	ug/kg	1	1	74.1	74.1	1.8E+05	N
Dicamba	1918-00-9	ug/kg	1	1	2.6	2.6	1.8E+05	N
Dichlorprop	120-36-5	ug/kg	1	1	22.1	22.1	--	NS
Dinoseb	88-85-7	ug/kg	1	1	27.3	27.3	6.1E+03	N
MCPA	94-74-6	ug/kg	1	1	1,810	1,810	3.1E+03	N
MCPP	93-65-2	ug/kg	1	1	6,570	6,570	6.1E+03	**Y**
TCL VOCs								
1,1,1-Trichloroethane	71-55-6	ug/kg	14	14	0.469	0.596	9.0E+05	N
1,1,2,2-Tetrachloroethane	79-34-5	ug/kg	14	14	0.718	0.914	5.9E+02	N
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	ug/kg	14	14	0.835	1.06	4.3E+06	N
1,1,2-Trichloroethane	79-00-5	ug/kg	14	14	0.652	0.83	1.1E+03	N
1,1-Dichloroethane	75-34-3	ug/kg	14	14	0.796	1.01	3.4E+03	N
1,1-Dichloroethene	75-35-4	ug/kg	14	14	0.806	1.03	2.5E+04	N
1,2,3-Trichlorobenzene	87-61-6	ug/kg	14	14	0.598	0.762	8.7E+03	N
1,2,4-Trichlorobenzene	120-82-1	ug/kg	13	14	0.451	0.574	8.7E+03	N
1,2-Dibromo-3-chloropropane	96-12-8	ug/kg	14	14	2.29	2.91	5.6E+00	N
1,2-Dibromoethane	106-93-4	ug/kg	14	14	0.754	0.959	3.4E+01	N
1,2-Dichlorobenzene	95-50-1	ug/kg	14	14	0.532	0.678	2.0E+05	N
1,2-Dichloroethane	107-06-2	ug/kg	14	14	0.474	0.603	4.5E+02	N
1,2-Dichloropropane	78-87-5	ug/kg	14	14	0.645	0.82	9.3E+02	N
1,3-Dichlorobenzene	541-73-1	ug/kg	14	14	0.295	0.375	2.6E+03	N
1,4-Dichlorobenzene	106-46-7	ug/kg	14	14	0.781	0.994	2.6E+03	N
2-Hexanone	591-78-6	ug/kg	14	14	2.49	3.16	--	NS
4-Methyl-2-pentanone	108-10-1	ug/kg	14	14	1.61	2.04	5.3E+05	N
Benzene	71-43-2	ug/kg	11	14	0.632	0.738	1.1E+03	N
Bromochloromethane	74-97-5	ug/kg	14	14	0.837	1.07	1.0E+04	N
Bromodichloromethane	75-27-4	ug/kg	14	14	0.551	0.701	1.0E+04	N
Bromoform	75-25-2	ug/kg	14	14	0.636	0.809	6.1E+04	N
Bromomethane	74-83-9	ug/kg	14	14	1.65	2.1	7.9E+02	N
Carbon disulfide	75-15-0	ug/kg	14	14	1.6	2.03	6.7E+04	N
Carbon tetrachloride	56-23-5	ug/kg	14	14	0.513	0.652	2.5E+02	N
Chlorobenzene	108-90-7	ug/kg	14	14	0.727	0.925	3.1E+04	N
Chloroethane	75-00-3	ug/kg	14	14	1.49	1.89	1.5E+06	N
Chloroform	67-66-3	ug/kg	14	14	0.491	0.624	3.0E+02	N
Chloromethane	74-87-3	ug/kg	14	14	0.917	1.17	1.7E+03	N
cis-1,2-Dichloroethene	156-59-2	ug/kg	12	14	0.852	0.994	7.8E+04	N
cis-1,3-Dichloropropene [7]	10061-01-5	ug/kg	14	14	0.54	0.687	1.7E+03	N
Cyclohexane	110-82-7	ug/kg	14	14	0.348	0.442	7.2E+05	N

Table E.1-2.3
Non-detected Chemicals MDL Screening - Total Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Adjusted Residential RSL	Maximum MDL Exceeds RSL
Dibromochloromethane	124-48-1	ug/kg	14	14	0.569	0.724	5.8E+03	N
Dichlorodifluoromethane	75-71-8	ug/kg	14	14	0.735	0.935	1.9E+04	N
Ethylbenzene	100-41-4	ug/kg	14	14	0.465	0.592	5.7E+03	N
Isopropylbenzene	98-82-8	ug/kg	14	14	0.601	0.764	2.2E+05	N
Methyl acetate	79-20-9	ug/kg	14	14	3.82	4.86	7.8E+06	N
methyl tert-Butyl ether	1634-04-4	ug/kg	14	14	0.705	0.897	3.9E+04	N
Methylcyclohexane	108-87-2	ug/kg	14	14	0.93	1.18	--	NS
Styrene	100-42-5	ug/kg	14	14	0.486	0.619	6.5E+05	N
Tetrachloroethene	127-18-4	ug/kg	14	14	0.674	0.858	5.7E+02	N
Toluene	108-88-3	ug/kg	7	14	0.557	0.65	5.0E+05	N
trans-1,2-Dichloroethene	156-60-5	ug/kg	14	14	0.773	0.984	1.1E+04	N
trans-1,3-Dichloropropene[7]	10061-02-6	ug/kg	14	14	0.573	0.729	1.7E+03	N
Trichloroethene	79-01-6	ug/kg	11	14	0.812	0.948	2.8E+03	N
Trichlorofluoromethane	75-69-4	ug/kg	14	14	0.817	1.04	8.0E+04	N
Vinyl Chloride	75-01-4	ug/kg	14	14	0.407	0.518	6.0E+01	N
Xylenes	1330-20-7	ug/kg	14	14	0.463	0.589	6.0E+04	N
TCL SVOCs								
1,1'-Biphenyl	92-52-4	ug/kg	27	32	0.95	3.44	3.9E+05	N
1,2,4,5-Tetrachlorobenzene	95-94-3	ug/kg	32	32	1.1	40.2	1.8E+03	N
2,2'-oxybis(1-Chloropropane)	108-60-1	ug/kg	14	32	1.45	1.85	3.5E+03	N
2,3,4,6-Tetrachlorophenol	58-90-2	ug/kg	18	32	4	5.5	1.8E+05	N
2,4,5-Trichlorophenol	95-95-4	ug/kg	32	32	3.5	4.9	6.1E+05	N
2,4,6-Trichlorophenol[8]	88-06-2	ug/kg	32	32	1.4	3.67	6.1E+03	N
2,4-Dichlorophenol	120-83-2	ug/kg	31	32	2.3	4.93	1.8E+04	N
2,4-Dimethylphenol	105-67-9	ug/kg	32	32	6	11.1	1.2E+05	N
2,4-Dinitrophenol	51-28-5	ug/kg	32	32	3.52	49	1.2E+04	N
2,4-Dinitrotoluene	121-14-2	ug/kg	21	32	3.78	6	1.2E+04	N
2,6-Dinitrotoluene	606-20-2	ug/kg	28	32	2.4	38.8	6.1E+03	N
2-Chloronaphthalene	91-58-7	ug/kg	32	32	1.2	3.22	6.3E+05	N
2-Chlorophenol	95-57-8	ug/kg	32	32	0.63	2.81	3.9E+04	N
2-Methylnaphthalene	91-57-6	ug/kg	16	32	0.79	3.84	3.1E+04	N
2-Methylphenol	95-48-7	ug/kg	32	32	2.4	6.78	3.1E+05	N
2-Nitroaniline	88-74-4	ug/kg	32	32	2.4	6.44	--	NS
2-Nitrophenol	88-75-5	ug/kg	32	32	1.87	10	--	NS
3,3'-Dichlorobenzidine	91-94-1	ug/kg	32	32	60.9	120	1.1E+03	N
3-Nitroaniline	99-09-2	ug/kg	32	32	12	25.6	1.8E+03	N
4,6-Dinitro-2-methylphenol	534-52-1	ug/kg	32	32	3.9	6.31	6.1E+02	N
4-Bromophenyl-phenylether	101-55-3	ug/kg	32	32	1.3	4.73	--	NS
4-Chloro-3-Methylphenol[9]	59-50-7	ug/kg	24	32	2.2	7.29	3.1E+05	N
4-Chloroaniline	106-47-8	ug/kg	32	32	1.39	29	9.0E+03	N
4-Chlorophenyl-phenylether	7005-72-3	ug/kg	32	32	0.48	4.58	--	NS
4-Methylphenol	106-44-5	ug/kg	32	32	1.4	8.92	3.1E+04	N
4-Nitroaniline	100-01-6	ug/kg	32	32	7.98	34	1.8E+04	N
4-Nitrophenol	100-02-7	ug/kg	32	32	3.11	17	--	NS
Acenaphthene	83-32-9	ug/kg	20	32	1.7	2.41	3.4E+05	N
Acenaphthylene[10]	208-96-8	ug/kg	13	32	1.1	2.1	1.7E+05	N
Acetophenone	98-86-2	ug/kg	24	32	2.09	4.1	7.8E+05	N
Anthracene	120-12-7	ug/kg	17	32	2.7	6.47	1.7E+06	N
Atrazine	1912-24-9	ug/kg	32	32	1.6	9.63	2.1E+03	N
Benzaldehyde	100-52-7	ug/kg	32	32	4.46	39	7.8E+05	N
Benzo(a)anthracene	56-55-3	ug/kg	7	32	14.6	17.3	1.5E+02	N
Benzo(a)pyrene	50-32-8	ug/kg	3	32	1.5	7.42	1.5E+01	N
Benzo(b)fluoranthene	205-99-2	ug/kg	3	32	1.3	12.7	1.5E+02	N
Benzo(g,h,i)perylene[10]	191-24-2	ug/kg	5	32	1.2	11.3	1.7E+05	N
Benzo(k)fluoranthene	207-08-9	ug/kg	10	32	1.7	18.8	1.5E+03	N
Bis(2-chloroethoxy)methane	111-91-1	ug/kg	32	32	0.89	4.4	1.8E+04	N
Bis(2-chloroethyl)ether	111-44-4	ug/kg	32	32	1.1	2.42	1.9E+02	N
Bis(2-chloroisopropyl)ether	39638-32-9	ug/kg	18	32	1.2	1.7	--	NS
Butylbenzylphthalate	85-68-7	ug/kg	7	32	5.38	6.27	2.6E+05	N
Caprolactam	105-60-2	ug/kg	32	32	7.02	34	3.1E+06	N
Carbazole	86-74-8	ug/kg	17	32	0.59	8.54	--	NS
Chrysene	218-01-9	ug/kg	3	32	11.2	13.3	1.5E+04	N
Di-n-octylphthalate	117-84-0	ug/kg	32	32	3.41	15	--	NS
Dibenz(a,h)anthracene	53-70-3	ug/kg	18	32	3.9	8.26	1.5E+01	N
Dibenzofuran	132-64-9	ug/kg	23	32	1.6	4.42	--	NS
Dimethylphthalate	131-11-3	ug/kg	25	32	0.82	4.63	--	NS
Fluoranthene	206-44-0	ug/kg	4	32	2	3.06	2.3E+05	N
Fluorene	86-73-7	ug/kg	19	32	1.7	2.4	2.3E+05	N
Hexachlorobenzene	118-74-1	ug/kg	32	32	2.76	5	3.0E+02	N
Hexachlorobutadiene[11]	87-68-3	ug/kg	32	32	1.1	5.42	6.1E+03	N
Hexachlorocyclopentadiene	77-47-4	ug/kg	32	32	2.18	3.7	3.7E+04	N
Hexachloroethane[12]	67-72-1	ug/kg	32	32	0.83	3.27	6.1E+03	N
Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	5	32	2.9	5.1	1.5E+02	N
Isophorone	78-59-1	ug/kg	15	32	1.1	2.42	5.1E+05	N
N-Nitrosodi-n-propylamine	621-64-7	ug/kg	32	32	1.3	4.61	6.9E+01	N
N-Nitrosodiphenylamine	86-30-6	ug/kg	14	32	0.92	6.65	9.9E+04	N
Naphthalene	91-20-3	ug/kg	22	32	2	3.85	3.9E+03	N

Table E.1-2.3
Non-detected Chemicals MDL Screening - Total Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Adjusted Residential RSL	Maximum MDL Exceeds RSL
Nitrobenzene	98-95-3	ug/kg	32	32	2.1	4.48	3.1E+03	N
Pentachlorophenol	87-86-5	ug/kg	32	32	3.9	6.15	3.0E+03	N
Phenanthrene [10]	85-01-8	ug/kg	6	32	2.4	3.3	1.7E+05	N
Phenol	108-95-2	ug/kg	32	32	4.36	7.3	1.8E+06	N
Pyrene	129-00-0	ug/kg	2	32	1.78	1.92	1.7E+05	N
Dioxin/Furans								
1,2,3,7,8,9-HxCDF	72918-21-9	pg/g	1	1	0.622	0.622	--	NS
2,3,7,8-TCDD	1746-01-6	pg/g	1	1	0.132	0.132	4.5E+00	N
PAHs								
Acenaphthene	83-32-9	ug/kg	12	14	10.3	13.2	3.4E+05	N
Acenaphthylene [10]	208-96-8	ug/kg	14	14	12.8	16.2	1.7E+05	N
Anthracene	120-12-7	ug/kg	4	14	0.84	0.91	1.7E+06	N
Benzo(a)anthracene	56-55-3	ug/kg	1	14	1.04	1.04	1.5E+02	N
Benzo(a)pyrene	50-32-8	ug/kg	5	14	1.2	1.3	1.5E+01	N
Benzo(b)fluoranthene	205-99-2	ug/kg	5	14	1.56	1.69	1.5E+02	N
Benzo(g,h,i)perylene [10]	191-24-2	ug/kg	6	14	15	17.5	1.7E+05	N
Benzo(k)fluoranthene	207-08-9	ug/kg	5	14	1.2	1.3	1.5E+03	N
Chrysene	218-01-9	ug/kg	1	14	1.56	1.56	1.5E+04	N
Dibenz(a,h)anthracene	53-70-3	ug/kg	10	14	1.54	1.96	1.5E+01	N
Fluoranthene	206-44-0	ug/kg	3	14	1.87	2.82	2.3E+05	N
Fluorene	86-73-7	ug/kg	11	14	1.56	1.82	2.3E+05	N
Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	5	14	0.84	0.91	1.5E+02	N
Naphthalene	91-20-3	ug/kg	14	14	8.69	11.1	3.9E+03	N
Phenanthrene [10]	85-01-8	ug/kg	1	14	0.78	0.78	1.7E+05	N
Pyrene	129-00-0	ug/kg	1	14	1.17	1.17	1.7E+05	N
Explosives								
1,3,5-Trinitrobenzene	99-35-4	mg/kg	31	32	0.074	0.14	220	N
1,3-Dinitrobenzene	99-65-0	mg/kg	32	32	0.076	0.159	0.61	N
2,4,6-Trinitrotoluene [13]	118-96-7	mg/kg	27	32	0.15	0.167	3.6	N
2,4-Dinitrotoluene	121-14-2	mg/kg	31	32	0.1	0.142	12	N
2,6-Dinitrotoluene	606-20-2	mg/kg	31	32	0.2	0.25	6.1	N
2-Amino-4,6-dinitrotoluene	35572-78-2	mg/kg	32	32	0.151	0.22	15	N
2-Nitrotoluene	88-72-2	mg/kg	32	32	0.17	0.266	2.9	N
3-Nitrotoluene	99-08-1	mg/kg	32	32	0.184	0.21	120	N
4-Amino-2,6-dinitrotoluene	1946-51-0	mg/kg	32	32	0.162	0.3	--	NS
4-Nitrotoluene [14]	99-99-0	mg/kg	32	32	0.2	0.251	24	N
HMX	2691-41-0	mg/kg	29	32	0.066	0.229	380	N
Nitrobenzene	98-95-3	mg/kg	32	32	0.03	0.102	3.1	N
RDX	121-82-4	mg/kg	32	32	0.048	0.131	5.5	N
Tetryl	479-45-8	mg/kg	32	32	0.065	0.169	24	N
Nitroglycerin/PETN								
Nitroglycerin	55-63-0	mg/kg	26	32	0.195	0.39	0.61	N
PETN	78-11-5	mg/kg	32	32	0.23	0.381	--	NS
Cyanide								
Cyanide	57-12-5	mg/kg	3	32	0.0356	0.0356	160	N

Notes:

CAS = Chemical Abstracts Service
MDL = Method Detection Limit
mg/kg = Milligram Per Kilogram
ug/kg = Microgram Per Kilogram
pg/g = Picogram Per Gram
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
PETN = Pentaerythritol Tetranitrate

RSL = Regional Screening Level (RSL) from October 2008 RSL Table
Adjusted RSLs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
-- = No Value Available

Y = MDL exceeds screening level
N = MDL does not exceed screening level
NS = No screening level available

[1] = Mercuric chloride RBC value was used
[2] = Chlordane RBC value was used
[3] = Alpha-BHC RBC value was used
[4] = Endosulfan RBC value was used
[5] = Endrin RBC value was used
[6] = Noncarcinogenic RBC value for Aroclor 1254 was used
[7] = 1,3-Dichloropropene RBC value was used
[8] = Noncarcinogenic RBC value for 2,4,6-Trichlorophenol was used
[9] = 3-Methylphenol RBC value was used
[10] = Pyrene RBC value was used
[11] = Noncarcinogenic RBC value for Hexachlorobutadiene was used
[12] = Noncarcinogenic RBC value for Hexachloroethane was used
[13] = Noncarcinogenic RBC value for 2,4,6-Trinitrotoluene was used
[14] = Noncarcinogenic RBC value for 4-Nitrotoluene was used

Table E.1-2.4
Dioxin/Furan 2,3,7,8-TCDD Equivalents Calculation - Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID Sample Date Sample Depth (ft bgs)	CAS #	Adjusted Soil RSL (Residential)	C/N	Adjusted Soil RSL (Industrial)	C/N	TEF	13SB9A DUP AVG 9/30/2003 0-1	
							Result	LQ, VQ, r
Dioxin/Furans (pg/g)								
1,2,3,4,6,7,8,9-OCDD (OCDD)	3268-87-9	15,000	c	61,000	c	0.0003	2,210	J
1,2,3,4,6,7,8,9-OCDF (OCDF)	39001-02-0	12,000	c	44,000	c	0.0003	7.775	J
1,2,3,4,6,7,8-HpCDD	35822-39-4	--	--	--	--	0.01	45.3	
1,2,3,4,6,7,8-HpCDF	67562-39-4	--	--	--	--	0.01	3.625	J
1,2,3,4,7,8,9-HpCDF	55673-89-7	--	--	--	--	0.01	0.3522	J
1,2,3,4,7,8-HxCDD	39227-28-6	--	--	--	--	0.1	0.606	J
1,2,3,4,7,8-HxCDF	70648-26-9	--	--	--	--	0.1	0.4785	J
1,2,3,6,7,8-HxCDD	57653-85-7	--	--	--	--	0.1	1.64	J
1,2,3,6,7,8-HxCDF	57117-44-9	--	--	--	--	0.1	0.3885	J
1,2,3,7,8,9-HxCDD	19408-74-3	--	--	--	--	0.1	1.85	
1,2,3,7,8,9-HxCDF	72918-21-9	--	--	--	--	0.1	<0.588	
1,2,3,7,8-PeCDD	40321-76-4	--	--	--	--	1	0.421	J
1,2,3,7,8-PeCDF	57117-41-6	120	c	440	c	0.03	0.279	J
2,3,4,6,7,8-HxCDF	60851-34-5	--	--	--	--	0.1	0.373	J
2,3,4,7,8-PeCDF	57117-31-4	12	c	44	c	0.3	0.37	J
2,3,7,8-TCDD	1746-01-6	4.5	c*	18	c*	1	<0.132	
2,3,7,8-TCDF	51207-31-9	37	c	130	c	0.1	0.489	A
Total 2,3,7,8-TCDD Equivalents	--	4.5E+00	c*	1.8E+01	c*		2.281	

Notes:

CAS = Chemical Abstracts Service
pg/g = Picogram per gram
LQ = Laboratory Qualifier
VQ = Validation Qualifier
r = Reason Code

Data Qualifiers:
A = Amount detected is less than the Lower Calibration Limit.
J = Analyte present. Reported value may not be accurate or precise.

RSL = Regional Screening Level (RSL) from October 2008 RSL Table
Adjusted RSLs = a Hazard Quotient (HQ) of 0.1 applied to non-carcinogens
-- = No Value Available

Key per October 2008 Regional RSL Table:
c = cancer
n = noncancer
c* = cancer where n SL < 100X c SL
c** = cancer where n SL <10X c SL
m = concentration may exceed ceiling
s = concentration may exceed Csat

Total 2,3,7,8-TCDD Equivalents are calculated by summing the detected concentration times the TEF for each chemical. Non-detects, R-flagged data, and B-flagged data are excluded from summed total.

= Concentration Exceeds Adjusted Soil Residential RSL

= Concentration Exceeds Adjusted Soil Industrial RSL

TEF = Toxicity Equivalency Factor (WHO 2005)

Table E.1-3.1
Exposure Point Concentration Summary for Surface Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Exposure Point		Chemical of Potential Concern	Units	Arithmetic Mean of Detects	UCL	Maximum Concentration	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Surface Soil	7429-90-5	Aluminum	mg/kg	15,410	18,614	35,000	18,614	mg/kg	95% Student's t UCL	ProUCL 4.0
	7440-38-2	Arsenic	mg/kg	2.315	2.794	5.6	2.794	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	7440-48-4	Cobalt	mg/kg	11.37	12.97	19	12.97	mg/kg	95% Student's t UCL	ProUCL 4.0
	7439-89-6	Iron	mg/kg	31,547	38,358	78,000	38,358	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	7439-92-1	Lead	mg/kg	313.9	721.8	8,620	721.8	mg/kg	95% Chebyshev (Mean, Sd) UCL	ProUCL 4.0
	7439-96-5	Manganese	mg/kg	1,036	1,239	2,200	1,239	mg/kg	95% Student's t UCL	ProUCL 4.0
	7440-28-0	Thallium	mg/kg	0.586	1.514	3.5	1.514	mg/kg	95% Chebyshev (Mean, Sd) UCL	ProUCL 4.0
	7440-62-2	Vanadium	mg/kg	29.3	34.02	59	34.02	mg/kg	95% Student's t UCL	ProUCL 4.0
	56-55-3	Benzo(a)anthracene	mg/kg	0.0698	0.0905	0.170	0.0905	mg/kg	95% KM (t) UCL	ProUCL 4.0
	50-32-8	Benzo(a)pyrene	mg/kg	0.0550	0.0743	0.130	0.0743	mg/kg	95% Student's t UCL	ProUCL 4.0
	205-99-2	Benzo(b)fluoranthene	mg/kg	0.0973	0.1648	0.205	0.1648	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	86-74-8	Carbazole	mg/kg	0.00856	0.009436	0.02048	0.009436	mg/kg	95% KM (t) UCL	ProUCL 4.0
	53-70-3	Dibenz(a,h)anthracene	mg/kg	0.01771	0.01695	0.035	0.01695	mg/kg	95% KM (t) UCL	ProUCL 4.0
	132-64-9	Dibenzofuran	mg/kg	0.0054	0.004934	0.013	0.004934	mg/kg	95% KM (t) UCL	ProUCL 4.0
	131-11-3	Dimethyl Phthalate	mg/kg	0.1659	0.1168	0.500	0.1168	mg/kg	95% KM (t) UCL	ProUCL 4.0
	55-63-0	Nitroglycerin*	mg/kg	1.28	--	2.11	2.11	mg/kg	Maximum Detected Concentration	--

Notes:

UCL = Upper Confidence Limit

mg/kg = Milligram Per Kilogram

* Due to the low frequency of detection, a mean and/or UCL were not calculated.

EPC = Exposure Point Concentration

MDC = Maximum Detected Concentration

Table E.1-3.2
Exposure Point Concentration Summary for Total Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Exposure Point		Chemical of Potential Concern	Units	Arithmetic Mean of Detects	UCL	Maximum Concentration	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Total Soil	7429-90-5	Aluminum	mg/kg	14,273	16,337	35,000	16,337	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	7440-36-0	Antimony	mg/kg	0.78	1.849	4.7	1.849	mg/kg	97.5% KM (Chebyshev) UCL	ProUCL 4.0
	7440-38-2	Arsenic	mg/kg	2.408	2.806	5.6	2.806	mg/kg	95% Student's t UCL	ProUCL 4.0
	7440-48-4	Cobalt	mg/kg	11.33	12.67	24	12.67	mg/kg	95% Student's t UCL	ProUCL 4.0
	7439-89-6	Iron	mg/kg	32,010	37,853	87,000	37,853	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	7439-92-1	Lead	mg/kg	414.9	1,074	26,500	1,074	mg/kg	95% Chebyshev (Mean, Sd) UCL	ProUCL 4.0
	7439-96-5	Manganese	mg/kg	1003	1,152	2,200	1,152	mg/kg	95% Student's t UCL	ProUCL 4.0
	7440-28-0	Thallium	mg/kg	0.529	0.705	3.5	0.705	mg/kg	95% H-UCL	ProUCL 4.0
	7440-62-2	Vanadium	mg/kg	27.02	29.9	59	29.9	mg/kg	95% Student's t UCL	ProUCL 4.0
	56-55-3	Benzo(a)anthracene	mg/kg	0.0695	0.1257	0.480	0.1257	mg/kg	95% KM (Chebyshev) UCL	ProUCL 4.0
	50-32-8	Benzo(a)pyrene	mg/kg	0.05196	0.0922	0.290	0.0922	mg/kg	95% KM (Chebyshev) UCL	ProUCL 4.0
	205-99-2	Benzo(b)fluoranthene	mg/kg	0.09459	0.1789	0.630	0.1789	mg/kg	95% KM (Chebyshev) UCL	ProUCL 4.0
	86-74-8	Carbazole	mg/kg	0.00811	0.00725	0.02048	0.00725	mg/kg	95% KM (t) UCL	ProUCL 4.0
	53-70-3	Dibenz(a,h)anthracene	mg/kg	0.01709	0.014	0.041	0.014	mg/kg	95% KM (t) UCL	ProUCL 4.0
	132-64-9	Dibenzofuran	mg/kg	0.00686	0.00484	0.024	0.00484	mg/kg	95% KM (t) UCL	ProUCL 4.0
	131-11-3	Dimethyl Phthalate	mg/kg	0.178	0.0812	0.550	0.0812	mg/kg	95% KM (t) UCL	ProUCL 4.0
	55-63-0	Nitroglycerin	mg/kg	4.921	2.467	21	2.467	mg/kg	95% KM (t) UCL	ProUCL 4.0

Notes:

UCL = Upper Confidence Limit

mg/kg = Milligram Per Kilogram

EPC = Exposure Point Concentration

MDC = Maximum Detected Concentration

Table E.1-4.1a
Values used for Daily Intake Equations for Current Scenarios -Surface Soil - Exposure Medium Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current
Medium:	Surface Soil
Exposure Medium:	Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Ingestion	Maintenance Worker	Adult	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = $\frac{CS \times IRS \times EF \times ED \times FI \times CF1}{BW \times AT}$
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 2004	
				EF	Exposure Frequency	50	days/year	(1)	
				FI	Fraction Ingested	1	(unitless)	(2)	
				IRS	Ingestion Rate of Soil	100	mg/day	USEPA, 1991	
	Trespasser	Adolescent	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	USEPA, 1991	
				BW	Body Weight	47	kg	(3)	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = $\frac{CS \times IRS \times EF \times ED \times FI \times CF1}{BW \times AT}$
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	10	years	(4)	
				EF	Exposure Frequency	24	days/year	(5)	
				FI	Fraction Ingested	1	(unitless)	(2)	
				IRS	Ingestion Rate of Soil	100	mg/day	USEPA, 1991	
Dermal Absorption	Maintenance Worker	Adult	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.1	mg/(cm^2-event)	USEPA, 2004	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 2004	
				EF	Exposure Frequency	50	days/year	(1)	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	3,300	cm^2	USEPA, 2004	
	Trespasser	Adolescent	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.2	mg/(cm^2-event)	(6)	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	USEPA, 1991	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	47	kg	(3)	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	10	years	(4)	
				EF	Exposure Frequency	24	days/year	(5)	
				EV	Event Frequency	1	events/day	USEPA, 2002	
				SA	Skin Surface Area Available for Contact	4,050	cm^2	(7)	

Table E.1-4.1a
Values used for Daily Intake Equations for Current Scenarios -Surface Soil - Exposure Medium Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Notes:

(1) Best professional judgement. Based on site maintenance conducted 1 day/week with 2 weeks/year vacation. This is considered a conservative exposure frequency based on the nature of maintenance activities likely conducted at the site which would include occasional mowing along the fence line since the site not active.

(2) Fraction ingested assumed 100%.

(3) Body weight value for adolescent trespasser based on average for both gender from age 8 to 17 years from USEPA, 1997.

(4) Best Professional Judgement. Based on an exposure duration of 10 years, from age 8 to 18.

(5) Best Professional Judgement. Based on VDEQ VRP exposure frequency for a child trespasser of 6 days per month for 4 months per year.

(6) Best Professional Judgement. Based on child adherence factor.

(7) Best Professional Judgement. Based on adolescent exposure (age 8 to 18) surface area for head, forearms, hands, lower legs, and feet.

See Table E.1-4.2 for chemical specific dermal absorption fractions

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

USEPA, 1997. Exposure Factors Handbook. Office of Research and Development. EPA/600/P-95/002Fa through Fc.

USEPA, 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Part E - Supplemental Guidance for Dermal Risk Assessment. Final. EPA/540/R/99/005.

kg/mg = Kilogram Per Millogram

mg/kg = Milligram Per Kilogram

cm^2 = square centimeter

USEPA = U.S. Environmental Protection Agency

VDEQ = Virginia Department of Environmental Quality

Table E.1-4.1b
Values used for Daily Intake Equations for Current Scenario - Surface Soil - Exposure Medium Air
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current
Medium:	Surface Soil
Exposure Medium:	Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name	
Inhalation	Maintenance Worker	Adult	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991		
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991		
				CF2	Conversion Factor 2	24	hours/day	unit conversion		
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	EC (mg/m3) =	CS x 1/PEF x ET x EF x ED / AT*CF2
				ED	Exposure Duration	25	years	USEPA, 1991		
				EF	Exposure Frequency	50	days/year	(1)		
				ET	Exposure Time	8	hr/day	USEPA, 1991		
				PEF	Particulate Emission Factor	6.86E+08	m^3/kg	(2)		
	Trespasser	Adolescent	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991		
				AT-N	Averaging Time (Non-Cancer)	3,650	days	USEPA, 1991		
				CF2	Conversion Factor 2	24	hours/day	unit conversion		
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	EC (mg/m3) =	CS x 1/PEF x ET x EF x ED / AT*CF2
				ED	Exposure Duration	10	years	(3)		
				EF	Exposure Frequency	24	days/year	(4)		
				ET	Exposure Time	2	hr/day	VDEQ, 2006		
				PEF	Particulate Emission Factor	6.86E+08	m^3/kg	(2)		

Notes:

(1) Best professional judgement. Based on site maintenance conducted 1 day/week with 2 weeks/year vacation. This is considered a conservative exposure frequency based on the nature of maintenance activities likely conducted at the site which would include occasional mowing along the fence line since the site not active.

(2) PEFs provided on Table E.1-4.3

(3) Best Professional Judgement. Based on an exposure duration of 10 years, from age 8 to 18.

(4) Best Professional Judgement. Based on VDEQ VRP exposure frequency for a child trespasser of 6 days per month for 4 months per year.

Note that VOCs were not analytes of interest for the site; therefore, the outdoor and indoor vapor inhalation pathways are not quantitatively assessed for the site.

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

VDEQ, 2006. Voluntary Remediation Program Risk Assessment Guidance. www.deq.virginia.gov/vrprisk/raguide.html.

mg/kg = Milligram Per Kilogram

hr/day = hour per day

m^3/kg = cubic meters per kilogram

USEPA = U.S. Environmental Protection Agency

VDEQ = Virginia Department of Environmental Quality

Table E.1-4.1c
Values used for Daily Intake Equations for Future Scenarios - Soil - Exposure Medium Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Ingestion	Maintenance Worker	Adult	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = CS x IRS x EF x ED x FI x CF1 / BW X AT
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 2004	
				EF	Exposure Frequency	50	days/year	(1)	
				FI	Fraction Ingested	1	(unitless)	(2)	
				IRS	Ingestion Rate of Soil	100	mg/day	USEPA, 1991	
	Construction Worker	Adult	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = CS x IRS x EF x ED x FI x CF1 / BW X AT
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	1	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				FI	Fraction Ingested	1	(unitless)	(2)	
				IRS	Ingestion Rate of Soil	330	mg/day	USEPA, 2002	
	Commercial Worker	Adult	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = CS x IRS x EF x ED x FI x CF1 / BW X AT
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	250	days/year	USEPA, 1991	
				FI	Fraction Ingested	1	(unitless)	(2)	
				IRS	Ingestion Rate of Soil	50	mg/day	USEPA, 2002	
	Resident	Adult	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = CS x IRS x EF x ED x FI x CF1 / BW X AT
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				FI	Fraction Ingested	1	(unitless)	(2)	
				IRS	Ingestion Rate of Soil	100	mg/day	USEPA, 1991	
		Child	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				BW	Body Weight	15	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = CS x IRS x EF x ED x FI x CF1 / BW X AT
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				FI	Fraction Ingested	1	(unitless)	(2)	
				IRS	Ingestion Rate of Soil	200	mg/day	USEPA, 1991	

Table E.1-4.1c
Values used for Daily Intake Equations for Future Scenarios - Soil - Exposure Medium Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Ingestion Cont.	Trespasser	Adolescent	Soil	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	USEPA, 1991	
				BW	Body Weight	47	kg	(3)	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	CDI (mg/kg-day) = $\frac{CS \times IRS \times EF \times ED \times FI \times CF1}{BW \times AT}$
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	10	years	(4)	
				EF	Exposure Frequency	24	days/year	(5)	
				FI	Fraction Ingested	1	(unitless)	(2)	
				IRS	Ingestion Rate of Soil	100	mg/day	USEPA, 1991	
Dermal Absorption	Maintenance Worker	Adult	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.1	mg/(cm^2-event)	USEPA, 2004	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 2004	
				EF	Exposure Frequency	50	days/year	(1)	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	3,300	cm^2	USEPA, 2004	
	Construction Worker	Adult	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.3	mg/(cm^2-event)	USEPA, 2002	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 2002	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	1	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				EV	Event Frequency	1	events/day	USEPA, 2002	
				SA	Skin Surface Area Available for Contact	3,300	cm^2	USEPA, 2004	
	Commercial Worker	Adult	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.1	mg/(cm^2-event)	USEPA, 2004	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	250	days/year	USEPA, 1991	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	3,300	cm^2	USEPA, 2004	

Table E.1-4.1c
Values used for Daily Intake Equations for Future Scenarios - Soil - Exposure Medium Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Dermal Absorption Cont.	Resident	Adult	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.07	$mg/(cm^2\text{-event})$	USEPA, 2004	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	70	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				EV	Event Frequency	1	events/day	USEPA, 2004	
				SA	Skin Surface Area Available for Contact	5,700	cm^2	USEPA, 2004	
		Child	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.2	$mg/(cm^2\text{-event})$	USEPA, 2004	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	15	kg	USEPA, 1991	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				EV	Event Frequency	1	events/day	USEPA, 2002	
				SA	Skin Surface Area Available for Contact	2,800	cm^2	USEPA, 2004	
	Trespasser	Adolescent	Soil	ABS_d	Dermal Absorption Fraction	Chemical Specific	(unitless)	USEPA, 2004	
				AF	Soil-to-Skin Adherence Factor	0.2	$mg/(cm^2\text{-event})$	(3)	
				AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	USEPA, 1991	CDI (mg/kg-day) = $\frac{CS \times EF \times ED \times CF1 \times AF \times ABS_d \times SA \times EV}{BW \times AT}$
				BW	Body Weight	47	kg	(4)	
				CF1	Conversion Factor 1	1.00E-06	kg/mg	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	
				ED	Exposure Duration	10	years	(5)	
				EF	Exposure Frequency	24	days/year	(6)	
				EV	Event Frequency	1	events/day	USEPA, 2002	
				SA	Skin Surface Area Available for Contact	4,050	cm^2	(7)	

Notes:

(1) Best professional judgement. Based on site maintenance conducted 1 day/week with 2 weeks/year vacation. This is considered a conservative exposure frequency based on the nature of maintenance activities likely conducted at the site which would include occasional mowing along the fence line since the site not active.

(2) Fraction ingested assumed 100%.

(3) Best Professional Judgement. Based on child adherence factor.

(4) Body weight value for adolescent trespasser based on average for both gender from age 8 to 17 years from USEPA, 1997.

(5) Best Professional Judgement. Based on an exposure duration of 10 years, from age 8 to 18.

(6) Best Professional Judgement. Based on VDEQ VRP exposure frequency for a child trespasser of 6 days per month for 4 months per year.

(7) Best Professional Judgement. Based on adolescent exposure (age 8 to 18) surface area for head, forearms, hands, lower legs, and feet.

See Table E.1-4.2 for chemical specific dermal absorption fractions

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

USEPA, 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

USEPA, 2004. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Part E - Supplemental Guidance for Dermal Risk Assessment. Final. EPA/540/R/99/005.

kg/mg = Kilogram Per Millogram

mg/kg = Milligram Per Kilogram

cm^2 = square centimeter

USEPA = U.S. Environmental Protection Agency

Table E.1-4.1d
Values used for Daily Intake Equations for Future Scenarios - Soil - Exposure Medium Air
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Inhalation	Maintenance Worker	Adult	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				CF2	Conversion Factor 2	24	hours/day	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	EC (mg/m3) = CS x 1/PEF x ET x EF x ED / AT*CF2
				ED	Exposure Duration	25	years	USEPA, 1991	
				EF	Exposure Frequency	50	days/year	(1)	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				PEF	Particulate Emission Factor	6.86E+08	m^3/kg	(2)	
	Construction Worker	Adult	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	365	days	USEPA, 1991	
				CF2	Conversion Factor 2	24	hours/day	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	EC (mg/m3) = CS x 1/PEF x ET x EF x ED / AT*CF2
				ED	Exposure Duration	1	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				PEF	Particulate Emission Factor	1.23E+06	m^3/kg	(2)	
	Commercial Worker	Adult	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	9,125	days	USEPA, 1991	
				CF2	Conversion Factor 2	24	hours/day	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	EC (mg/m3) = CS x 1/PEF x ET x EF x ED / AT*CF2
				ED	Exposure Duration	25	years	USEPA, 2002	
				EF	Exposure Frequency	250	days/year	USEPA, 2002	
				ET	Exposure Time	8	hr/day	USEPA, 1991	
				PEF	Particulate Emission Factor	6.86E+08	m^3/kg	(2)	
	Resident	Adult	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	8,760	days	USEPA, 1991	
				CF2	Conversion Factor 2	24	hours/day	unit conversion	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	EC (mg/m3) = CS x 1/PEF x ET x EF x ED / AT*CF2
				ED	Exposure Duration	24	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	2	hr/day	USEPA, 1997	
				PEF	Particulate Emission Factor	6.86E+08	m^3/kg	(2)	
		Child	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	2,190	days	USEPA, 1991	
				CF2	Conversion Factor 2	24	hours/day	USEPA, 1991	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	EC (mg/m3) = CS x 1/PEF x ET x EF x ED / AT*CF2
				ED	Exposure Duration	6	years	USEPA, 1991	
				EF	Exposure Frequency	350	days/year	USEPA, 1991	
				ET	Exposure Time	6	hr/day	USEPA, 1997	
				PEF	Particulate Emission Factor	6.86E+08	m^3/kg	(2)	

Table E.1-4.1d
Values used for Daily Intake Equations for Future Scenarios - Soil - Exposure Medium Air
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Value	Units	Rationale/ Reference	Intake Equation/Model Name
Inhalation Cont.	Trespasser	Adolescent	Fugitive Dust	AT-C	Averaging Time (Cancer)	25,550	days	USEPA, 1991	
				AT-N	Averaging Time (Non-Cancer)	3,650	days	USEPA, 1991	
				CF2	Conversion Factor 2	24	hours/day	(3)	
				CS	Chemical Concentration in Soil	Chemical Specific	mg/kg	EPC	EC (mg/m3) = $\frac{CS \times 1/PEF \times ET \times EF \times ED}{AT*CF2}$
				ED	Exposure Duration	10	years	(4)	
				EF	Exposure Frequency	24	days/year	(5)	
				ET	Exposure Time	2	hr/day	VDEQ, 2006	
				PEF	Particulate Emission Factor	6.86E+08	m^3/kg	(2)	

Notes:

(1) Best professional judgement. Based on site maintenance conducted 1 day/week with 2 weeks/year vacation. This is considered a conservative exposure frequency based on the nature of maintenance activities likely conducted at the site which would include occasional mowing along the fence line since the site not active.

(2) PEFs provided on Table E.1-4.3

(3) Body weight value for adolescent trespasser based on average for both gender from age 8 to 17 years from USEPA, 1997.

(4) Best Professional Judgement. Based on an exposure duration of 10 years, from age 8 to 18.

(5) Best Professional Judgement. Based on VDEQ VRP exposure frequency for a child trespasser of 6 days per month for 4 months per year.

Note that VOCs were not analytes of interest for the site; therefore, the outdoor and indoor vapor inhalation pathways are not quantitatively assessed for the site.

USEPA, 1991. Risk Assessment Guidance for Superfund (RAGS), Volume I: Human Health Evaluation Manual, Supplemental Guidance, "Standard Default Exposure Factors". OSWER 9285.6-03.

USEPA, 1997. Exposure Factors Handbook. Office of Research and Development. EPA/600/P-95/002Fa through Fc.

USEPA, 2002. Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24.

VDEQ, 2006. Voluntary Remediation Program Risk Assessment Guidance. www.deq.virginia.gov/vrprisk/raguide.html.

hr/day = hour per day

m^3/kg = cubic meters per kilogram

USEPA = U.S. Environmental Protection Agency

VDEQ = Virginia Department of Environmental Quality

Table E.1-4.2
Dermal Absorption Fractions for Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Analyte	CAS	ABSd *
Aluminum	7429-90-5	1.00E-02
Antimony	7440-36-0	1.00E-02
Arsenic	7440-38-2	3.00E-02
Cobalt	7440-48-4	1.00E-02
Iron	7439-89-6	1.00E-02
Lead	7439-92-1	1.00E-02
Manganese	7439-96-5	1.00E-02
Thallium	7440-28-0	1.00E-02
Vanadium	7440-62-2	1.00E-02
Benzo(a)anthracene	56-55-3	1.30E-01
Benzo(a)pyrene	50-32-8	1.30E-01
Benzo(b)fluoranthene	205-99-2	1.30E-01
Carbazole	86-74-8	1.30E-01
Dibenz(a,h)anthracene	53-70-3	1.30E-01
Dibenzofuran	132-64-9	1.30E-01
Dimethyl Phthalate	131-11-3	1.00E-01
Nitroglycerin	55-63-0	1.00E-02

Notes:

CAS = Chemical Abstract Service

ABS_d = Dermal Absorption Fraction

*ABS_d values are taken from Exhibit 3-4, Risk Assessment Guidance for Superfund (RAGS), Volume I, Human Health Evaluation and Manual, Part E; Supplemental Guidance for Dermal Risk Assessment, July 2004, and Region III Technical Guidance, Assessing Dermal Exposure in Soil, December 1995.

Table E.1-4.3
PEF Calculations
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Commercial/Industrial Worker

Equation 4-5 from Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002.

$$PEF = Q / C_{wind} \cdot \frac{3{,}600 s/h}{0.036 \cdot (1-V) \cdot (U_m / U_t)\text{^}3 \cdot F(x)}$$

Parameter	Value	
PEF	6.86E+08	
Q/C_{wind}	47.34	calculated below
V	0.5	default
U_m	4.69	default
U_t	11.32	default
F(x)	0.194	default

PEF = particulate emission factor (m^3/kg)
s/h = seconds per hour
Q/Cwind = Inverse of the ratio of the geometric mean air concentration to the emission flux at the center of a square source (g/m^3-s per kg/m^3)
V = fraction of vegatative cover (unitless)
U_m = mean annual windspeed (m/s)
U_t = equivalent threshold value of windspeed at 7m (m/s)
F(x) = function dependent on U_m/U_t derived using Cowherd et al. (1985)
Site Area = 1.6 acres

Q/C_{wind} calculated in accordance with Exhibit D-2 from USEPA, 2002 using A, B, and C values for Huntington, WV:
$Q/C_{wind} = A*e\text{^}((\ln A_{site} - B)^2/C))$

Q/C_{wind}=	47.34	
A =	9.9253	unitless
B =	18.6636	unitless
C =	211.8862	unitless
A_{site}=	1.6	acres

Table E.1-4.3
PEF Calculations
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Construction Worker

Equation 5-5 from Supplemental Guidance for Developing Soil Screening Levels for Superfund Sites. OSWER 9355.4-24. USEPA, 2002.

$$PEF_{sc} = Q / C_{sr} \cdot \frac{1}{F_D} \cdot \left[\frac{T \cdot A_R}{556 \cdot (W/3)^{0.4} \cdot \frac{(365\ d/yr - p)}{365\ d/yr} \cdot \sum VKT} \right]$$

Parameter	Value	
PEF_{sc}	1.23E+06	
Q/C_{sr}	19.04	calculated
F_D	0.185	default
T (sec)	7,488,000	assumed-see below
A_R (m^2)	491	calculated
W (tons)	8	assumed-see below
p (days/yr)	140	determined-see below
sumVKT (km)	608	assumed-see below

PEF_{sr} = subchronic road particulate emission factor (m^3/kg)

Q/C_{sr} = Inverse of the ratio of the 1-h geometric mean air concentration to the emission flux along a straight road segment bisecting a square site (g/m2-s per kg/m3)

F_D = dispersion correction factor (unitless)

T = total time over which construction occurs-total time period assumed to be 6 months (52wks x 5days per week x 8 hours per day x 3,600 s per hour)

A_R = surface area of contaminated road segment (m^2)

L_R = length of road segment (assumed to equal to (1.6 acres*43,560 ft^2/acre)$^{1/2}$)

W_R = width of road segment (assumed to be 20 ft)

$A_R = L_R \times W_R \times 0.092903 m^2/ft^2$

A_R= 491 m^2

W = mean vehicle weight assumed to be 8 tons ([(20 cars * 2 tons/car)+(10 trucks*20 tons/truck)]/30 vehicles)

p = number of days with at least 0.01 inches of precipitation (from Exhibit 5-2 140 days/year)

sumVKT = sum of fleet vehicle kilometers traveled during the exposure duration (km) (30 of vehicles x 0.078 km/day x 52wks x 5 days/wk)

Q/C_{sr} calculated in accordance with Equation 5-6:

using A, B, and C default values:

$Q/C_{sr} = A*e^{((\ln A_s - B)^2/C)}$

Q/C_{sr}=	19.04	g/m^2-s per kg/m^3
A =	12.9351	unitless
B =	5.7383	unitless
C =	71.7711	unitless
A_s =	1.6	acres

Table E.1-5.1
Non-Cancer Toxicity Data - Oral/Dermal
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical of Potential Concern	CAS	Chronic/ Subchronic	Oral RfD		Oral Absorption Efficiency for Dermal (1)	Absorbed RfD for Dermal (2)		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfD	
			Value	Units		Value	Units			Source(s)	Date(s)
Aluminum	7429-90-5	Chronic	1.0E+00	mg/kg-day	1	1.0E+00	mg/kg-day	developmental CNS	100	PPRTV	10/23/2006
Antimony	7440-36-0	Chronic	4.0E-04	mg/kg-day	0.15	6.0E-05	mg/kg-day	blood	1000	IRIS	03/04/2009
Antimony	7440-36-0	Subchronic	4.0E-04	mg/kg-day	0.15	6.0E-05	mg/kg-day	blood, whole body	1000	HEAST	07/31/1997
Arsenic	7440-38-2	Chronic	3.0E-04	mg/kg-day	1	3.0E-04	mg/kg-day	skin, vascular	3	IRIS	03/04/2009
Arsenic	7440-38-2	Subchronic	3.0E-04	mg/kg-day	1	3.0E-04	mg/kg-day	skin	3	HEAST	07/31/1997
Cobalt	7440-48-4	Chronic	3.0E-04	mg/kg-day	1	3.0E-04	mg/kg-day	blood, thyroid	1000	PPRTV	08/25/2008
Cobalt	7440-48-4	Subchronic	3.0E-03	mg/kg-day	1	3.0E-03	mg/kg-day	blood, thyroid	300	PPRTV	08/25/2008
Iron	7439-89-6	Chronic	7.0E-01	mg/kg-day	1	7.0E-01	mg/kg-day	GI tract	1.5	PPRTV	09/11/2006
Manganese	7439-96-5	Chronic	2.4E-02	mg/kg-day	0.04	9.6E-04	mg/kg-day	CNS	1	IRIS	03/04/2009
Thallium	7440-28-0	Chronic	6.5E-05	mg/kg-day	1	6.5E-05	mg/kg-day	liver, blood, hair	NA	RST	09/12/2008
Vanadium	7440-62-2	Chronic	7.0E-03	mg/kg-day	0.026	1.8E-04	mg/kg-day	kidney	100	HEAST	07/31/1997
Benzo(a)anthracene	56-55-3	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	205-99-2	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Carbazole	86-74-8	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	53-70-3	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Dibenzofuran	132-64-9	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Dimethylphthalate	131-11-3	NA	NA	NA	1	NA	NA	NA	NA	NA	NA
Nitroglycerin	55-63-0	Chronic	1.0E-04	mg/kg-day	1	1.0E-04	mg/kg-day	vascular	300	PPRTV	04/19/2005

Notes:

CAS = Chemical Abstract Service
RfD = Reference Dose
mg/(kg-d) = milligrams per kilogram day
PPRTV = Provisional Peer Reviewed Toxicity Values
IRIS = Integrated Risk Information System
HEAST = Health Effects Assessment Summary Tables
RST = USEPA Regional Screening Table (September 2008)
NA = Not Available
(1) Oral absorption efficiency for dermal from USEPA Regional Screening Table (September 2008)
(2) Absorbed RfD for Dermal = Oral RfD x Oral Absorption Efficiency for Dermal
CNS = Central Nervous System
GI = Gastrointestinal

Source Date:
The hierarchy of toxicity values used is:
IRIS, PPRTVs (if available), and other values:
For IRIS values, the date of the IRIS search is provided.
For PPRTV, date of paper is provided.
For HEAST values, the date of HEAST is provided.
For RST, the date of the regional screening table is provided.

Table E.1-5.2
Non-Cancer Toxicity Data - Inhalation
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical of Potential Concern	CAS	Chronic/ Subchronic	Inhalation RfC		Primary Target Organ(s)	Combined Uncertainty/Modifying Factors	RfC	
			Value	Units			Source(s)	Date(s)
Aluminum	7429-90-5	Chronic	5.0E-03	mg/m3	CNS	300	PPRTV	10/23/2006
Antimony	7440-36-0	NA	NA	NA	NA	NA	NA	NA
Arsenic	7440-38-2	Chronic	3.0E-05	mg/m3	cardiovascular, CNS	NA	CalEPA	03/04/2009
Cobalt	7440-48-4	Chronic	6.0E-06	mg/m3	respiratory	300	PPRTV	08/25/2008
Cobalt	7440-48-4	Subchronic	2.0E-05	mg/m3	respiratory	100	PPRTV	08/25/2008
Iron	7439-89-6	NA	NA	NA	NA	NA	NA	NA
Manganese	7439-96-5	Chronic	5.0E-05	mg/m3	CNS	1000	IRIS	03/04/2009
Thallium	7440-28-0	NA	NA	NA	NA	NA	NA	NA
Vanadium	7440-62-2	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	56-55-3	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	50-32-8	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	205-99-2	NA	NA	NA	NA	NA	NA	NA
Carbazole	86-74-8	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	53-70-3	NA	NA	NA	NA	NA	NA	NA
Dibenzofuran	132-64-9	NA	NA	NA	NA	NA	NA	NA
Dimethylphthalate	131-11-3	NA	NA	NA	NA	NA	NA	NA
Nitroglycerin	55-63-0	NA	NA	NA	NA	NA	NA	NA

Notes:

RfC = Reference Concentration

mg/m^3 = milligrams per cubic meter

PPRTV = Provisional Peer Reviewed Toxicity Values

CalEPA = California Enrvironmental Protection Agency

IRIS = Integrated Risk Information System

NA = Not Available

CNS = Central Nervous System

Source Date:

The hierarchy of toxicity values used is:

IRIS, PPRTVs (if available), and other values:

For IRIS values, the date of the IRIS search is provided.

For PPRTV, date of paper is provided.

For CalEPA values, the date of CalEPA website search is provided.

Table E.1-6.1
Cancer Toxicity Data - Oral/Dermal
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical of Potential Concern	CAS	Oral Cancer Slope Factor		Oral Absorption Efficiency for Dermal (1)	Absorbed Cancer Slope Factor for Dermal		Weight of Evidence/ Cancer Guideline Description	Oral CSF	
		Value	Units		Value	Units		Source(s)	Date(s)
Aluminum	7429-90-5	NA	NA	1	NA	NA	NA	NA	NA
Antimony	7440-36-0	NA	NA	0.15	NA	NA	NA	NA	NA
Arsenic	7440-38-2	1.5E+00	1/(mg/kg-day)	1	1.5E+00	1/(mg/kg-day)	A	IRIS	03/04/2009
Cobalt	7440-48-4	NA	NA	1	NA	NA	NA	NA	NA
Iron	7439-89-6	NA	NA	1	NA	NA	NA	NA	NA
Manganese	7439-96-5	NA	NA	0.04	NA	NA	D	NA	NA
Thallium	7440-28-0	NA	NA	1	NA	NA	NA	NA	NA
Vanadium	7440-62-2	NA	NA	0.026	NA	NA	NA	NA	NA
Benzo(a)anthracene	56-55-3	7.3E-01	1/(mg/kg-day)	1	7.3E-01	1/(mg/kg-day)	B2	TEF	03/04/2009
Benzo(a)pyrene	50-32-8	7.3E+00	1/(mg/kg-day)	1	7.3E+00	1/(mg/kg-day)	B2	IRIS	03/04/2009
Benzo(b)fluoranthene	205-99-2	7.3E-01	1/(mg/kg-day)	1	7.3E-01	1/(mg/kg-day)	B2	TEF	03/04/2009
Carbazole	86-74-8	2.0E-02	1/(mg/kg-day)	1	2.0E-02	1/(mg/kg-day)	B2	HEAST	07/31/1997
Dibenz(a,h)anthracene	53-70-3	7.3E+00	1/(mg/kg-day)	1	7.3E+00	1/(mg/kg-day)	B2	TEF	03/04/2009
Dibenzofuran	132-64-9	NA	NA	1	NA	NA	D	NA	NA
Dimethylphthalate	131-11-3	NA	NA	1	NA	NA	D	NA	NA
Nitroglycerin	55-63-0	1.7E-02	1/(mg/kg-day)	1	1.7E-02	1/(mg/kg-day)	C	PPRTV	09/13/2005

Notes:

CSF = Cancer Slope Factor
mg/(kg-day) = Milligrams Per Kilogram Day
IRIS = Integrated Risk Information System
TEF = Toxicity Equivalency Factor
PPRTV = Provisional Peer Reviewed Toxicity Values
NA = Not Available
Source Date:
The hierarchy of toxicity values used is:
IRIS, PPRTVs (if available), and other values:
For IRIS values, the date of the IRIS search is provided.
For PPRTV, date of paper is provided.
For TEF, date of the toxicity data used (benzo(a)pyrene) is provided.
TEFs from Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons (EPA/600/R-93/089, July 1993).

1986 Cancer Guideline Description:
A = Human carcinogen
B1 = Probable human carcinogen - indicates that limited human data are available.
B2 = Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans
C = Possible human carcinogen
D = Not classifiable as a human carcinogen

(1) Oral absorption efficiency for dermal from USEPA Regional Screening Table (September 2008)
(2) Absorbed CSF for Dermal = Oral CSF/Oral Absorption Efficiency for Dermal

Table E.1-6.2
Cancer Toxicity Data - Inhalation
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical of Potential Concern	CAS	Unit Risk		Weight of Evidence/ Cancer Guideline Description	Unit Risk	
		Value	Units		Source(s)	Date(s)
Aluminum	7429-90-5	NA	NA	NA	NA	NA
Antimony	7440-36-0	NA	NA	NA	NA	NA
Arsenic	7440-38-2	4.3E+00	1/(mg/m3)	A	IRIS	03/04/2009
Cobalt	7440-48-4	9.0E+00	1/(mg/m3)	B1	PPRTV	08/25/2008
Iron	7439-89-6	NA	NA	NA	NA	NA
Manganese	7439-96-5	NA	NA	D	NA	NA
Thallium	7440-28-0	NA	NA	NA	NA	NA
Vanadium	7440-62-2	NA	NA	NA	NA	NA
Benzo(a)anthracene	56-55-3	1.1E-01	1/(mg/m3)	NA	CalEPA	03/04/2009
Benzo(a)pyrene	50-32-8	1.1E+00	1/(mg/m3)	B2	CalEPA	03/04/2009
Benzo(b)fluoranthene	205-99-2	1.1E-01	1/(mg/m3)	NA	CalEPA	03/04/2009
Carbazole	86-74-8	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	53-70-3	1.2E+00	1/(mg/m3)	NA	CalEPA	03/04/2009
Dibenzofuran	132-64-9	NA	NA	D	NA	NA
Dimethylphthalate	131-11-3	NA	NA	D	IRIS	NA
Nitroglycerin	55-63-0	NA	NA	NA	NA	NA

Notes:

CSF = Cancer Slope Factor

mg/m^3 = milligrams per cubic meter

PPRTV = Provisional Peer Reviewed Toxicity Values

CalEPA = California Enrvironmental Protection Agency

IRIS = Integrated Risk Information System

NA = Not Available

Source Date:

The hierarchy of toxicity values used is:

IRIS, PPRTVs (if available), and other values:

For IRIS values, the date of the IRIS search is provided.

For PPRTV, date of paper is provided.

For CalEPA values, the date of CalEPA website search is provided.

1986 Cancer Guideline Description:

A = Human carcinogen

B1 = Probable human carcinogen - indicates that limited human data are available.

B2 = Probable human carcinogen - indicates sufficient evidence in animals and inadequate or no evidence in humans

C = Possible human carcinogen

D = Not classifiable as a human carcinogen

TABLE E.1-7.1.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Maintenance Worker
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Current/Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Soil	Soil	Ingestion	Aluminum	18,614	mg/kg	1.30E-03	mg/kg-day	--	--	--	3.64E-03	mg/kg-day	1.0E+00	mg/kg-day	4.E-03
				Arsenic	2.794	mg/kg	1.95E-07	mg/kg-day	1.5E+00	mg/kg-day $^{-1}$	3.E-07	5.47E-07	mg/kg-day	3.0E-04	mg/kg-day	2.E-03
				Cobalt	12.97	mg/kg	9.06E-07	mg/kg-day	--	--	--	2.54E-06	mg/kg-day	3.0E-04	mg/kg-day	8.E-03
				Iron	38,358	mg/kg	2.68E-03	mg/kg-day	--	--	--	7.51E-03	mg/kg-day	7.0E-01	mg/kg-day	1.E-02
				Manganese	1,239	mg/kg	8.66E-05	mg/kg-day	--	--	--	2.42E-04	mg/kg-day	2.4E-02	mg/kg-day	1.E-02
				Thallium	1.514	mg/kg	1.06E-07	mg/kg-day	--	--	--	2.96E-07	mg/kg-day	6.5E-05	mg/kg-day	5.E-03
				Vanadium	34.02	mg/kg	2.38E-06	mg/kg-day	--	--	--	6.66E-06	mg/kg-day	7.0E-03	mg/kg-day	1.E-03
				Benzo(a)anthracene	0.09053	mg/kg	6.33E-09	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	5.E-09	1.77E-08	mg/kg-day	--	--	--
				Benzo(a)pyrene	0.07426	mg/kg	5.19E-09	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	4.E-08	1.45E-08	mg/kg-day	--	--	--
				Benzo(b)fluoranthene	0.1648	mg/kg	1.15E-08	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	8.E-09	3.23E-08	mg/kg-day	--	--	--
				Carbazole	0.009436	mg/kg	6.59E-10	mg/kg-day	2.0E-02	mg/kg-day $^{-1}$	1.E-11	1.85E-09	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	0.01695	mg/kg	1.18E-09	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	9.E-09	3.32E-09	mg/kg-day	--	--	--
				Dibenzofuran	0.004934	mg/kg	3.45E-10	mg/kg-day	--	--	--	9.66E-10	mg/kg-day	--	--	--
				Dimethyl Phthalate	0.1168	mg/kg	8.16E-09	mg/kg-day	--	--	--	2.29E-08	mg/kg-day	--	--	--
				Nitroglycerin	2.11	mg/kg	1.47E-07	mg/kg-day	1.7E-02	mg/kg-day $^{-1}$	3.E-09	4.13E-07	mg/kg-day	1.0E-04	mg/kg-day	4.E-03
			Exp. Route Total								3.5E-07					4.4E-02
			Dermal Absorption	Aluminum	18,614	mg/kg	4.29E-05	mg/kg-day	--	--	--	1.20E-04	mg/kg-day	1.0E+00	mg/kg-day	1.E-04
				Arsenic	2.794	mg/kg	1.93E-08	mg/kg-day	1.5E+00	mg/kg-day $^{-1}$	3.E-08	5.41E-08	mg/kg-day	3.0E-04	mg/kg-day	2.E-04
				Cobalt	12.97	mg/kg	2.99E-08	mg/kg-day	--	--	--	8.38E-08	mg/kg-day	3.0E-04	mg/kg-day	3.E-04
				Iron	38,358	mg/kg	8.85E-05	mg/kg-day	--	--	--	2.48E-04	mg/kg-day	7.0E-01	mg/kg-day	4.E-04
				Manganese	1,239	mg/kg	2.86E-06	mg/kg-day	--	--	--	8.00E-06	mg/kg-day	9.6E-04	mg/kg-day	8.E-03
				Thallium	1.514	mg/kg	3.49E-09	mg/kg-day	--	--	--	9.78E-09	mg/kg-day	6.5E-05	mg/kg-day	2.E-04
				Vanadium	34.02	mg/kg	7.85E-08	mg/kg-day	--	--	--	2.20E-07	mg/kg-day	1.8E-04	mg/kg-day	1.E-03
				Benzo(a)anthracene	0.09053	mg/kg	2.71E-09	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	2.E-09	7.60E-09	mg/kg-day	--	--	--
				Benzo(a)pyrene	0.07426	mg/kg	2.23E-09	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	2.E-08	6.23E-09	mg/kg-day	--	--	--
				Benzo(b)fluoranthene	0.1648	mg/kg	4.94E-09	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	4.E-09	1.38E-08	mg/kg-day	--	--	--
				Carbazole	0.009436	mg/kg	2.83E-10	mg/kg-day	2.0E-02	mg/kg-day $^{-1}$	6.E-12	7.92E-10	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	0.01695	mg/kg	5.08E-10	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	4.E-09	1.42E-09	mg/kg-day	--	--	--
				Dibenzofuran	0.004934	mg/kg	1.48E-10	mg/kg-day	--	--	--	4.14E-10	mg/kg-day	--	--	--
				Dimethyl Phthalate	0.1168	mg/kg	2.69E-09	mg/kg-day	--	--	--	7.54E-09	mg/kg-day	--	--	--
				Nitroglycerin	2.11	mg/kg	4.87E-09	mg/kg-day	1.7E-02	mg/kg-day $^{-1}$	8.E-11	1.36E-08	mg/kg-day	1.0E-04	mg/kg-day	1.E-04
			Exp. Route Total								5.E-08					1.1E-02
		Exposure Point Total									4.E-07					6.E-02
	Exposure Medium Total										4.E-07					6.E-02

TABLE E.1-7.1.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Maintenance Worker
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Current/Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil Cont.	Air	Fugitive Dust	Inhalation	Aluminum	18,614	mg/kg	4.42E-07	mg/m3	--	--	--	1.24E-06	mg/m3	5.0E-03	mg/m3	2.E-04
				Arsenic	2.794	mg/kg	6.64E-11	mg/m3	4.3E+00	mg/m3 $^{-1}$	3.E-10	1.86E-10	mg/m3	3.0E-05	mg/m3	6.E-06
				Cobalt	12.97	mg/kg	3.08E-10	mg/m3	9.0E+00	mg/m3 $^{-1}$	3.E-09	8.63E-10	mg/m3	6.0E-06	mg/m3	1.E-04
				Iron	38,358	mg/kg	9.12E-07	mg/m3	--	--	--	2.55E-06	mg/m3	--	--	--
				Manganese	1,239	mg/kg	2.94E-08	mg/m3	--	--	--	8.24E-08	mg/m3	5.0E-05	mg/m3	2.E-03
				Thallium	1.514	mg/kg	3.60E-11	mg/m3	--	--	--	1.01E-10	mg/m3	--	--	--
				Vanadium	34.02	mg/kg	8.09E-10	mg/m3	--	--	--	2.26E-09	mg/m3	--	--	--
				Benzo(a)anthracene	0.09053	mg/kg	2.15E-12	mg/m3	1.1E-01	mg/m3 $^{-1}$	2.E-13	6.02E-12	mg/m3	--	--	--
				Benzo(a)pyrene	0.07426	mg/kg	1.76E-12	mg/m3	1.1E+00	mg/m3 $^{-1}$	2.E-12	4.94E-12	mg/m3	--	--	--
				Benzo(b)fluoranthene	0.1648	mg/kg	3.92E-12	mg/m3	1.1E-01	mg/m3 $^{-1}$	4.E-13	1.10E-11	mg/m3	--	--	--
				Carbazole	0.009436	mg/kg	2.24E-13	mg/m3	--	--	--	6.28E-13	mg/m3	--	--	--
				Dibenz(a,h)anthracene	0.01695	mg/kg	4.03E-13	mg/m3	1.2E+00	mg/m3 $^{-1}$	5.E-13	1.13E-12	mg/m3	--	--	--
				Dibenzofuran	0.004934	mg/kg	1.17E-13	mg/m3	--	--	--	3.28E-13	mg/m3	--	--	--
				Dimethyl Phthalate	0.1168	mg/kg	2.78E-12	mg/m3	--	--	--	7.77E-12	mg/m3	--	--	--
				Nitroglycerin	2.11	mg/kg	5.01E-11	mg/m3	--	--	--	1.40E-10	mg/m3	--	--	--
			Exp. Route Total								3.E-09					2.E-03
		Exposure Point Total									3.E-09					2.E-03
	Exposure Medium Total										3.E-09					2.E-03
Soil Total											4.E-07					6.E-02
											Total of Receptor Risks Across All Media	4.E-07	Total of Receptor Hazards Across All Media			6.E-02

TABLE E.1-7.2.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Maintenance Worker
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil	Soil	Soil	Ingestion	Aluminum	16,337	mg/kg	1.14E-03	mg/kg-day	--	--	--	3.20E-03	mg/kg-day	1.0E+00	mg/kg-day	3.E-03
				Antimony	1.849	mg/kg	1.29E-07	mg/kg-day	--	--	--	3.62E-07	mg/kg-day	4.0E-04	mg/kg-day	9.E-04
				Arsenic	2.806	mg/kg	1.96E-07	mg/kg-day	1.5E+00	mg/kg-day $^{-1}$	3.E-07	5.49E-07	mg/kg-day	3.0E-04	mg/kg-day	2.E-03
				Cobalt	12.67	mg/kg	8.86E-07	mg/kg-day	--	--	--	2.48E-06	mg/kg-day	3.0E-04	mg/kg-day	8.E-03
				Iron	37,853	mg/kg	2.65E-03	mg/kg-day	--	--	--	7.41E-03	mg/kg-day	7.0E-01	mg/kg-day	1.E-02
				Manganese	1,152	mg/kg	8.05E-05	mg/kg-day	--	--	--	2.25E-04	mg/kg-day	2.4E-02	mg/kg-day	9.E-03
				Thallium	0.705	mg/kg	4.93E-08	mg/kg-day	--	--	--	1.38E-07	mg/kg-day	6.5E-05	mg/kg-day	2.E-03
				Vanadium	29.9	mg/kg	2.09E-06	mg/kg-day	--	--	--	5.85E-06	mg/kg-day	7.0E-03	mg/kg-day	8.E-04
				Benzo(a)anthracene	0.1257	mg/kg	8.79E-09	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	6.E-09	2.46E-08	mg/kg-day	--	--	--
				Benzo(a)pyrene	0.0922	mg/kg	6.44E-09	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	5.E-08	1.80E-08	mg/kg-day	--	--	--
				Benzo(b)fluoranthene	0.1789	mg/kg	1.25E-08	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	9.E-09	3.50E-08	mg/kg-day	--	--	--
				Carbazole	0.00725	mg/kg	5.07E-10	mg/kg-day	2.0E-02	mg/kg-day $^{-1}$	1.E-11	1.42E-09	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	0.014	mg/kg	9.78E-10	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	7.E-09	2.74E-09	mg/kg-day	--	--	--
				Dibenzofuran	0.004838	mg/kg	3.38E-10	mg/kg-day	--	--	--	9.47E-10	mg/kg-day	--	--	--
				Dimethyl Phthalate	0.081	mg/kg	5.66E-09	mg/kg-day	--	--	--	1.59E-08	mg/kg-day	--	--	--
				Nitroglycerin	2.467	mg/kg	1.72E-07	mg/kg-day	1.7E-02	mg/kg-day $^{-1}$	3.E-09	4.83E-07	mg/kg-day	1.0E-04	mg/kg-day	5.E-03
			Exp. Route Total								3.7E-07					4.E-02
			Dermal Absorption	Aluminum	16,337	mg/kg	3.77E-05	mg/kg-day	--	--	--	1.06E-04	mg/kg-day	1.0E+00	mg/kg-day	1.E-04
				Antimony	1.849	mg/kg	4.26E-09	mg/kg-day	--	--	--	1.19E-08	mg/kg-day	6.0E-05	mg/kg-day	2.E-04
				Arsenic	2.806	mg/kg	1.94E-08	mg/kg-day	1.5E+00	mg/kg-day $^{-1}$	3.E-08	5.44E-08	mg/kg-day	3.0E-04	mg/kg-day	2.E-04
				Cobalt	12.67	mg/kg	2.92E-08	mg/kg-day	--	--	--	8.18E-08	mg/kg-day	3.0E-04	mg/kg-day	3.E-04
				Iron	37,853	mg/kg	8.73E-05	mg/kg-day	--	--	--	2.44E-04	mg/kg-day	7.0E-01	mg/kg-day	3.E-04
				Manganese	1,152	mg/kg	2.66E-06	mg/kg-day	--	--	--	7.44E-06	mg/kg-day	9.6E-04	mg/kg-day	8.E-03
				Thallium	0.705	mg/kg	1.63E-09	mg/kg-day	--	--	--	4.55E-09	mg/kg-day	6.5E-05	mg/kg-day	7.E-05
				Vanadium	29.9	mg/kg	6.90E-08	mg/kg-day	--	--	--	1.93E-07	mg/kg-day	1.8E-04	mg/kg-day	1.E-03
				Benzo(a)anthracene	0.1257	mg/kg	3.77E-09	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	3.E-09	1.06E-08	mg/kg-day	--	--	--
				Benzo(a)pyrene	0.0922	mg/kg	2.76E-09	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	2.E-08	7.74E-09	mg/kg-day	--	--	--
				Benzo(b)fluoranthene	0.1789	mg/kg	5.36E-09	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	4.E-09	1.50E-08	mg/kg-day	--	--	--
				Carbazole	0.00725	mg/kg	2.17E-10	mg/kg-day	2.0E-02	mg/kg-day $^{-1}$	4.E-12	6.09E-10	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	0.014	mg/kg	4.20E-10	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	3.E-09	1.18E-09	mg/kg-day	--	--	--
				Dibenzofuran	0.004838	mg/kg	1.45E-10	mg/kg-day	--	--	--	4.06E-10	mg/kg-day	--	--	--
				Dimethyl Phthalate	0.081	mg/kg	1.87E-09	mg/kg-day	--	--	--	5.23E-09	mg/kg-day	--	--	--
				Nitroglycerin	2.467	mg/kg	5.69E-09	mg/kg-day	1.7E-02	mg/kg-day $^{-1}$	1.E-10	1.59E-08	mg/kg-day	1.0E-04	mg/kg-day	2.E-04
			Exp. Route Total								6.E-08					1.E-02
		Exposure Point Total									4.E-07					5.E-02
	Exposure Medium Total										4.E-07					5.E-02

TABLE E.1-7.2.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Maintenance Worker
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Maintenance Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Air	Fugitive Dust	Inhalation	Aluminum	16,337	mg/kg	3.88E-07	mg/m3	--	--	--	1.09E-06	mg/m3	5.0E-03	mg/m3	2.E-04
				Antimony	1.849	mg/kg	4.39E-11	mg/m3	--	--	--	1.23E-10	mg/m3	--	--	--
				Arsenic	2.806	mg/kg	6.67E-11	mg/m3	4.3E+00	mg/m3 $^{-1}$	3.E-10	1.87E-10	mg/m3	3.0E-05	mg/m3	6.E-06
				Cobalt	12.67	mg/kg	3.01E-10	mg/m3	9.0E+00	mg/m3 $^{-1}$	3.E-09	8.43E-10	mg/m3	6.0E-06	mg/m3	1.E-04
				Iron	37,853	mg/kg	9.00E-07	mg/m3	--	--	--	2.52E-06	mg/m3	--	--	--
				Manganese	1,152	mg/kg	2.74E-08	mg/m3	--	--	--	7.67E-08	mg/m3	5.0E-05	mg/m3	2.E-03
				Thallium	0.705	mg/kg	1.68E-11	mg/m3	--	--	--	4.69E-11	mg/m3	--	--	--
				Vanadium	29.9	mg/kg	7.11E-10	mg/m3	--	--	--	1.99E-09	mg/m3	--	--	--
				Benzo(a)anthracene	0.1257	mg/kg	2.99E-12	mg/m3	1.1E-01	mg/m3 $^{-1}$	3.E-13	8.36E-12	mg/m3	--	--	--
				Benzo(a)pyrene	0.0922	mg/kg	2.19E-12	mg/m3	1.1E+00	mg/m3 $^{-1}$	2.E-12	6.14E-12	mg/m3	--	--	--
				Benzo(b)fluoranthene	0.1789	mg/kg	4.25E-12	mg/m3	1.1E-01	mg/m3 $^{-1}$	5.E-13	1.19E-11	mg/m3	--	--	--
				Carbazole	0.00725	mg/kg	1.72E-13	mg/m3	--	--	--	4.82E-13	mg/m3	--	--	--
				Dibenz(a,h)anthracene	0.014	mg/kg	3.33E-13	mg/m3	1.2E+00	mg/m3 $^{-1}$	4.E-13	9.32E-13	mg/m3	--	--	--
				Dibenzofuran	0.004838	mg/kg	1.15E-13	mg/m3	--	--	--	3.22E-13	mg/m3	--	--	--
				Dimethyl Phthalate	0.081	mg/kg	1.93E-12	mg/m3	--	--	--	5.39E-12	mg/m3	--	--	--
				Nitroglycerin	2.467	mg/kg	5.86E-11	mg/m3	--	--	--	1.64E-10	mg/m3	--	--	--
			Exp. Route Total								3.E-09					2.E-03
		Exposure Point Total									3.E-09					2.E-03
	Exposure Medium Total										3.E-09					2.E-03
Soil Total											4.E-07					5.E-02
											Total of Receptor Risks Across All Media	4.E-07		Total of Receptor Hazards Across All Media		5.E-02

TABLE E.1-7.3.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Commercial Worker
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil	Soil	Soil	Ingestion	Aluminum	16,337	mg/kg	2.85E-03	mg/kg-day	--	--	--	7.99E-03	mg/kg-day	1.0E+00	mg/kg-day	8.E-03
				Antimony	1.849	mg/kg	3.23E-07	mg/kg-day	--	--	--	9.05E-07	mg/kg-day	4.0E-04	mg/kg-day	2.E-03
				Arsenic	2.806	mg/kg	4.90E-07	mg/kg-day	1.5E+00	mg/kg-day^{-1}	7.E-07	1.37E-06	mg/kg-day	3.0E-04	mg/kg-day	5.E-03
				Cobalt	12.67	mg/kg	2.21E-06	mg/kg-day	--	--	--	6.20E-06	mg/kg-day	3.0E-04	mg/kg-day	2.E-02
				Iron	37,853	mg/kg	6.61E-03	mg/kg-day	--	--	--	1.85E-02	mg/kg-day	7.0E-01	mg/kg-day	3.E-02
				Manganese	1,152	mg/kg	2.01E-04	mg/kg-day	--	--	--	5.64E-04	mg/kg-day	2.4E-02	mg/kg-day	2.E-02
				Thallium	0.705	mg/kg	1.23E-07	mg/kg-day	--	--	--	3.45E-07	mg/kg-day	6.5E-05	mg/kg-day	5.E-03
				Vanadium	29.9	mg/kg	5.22E-06	mg/kg-day	--	--	--	1.46E-05	mg/kg-day	7.0E-03	mg/kg-day	2.E-03
				Benzo(a)anthracene	0.1257	mg/kg	2.20E-08	mg/kg-day	7.3E-01	mg/kg-day^{-1}	2.E-08	6.15E-08	mg/kg-day	--	--	--
				Benzo(a)pyrene	0.0922	mg/kg	1.61E-08	mg/kg-day	7.3E+00	mg/kg-day^{-1}	1.E-07	4.51E-08	mg/kg-day	--	--	--
				Benzo(b)fluoranthene	0.1789	mg/kg	3.13E-08	mg/kg-day	7.3E-01	mg/kg-day^{-1}	2.E-08	8.75E-08	mg/kg-day	--	--	--
				Carbazole	0.00725	mg/kg	1.27E-09	mg/kg-day	2.0E-02	mg/kg-day^{-1}	3.E-11	3.55E-09	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	0.014	mg/kg	2.45E-09	mg/kg-day	7.3E+00	mg/kg-day^{-1}	2.E-08	6.85E-09	mg/kg-day	--	--	--
				Dibenzofuran	0.004838	mg/kg	8.45E-10	mg/kg-day	--	--	--	2.37E-09	mg/kg-day	--	--	--
				Dimethyl Phthalate	0.081	mg/kg	1.42E-08	mg/kg-day	--	--	--	3.96E-08	mg/kg-day	--	--	--
				Nitroglycerin	2.467	mg/kg	4.31E-07	mg/kg-day	1.7E-02	mg/kg-day^{-1}	7.E-09	1.21E-06	mg/kg-day	1.0E-04	mg/kg-day	1.E-02
			Exp. Route Total								9.E-07					1.E-01
			Dermal Absorption	Aluminum	16,337	mg/kg	1.88E-04	mg/kg-day	--	--	--	5.28E-04	mg/kg-day	1.0E+00	mg/kg-day	5.E-04
				Antimony	1.849	mg/kg	2.13E-08	mg/kg-day	--	--	--	5.97E-08	mg/kg-day	6.0E-05	mg/kg-day	1.E-03
				Arsenic	2.806	mg/kg	9.71E-08	mg/kg-day	1.5E+00	mg/kg-day^{-1}	1.E-07	2.72E-07	mg/kg-day	3.0E-04	mg/kg-day	9.E-04
				Cobalt	12.67	mg/kg	1.46E-07	mg/kg-day	--	--	--	4.09E-07	mg/kg-day	3.0E-04	mg/kg-day	1.E-03
				Iron	37,853	mg/kg	4.37E-04	mg/kg-day	--	--	--	1.22E-03	mg/kg-day	7.0E-01	mg/kg-day	2.E-03
				Manganese	1,152	mg/kg	1.33E-05	mg/kg-day	--	--	--	3.72E-05	mg/kg-day	9.6E-04	mg/kg-day	4.E-02
				Thallium	0.705	mg/kg	8.13E-09	mg/kg-day	--	--	--	2.28E-08	mg/kg-day	6.5E-05	mg/kg-day	4.E-04
				Vanadium	29.9	mg/kg	3.45E-07	mg/kg-day	--	--	--	9.65E-07	mg/kg-day	1.8E-04	mg/kg-day	5.E-03
				Benzo(a)anthracene	0.1257	mg/kg	1.88E-08	mg/kg-day	7.3E-01	mg/kg-day^{-1}	1.E-08	5.28E-08	mg/kg-day	--	--	--
				Benzo(a)pyrene	0.0922	mg/kg	1.38E-08	mg/kg-day	7.3E+00	mg/kg-day^{-1}	1.E-07	3.87E-08	mg/kg-day	--	--	--
				Benzo(b)fluoranthene	0.1789	mg/kg	2.68E-08	mg/kg-day	7.3E-01	mg/kg-day^{-1}	2.E-08	7.51E-08	mg/kg-day	--	--	--
				Carbazole	0.00725	mg/kg	1.09E-09	mg/kg-day	2.0E-02	mg/kg-day^{-1}	2.E-11	3.04E-09	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	0.014	mg/kg	2.10E-09	mg/kg-day	7.3E+00	mg/kg-day^{-1}	2.E-08	5.88E-09	mg/kg-day	--	--	--
				Dibenzofuran	0.004838	mg/kg	7.25E-10	mg/kg-day	--	--	--	2.03E-09	mg/kg-day	--	--	--
				Dimethyl Phthalate	0.081	mg/kg	9.34E-09	mg/kg-day	--	--	--	2.62E-08	mg/kg-day	--	--	--
				Nitroglycerin	2.467	mg/kg	2.84E-08	mg/kg-day	1.7E-02	mg/kg-day^{-1}	5.E-10	7.97E-08	mg/kg-day	1.0E-04	mg/kg-day	8.E-04
			Exp. Route Total								3.E-07					5.E-02
		Exposure Point Total									1.E-06					2.E-01
	Exposure Medium Total										1.E-06					2.E-01

TABLE E.1-7.3.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Commercial Worker
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Commercial Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Air	Fugitive Dust	Inhalation	Aluminum	16,337	mg/kg	1.94E-06	mg/m3	--	--	--	5.44E-06	mg/m3	5.0E-03	mg/m3	1.E-03
				Antimony	1.849	mg/kg	2.20E-10	mg/m3	--	--	--	6.15E-10	mg/m3	--	--	--
				Arsenic	2.806	mg/kg	3.33E-10	mg/m3	4.3E+00	mg/m3 $^{-1}$	1.4E-09	9.34E-10	mg/m3	3.0E-05	mg/m3	3.E-05
				Cobalt	12.67	mg/kg	1.51E-09	mg/m3	9.0E+00	mg/m3 $^{-1}$	1.4E-08	4.22E-09	mg/m3	6.0E-06	mg/m3	7.E-04
				Iron	37,853	mg/kg	4.50E-06	mg/m3	--	--	--	1.26E-05	mg/m4	--	--	--
				Manganese	1,152	mg/kg	1.37E-07	mg/m3	--	--	--	3.83E-07	mg/m6	5.0E-05	mg/m3	7.7E-03
				Thallium	0.705	mg/kg	8.38E-11	mg/m3	--	--	--	2.35E-10	mg/m7	--	--	--
				Vanadium	29.9	mg/kg	3.55E-09	mg/m3	--	--	--	9.95E-09	mg/m8	--	--	--
				Benzo(a)anthracene	0.1257	mg/kg	1.49E-11	mg/m3	1.1E-01	mg/m3 $^{-1}$	2.E-12	4.18E-11	mg/m9	--	--	--
				Benzo(a)pyrene	0.0922	mg/kg	1.10E-11	mg/m3	1.1E+00	mg/m3 $^{-1}$	1.E-11	3.07E-11	mg/m10	--	--	--
				Benzo(b)fluoranthene	0.1789	mg/kg	2.13E-11	mg/m3	1.1E-01	mg/m3 $^{-1}$	2.E-12	5.95E-11	mg/m11	--	--	--
				Carbazole	0.00725	mg/kg	8.62E-13	mg/m3	--	--	--	2.41E-12	mg/m12	--	--	--
				Dibenz(a,h)anthracene	0.014	mg/kg	1.66E-12	mg/m3	1.2E+00	mg/m3 $^{-1}$	2.E-12	4.66E-12	mg/m13	--	--	--
				Dibenzofuran	0.004838	mg/kg	5.75E-13	mg/m3	--	--	--	1.61E-12	mg/m14	--	--	--
				Dimethyl Phthalate	0.081	mg/kg	9.63E-12	mg/m3	--	--	--	2.70E-11	mg/m15	--	--	--
				Nitroglycerin	2.467	mg/kg	2.93E-10	mg/m3	--	--	--	8.21E-10	mg/m16	--	--	--
			Exp. Route Total								2.E-08					9.E-03
		Exposure Point Total									2.E-08					9.E-03
	Exposure Medium Total										2.E-08					9.E-03
Soil Total											1.E-06					2.E-01
											Total of Receptor Risks Across All Media 1.E-06					Total of Receptor Hazards Across All Media 2.E-01

TABLE E.1-7.4.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Construction Worker
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil	Soil	Soil	Ingestion	Aluminum	16,337	mg/kg	7.54E-04	mg/kg-day	--	--	--	5.28E-02	mg/kg-day	1.0E+00	mg/kg-day	5.E-02
				Antimony	1.849	mg/kg	8.53E-08	mg/kg-day	--	--	--	5.97E-06	mg/kg-day	4.0E-04	mg/kg-day	1.E-02
				Arsenic	2.806	mg/kg	1.29E-07	mg/kg-day	1.5E+00	mg/kg-day^{-1}	2.E-07	9.06E-06	mg/kg-day	3.0E-04	mg/kg-day	3.E-02
				Cobalt	12.67	mg/kg	5.84E-07	mg/kg-day	--	--	--	4.09E-05	mg/kg-day	3.0E-03	mg/kg-day	1.E-02
				Iron	37,853	mg/kg	1.75E-03	mg/kg-day	--	--	--	1.22E-01	mg/kg-day	7.0E-01	mg/kg-day	2.E-01
				Manganese	1,152	mg/kg	5.31E-05	mg/kg-day	--	--	--	3.72E-03	mg/kg-day	2.4E-02	mg/kg-day	1.5E-01
				Thallium	0.705	mg/kg	3.25E-08	mg/kg-day	--	--	--	2.28E-06	mg/kg-day	6.5E-05	mg/kg-day	4.E-02
				Vanadium	29.9	mg/kg	1.38E-06	mg/kg-day	--	--	--	9.65E-05	mg/kg-day	5.0E-03	mg/kg-day	2.E-02
				Benzo(a)anthracene	0.1257	mg/kg	5.80E-09	mg/kg-day	7.3E-01	mg/kg-day^{-1}	4.E-09	4.06E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene	0.0922	mg/kg	4.25E-09	mg/kg-day	7.3E+00	mg/kg-day^{-1}	3.E-08	2.98E-07	mg/kg-day	--	--	--
				Benzo(b)fluoranthene	0.1789	mg/kg	8.25E-09	mg/kg-day	7.3E-01	mg/kg-day^{-1}	6.E-09	5.78E-07	mg/kg-day	--	--	--
				Carbazole	0.00725	mg/kg	3.34E-10	mg/kg-day	2.0E-02	mg/kg-day^{-1}	7.E-12	2.34E-08	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	0.014	mg/kg	6.46E-10	mg/kg-day	7.3E+00	mg/kg-day^{-1}	5.E-09	4.52E-08	mg/kg-day	--	--	--
				Dibenzofuran	0.004838	mg/kg	2.23E-10	mg/kg-day	--	--	--	1.56E-08	mg/kg-day	--	--	--
				Dimethyl Phthalate	0.081	mg/kg	3.74E-09	mg/kg-day	--	--	--	2.62E-07	mg/kg-day	--	--	--
				Nitroglycerin	2.467	mg/kg	1.14E-07	mg/kg-day	1.7E-02	mg/kg-day^{-1}	2.E-09	7.97E-06	mg/kg-day	1.0E-04	mg/kg-day	8.E-02
			Exp. Route Total								2.4E-07					5.8E-01
			Dermal Absorption	Aluminum	16,337	mg/kg	2.26E-05	mg/kg-day	--	--	--	1.58E-03	mg/kg-day	1.0E+00	mg/kg-day	2.E-03
				Antimony	1.849	mg/kg	2.56E-09	mg/kg-day	--	--	--	1.79E-07	mg/kg-day	6.0E-05	mg/kg-day	3.E-03
				Arsenic	2.806	mg/kg	1.16E-08	mg/kg-day	1.5E+00	mg/kg-day^{-1}	2.E-08	8.15E-07	mg/kg-day	3.0E-04	mg/kg-day	3.E-03
				Cobalt	12.67	mg/kg	1.75E-08	mg/kg-day	--	--	--	1.23E-06	mg/kg-day	3.0E-03	mg/kg-day	4.E-04
				Iron	37,853	mg/kg	5.24E-05	mg/kg-day	--	--	--	3.67E-03	mg/kg-day	7.0E-01	mg/kg-day	5.E-03
				Manganese	1,152	mg/kg	1.59E-06	mg/kg-day	--	--	--	1.12E-04	mg/kg-day	9.6E-04	mg/kg-day	1.E-01
				Thallium	0.705	mg/kg	9.76E-10	mg/kg-day	--	--	--	6.83E-08	mg/kg-day	6.5E-05	mg/kg-day	1.E-03
				Vanadium	29.9	mg/kg	4.14E-08	mg/kg-day	--	--	--	2.90E-06	mg/kg-day	1.3E-04	mg/kg-day	2.E-02
				Benzo(a)anthracene	0.1257	mg/kg	2.26E-09	mg/kg-day	7.3E-01	mg/kg-day^{-1}	2.E-09	1.58E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene	0.0922	mg/kg	1.66E-09	mg/kg-day	7.3E+00	mg/kg-day^{-1}	1.E-08	1.16E-07	mg/kg-day	--	--	--
				Benzo(b)fluoranthene	0.1789	mg/kg	3.22E-09	mg/kg-day	7.3E-01	mg/kg-day^{-1}	2.E-09	2.25E-07	mg/kg-day	--	--	--
				Carbazole	0.00725	mg/kg	1.30E-10	mg/kg-day	2.0E-02	mg/kg-day^{-1}	3.E-12	9.13E-09	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene	0.014	mg/kg	2.52E-10	mg/kg-day	7.3E+00	mg/kg-day^{-1}	2.E-09	1.76E-08	mg/kg-day	--	--	--
				Dibenzofuran	0.004838	mg/kg	8.70E-11	mg/kg-day	--	--	--	6.09E-09	mg/kg-day	--	--	--
				Dimethyl Phthalate	0.081	mg/kg	1.12E-09	mg/kg-day	--	--	--	7.85E-08	mg/kg-day	--	--	--
				Nitroglycerin	2.467	mg/kg	3.41E-09	mg/kg-day	1.7E-02	mg/kg-day^{-1}	6.E-11	2.39E-07	mg/kg-day	1.0E-04	mg/kg-day	2.E-03
			Exp. Route Total								4.E-08					1.5E-01
		Exposure Point Total									3.E-07					7.E-01
	Exposure Medium Total										3.E-07					7.E-01

TABLE E.1-7.4.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Construction Worker
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Construction Worker
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Air	Fugitive Dust	Inhalation	Aluminum	16,337	mg/kg	4.35E-05	mg/m3	--	--	--	3.04E-03	mg/m3	5.0E-03	mg/m3	6.E-01
				Antimony	1.849	mg/kg	4.92E-09	mg/m3	--	--	--	3.44E-07	mg/m3	--	--	--
				Arsenic	2.806	mg/kg	7.47E-09	mg/m3	4.3E+00	mg/m3 $^{-1}$	3.E-08	5.23E-07	mg/m3	3.0E-05	mg/m3	2.E-02
				Cobalt	12.67	mg/kg	3.37E-08	mg/m3	9.0E+00	mg/m3 $^{-1}$	3.E-07	2.36E-06	mg/m3	2.0E-05	mg/m3	1.E-01
				Iron	37,853	mg/kg	1.01E-04	mg/m3	--	--	--	7.05E-03	mg/m3	--	--	--
				Manganese	1,152	mg/kg	3.07E-06	mg/m3	--	--	--	2.15E-04	mg/m3	5.0E-05	mg/m3	4.E+00
				Thallium	0.705	mg/kg	1.88E-09	mg/m3	--	--	--	1.31E-07	mg/m3	--	--	--
				Vanadium	29.9	mg/kg	7.96E-08	mg/m3	--	--	--	5.57E-06	mg/m3	--	--	--
				Benzo(a)anthracene	0.1257	mg/kg	3.35E-10	mg/m3	1.1E-01	mg/m3 $^{-1}$	4.E-11	2.34E-08	mg/m3	--	--	--
				Benzo(a)pyrene	0.0922	mg/kg	2.45E-10	mg/m3	1.1E+00	mg/m3 $^{-1}$	3.E-10	1.72E-08	mg/m3	--	--	--
				Benzo(b)fluoranthene	0.1789	mg/kg	4.76E-10	mg/m3	1.1E-01	mg/m3 $^{-1}$	5.E-11	3.33E-08	mg/m3	--	--	--
				Carbazole	0.00725	mg/kg	1.93E-11	mg/m3	--	--	--	1.35E-09	mg/m3	--	--	--
				Dibenz(a,h)anthracene	0.014	mg/kg	3.73E-11	mg/m3	1.2E+00	mg/m3 $^{-1}$	4.E-11	2.61E-09	mg/m3	--	--	--
				Dibenzofuran	0.004838	mg/kg	1.29E-11	mg/m3	--	--	--	9.01E-10	mg/m3	--	--	--
				Dimethyl Phthalate	0.081	mg/kg	2.16E-10	mg/m3	--	--	--	1.51E-08	mg/m3	--	--	--
				Nitroglycerin	2.467	mg/kg	6.57E-09	mg/m3	--	--	--	4.60E-07	mg/m3	--	--	--
			Exp. Route Total								3.E-07					5.E+00
		Exposure Point Total									3.E-07					5.E+00
	Exposure Medium Total										3.E-07					5.E+00
Soil Total											6.E-07					6.E+00
										Total of Receptor Risks Across All Media	6.E-07			Total of Receptor Hazards Across All Media		6.E+00

TABLE E.1-7.5.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Adult Resident
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Soil	Soil	Ingestion	Aluminum	18,614	mg/kg	8.74E-03	mg/kg-day	--	--	--	2.55E-02	mg/kg-day	1.0E+00	mg/kg-day	3.E-02
				Arsenic	2.794	mg/kg	1.31E-06	mg/kg-day	1.5E+00	mg/kg-day^{-1}	2.E-06	3.83E-06	mg/kg-day	3.0E-04	mg/kg-day	1.E-02
				Cobalt	12.97	mg/kg	6.09E-06	mg/kg-day	--	--	--	1.78E-05	mg/kg-day	3.0E-04	mg/kg-day	6.E-02
				Iron	38,358	mg/kg	1.80E-02	mg/kg-day	--	--	--	5.25E-02	mg/kg-day	7.0E-01	mg/kg-day	8.E-02
				Manganese	1,239	mg/kg	5.82E-04	mg/kg-day	--	--	--	1.70E-03	mg/kg-day	2.4E-02	mg/kg-day	7.E-02
				Thallium	1.514	mg/kg	7.11E-07	mg/kg-day	--	--	--	2.07E-06	mg/kg-day	6.5E-05	mg/kg-day	3.E-02
				Vanadium	34.02	mg/kg	1.60E-05	mg/kg-day	--	--	--	4.66E-05	mg/kg-day	7.0E-03	mg/kg-day	7.E-03
				Benzo(a)anthracene*	0.09053	mg/kg	4.25E-08	mg/kg-day	7.3E-01	mg/kg-day^{-1}	6.E-08	1.24E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.07426	mg/kg	3.49E-08	mg/kg-day	7.3E+00	mg/kg-day^{-1}	5.E-07	1.02E-07	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.1648	mg/kg	7.74E-08	mg/kg-day	7.3E-01	mg/kg-day^{-1}	1.E-07	2.26E-07	mg/kg-day	--	--	--
				Carbazole	0.009436	mg/kg	4.43E-09	mg/kg-day	2.0E-02	mg/kg-day^{-1}	9.E-11	1.29E-08	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene*	0.01695	mg/kg	7.96E-09	mg/kg-day	7.3E+00	mg/kg-day^{-1}	1.E-07	2.32E-08	mg/kg-day	--	--	--
				Dibenzofuran	0.004934	mg/kg	2.32E-09	mg/kg-day	--	--	--	6.76E-09	mg/kg-day	--	--	--
				Dimethyl Phthalate	0.1168	mg/kg	5.49E-08	mg/kg-day	--	--	--	1.60E-07	mg/kg-day	--	--	--
				Nitroglycerin	2.11	mg/kg	9.91E-07	mg/kg-day	1.7E-02	mg/kg-day^{-1}	2.E-08	2.89E-06	mg/kg-day	1.0E-04	mg/kg-day	3.E-02
			Exp. Route Total								2.7E-06					3.E-01
			Dermal Absorption	Aluminum	18,614	mg/kg	3.49E-04	mg/kg-day	--	--	--	1.02E-03	mg/kg-day	1.0E+00	mg/kg-day	1.E-03
				Arsenic	2.794	mg/kg	1.57E-07	mg/kg-day	1.5E+00	mg/kg-day^{-1}	2.E-07	4.58E-07	mg/kg-day	3.0E-04	mg/kg-day	2.E-03
				Cobalt	12.97	mg/kg	2.43E-07	mg/kg-day	--	--	--	7.09E-07	mg/kg-day	3.0E-04	mg/kg-day	2.E-03
				Iron	38,358	mg/kg	7.19E-04	mg/kg-day	--	--	--	2.10E-03	mg/kg-day	7.0E-01	mg/kg-day	3.E-03
				Manganese	1,239	mg/kg	2.32E-05	mg/kg-day	--	--	--	6.77E-05	mg/kg-day	9.6E-04	mg/kg-day	7.E-02
				Thallium	1.514	mg/kg	2.84E-08	mg/kg-day	--	--	--	8.28E-08	mg/kg-day	6.5E-05	mg/kg-day	1.E-03
				Vanadium	34.02	mg/kg	6.38E-07	mg/kg-day	--	--	--	1.86E-06	mg/kg-day	1.8E-04	mg/kg-day	1.E-02
				Benzo(a)anthracene*	0.09053	mg/kg	2.21E-08	mg/kg-day	7.3E-01	mg/kg-day^{-1}	3.E-08	6.43E-08	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.07426	mg/kg	1.81E-08	mg/kg-day	7.3E+00	mg/kg-day^{-1}	2.E-07	5.28E-08	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.1648	mg/kg	4.01E-08	mg/kg-day	7.3E-01	mg/kg-day^{-1}	5.E-08	1.17E-07	mg/kg-day	--	--	--
				Carbazole	0.009436	mg/kg	2.30E-09	mg/kg-day	2.0E-02	mg/kg-day^{-1}	5.E-11	6.70E-09	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene*	0.01695	mg/kg	4.13E-09	mg/kg-day	7.3E+00	mg/kg-day^{-1}	6.E-08	1.20E-08	mg/kg-day	--	--	--
				Dibenzofuran	0.004934	mg/kg	1.20E-09	mg/kg-day	--	--	--	3.51E-09	mg/kg-day	--	--	--
				Dimethyl Phthalate	0.1168	mg/kg	2.19E-08	mg/kg-day	--	--	--	6.38E-08	mg/kg-day	--	--	--
				Nitroglycerin	2.11	mg/kg	3.95E-08	mg/kg-day	1.7E-02	mg/kg-day^{-1}	7.E-10	1.15E-07	mg/kg-day	1.0E-04	mg/kg-day	1.E-03
			Exp. Route Total								6.E-07					9.E-02
		Exposure Point Total									3.3E-06					4.E-01
	Exposure Medium Total										3.3E-06					4.E-01

TABLE E.1-7.5.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Adult Resident
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil Cont.	Air	Fugitive Dust	Inhalation	Aluminum	18,614	mg/kg	7.43E-07	mg/m3	--	--	--	2.17E-06	mg/m3	5.0E-03	mg/m3	4.E-04
				Arsenic	2.794	mg/kg	1.12E-10	mg/m3	4.3E+00	mg/m3 $^{-1}$	5.E-10	3.25E-10	mg/m3	3.0E-05	mg/m3	1.E-05
				Cobalt	12.97	mg/kg	5.18E-10	mg/m3	9.0E+00	mg/m3 $^{-1}$	4.7E-09	1.51E-09	mg/m3	6.0E-06	mg/m3	3.E-04
				Iron	38,358	mg/kg	1.53E-06	mg/m3	--	--	--	4.47E-06	mg/m3	--	--	--
				Manganese	1,239	mg/kg	4.95E-08	mg/m3	--	--	--	1.44E-07	mg/m3	5.0E-05	mg/m3	3.E-03
				Thallium	1.514	mg/kg	6.04E-11	mg/m3	--	--	--	1.76E-10	mg/m3	--	--	--
				Vanadium	34.02	mg/kg	1.36E-09	mg/m3	--	--	--	3.96E-09	mg/m3	--	--	--
				Benzo(a)anthracene*	0.09053	mg/kg	3.61E-12	mg/m3	1.1E-01	mg/m3 $^{-1}$	7.E-13	1.05E-11	mg/m3	--	--	--
				Benzo(a)pyrene*	0.07426	mg/kg	2.96E-12	mg/m3	1.1E+00	mg/m3 $^{-1}$	6.E-12	8.65E-12	mg/m3	--	--	--
				Benzo(b)fluoranthene*	0.1648	mg/kg	6.58E-12	mg/m3	1.1E-01	mg/m3 $^{-1}$	1.E-12	1.92E-11	mg/m3	--	--	--
				Carbazole	0.009436	mg/kg	3.77E-13	mg/m3	--	--	--	1.10E-12	mg/m3	--	--	--
				Dibenz(a,h)anthracene*	0.01695	mg/kg	6.77E-13	mg/m3	1.2E+00	mg/m3 $^{-1}$	1.E-12	1.97E-12	mg/m3	--	--	--
				Dibenzofuran	0.004934	mg/kg	1.97E-13	mg/m3	--	--	--	5.75E-13	mg/m3	--	--	--
				Dimethyl Phthalate	0.1168	mg/kg	4.66E-12	mg/m3	--	--	--	1.36E-11	mg/m3	--	--	--
				Nitroglycerin	2.11	mg/kg	8.42E-11	mg/m3	--	--	--	2.46E-10	mg/m3	--	--	--
			Exp. Route Total								5.E-09					4.E-03
		Exposure Point Total									5.E-09					4.E-03
	Exposure Medium Total										5.E-09					4.E-03
Soil Total											3.3E-06					4.E-01
											Total of Receptor Risks Across All Media					
											3.3E-06	Total of Receptor Hazards Across All Media				4.E-01

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.3).

TABLE E.1-7.6.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Adult Resident
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil	Soil	Soil	Ingestion	Aluminum	16,337	mg/kg	7.67E-03	mg/kg-day	--	--	--	2.24E-02	mg/kg-day	1.0E+00	mg/kg-day	2.E-02
				Antimony	1.849	mg/kg	8.68E-07	mg/kg-day	--	--	--	2.53E-06	mg/kg-day	4.0E-04	mg/kg-day	6.E-03
				Arsenic	2.806	mg/kg	1.32E-06	mg/kg-day	1.5E+00	mg/kg-day $^{-1}$	2.E-06	3.84E-06	mg/kg-day	3.0E-04	mg/kg-day	1.E-02
				Cobalt	12.67	mg/kg	5.95E-06	mg/kg-day	--	--	--	1.74E-05	mg/kg-day	3.0E-04	mg/kg-day	6.E-02
				Iron	37,853	mg/kg	1.78E-02	mg/kg-day	--	--	--	5.19E-02	mg/kg-day	7.0E-01	mg/kg-day	7.E-02
				Manganese	1,152	mg/kg	5.41E-04	mg/kg-day	--	--	--	1.58E-03	mg/kg-day	2.4E-02	mg/kg-day	7.E-02
				Thallium	0.705	mg/kg	3.31E-07	mg/kg-day	--	--	--	9.66E-07	mg/kg-day	6.5E-05	mg/kg-day	1.E-02
				Vanadium	29.9	mg/kg	1.40E-05	mg/kg-day	--	--	--	4.10E-05	mg/kg-day	7.0E-03	mg/kg-day	6.E-03
				Benzo(a)anthracene*	0.1257	mg/kg	5.90E-08	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	8.E-08	1.72E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.0922	mg/kg	4.33E-08	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	6.E-07	1.26E-07	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.1789	mg/kg	8.40E-08	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	1.E-07	2.45E-07	mg/kg-day	--	--	--
				Carbazole	0.00725	mg/kg	3.41E-09	mg/kg-day	2.0E-02	mg/kg-day $^{-1}$	7.E-11	9.93E-09	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene*	0.014	mg/kg	6.58E-09	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	9.E-08	1.92E-08	mg/kg-day	--	--	--
				Dibenzofuran	0.004838	mg/kg	2.27E-09	mg/kg-day	--	--	--	6.63E-09	mg/kg-day	--	--	--
				Dimethyl Phthalate	0.081	mg/kg	3.80E-08	mg/kg-day	--	--	--	1.11E-07	mg/kg-day	--	--	--
				Nitroglycerin	2.467	mg/kg	1.16E-06	mg/kg-day	1.7E-02	mg/kg-day $^{-1}$	2.E-08	3.38E-06	mg/kg-day	1.0E-04	mg/kg-day	3.E-02
			Exp. Route Total								3.E-06					3.E-01
			Dermal Absorption	Aluminum	16,337	mg/kg	3.06E-04	mg/kg-day	--	--	--	8.93E-04	mg/kg-day	1.0E+00	mg/kg-day	9.E-04
				Antimony	1.849	mg/kg	3.46E-08	mg/kg-day	--	--	--	1.01E-07	mg/kg-day	6.0E-05	mg/kg-day	2.E-03
				Arsenic	2.806	mg/kg	1.58E-07	mg/kg-day	1.5E+00	mg/kg-day $^{-1}$	2.4E-07	4.60E-07	mg/kg-day	3.0E-04	mg/kg-day	2.E-03
				Cobalt	12.67	mg/kg	2.37E-07	mg/kg-day	--	--	--	6.93E-07	mg/kg-day	3.0E-04	mg/kg-day	2.E-03
				Iron	37,853	mg/kg	7.09E-04	mg/kg-day	--	--	--	2.07E-03	mg/kg-day	7.0E-01	mg/kg-day	3.E-03
				Manganese	1,152	mg/kg	2.16E-05	mg/kg-day	--	--	--	6.30E-05	mg/kg-day	9.6E-04	mg/kg-day	7.E-02
				Thallium	0.705	mg/kg	1.32E-08	mg/kg-day	--	--	--	3.85E-08	mg/kg-day	6.5E-05	mg/kg-day	6.E-04
				Vanadium	29.9	mg/kg	5.60E-07	mg/kg-day	--	--	--	1.63E-06	mg/kg-day	1.8E-04	mg/kg-day	9.E-03
				Benzo(a)anthracene*	0.1257	mg/kg	3.06E-08	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	4.E-08	8.93E-08	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.0922	mg/kg	2.25E-08	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	3.E-07	6.55E-08	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.1789	mg/kg	4.36E-08	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	6.E-08	1.27E-07	mg/kg-day	--	--	--
				Carbazole	0.00725	mg/kg	1.77E-09	mg/kg-day	2.0E-02	mg/kg-day $^{-1}$	4.E-11	5.15E-09	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene*	0.014	mg/kg	3.41E-09	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	5.E-08	9.95E-09	mg/kg-day	--	--	--
				Dibenzofuran	0.004838	mg/kg	1.18E-09	mg/kg-day	--	--	--	3.44E-09	mg/kg-day	--	--	--
				Dimethyl Phthalate	0.081	mg/kg	1.52E-08	mg/kg-day	--	--	--	4.43E-08	mg/kg-day	--	--	--
				Nitroglycerin	2.467	mg/kg	4.62E-08	mg/kg-day	1.7E-02	mg/kg-day $^{-1}$	8.E-10	1.35E-07	mg/kg-day	1.0E-04	mg/kg-day	1.E-03
			Exp. Route Total								7.E-07					9.E-02
		Exposure Point Total									4.E-06					4.E-01
	Exposure Medium Total										4.E-06					4.E-01

TABLE E.1-7.6.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Adult Resident
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Air	Fugitive Dust	Inhalation	Aluminum	16,337	mg/kg	6.52E-07	mg/m3	--	--	--	1.90E-06	mg/m3	5.0E-03	mg/m3	4.E-04
				Antimony	1.849	mg/kg	7.38E-11	mg/m3	--	--	--	2.15E-10	mg/m3	--	--	--
				Arsenic	2.806	mg/kg	1.12E-10	mg/m3	4.3E+00	mg/m3 $^{-1}$	5.E-10	3.27E-10	mg/m3	3.0E-05	mg/m3	1.E-05
				Cobalt	12.67	mg/kg	5.06E-10	mg/m3	9.0E+00	mg/m3 $^{-1}$	4.6E-09	1.48E-09	mg/m3	6.0E-06	mg/m3	2.E-04
				Iron	37,853	mg/kg	1.51E-06	mg/m3	--	--	--	4.41E-06	mg/m3	--	--	--
				Manganese	1,152	mg/kg	4.60E-08	mg/m3	--	--	--	1.34E-07	mg/m3	5.0E-05	mg/m3	3.E-03
				Thallium	0.705	mg/kg	2.81E-11	mg/m3	--	--	--	8.21E-11	mg/m3	--	--	--
				Vanadium	29.9	mg/kg	1.19E-09	mg/m3	--	--	--	3.48E-09	mg/m3	--	--	--
				Benzo(a)anthracene*	0.1257	mg/kg	5.02E-12	mg/m3	1.1E-01	mg/m3 $^{-1}$	1.E-12	1.46E-11	mg/m3	--	--	--
				Benzo(a)pyrene*	0.0922	mg/kg	3.68E-12	mg/m3	1.1E+00	mg/m3 $^{-1}$	7.E-12	1.07E-11	mg/m3	--	--	--
				Benzo(b)fluoranthene*	0.1789	mg/kg	7.14E-12	mg/m3	1.1E-01	mg/m3 $^{-1}$	1.E-12	2.08E-11	mg/m3	--	--	--
				Carbazole	0.00725	mg/kg	2.89E-13	mg/m3	--	--	--	8.44E-13	mg/m3	--	--	--
				Dibenz(a,h)anthracene*	0.014	mg/kg	5.59E-13	mg/m3	1.2E+00	mg/m3 $^{-1}$	1.E-12	1.63E-12	mg/m3	--	--	--
				Dibenzofuran	0.004838	mg/kg	1.93E-13	mg/m3	--	--	--	5.63E-13	mg/m3	--	--	--
				Dimethyl Phthalate	0.081	mg/kg	3.23E-12	mg/m3	--	--	--	9.43E-12	mg/m3	--	--	--
				Nitroglycerin	2.467	mg/kg	9.85E-11	mg/m3	--	--	--	2.87E-10	mg/m3	--	--	--
			Exp. Route Total								5.E-09					3.E-03
		Exposure Point Total									5.E-09					3.E-03
	Exposure Medium Total										5.E-09					3.E-03
Soil Total											4.E-06					4.E-01
											Total of Receptor Risks Across All Media	4.E-06		Total of Receptor Hazards Across All Media		4.E-01

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.3).

TABLE E.1-7.7.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Child Resident
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Soil	Soil	Ingestion	Aluminum	18,614	mg/kg	2.04E-02	mg/kg-day	--	--	--	2.38E-01	mg/kg-day	1.0E+00	mg/kg-day	2.E-01
				Arsenic	2.794	mg/kg	3.06E-06	mg/kg-day	1.5E+00	mg/kg-day $^{-1}$	5.E-06	3.57E-05	mg/kg-day	3.0E-04	mg/kg-day	1.E-01
				Cobalt	12.97	mg/kg	1.42E-05	mg/kg-day	--	--	--	1.66E-04	mg/kg-day	3.0E-04	mg/kg-day	6.E-01
				Iron	38,358	mg/kg	4.20E-02	mg/kg-day	--	--	--	4.90E-01	mg/kg-day	7.0E-01	mg/kg-day	7.E-01
				Manganese	1,239	mg/kg	1.36E-03	mg/kg-day	--	--	--	1.58E-02	mg/kg-day	2.4E-02	mg/kg-day	7.E-01
				Thallium	1.514	mg/kg	1.66E-06	mg/kg-day	--	--	--	1.94E-05	mg/kg-day	6.5E-05	mg/kg-day	3.E-01
				Vanadium	34.02	mg/kg	3.73E-05	mg/kg-day	--	--	--	4.35E-04	mg/kg-day	7.0E-03	mg/kg-day	6.E-02
				Benzo(a)anthracene*	0.09053	mg/kg	9.92E-08	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	4.E-07	1.16E-06	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.07426	mg/kg	8.14E-08	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	3.E-06	9.49E-07	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.1648	mg/kg	1.81E-07	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	7.E-07	2.11E-06	mg/kg-day	--	--	--
				Carbazole	0.009436	mg/kg	1.03E-08	mg/kg-day	2.0E-02	mg/kg-day $^{-1}$	2.E-10	1.21E-07	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene*	0.01695	mg/kg	1.86E-08	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	7.E-07	2.17E-07	mg/kg-day	--	--	--
				Dibenzofuran	0.004934	mg/kg	5.41E-09	mg/kg-day	--	--	--	6.31E-08	mg/kg-day	--	--	--
				Dimethyl Phthalate	0.1168	mg/kg	1.28E-07	mg/kg-day	--	--	--	1.49E-06	mg/kg-day	--	--	--
				Nitroglycerin	2.11	mg/kg	2.31E-06	mg/kg-day	1.7E-02	mg/kg-day $^{-1}$	4.E-08	2.70E-05	mg/kg-day	1.0E-04	mg/kg-day	3.E-01
			Exp. Route Total								1.E-05					2.9E+00
			Dermal Absorption	Aluminum	18,614	mg/kg	5.71E-04	mg/kg-day	--	--	--	6.66E-03	mg/kg-day	1.0E+00	mg/kg-day	7.E-03
				Arsenic	2.794	mg/kg	2.57E-07	mg/kg-day	1.5E+00	mg/kg-day $^{-1}$	4.E-07	3.00E-06	mg/kg-day	3.0E-04	mg/kg-day	1.E-02
				Cobalt	12.97	mg/kg	3.98E-07	mg/kg-day	--	--	--	4.64E-06	mg/kg-day	3.0E-04	mg/kg-day	2.E-02
				Iron	38,358	mg/kg	1.18E-03	mg/kg-day	--	--	--	1.37E-02	mg/kg-day	7.0E-01	mg/kg-day	2.E-02
				Manganese	1,239	mg/kg	3.80E-05	mg/kg-day	--	--	--	4.44E-04	mg/kg-day	9.6E-04	mg/kg-day	4.6E-01
				Thallium	1.514	mg/kg	4.65E-08	mg/kg-day	--	--	--	5.42E-07	mg/kg-day	6.5E-05	mg/kg-day	8.E-03
				Vanadium	34.02	mg/kg	1.04E-06	mg/kg-day	--	--	--	1.22E-05	mg/kg-day	1.8E-04	mg/kg-day	7.E-02
				Benzo(a)anthracene*	0.09053	mg/kg	3.61E-08	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	1.E-07	4.21E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.07426	mg/kg	2.96E-08	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	1.E-06	3.46E-07	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.1648	mg/kg	6.57E-08	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	3.E-07	7.67E-07	mg/kg-day	--	--	--
				Carbazole	0.009436	mg/kg	3.76E-09	mg/kg-day	2.0E-02	mg/kg-day $^{-1}$	8.E-11	4.39E-08	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene*	0.01695	mg/kg	6.76E-09	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	3.E-07	7.89E-08	mg/kg-day	--	--	--
				Dibenzofuran	0.004934	mg/kg	1.97E-09	mg/kg-day	--	--	--	2.30E-08	mg/kg-day	--	--	--
				Dimethyl Phthalate	0.1168	mg/kg	3.58E-08	mg/kg-day	--	--	--	4.18E-07	mg/kg-day	--	--	--
				Nitroglycerin	2.11	mg/kg	6.47E-08	mg/kg-day	1.7E-02	mg/kg-day $^{-1}$	1.E-09	7.55E-07	mg/kg-day	1.0E-04	mg/kg-day	8.E-03
			Exp. Route Total								2.E-06					6.E-01
		Exposure Point Total									1.E-05					3.5E+00
	Exposure Medium Total										1.E-05					3.5E+00

TABLE E.1-7.7.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Child Resident
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil Cont.	Air	Fugitive Dust	Inhalation	Aluminum	18,614	mg/kg	5.57E-07	mg/m3	--	--	--	6.50E-06	mg/m3	5.0E-03	mg/m3	1.E-03
				Arsenic	2.794	mg/kg	8.37E-11	mg/m3	4.3E+00	mg/m3 $^{-1}$	4.E-10	9.76E-10	mg/m3	3.0E-05	mg/m3	3.E-05
				Cobalt	12.97	mg/kg	3.88E-10	mg/m3	9.0E+00	mg/m3 $^{-1}$	3.5E-09	4.53E-09	mg/m3	6.0E-06	mg/m3	8.E-04
				Iron	38,358	mg/kg	1.15E-06	mg/m3	--	--	--	1.34E-05	mg/m3	--	--	--
				Manganese	1,239	mg/kg	3.71E-08	mg/m3	--	--	--	4.33E-07	mg/m3	5.0E-05	mg/m3	9.E-03
				Thallium	1.514	mg/kg	4.53E-11	mg/m3	--	--	--	5.29E-10	mg/m3	--	--	--
				Vanadium	34.02	mg/kg	1.02E-09	mg/m3	--	--	--	1.19E-08	mg/m3	--	--	--
				Benzo(a)anthracene*	0.09053	mg/kg	2.71E-12	mg/m3	1.1E-01	mg/m3 $^{-1}$	2.E-12	3.16E-11	mg/m3	--	--	--
				Benzo(a)pyrene*	0.07426	mg/kg	2.22E-12	mg/m3	1.1E+00	mg/m3 $^{-1}$	1.E-11	2.59E-11	mg/m3	--	--	--
				Benzo(b)fluoranthene*	0.1648	mg/kg	4.93E-12	mg/m3	1.1E-01	mg/m3 $^{-1}$	3.E-12	5.76E-11	mg/m3	--	--	--
				Carbazole	0.009436	mg/kg	2.83E-13	mg/m3	--	--	--	3.30E-12	mg/m3	--	--	--
				Dibenz(a,h)anthracene*	0.01695	mg/kg	5.08E-13	mg/m3	1.2E+00	mg/m3 $^{-1}$	3.E-12	5.92E-12	mg/m3	--	--	--
				Dibenzofuran	0.004934	mg/kg	1.48E-13	mg/m3	--	--	--	1.72E-12	mg/m3	--	--	--
				Dimethyl Phthalate	0.1168	mg/kg	3.50E-12	mg/m3	--	--	--	4.08E-11	mg/m3	--	--	--
				Nitroglycerin	2.11	mg/kg	6.32E-11	mg/m3	--	--	--	7.37E-10	mg/m3	--	--	--
			Exp. Route Total								4.E-09					1.E-02
		Exposure Point Total									4.E-09					1.E-02
	Exposure Medium Total										4.E-09					1.E-02
Soil Total											1.E-05					3.5E+00
											Total of Receptor Risks Across All Media					
											1.E-05	Total of Receptor Hazards Across All Media				3.5E+00

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.3).

TABLE E.1-7.8.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Child Resident
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil	Soil	Soil	Ingestion	Aluminum	16,337	mg/kg	1.79E-02	mg/kg-day	--	--	--	2.09E-01	mg/kg-day	1.0E+00	mg/kg-day	2.E-01
				Antimony	1.849	mg/kg	2.03E-06	mg/kg-day	--	--	--	2.36E-05	mg/kg-day	4.0E-04	mg/kg-day	6.E-02
				Arsenic	2.806	mg/kg	3.08E-06	mg/kg-day	1.5E+00	mg/kg-day^{-1}	5.E-06	3.59E-05	mg/kg-day	3.0E-04	mg/kg-day	1.E-01
				Cobalt	12.67	mg/kg	1.39E-05	mg/kg-day	--	--	--	1.62E-04	mg/kg-day	3.0E-04	mg/kg-day	5.E-01
				Iron	37,853	mg/kg	4.15E-02	mg/kg-day	--	--	--	4.84E-01	mg/kg-day	7.0E-01	mg/kg-day	7.E-01
				Manganese	1,152	mg/kg	1.26E-03	mg/kg-day	--	--	--	1.47E-02	mg/kg-day	2.4E-02	mg/kg-day	6.E-01
				Thallium	0.705	mg/kg	7.73E-07	mg/kg-day	--	--	--	9.01E-06	mg/kg-day	6.5E-05	mg/kg-day	1.E-01
				Vanadium	29.9	mg/kg	3.28E-05	mg/kg-day	--	--	--	3.82E-04	mg/kg-day	7.0E-03	mg/kg-day	5.E-02
				Benzo(a)anthracene*	0.1257	mg/kg	1.38E-07	mg/kg-day	7.3E-01	mg/kg-day^{-1}	5.E-07	1.61E-06	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.0922	mg/kg	1.01E-07	mg/kg-day	7.3E+00	mg/kg-day^{-1}	4.E-06	1.18E-06	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.1789	mg/kg	1.96E-07	mg/kg-day	7.3E-01	mg/kg-day^{-1}	8.E-07	2.29E-06	mg/kg-day	--	--	--
				Carbazole	0.00725	mg/kg	7.95E-09	mg/kg-day	2.0E-02	mg/kg-day^{-1}	2.E-10	9.27E-08	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene*	0.014	mg/kg	1.53E-08	mg/kg-day	7.3E+00	mg/kg-day^{-1}	6.E-07	1.79E-07	mg/kg-day	--	--	--
				Dibenzofuran	0.004838	mg/kg	5.30E-09	mg/kg-day	--	--	--	6.19E-08	mg/kg-day	--	--	--
				Dimethyl Phthalate	0.081	mg/kg	8.88E-08	mg/kg-day	--	--	--	1.04E-06	mg/kg-day	--	--	--
				Nitroglycerin	2.467	mg/kg	2.70E-06	mg/kg-day	1.7E-02	mg/kg-day^{-1}	5.E-08	3.15E-05	mg/kg-day	1.0E-04	mg/kg-day	3.E-01
			Exp. Route Total								1.E-05					2.7.E+00
			Dermal Absorption	Aluminum	16,337	mg/kg	5.01E-04	mg/kg-day	--	--	--	5.85E-03	mg/kg-day	1.0E+00	mg/kg-day	6.E-03
				Antimony	1.849	mg/kg	5.67E-08	mg/kg-day	--	--	--	6.62E-07	mg/kg-day	6.0E-05	mg/kg-day	1.E-02
				Arsenic	2.806	mg/kg	2.58E-07	mg/kg-day	1.5E+00	mg/kg-day^{-1}	4.E-07	3.01E-06	mg/kg-day	3.0E-04	mg/kg-day	1.E-02
				Cobalt	12.67	mg/kg	3.89E-07	mg/kg-day	--	--	--	4.54E-06	mg/kg-day	3.0E-04	mg/kg-day	2.E-02
				Iron	37,853	mg/kg	1.16E-03	mg/kg-day	--	--	--	1.36E-02	mg/kg-day	7.0E-01	mg/kg-day	2.E-02
				Manganese	1,152	mg/kg	3.53E-05	mg/kg-day	--	--	--	4.12E-04	mg/kg-day	9.6E-04	mg/kg-day	4.3E-01
				Thallium	0.705	mg/kg	2.16E-08	mg/kg-day	--	--	--	2.52E-07	mg/kg-day	6.5E-05	mg/kg-day	4.E-03
				Vanadium	29.9	mg/kg	9.17E-07	mg/kg-day	--	--	--	1.07E-05	mg/kg-day	1.8E-04	mg/kg-day	6.E-02
				Benzo(a)anthracene*	0.1257	mg/kg	5.01E-08	mg/kg-day	7.3E-01	mg/kg-day^{-1}	2.E-07	5.85E-07	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.0922	mg/kg	3.68E-08	mg/kg-day	7.3E+00	mg/kg-day^{-1}	1.4E-06	4.29E-07	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.1789	mg/kg	7.14E-08	mg/kg-day	7.3E-01	mg/kg-day^{-1}	3.E-07	8.33E-07	mg/kg-day	--	--	--
				Carbazole	0.00725	mg/kg	2.89E-09	mg/kg-day	2.0E-02	mg/kg-day^{-1}	6.E-11	3.37E-08	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene*	0.014	mg/kg	5.58E-09	mg/kg-day	7.3E+00	mg/kg-day^{-1}	2.E-07	6.52E-08	mg/kg-day	--	--	--
				Dibenzofuran	0.004838	mg/kg	1.93E-09	mg/kg-day	--	--	--	2.25E-08	mg/kg-day	--	--	--
				Dimethyl Phthalate	0.081	mg/kg	2.49E-08	mg/kg-day	--	--	--	2.90E-07	mg/kg-day	--	--	--
				Nitroglycerin	2.467	mg/kg	7.57E-08	mg/kg-day	1.7E-02	mg/kg-day^{-1}	1.E-09	8.83E-07	mg/kg-day	1.0E-04	mg/kg-day	9.E-03
			Exp. Route Total								2.5E-06					6.E-01
		Exposure Point Total									1.E-05					3.E+00
	Exposure Medium Total										1.E-05					3.E+00

TABLE E.1-7.8.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Child Resident
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Air	Fugitive Dust	Inhalation	Aluminum	16,337	mg/kg	4.89E-07	mg/m3	--	--	--	5.71E-06	mg/m3	5.0E-03	mg/m3	1.E-03
				Antimony	1.849	mg/kg	5.54E-11	mg/m3	--	--	--	6.46E-10	mg/m3	--	--	--
				Arsenic	2.806	mg/kg	8.40E-11	mg/m3	4.3E+00	mg/m3 $^{-1}$	4.E-10	9.80E-10	mg/m3	3.0E-05	mg/m3	3.E-05
				Cobalt	12.67	mg/kg	3.79E-10	mg/m3	9.0E+00	mg/m3 $^{-1}$	3.4E-09	4.43E-09	mg/m3	6.0E-06	mg/m3	7.E-04
				Iron	37,853	mg/kg	1.13E-06	mg/m3	--	--	--	1.32E-05	mg/m3	--	--	--
				Manganese	1,152	mg/kg	3.45E-08	mg/m3	--	--	--	4.02E-07	mg/m3	5.0E-05	mg/m3	8.E-03
				Thallium	0.705	mg/kg	2.11E-11	mg/m3	--	--	--	2.46E-10	mg/m3	--	--	--
				Vanadium	29.9	mg/kg	8.95E-10	mg/m3	--	--	--	1.04E-08	mg/m3	--	--	--
				Benzo(a)anthracene*	0.1257	mg/kg	3.76E-12	mg/m3	1.1E-01	mg/m3 $^{-1}$	2.E-12	4.39E-11	mg/m3	--	--	--
				Benzo(a)pyrene*	0.0922	mg/kg	2.76E-12	mg/m3	1.1E+00	mg/m3 $^{-1}$	2.E-11	3.22E-11	mg/m3	--	--	--
				Benzo(b)fluoranthene*	0.1789	mg/kg	5.36E-12	mg/m3	1.1E-01	mg/m3 $^{-1}$	3.E-12	6.25E-11	mg/m3	--	--	--
				Carbazole	0.00725	mg/kg	2.17E-13	mg/m3	--	--	--	2.53E-12	mg/m3	--	--	--
				Dibenz(a,h)anthracene*	0.014	mg/kg	4.19E-13	mg/m3	1.2E+00	mg/m3 $^{-1}$	3.E-12	4.89E-12	mg/m3	--	--	--
				Dibenzofuran	0.004838	mg/kg	1.45E-13	mg/m3	--	--	--	1.69E-12	mg/m3	--	--	--
				Dimethyl Phthalate	0.081	mg/kg	2.43E-12	mg/m3	--	--	--	2.83E-11	mg/m3	--	--	--
				Nitroglycerin	2.467	mg/kg	7.39E-11	mg/m3	--	--	--	8.62E-10	mg/m3	--	--	--
			Exp. Route Total								4.E-09					1.E-02
		Exposure Point Total									4.E-09					1.E-02
	Exposure Medium Total										4.E-09					1.E-02
Soil Total											1.E-05					3.E+00
										Total of Receptor Risks Across All Media	1.E-05			Total of Receptor Hazards Across All Media		3.E+00

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.3).

TABLE E.1-7.9.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Lifetime Resident
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk
Surface Soil	Soil	Soil	Ingestion	Aluminum	18,614	mg/kg	--
				Arsenic	2.794	mg/kg	6.6E-06
				Cobalt	12.97	mg/kg	--
				Iron	38,358	mg/kg	--
				Manganese	1,239	mg/kg	--
				Thallium	1.514	mg/kg	--
				Vanadium	34.02	mg/kg	--
				Benzo(a)anthracene*	0.09053	mg/kg	4.E-07
				Benzo(a)pyrene*	0.07426	mg/kg	3.6E-06
				Benzo(b)fluoranthene*	0.1648	mg/kg	8.E-07
				Carbazole	0.009436	mg/kg	3.E-10
				Dibenz(a,h)anthracene*	0.01695	mg/kg	8.E-07
				Dibenzofuran	0.004934	mg/kg	--
				Dimethyl Phthalate	0.1168	mg/kg	--
				Nitroglycerin	2.11	mg/kg	6.E-08
			Exp. Route Total				1.2E-05
			Dermal Absorption	Aluminum	18,614	mg/kg	--
				Arsenic	2.794	mg/kg	6.E-07
				Cobalt	12.97	mg/kg	--
				Iron	38,358	mg/kg	--
				Manganese	1,239	mg/kg	--
				Thallium	1.514	mg/kg	--
				Vanadium	34.02	mg/kg	--
				Benzo(a)anthracene*	0.09053	mg/kg	2.E-07
				Benzo(a)pyrene*	0.07426	mg/kg	1.4E-06
				Benzo(b)fluoranthene*	0.1648	mg/kg	3.E-07
				Carbazole	0.009436	mg/kg	1.E-10
				Dibenz(a,h)anthracene*	0.01695	mg/kg	3.E-07
				Dibenzofuran	0.004934	mg/kg	--
				Dimethyl Phthalate	0.1168	mg/kg	--
				Nitroglycerin	2.11	mg/kg	2.E-09
			Exp. Route Total				3.E-06
		Exposure Point Total					2.E-05
	Exposure Medium Total						2.E-05
	Air	Fugitive Dust	Inhalation	Aluminum	18,614	mg/kg	--
				Arsenic	2.794	mg/kg	8.E-10
				Cobalt	12.97	mg/kg	8.E-09
				Iron	38,358	mg/kg	--
				Manganese	1,239	mg/kg	--
				Thallium	1.514	mg/kg	--
				Vanadium	34.02	mg/kg	--
				Benzo(a)anthracene*	0.09053	mg/kg	2.E-12
				Benzo(a)pyrene*	0.07426	mg/kg	2.E-11
				Benzo(b)fluoranthene*	0.1648	mg/kg	4.E-12
				Carbazole	0.009436	mg/kg	--
				Dibenz(a,h)anthracene*	0.01695	mg/kg	5.E-12
				Dibenzofuran	0.004934	mg/kg	--
				Dimethyl Phthalate	0.1168	mg/kg	--
				Nitroglycerin	2.11	mg/kg	--
			Exp. Route Total				9.E-09
		Exposure Point Total					9.E-09
	Exposure Medium Total						9.E-09
Soil Total							2.E-05
							2.E-05

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.3).

TABLE E.1-7.10.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Lifetime Resident
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC Value	EPC Units	Cancer Risk
Total Soil	Soil	Soil	Ingestion	Aluminum	16,337	mg/kg	--
				Antimony	1.849	mg/kg	--
				Arsenic	2.806	mg/kg	6.6E-06
				Cobalt	12.67	mg/kg	--
				Iron	37,853	mg/kg	--
				Manganese	1,152	mg/kg	--
				Thallium	0.705	mg/kg	--
				Vanadium	29.9	mg/kg	--
				Benzo(a)anthracene*	0.1257	mg/kg	6.E-07
				Benzo(a)pyrene*	0.0922	mg/kg	4.5E-06
				Benzo(b)fluoranthene*	0.1789	mg/kg	9.E-07
				Carbazole	0.00725	mg/kg	2.E-10
				Dibenz(a,h)anthracene*	0.014	mg/kg	7.E-07
				Dibenzofuran	0.004838	mg/kg	--
				Dimethyl Phthalate	0.081	mg/kg	--
				Nitroglycerin	2.467	mg/kg	3.E-06
			Exp. Route Total				1.6E-05
			Dermal Absorption	Aluminum	16,337	mg/kg	--
				Antimony	1.849	mg/kg	--
				Arsenic	2.806	mg/kg	6.E-07
				Cobalt	12.67	mg/kg	--
				Iron	37,853	mg/kg	--
				Manganese	1,152	mg/kg	--
				Thallium	0.705	mg/kg	--
				Vanadium	29.9	mg/kg	--
				Benzo(a)anthracene*	0.1257	mg/kg	2.E-07
				Benzo(a)pyrene*	0.0922	mg/kg	1.7E-06
				Benzo(b)fluoranthene*	0.1789	mg/kg	3.E-07
				Carbazole	0.00725	mg/kg	9.E-11
				Dibenz(a,h)anthracene*	0.014	mg/kg	3.E-07
				Dibenzofuran	0.004838	mg/kg	--
				Dimethyl Phthalate	0.081	mg/kg	--
				Nitroglycerin	2.467	mg/kg	2.E-09
			Exp. Route Total				3.E-06
		Exposure Point Total					2.E-05
	Exposure Medium Total						2.E-05
	Air	Fugitive Dust	Inhalation	Aluminum	16,337	mg/kg	--
				Antimony	1.849	mg/kg	--
				Arsenic	2.806	mg/kg	8.E-10
				Cobalt	12.67	mg/kg	8.0E-09
				Iron	37,853	mg/kg	--
				Manganese	1,152	mg/kg	--
				Thallium	0.705	mg/kg	--
				Vanadium	29.9	mg/kg	--
				Benzo(a)anthracene*	0.1257	mg/kg	3.E-12
				Benzo(a)pyrene*	0.0922	mg/kg	2.E-11
				Benzo(b)fluoranthene*	0.1789	mg/kg	5.E-12
				Carbazole	0.00725	mg/kg	--
				Dibenz(a,h)anthracene*	0.014	mg/kg	4.E-12
				Dibenzofuran	0.004838	mg/kg	--
				Dimethyl Phthalate	0.081	mg/kg	--
				Nitroglycerin	2.467	mg/kg	--
			Exp. Route Total				9.E-09
		Exposure Point Total					9.E-09
	Exposure Medium Total						9.E-09
Soil Total							2.E-05
							2.E-05

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.3).

TABLE E.1-7.11.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Adolescent Trespasser
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil	Soil	Soil	Ingestion	Aluminum	18,614	mg/kg	3.72E-04	mg/kg-day	--	--	--	2.60E-03	mg/kg-day	1.E+00	mg/kg-day	3.E-03
				Arsenic	2.794	mg/kg	5.58E-08	mg/kg-day	1.5E+00	mg/kg-day $^{-1}$	8.E-08	3.91E-07	mg/kg-day	3.E-04	mg/kg-day	1.E-03
				Cobalt	12.97	mg/kg	2.59E-07	mg/kg-day	--	--	--	1.81E-06	mg/kg-day	3.E-04	mg/kg-day	6.E-03
				Iron	38,358	mg/kg	7.67E-04	mg/kg-day	--	--	--	5.37E-03	mg/kg-day	7.E-01	mg/kg-day	8.E-03
				Manganese	1,239	mg/kg	2.48E-05	mg/kg-day	--	--	--	1.73E-04	mg/kg-day	2.E-02	mg/kg-day	7.E-03
				Thallium	1.514	mg/kg	3.03E-08	mg/kg-day	--	--	--	2.12E-07	mg/kg-day	7.E-05	mg/kg-day	3.E-03
				Vanadium	34.02	mg/kg	6.80E-07	mg/kg-day	--	--	--	4.76E-06	mg/kg-day	7.E-03	mg/kg-day	7.E-04
				Benzo(a)anthracene*	0.09053	mg/kg	1.81E-09	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	3.E-09	1.27E-08	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.07426	mg/kg	1.48E-09	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	3.E-08	1.04E-08	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.1648	mg/kg	3.29E-09	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	6.E-09	2.31E-08	mg/kg-day	--	--	--
				Carbazole	0.009436	mg/kg	1.89E-10	mg/kg-day	2.0E-02	mg/kg-day $^{-1}$	4.E-12	1.32E-09	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene*	0.01695	mg/kg	3.39E-10	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	6.E-09	2.37E-09	mg/kg-day	--	--	--
				Dibenzofuran	0.004934	mg/kg	9.86E-11	mg/kg-day	--	--	--	6.90E-10	mg/kg-day	--	--	--
				Dimethyl Phthalate	0.1168	mg/kg	2.33E-09	mg/kg-day	--	--	--	1.63E-08	mg/kg-day	--	--	--
				Nitroglycerin	2.11	mg/kg	4.22E-08	mg/kg-day	1.7E-02	mg/kg-day $^{-1}$	7.E-10	2.95E-07	mg/kg-day	1.E-04	mg/kg-day	3.E-03
			Exp. Route Total								1.E-07					3.E-02
			Dermal Absorption	Aluminum	18,614	mg/kg	3.01E-05	mg/kg-day	--	--	--	2.11E-04	mg/kg-day	1.E+00	mg/kg-day	2.E-04
				Arsenic	2.794	mg/kg	1.36E-08	mg/kg-day	1.5E+00	mg/kg-day $^{-1}$	2.E-08	9.50E-08	mg/kg-day	3.E-04	mg/kg-day	3.E-04
				Cobalt	12.97	mg/kg	2.10E-08	mg/kg-day	--	--	--	1.47E-07	mg/kg-day	3.E-04	mg/kg-day	5.E-04
				Iron	38,358	mg/kg	6.21E-05	mg/kg-day	--	--	--	4.35E-04	mg/kg-day	7.E-01	mg/kg-day	6.E-04
				Manganese	1,239	mg/kg	2.01E-06	mg/kg-day	--	--	--	1.40E-05	mg/kg-day	1.E-03	mg/kg-day	1.5E-02
				Thallium	1.514	mg/kg	2.45E-09	mg/kg-day	--	--	--	1.72E-08	mg/kg-day	7.E-05	mg/kg-day	3.E-04
				Vanadium	34.02	mg/kg	5.51E-08	mg/kg-day	--	--	--	3.86E-07	mg/kg-day	2.E-04	mg/kg-day	2.E-03
				Benzo(a)anthracene*	0.09053	mg/kg	1.91E-09	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	4.E-09	1.33E-08	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.07426	mg/kg	1.56E-09	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	3.E-08	1.09E-08	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.1648	mg/kg	3.47E-09	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	7.E-09	2.43E-08	mg/kg-day	--	--	--
				Carbazole	0.009436	mg/kg	1.99E-10	mg/kg-day	2.0E-02	mg/kg-day $^{-1}$	4.E-12	1.39E-09	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene*	0.01695	mg/kg	3.57E-10	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	7.E-09	2.50E-09	mg/kg-day	--	--	--
				Dibenzofuran	0.004934	mg/kg	1.04E-10	mg/kg-day	--	--	--	7.27E-10	mg/kg-day	--	--	--
				Dimethyl Phthalate	0.1168	mg/kg	1.89E-09	mg/kg-day	--	--	--	1.32E-08	mg/kg-day	--	--	--
				Nitroglycerin	2.11	mg/kg	3.42E-09	mg/kg-day	1.7E-02	mg/kg-day $^{-1}$	6.E-11	2.39E-08	mg/kg-day	1.E-04	mg/kg-day	2.E-04
			Exp. Route Total								7.E-08					2.E-02
		Exposure Point Total									2.E-07					5.E-02
	Exposure Medium Total										2.E-07					5.E-02

TABLE E.1-7.11.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Adolescent Trespasser
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Surface Soil Cont.	Air	Fugitive Dust	Inhalation	Aluminum	18,614	mg/kg	2.12E-08	mg/m3	--	--	--	1.49E-07	mg/m3	5.E-03	mg/m3	3.E-05
				Arsenic	2.794	mg/kg	3.19E-12	mg/m3	4.3E+00	mg/m3 $^{-1}$	1.E-11	2.23E-11	mg/m3	3.E-05	mg/m3	7.E-07
				Cobalt	12.97	mg/kg	1.48E-11	mg/m3	9.0E+00	mg/m3 $^{-1}$	1.E-10	1.04E-10	mg/m3	6.E-06	mg/m3	1.7E-05
				Iron	38,358	mg/kg	4.38E-08	mg/m3	--	--	--	3.06E-07	mg/m3	--	--	--
				Manganese	1,239	mg/kg	1.41E-09	mg/m3	--	--	--	9.89E-09	mg/m3	5.E-05	mg/m3	2.E-04
				Thallium	1.514	mg/kg	1.73E-12	mg/m3	--	--	--	1.21E-11	mg/m3	--	--	--
				Vanadium	34.02	mg/kg	3.88E-11	mg/m3	--	--	--	2.72E-10	mg/m3	--	--	--
				Benzo(a)anthracene*	0.09053	mg/kg	1.03E-13	mg/m3	1.1E-01	mg/m3 $^{-1}$	3.E-14	7.23E-13	mg/m3	--	--	--
				Benzo(a)pyrene*	0.07426	mg/kg	8.47E-14	mg/m3	1.1E+00	mg/m3 $^{-1}$	2.E-13	5.93E-13	mg/m3	--	--	--
				Benzo(b)fluoranthene*	0.1648	mg/kg	1.88E-13	mg/m3	1.1E-01	mg/m3 $^{-1}$	5.E-14	1.32E-12	mg/m3	--	--	--
				Carbazole	0.009436	mg/kg	1.08E-14	mg/m3	--	--	--	7.53E-14	mg/m3	--	--	--
				Dibenz(a,h)anthracene*	0.01695	mg/kg	1.93E-14	mg/m3	1.2E+00	mg/m3 $^{-1}$	6.E-14	1.35E-13	mg/m3	--	--	--
				Dibenzofuran	0.004934	mg/kg	5.63E-15	mg/m3	--	--	--	3.94E-14	mg/m3	--	--	--
				Dimethyl Phthalate	0.1168	mg/kg	1.33E-13	mg/m3	--	--	--	9.33E-13	mg/m3	--	--	--
				Nitroglycerin	2.11	mg/kg	2.41E-12	mg/m3	--	--	--	1.68E-11	mg/m3	--	--	--
			Exp. Route Total								1.E-10					2.E-04
		Exposure Point Total									1.E-10					2.E-04
	Exposure Medium Total										1.E-10					2.E-04
Soil Total											2.E-07					5.E-02
											Total of Receptor Risks Across All Media	2.E-07		Total of Receptor Hazards Across All Media		5.E-02

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.3).

TABLE E.1-7.12.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Adolescent Trespasser
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe: Current/Future
Receptor Population: Trespasser
Receptor Age: Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil	Soil	Soil	Ingestion	Aluminum	16,337	mg/kg	3.27E-04	mg/kg-day	--	--	--	2.29E-03	mg/kg-day	1.E+00	mg/kg-day	2.E-03
				Antimony	1.849	mg/kg	3.70E-08	mg/kg-day	--	--	--	2.59E-07	mg/kg-day	4.E-04	mg/kg-day	6.E-04
				Arsenic	2.806	mg/kg	5.61E-08	mg/kg-day	1.5E+00	mg/kg-day $^{-1}$	8.E-08	3.93E-07	mg/kg-day	3.E-04	mg/kg-day	1.E-03
				Cobalt	12.67	mg/kg	2.53E-07	mg/kg-day	--	--	--	1.77E-06	mg/kg-day	3.E-04	mg/kg-day	6.E-03
				Iron	37,853	mg/kg	7.57E-04	mg/kg-day	--	--	--	5.30E-03	mg/kg-day	7.E-01	mg/kg-day	8.E-03
				Manganese	1,152	mg/kg	2.30E-05	mg/kg-day	--	--	--	1.61E-04	mg/kg-day	2.E-02	mg/kg-day	7.E-03
				Thallium	0.705	mg/kg	1.41E-08	mg/kg-day	--	--	--	9.86E-08	mg/kg-day	7.E-05	mg/kg-day	2.E-03
				Vanadium	29.9	mg/kg	5.98E-07	mg/kg-day	--	--	--	4.18E-06	mg/kg-day	7.E-03	mg/kg-day	6.E-04
				Benzo(a)anthracene*	0.1257	mg/kg	2.51E-09	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	5.E-09	1.76E-08	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.0922	mg/kg	1.84E-09	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	3.E-08	1.29E-08	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.1789	mg/kg	3.58E-09	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	7.E-09	2.50E-08	mg/kg-day	--	--	--
				Carbazole	0.00725	mg/kg	1.45E-10	mg/kg-day	2.0E-02	mg/kg-day $^{-1}$	3.E-12	1.01E-09	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene*	0.014		2.80E-10	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	5.E-09	1.96E-09	mg/kg-day	--	--	--
				Dibenzofuran	0.004838	mg/kg	9.67E-11	mg/kg-day	--	--	--	6.77E-10	mg/kg-day	--	--	--
				Dimethyl Phthalate	0.081	mg/kg	1.62E-09	mg/kg-day	--	--	--	1.13E-08	mg/kg-day	--	--	--
				Nitroglycerin	2.467	mg/kg	4.93E-08	mg/kg-day	1.7E-02	mg/kg-day $^{-1}$	8.E-10	3.45E-07	mg/kg-day	1.E-04	mg/kg-day	3.E-03
			Exp. Route Total								1.E-07					3.E-02
			Dermal Absorption	Aluminum	16,337	mg/kg	2.64E-05	mg/kg-day	--	--	--	1.85E-04	mg/kg-day	1.E+00	mg/kg-day	2.E-04
				Antimony	1.849	mg/kg	2.99E-09	mg/kg-day	--	--	--	2.10E-08	mg/kg-day	6.E-05	mg/kg-day	3.E-04
				Arsenic	2.806	mg/kg	1.36E-08	mg/kg-day	1.5E+00	mg/kg-day $^{-1}$	2.E-08	9.54E-08	mg/kg-day	3.E-04	mg/kg-day	3.E-04
				Cobalt	12.67	mg/kg	2.05E-08	mg/kg-day	--	--	--	1.44E-07	mg/kg-day	3.E-04	mg/kg-day	5.E-04
				Iron	37,853	mg/kg	6.13E-05	mg/kg-day	--	--	--	4.29E-04	mg/kg-day	7.E-01	mg/kg-day	6.E-04
				Manganese	1,152	mg/kg	1.86E-06	mg/kg-day	--	--	--	1.31E-05	mg/kg-day	1.E-03	mg/kg-day	1.4E-02
				Thallium	0.705	mg/kg	1.14E-09	mg/kg-day	--	--	--	7.99E-09	mg/kg-day	7.E-05	mg/kg-day	1.E-04
				Vanadium	29.9	mg/kg	4.84E-08	mg/kg-day	--	--	--	3.39E-07	mg/kg-day	2.E-04	mg/kg-day	2.E-03
				Benzo(a)anthracene*	0.1257	mg/kg	2.65E-09	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	5.E-09	1.85E-08	mg/kg-day	--	--	--
				Benzo(a)pyrene*	0.0922	mg/kg	1.94E-09	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	4.E-08	1.36E-08	mg/kg-day	--	--	--
				Benzo(b)fluoranthene*	0.1789	mg/kg	3.76E-09	mg/kg-day	7.3E-01	mg/kg-day $^{-1}$	7.E-09	2.64E-08	mg/kg-day	--	--	--
				Carbazole	0.00725	mg/kg	1.53E-10	mg/kg-day	2.0E-02	mg/kg-day $^{-1}$	3.E-12	1.07E-09	mg/kg-day	--	--	--
				Dibenz(a,h)anthracene*	0.014	mg/kg	2.95E-10	mg/kg-day	7.3E+00	mg/kg-day $^{-1}$	6.E-09	2.06E-09	mg/kg-day	--	--	--
				Dibenzofuran	0.004838	mg/kg	1.02E-10	mg/kg-day	--	--	--	7.13E-10	mg/kg-day	--	--	--
				Dimethyl Phthalate	0.081	mg/kg	1.31E-09	mg/kg-day	--	--	--	9.18E-09	mg/kg-day	--	--	--
				Nitroglycerin	2.467	mg/kg	3.99E-09	mg/kg-day	1.7E-02	mg/kg-day $^{-1}$	7.E-11	2.80E-08	mg/kg-day	1.E-04	mg/kg-day	3.E-04
			Exp. Route Total								8.E-08					2.E-02
		Exposure Point Total									2.E-07					5.E-02
	Exposure Medium Total										2.E-07					5.E-02

TABLE E.1-7.12.RME
Calculation of Chemical Cancer Risks and Non-Cancer Hazards
Reasonable Maximum Exposure - Adolescent Trespasser
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
							Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
					Value	Units	Value	Units	Value	Units		Value	Units	Value	Units	
Total Soil Cont.	Air	Fugitive Dust	Inhalation	Aluminum	16,337	mg/kg	1.86E-08	mg/m3	--	--	--	1.30E-07	mg/m3	5.E-03	mg/m3	3.E-05
				Antimony	1.849	mg/kg	2.11E-12	mg/m3	--	--	--	1.48E-11	mg/m3	--	--	--
				Arsenic	2.806	mg/kg	3.20E-12	mg/m3	4.3E+00	$mg/m3^{-1}$	1.E-11	2.24E-11	mg/m3	3.E-05	mg/m3	7.E-07
				Cobalt	12.67	mg/kg	1.45E-11	mg/m3	9.0E+00	$mg/m3^{-1}$	1.E-10	1.01E-10	mg/m3	6.E-06	mg/m3	2.E-05
				Iron	37,853	mg/kg	4.32E-08	mg/m3	--	--	--	3.02E-07	mg/m3	--	--	--
				Manganese	1,152	mg/kg	1.31E-09	mg/m3	--	--	--	9.20E-09	mg/m3	5.E-05	mg/m3	1.8E-04
				Thallium	0.705	mg/kg	8.04E-13	mg/m3	--	--	--	5.63E-12	mg/m3	--	--	--
				Vanadium	29.9	mg/kg	3.41E-11	mg/m3	--	--	--	2.39E-10	mg/m3	--	--	--
				Benzo(a)anthracene*	0.1257	mg/kg	1.43E-13	mg/m3	1.1E-01	$mg/m3^{-1}$	4.E-14	1.00E-12	mg/m3	--	--	--
				Benzo(a)pyrene*	0.0922	mg/kg	1.05E-13	mg/m3	1.1E+00	$mg/m3^{-1}$	3.E-13	7.36E-13	mg/m3	--	--	--
				Benzo(b)fluoranthene*	0.1789	mg/kg	2.04E-13	mg/m3	1.1E-01	$mg/m3^{-1}$	6.E-14	1.43E-12	mg/m3	--	--	--
				Carbazole	0.00725	mg/kg	8.27E-15	mg/m3	--	--	--	5.79E-14	mg/m3	--	--	--
				Dibenz(a,h)anthracene*	0.014	mg/kg	1.60E-14	mg/m3	1.2E+00	$mg/m3^{-1}$	5.E-14	1.12E-13	mg/m3	--	--	--
				Dibenzofuran	0.004838	mg/kg	5.52E-15	mg/m3	--	--	--	3.86E-14	mg/m3	--	--	--
				Dimethyl Phthalate	0.081	mg/kg	9.24E-14	mg/m3	--	--	--	6.47E-13	mg/m3	--	--	--
				Nitroglycerin	2.467	mg/kg	2.81E-12	mg/m3	--	--	--	1.97E-11	mg/m3	--	--	--
			Exp. Route Total								1.E-10					2.E-04
		Exposure Point Total									1.E-10					2.E-04
	Exposure Medium Total										1.E-10					2.E-04
Soil Total											2.E-07					5.E-02
											Total of Receptor Risks Across All Media					
											2.E-07	Total of Receptor Hazards Across All Media				5.E-02

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.3).

TABLE E.1-9.1.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Maintenance Worker
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Maintenance Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	4.E-03	--	1.E-04	4.E-03
			Arsenic	3.E-07	--	3.E-08	3.E-07	Arsenic	skin, vascular	2.E-03	--	2.E-04	2.E-03
			Cobalt	--	--	--	--	Cobalt	blood, thyroid	8.5E-03	--	3.E-04	9.E-03
			Iron	--	--	--	--	Iron	GI tract	1.E-02	--	4.E-04	1.E-02
			Manganese	--	--	--	--	Manganese	CNS	1.E-02	--	8.E-03	1.8E-02
			Thallium	--	--	--	--	Thallium	liver, blood, hair	5.E-03	--	2.E-04	5.E-03
			Vanadium	--	--	--	--	Vanadium	kidney	1.E-03	--	1.E-03	2.E-03
			Benzo(a)anthracene	5.E-09	--	2.E-09	7.E-09	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	3.8.E-08	--	1.6E-08	5.E-08	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	8.E-09	--	4.E-09	1.E-08	Benzo(b)fluoranthene	NA	--	--	--	--
			Carbazole	1.E-11	--	6.E-12	2.E-11	Carbazole	NA	--	--	--	--
			Dibenz(a,h)anthracene	8.6.E-09	--	4.E-09	1.E-08	Dibenz(a,h)anthracene	NA	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	NA	--	--	--	--
			Dimethyl Phthalate	--	--	--	--	Dimethyl Phthalate	NA	--	--	--	--
			Nitroglycerin	3.E-09	--	8.E-11	3.E-09	Nitroglycerin	vascular	4.E-03	--	1.E-04	4.E-03
				4.E-07	--	5.E-08	4.E-07			4.E-02	--	1.E-02	6.E-02
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	2.E-04	--	2.E-04
			Arsenic	--	3.E-10	--	3.E-10	Arsenic	cardiovascular, CNS	--	6.E-06	--	6.E-06
			Cobalt	--	3.E-09	--	3.E-09	Cobalt	respiratory	--	1.E-04	--	1.E-04
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	1.6E-03	--	1.6E-03
			Thallium	--	--	--	--	Thallium	NA	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Benzo(a)anthracene	--	2.E-13	--	2.E-13	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	--	2.E-12	--	2.E-12	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	--	4.E-13	--	4.E-13	Benzo(b)fluoranthene	NA	--	--	--	--
			Carbazole	--	--	--	--	Carbazole	NA	--	--	--	--
			Dibenz(a,h)anthracene	--	5.E-13	--	5.E-13	Dibenz(a,h)anthracene	NA	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	NA	--	--	--	--
			Dimethyl Phthalate	--	--	--	--	Dimethyl Phthalate	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
				--	3.E-09	--	3.E-09			--	2.E-03	--	2.E-03
						Total Risk Across Soil	4.E-07					Total Hazard Index Across Soil	6.E-02

Total Risk Across All Media and All Exposure Routes	4.E-07
Total Hazard Index Across All Media and All Exposure Routes	6.E-02

Total blood HI across all media =	1.E-02
Total CNS HI across all media =	2.E-02
Total skin HI across all media =	2.E-03
Total respiratory HI across all media =	1.E-04
Total GI tract HI across all media =	1.E-02
Total kidney HI across all media =	2.E-03
Total liver HI across all media =	5.E-03
Total vascular HI across all media =	6.E-03
Total thyroid HI across all media =	9.E-03
Total hair HI across all media =	5.E-03

TABLE E.1-9.2.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Maintenance Worker
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Maintenance Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	3.E-03	--	1.E-04	3.3E-03
			Antimony	--	--	--	--	Antimony	blood	9.E-04	--	2.E-04	1.E-03
			Arsenic	3.E-07	--	3.E-08	3.E-07	Arsenic	skin, vascular	2.E-03	--	2.E-04	2.E-03
			Cobalt	--	--	--	--	Cobalt	blood, thyroid	8.E-03	--	3.E-04	9.E-03
			Iron	--	--	--	--	Iron	GI tract	1.E-02	--	3.E-04	1.E-02
			Manganese	--	--	--	--	Manganese	CNS	9.E-03	--	8.E-03	2.E-02
			Thallium	--	--	--	--	Thallium	liver, blood, hair	2.E-03	--	7.E-05	2.E-03
			Vanadium	--	--	--	--	Vanadium	kidney	8.E-04	--	1.E-03	2.E-03
			Benzo(a)anthracene	6.E-09	--	3.E-09	9.E-09	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	5.E-08	--	2.E-08	7.E-08	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	9.E-09	--	4.E-09	1.E-08	Benzo(b)fluoranthene	NA	--	--	--	--
			Carbazole	1.E-11	--	4.E-12	1.E-11	Carbazole	NA	--	--	--	--
			Dibenz(a,h)anthracene	7.1.E-09	--	3.1E-09	1.E-08	Dibenz(a,h)anthracene	NA	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	NA	--	--	--	--
			Dimethyl Phthalate	--	--	--	--	Dimethyl Phthalate	NA	--	--	--	--
			Nitroglycerin	3.E-09	--	1.E-10	3.E-09	Nitroglycerin	vascular	5.E-03	--	2.E-04	5.E-03
				3.7E-07	--	6.E-08	4.E-07			4.E-02	--	1.E-02	5.E-02
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	2.E-04	--	2.E-04
			Antimony	--	--	--	--	Antimony	NA	--	--	--	--
			Arsenic	--	3.E-10	--	3.E-10	Arsenic	cardiovascular, CNS	--	6.E-06	--	6.E-06
			Cobalt	--	3.E-09	--	3.E-09	Cobalt	respiratory	--	1.E-04	--	1.E-04
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	1.5E-03	--	1.5E-03
			Thallium	--	--	--	--	Thallium	NA	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Benzo(a)anthracene	--	3.E-13	--	3.E-13	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	--	2.E-12	--	2.E-12	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	--	5.E-13	--	5.E-13	Benzo(b)fluoranthene	NA	--	--	--	--
			Carbazole	--	--	--	--	Carbazole	NA	--	--	--	--
			Dibenz(a,h)anthracene	--	4.E-13	--	4.E-13	Dibenz(a,h)anthracene	NA	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	NA	--	--	--	--
			Dimethyl Phthalate	--	--	--	--	Dimethyl Phthalate	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
				--	3.E-09	--	3.E-09			--	2.E-03	--	2.E-03
						Total Risk Across Soil	4.E-07					Total Hazard Index Across Soil	5.E-02

Total Risk Across All Media and All Exposure Routes	4.E-07
Total Hazard Index Across All Media and All Exposure Routes	5.E-02

Total blood HI across all media =	1.E-02
Total CNS HI across all media =	2.E-02
Total skin HI across all media =	2.E-03
Total respiratory HI across all media =	1.E-04
Total GI tract HI across all media =	1.E-02
Total kidney HI across all media =	2.E-03
Total liver HI across all media =	2.E-03
Total vascular HI across all media =	7.E-03
Total thyroid HI across all media =	9.E-03
Total hair HI across all media =	2.E-03

TABLE E.1-9.3.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Commercial Worker
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Commercial Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	8.E-03	--	5.E-04	9.E-03
			Antimony	--	--	--	--	Antimony	blood	2.E-03	--	1.E-03	3.E-03
			Arsenic	7.E-07	--	1.E-07	9.E-07	Arsenic	skin, vascular	5.E-03	--	9.E-04	5.E-03
			Cobalt	--	--	--	--	Cobalt	blood, thyroid	2.E-02	--	1.E-03	2.E-02
			Iron	--	--	--	--	Iron	GI tract	3.E-02	--	2.E-03	3.E-02
			Manganese	--	--	--	--	Manganese	CNS	2.E-02	--	4.E-02	6.E-02
			Thallium	--	--	--	--	Thallium	liver, blood, hair	5.E-03	--	4.E-04	6.E-03
			Vanadium	--	--	--	--	Vanadium	kidney	2.E-03	--	5.E-03	7.E-03
			Benzo(a)anthracene	2.E-08	--	1.E-08	3.E-08	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	1.E-07	--	1.E-07	2.E-07	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	2.E-08	--	2.E-08	4.E-08	Benzo(b)fluoranthene	NA	--	--	--	--
			Carbazole	3.E-11	--	2.E-11	5.E-11	Carbazole	NA	--	--	--	--
			Dibenz(a,h)anthracene	2.E-08	--	2.E-08	3.E-08	Dibenz(a,h)anthracene	NA	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	NA	--	--	--	--
			Dimethyl Phthalate	--	--	--	--	Dimethyl Phthalate	NA	--	--	--	--
			Nitroglycerin	7.E-09	--	5.E-10	8.E-09	Nitroglycerin	vascular	1.E-02	--	8.E-04	1.3E-02
			Total	9.E-07	--	3.E-07	1.E-06	Total		1.E-01	--	5.E-02	2.E-01
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	1.E-03	--	1.E-03
			Antimony	--	--	--	--	Antimony	NA	--	--	--	--
			Arsenic	--	1.E-09	--	1.E-09	Arsenic	cardiovascular, CNS	--	3.E-05	--	3.E-05
			Cobalt	--	1.4E-08	--	1.4E-08	Cobalt	respiratory	--	7.E-04	--	7.E-04
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	7.7E-03	--	7.7E-03
			Thallium	--	--	--	--	Thallium	NA	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Benzo(a)anthracene	--	2.E-12	--	2.E-12	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	--	1.E-11	--	1.E-11	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	--	2.E-12	--	2.E-12	Benzo(b)fluoranthene	NA	--	--	--	--
			Carbazole	--	--	--	--	Carbazole	NA	--	--	--	--
			Dibenz(a,h)anthracene	--	2.E-12	--	2.E-12	Dibenz(a,h)anthracene	NA	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	NA	--	--	--	--
			Dimethyl Phthalate	--	--	--	--	Dimethyl Phthalate	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			Total	--	2.E-08	--	2.E-08	Total		--	9.E-03	--	9.E-03
						Total Risk Across Soil	1.E-06					Total Hazard Index Across Soil	2.E-01

Total blood HI across all media =	3.E-02
Total CNS HI across all media =	8.E-02
Total skin HI across all media =	5.E-03
Total respiratory HI across all media =	7.E-04
Total GI tract HI across all media =	3.E-02
Total kidney HI across all media =	7.E-03
Total liver HI across all media =	6.E-03
Total vascular HI across all media =	2.E-02
Total thyroid HI across all media =	2.E-02
Total hair HI across all media =	6.E-03

TABLE E.1-9.4.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Construction Worker
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	5.E-02	--	2.E-03	5.E-02
			Antimony	--	--	--	--	Antimony	blood	1.E-02	--	3.E-03	2.E-02
			Arsenic	1.9E-07	--	2.E-08	2.E-07	Arsenic	skin, vascular	3.E-02	--	3.E-03	3.E-02
			Cobalt	--	--	--	--	Cobalt	blood, thyroid	1.E-02	--	4.E-04	1.E-02
			Iron	--	--	--	--	Iron	GI tract	2.E-01	--	5.E-03	2.E-01
			Manganese	--	--	--	--	Manganese	CNS	1.5E-01	--	1.E-01	3.E-01
			Thallium	--	--	--	--	Thallium	liver, blood, hair	3.5E-02	--	1.E-03	4.E-02
			Vanadium	--	--	--	--	Vanadium	kidney	2.E-02	--	2.E-02	4.E-02
			Benzo(a)anthracene	4.E-09	--	2.E-09	6.E-09	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	3.E-08	--	1.E-08	4.E-08	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	6.E-09	--	2.E-09	8.E-09	Benzo(b)fluoranthene	NA	--	--	--	--
			Carbazole	7.E-12	--	3.E-12	9.E-12	Carbazole	NA	--	--	--	--
			Dibenz(a,h)anthracene	5.E-09	--	2.E-09	7.E-09	Dibenz(a,h)anthracene	NA	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	NA	--	--	--	--
			Dimethyl Phthalate	--	--	--	--	Dimethyl Phthalate	NA	--	--	--	--
			Nitroglycerin	2.E-09	--	6.E-11	2.E-09	Nitroglycerin	vascular	8.E-02	--	2.E-03	8.E-02
			Total	2.E-07	--	3.5E-08	3.E-07	Total		5.8E-01	--	1.5E-01	7.E-01
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	6.E-01	--	6.E-01
			Antimony	--	--	--	--	Antimony	NA	--	--	--	--
			Arsenic	--	3.E-08	--	3.E-08	Arsenic	cardiovascular, CNS	--	2.E-02	--	2.E-02
			Cobalt	--	3.E-07	--	3.E-07	Cobalt	respiratory	--	1.E-01	--	1.E-01
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	4.E+00	--	4.E+00
			Thallium	--	--	--	--	Thallium	NA	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Benzo(a)anthracene	--	4.E-11	--	4.E-11	Benzo(a)anthracene	NA	--	--	--	--
			Benzo(a)pyrene	--	3.E-10	--	3.E-10	Benzo(a)pyrene	NA	--	--	--	--
			Benzo(b)fluoranthene	--	5.E-11	--	5.E-11	Benzo(b)fluoranthene	NA	--	--	--	--
			Carbazole	--	--	--	--	Carbazole	NA	--	--	--	--
			Dibenz(a,h)anthracene	--	4.E-11	--	4.E-11	Dibenz(a,h)anthracene	NA	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	NA	--	--	--	--
			Dimethyl Phthalate	--	--	--	--	Dimethyl Phthalate	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			Total	--	3.E-07	--	3.E-07	Total		--	5.E+00	--	5.E+00
						Total Risk Across Soil	6.E-07					Total Hazard Index Across Soil	6.E+00

Total blood HI across all media =	7.E-02
Total CNS HI across all media =	5.E+00
Total skin HI across all media =	3.E-02
Total respiratory HI across all media =	1.E-01
Total GI tract HI across all media =	2.E-01
Total kidney HI across all media =	4.E-02
Total liver HI across all media =	4.E-02
Total vascular HI across all media =	1.E-01
Total thyroid HI across all media =	1.E-02
Total hair HI across all media =	4.E-02

TABLE E.1-9.5.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Adult Resident
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	3.E-02	--	1.E-03	3.E-02
			Arsenic	2.E-06	--	2.E-07	2.E-06	Arsenic	skin, vascular	1.E-02	--	2.E-03	1.E-02
			Cobalt	--	--	--	--	Cobalt	blood, thyroid	6.E-02	--	2.E-03	6.E-02
			Iron	--	--	--	--	Iron	GI tract	8.E-02	--	3.E-03	8.E-02
			Manganese	--	--	--	--	Manganese	CNS	7.E-02	--	7.E-02	1.4E-01
			Thallium	--	--	--	--	Thallium	liver, blood, hair	3.E-02	--	1.E-03	3.E-02
			Vanadium	--	--	--	--	Vanadium	kidney	7.E-03	--	1.E-02	2.E-02
			Benzo(a)anthracene*	6.E-08	--	3.E-08	9.E-08	Benzo(a)anthracene*	NA	--	--	--	--
			Benzo(a)pyrene*	5.E-07	--	2.E-07	7.E-07	Benzo(a)pyrene*	NA	--	--	--	--
			Benzo(b)fluoranthene*	1.E-07	--	5.E-08	2.E-07	Benzo(b)fluoranthene*	NA	--	--	--	--
			Carbazole	9.E-11	--	5.E-11	1.E-10	Carbazole	NA	--	--	--	--
			Dibenz(a,h)anthracene*	1.E-07	--	6.E-08	2.E-07	Dibenz(a,h)anthracene*	NA	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	NA	--	--	--	--
			Dimethyl Phthalate	--	--	--	--	Dimethyl Phthalate	NA	--	--	--	--
			Nitroglycerin	2.E-08	--	7.E-10	2.E-08	Nitroglycerin	vascular	3.E-02	--	1.E-03	3.E-02
			Total	2.7E-06	--	6.E-07	3.E-06	Total		3.E-01	--	9.E-02	4.E-01
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	4.E-04	--	4.E-04
			Arsenic	--	5.E-10	--	5.E-10	Arsenic	cardiovascular, CNS	--	1.E-05	--	1.E-05
			Cobalt	--	4.7E-09	--	4.7E-09	Cobalt	respiratory	--	3.E-04	--	3.E-04
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	3.E-03	--	3.E-03
			Thallium	--	--	--	--	Thallium	NA	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Benzo(a)anthracene*	--	7.E-13	--	7.E-13	Benzo(a)anthracene*	NA	--	--	--	--
			Benzo(a)pyrene*	--	6.E-12	--	6.E-12	Benzo(a)pyrene*	NA	--	--	--	--
			Benzo(b)fluoranthene*	--	1.E-12	--	1.E-12	Benzo(b)fluoranthene*	NA	--	--	--	--
			Carbazole	--	--	--	--	Carbazole	NA	--	--	--	--
			Dibenz(a,h)anthracene*	--	1.E-12	--	1.E-12	Dibenz(a,h)anthracene*	NA	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	NA	--	--	--	--
			Dimethyl Phthalate	--	--	--	--	Dimethyl Phthalate	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			Total	--	5.E-09	--	5.E-09	Total		--	4.E-03	--	4.E-03
						Total Risk Across Soil	3.E-06					Total Hazard Index Across Soil	4.E-01

Total blood HI across all media =	9.E-02
Total CNS HI across all media =	2.E-01
Total skin HI across all media =	1.E-02
Total respiratory HI across all media =	3.E-04
Total GI tract HI across all media =	8.E-02
Total kidney HI across all media =	2.E-02
Total liver HI across all media =	3.E-02
Total vascular HI across all media =	4.E-02
Total thyroid HI across all media =	6.E-02
Total hair HI across all media =	3.E-02

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.3).

TABLE E.1-9.6.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Adult Resident
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	2.E-02	--	9.E-04	2.E-02
			Antimony	--	--	--	--	Antimony	blood	6.E-03	--	2.E-03	8.E-03
			Arsenic	2.E-06	--	2.E-07	2.2E-06	Arsenic	skin, vascular	1.E-02	--	2.E-03	1.E-02
			Cobalt	--	--	--	--	Cobalt	blood, thyroid	6.E-02	--	2.E-03	6.E-02
			Iron	--	--	--	--	Iron	GI tract	7.E-02	--	3.E-03	8.E-02
			Manganese	--	--	--	--	Manganese	CNS	7.E-02	--	7.E-02	1.3E-01
			Thallium	--	--	--	--	Thallium	liver, blood, hair	1.5E-02	--	6.E-04	1.5E-02
			Vanadium	--	--	--	--	Vanadium	kidney	6.E-03	--	9.E-03	1.E-02
			Benzo(a)anthracene*	8.E-08	--	4.E-08	1.E-07	Benzo(a)anthracene*	NA	--	--	--	--
			Benzo(a)pyrene*	6.E-07	--	3.E-07	9.E-07	Benzo(a)pyrene*	NA	--	--	--	--
			Benzo(b)fluoranthene*	1.E-07	--	6.E-08	2.E-07	Benzo(b)fluoranthene*	NA	--	--	--	--
			Carbazole	7.E-11	--	4.E-11	1.E-10	Carbazole	NA	--	--	--	--
			Dibenz(a,h)anthracene*	9.E-08	--	5.E-08	1.E-07	Dibenz(a,h)anthracene*	NA	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	NA	--	--	--	--
			Dimethyl Phthalate	--	--	--	--	Dimethyl Phthalate	NA	--	--	--	--
			Nitroglycerin	2.E-08	--	8.E-10	2.E-08	Nitroglycerin	vascular	3.E-02	--	1.E-03	4.E-02
			Total	3.E-06	--	7.E-07	4.E-06	Total		3.E-01	--	9.E-02	4.E-01
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	4.E-04	--	4.E-04
			Antimony	--	--	--	--	Antimony	NA	--	--	--	--
			Arsenic	--	5.E-10	--	5.E-10	Arsenic	cardiovascular, CNS	--	1.E-05	--	1.E-05
			Cobalt	--	4.6E-09	--	4.6E-09	Cobalt	respiratory	--	2.E-04	--	2.E-04
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	2.7E-03	--	2.7E-03
			Thallium	--	--	--	--	Thallium	NA	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Benzo(a)anthracene*	--	1.E-12	--	1.E-12	Benzo(a)anthracene*	NA	--	--	--	--
			Benzo(a)pyrene*	--	7.E-12	--	7.E-12	Benzo(a)pyrene*	NA	--	--	--	--
			Benzo(b)fluoranthene*	--	1.E-12	--	1.E-12	Benzo(b)fluoranthene*	NA	--	--	--	--
			Carbazole	--	--	--	--	Carbazole	NA	--	--	--	--
			Dibenz(a,h)anthracene*	--	1.E-12	--	1.E-12	Dibenz(a,h)anthracene*	NA	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	NA	--	--	--	--
			Dimethyl Phthalate	--	--	--	--	Dimethyl Phthalate	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			Total	--	5.E-09	--	5.E-09	Total		--	3.E-03	--	3.E-03
						Total Risk Across Soil	4.E-06					Total Hazard Index Across Soil	4.E-01

Total blood HI across all media =	8.E-02
Total CNS HI across all media =	2.E-01
Total skin HI across all media =	1.E-02
Total respiratory HI across all media =	2.E-04
Total GI tract HI across all media =	8.E-02
Total kidney HI across all media =	1.E-02
Total liver HI across all media =	2.E-02
Total vascular HI across all media =	5.E-02
Total thyroid HI across all media =	6.E-02
Total hair HI across all media =	2.E-02

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.3).

TABLE E.1-9.7.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Child Resident
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	2.E-01	--	7.E-03	2.4E-01
			Arsenic	5.E-06	--	4.E-07	5.E-06	Arsenic	skin, vascular	1.E-01	--	1.E-02	1.3E-01
			Cobalt	--	--	--	--	Cobalt	blood, thyroid	5.5E-01	--	2.E-02	6.E-01
			Iron	--	--	--	--	Iron	GI tract	7.E-01	--	2.E-02	7.2E-01
			Manganese	--	--	--	--	Manganese	CNS	7.E-01	--	5.E-01	1.1E+00
			Thallium	--	--	--	--	Thallium	liver, blood, hair	3.E-01	--	8.E-03	3.E-01
			Vanadium	--	--	--	--	Vanadium	kidney	6.E-02	--	7.E-02	1.E-01
			Benzo(a)anthracene*	4.E-07	--	1.E-07	5.E-07	Benzo(a)anthracene*	NA	--	--	--	--
			Benzo(a)pyrene*	3.E-06	--	1.E-06	4.E-06	Benzo(a)pyrene*	NA	--	--	--	--
			Benzo(b)fluoranthene*	7.E-07	--	3.E-07	1.E-06	Benzo(b)fluoranthene*	NA	--	--	--	--
			Carbazole	2.E-10	--	8.E-11	3.E-10	Carbazole	NA	--	--	--	--
			Dibenz(a,h)anthracene*	7.E-07	--	3.E-07	1.E-06	Dibenz(a,h)anthracene*	NA	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	NA	--	--	--	--
			Dimethyl Phthalate	--	--	--	--	Dimethyl Phthalate	NA	--	--	--	--
			Nitroglycerin	4.E-08	--	1.E-09	4.E-08	Nitroglycerin	vascular	3.E-01	--	8.E-03	3.E-01
			Total	1.E-05	--	2.E-06	1.E-05	Total		3.E+00	--	6.E-01	3.5E+00
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	1.E-03	--	1.E-03
			Arsenic	--	4.E-10	--	4.E-10	Arsenic	cardiovascular, CNS	--	3.E-05	--	3.E-05
			Cobalt	--	3.5E-09	--	3.5E-09	Cobalt	respiratory	--	8.E-04	--	8.E-04
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	9.E-03	--	9.E-03
			Thallium	--	--	--	--	Thallium	NA	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Benzo(a)anthracene*	--	2.E-12	--	2.E-12	Benzo(a)anthracene*	NA	--	--	--	--
			Benzo(a)pyrene*	--	1.E-11	--	1.E-11	Benzo(a)pyrene*	NA	--	--	--	--
			Benzo(b)fluoranthene*	--	3.E-12	--	3.E-12	Benzo(b)fluoranthene*	NA	--	--	--	--
			Carbazole	--	--	--	--	Carbazole	NA	--	--	--	--
			Dibenz(a,h)anthracene*	--	3.E-12	--	3.E-12	Dibenz(a,h)anthracene*	NA	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	NA	--	--	--	--
			Dimethyl Phthalate	--	--	--	--	Dimethyl Phthalate	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			Total	--	4.E-09	--	4.E-09	Total		--	1.E-02	--	1.E-02
						Total Risk Across Soil	1.E-05					Total Hazard Index Across Soil	3.5E+00

Total blood HI across all media =	9.E-01
Total CNS HI across all media =	1.E+00
Total skin HI across all media =	1.E-01
Total respiratory HI across all media =	8.E-04
Total GI tract HI across all media =	7.E-01
Total kidney HI across all media =	1.E-01
Total liver HI across all media =	3.E-01
Total vascular HI across all media =	4.E-01
Total thyroid HI across all media =	6.E-01
Total hair HI across all media =	3.E-01

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.3).

TABLE E.1-9.8.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Child Resident
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Child

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	2.E-01	--	6.E-03	2.E-01
			Antimony	--	--	--	--	Antimony	blood	6.E-02	--	1.E-02	7.E-02
			Arsenic	5.E-06	--	4.E-07	5.E-06	Arsenic	skin, vascular	1.E-01	--	1.E-02	1.E-01
			Cobalt	--	--	--	--	Cobalt	blood, thyroid	5.4E-01	--	2.E-02	6.E-01
			Iron	--	--	--	--	Iron	GI tract	7.E-01	--	2.E-02	7.E-01
			Manganese	--	--	--	--	Manganese	CNS	6.E-01	--	4.E-01	1.E+00
			Thallium	--	--	--	--	Thallium	liver, blood, hair	1.E-01	--	4.E-03	1.E-01
			Vanadium	--	--	--	--	Vanadium	kidney	5.E-02	--	6.E-02	1.E-01
			Benzo(a)anthracene*	5.E-07	--	2.E-07	7.E-07	Benzo(a)anthracene*	NA	--	--	--	--
			Benzo(a)pyrene*	4.E-06	--	1.4E-06	5.E-06	Benzo(a)pyrene*	NA	--	--	--	--
			Benzo(b)fluoranthene*	8.E-07	--	3.E-07	1.E-06	Benzo(b)fluoranthene*	NA	--	--	--	--
			Carbazole	2.E-10	--	6.E-11	2.E-10	Carbazole	NA	--	--	--	--
			Dibenz(a,h)anthracene*	6.E-07	--	2.E-07	8.E-07	Dibenz(a,h)anthracene*	NA	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	NA	--	--	--	--
			Dimethyl Phthalate	--	--	--	--	Dimethyl Phthalate	NA	--	--	--	--
			Nitroglycerin	5.E-08	--	1.E-09	5.E-08	Nitroglycerin	vascular	3.E-01	--	9.E-03	3.E-01
			Total	1.E-05	--	3.E-06	1.E-05	Total		2.7E+00	--	5.6E-01	3.E+00
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	1.E-03	--	1.E-03
			Antimony	--	--	--	--	Antimony	NA	--	--	--	--
			Arsenic	--	4.E-10	--	4.E-10	Arsenic	cardiovascular, CNS	--	3.E-05	--	3.E-05
			Cobalt	--	3.4E-09	--	3.4E-09	Cobalt	respiratory	--	7.E-04	--	7.E-04
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	8.E-03	--	8.E-03
			Thallium	--	--	--	--	Thallium	NA	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Benzo(a)anthracene*	--	2.E-12	--	2.E-12	Benzo(a)anthracene*	NA	--	--	--	--
			Benzo(a)pyrene*	--	2.E-11	--	2.E-11	Benzo(a)pyrene*	NA	--	--	--	--
			Benzo(b)fluoranthene*	--	3.E-12	--	3.E-12	Benzo(b)fluoranthene*	NA	--	--	--	--
			Carbazole	--	--	--	--	Carbazole	NA	--	--	--	--
			Dibenz(a,h)anthracene*	--	3.E-12	--	3.E-12	Dibenz(a,h)anthracene*	NA	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	NA	--	--	--	--
			Dimethyl Phthalate	--	--	--	--	Dimethyl Phthalate	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
			Total	--	4.E-09	--	4.E-09	Total		--	1.E-02	--	1.E-02
						Total Risk Across Soil	1.E-05					Total Hazard Index Across Soil	3.E+00

Total blood HI across all media =	8.E-01
Total CNS HI across all media =	1.E+00
Total skin HI across all media =	1.E-01
Total respiratory HI across all media =	7.E-04
Total GI tract HI across all media =	7.E-01
Total kidney HI across all media =	1.E-01
Total liver HI across all media =	1.E-01
Total vascular HI across all media =	5.E-01
Total thyroid HI across all media =	6.E-01
Total hair HI across all media =	1.E-01

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.3).

TABLE E.1-9.9.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Lifetime Resident
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Soil	Aluminum	--	--	--	--
			Arsenic	6.6E-06	--	6.E-07	7.E-06
			Cobalt	--	--	--	--
			Iron	--	--	--	--
			Manganese	--	--	--	--
			Thallium	--	--	--	--
			Vanadium	--	--	--	--
			Benzo(a)anthracene*	4.E-07	--	2.E-07	6.1E-07
			Benzo(a)pyrene*	3.6E-06	--	1.4E-06	5.E-06
			Benzo(b)fluoranthene*	8.E-07	--	3.E-07	1.E-06
			Carbazole	3.E-10	--	1.E-10	4.E-10
			Dibenz(a,h)anthracene*	8.E-07	--	3.E-07	1.E-06
			Dibenzofuran	--	--	--	--
			Dimethyl Phthalate	--	--	--	--
			Nitroglycerin	6.E-08	--	2.E-09	6.E-08
			Total	1.2E-05	--	3.E-06	2.E-05
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--
			Arsenic	--	8.E-10	--	8.E-10
			Cobalt	--	8.E-09	--	8.E-09
			Iron	--	--	--	--
			Manganese	--	--	--	--
			Thallium	--	--	--	--
			Vanadium	--	--	--	--
			Benzo(a)anthracene*	--	2.E-12	--	2.E-12
			Benzo(a)pyrene*	--	2.E-11	--	2.E-11
			Benzo(b)fluoranthene*	--	4.E-12	--	4.E-12
			Carbazole	--	--	--	--
			Dibenz(a,h)anthracene*	--	5.E-12	--	5.E-12
			Dibenzofuran	--	--	--	--
			Dimethyl Phthalate	--	--	--	--
			Nitroglycerin	--	--	--	--
			Total	--	9.E-09	--	9.E-09
						Total Risk Across Soil	2.E-05

Total Risk Across All Media and All Exposure Routes 2.E-05

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.3).

TABLE E.1-9.10.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Lifetime Resident
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Resident
Receptor Age:	Lifetime

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk			
				Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--
			Antimony	--	--	--	--
			Arsenic	6.6E-06	--	6.E-07	7.E-06
			Cobalt	--	--	--	--
			Iron	--	--	--	--
			Manganese	--	--	--	--
			Thallium	--	--	--	--
			Vanadium	--	--	--	--
			Benzo(a)anthracene*	6.E-07	--	2.E-07	9.E-07
			Benzo(a)pyrene*	4.5E-06	--	2.E-06	6.E-06
			Benzo(b)fluoranthene*	9.E-07	--	3.E-07	1.E-06
			Carbazole	2.E-10	--	9.E-11	3.E-10
			Dibenz(a,h)anthracene*	7.E-07	--	3.E-07	9.E-07
			Dibenzofuran	--	--	--	--
			Dimethyl Phthalate	--	--	--	--
			Nitroglycerin	3.E-06	--	2.E-09	3.E-06
			Total	1.6E-05	--	3.2E-06	2.E-05
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--
			Antimony	--	--	--	--
			Arsenic	--	8.E-10	--	8.E-10
			Cobalt	--	8.0E-09	--	8.0E-09
			Iron	--	--	--	--
			Manganese	--	--	--	--
			Thallium	--	--	--	--
			Vanadium	--	--	--	--
			Benzo(a)anthracene*	--	3.E-12	--	3.E-12
			Benzo(a)pyrene*	--	2.E-11	--	2.E-11
			Benzo(b)fluoranthene*	--	5.E-12	--	5.E-12
			Carbazole	--	--	--	--
			Dibenz(a,h)anthracene*	--	4.E-12	--	4.E-12
			Dibenzofuran	--	--	--	--
			Dimethyl Phthalate	--	--	--	--
			Nitroglycerin	--	--	--	--
			Total	--	9.E-09	--	9.E-09
						Total Risk Across Soil	2.E-05

Total Risk Across All Media and All Exposure Routes 2.E-05

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.3).

TABLE E.1-9.11.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Adolescent Trespasser
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Surface Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	3.E-03	--	2.E-04	3.E-03
			Arsenic	8.E-08	--	2.E-08	1.E-07	Arsenic	skin, vascular	1.E-03	--	3.E-04	2.E-03
			Cobalt	--	--	--	--	Cobalt	blood, thyroid	6.E-03	--	5.E-04	7.E-03
			Iron	--	--	--	--	Iron	GI tract	7.7E-03	--	6.E-04	8.E-03
			Manganese	--	--	--	--	Manganese	CNS	7.E-03	--	1.5E-02	2.E-02
			Thallium	--	--	--	--	Thallium	liver, blood, hair	3.3E-03	--	3.E-04	4.E-03
			Vanadium	--	--	--	--	Vanadium	kidney	7.E-04	--	2.E-03	3.E-03
			Benzo(a)anthracene*	3.E-09	--	4.E-09	7.E-09	Benzo(a)anthracene*	NA	--	--	--	--
			Benzo(a)pyrene*	3.E-08	--	3.E-08	6.E-08	Benzo(a)pyrene*	NA	--	--	--	--
			Benzo(b)fluoranthene*	6.E-09	--	7.E-09	1.E-08	Benzo(b)fluoranthene*	NA	--	--	--	--
			Carbazole	4.E-12	--	4.E-12	8.E-12	Carbazole	NA	--	--	--	--
			Dibenz(a,h)anthracene*	6.E-09	--	7.E-09	1.E-08	Dibenz(a,h)anthracene*	NA	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	NA	--	--	--	--
			Dimethyl Phthalate	--	--	--	--	Dimethyl Phthalate	NA	--	--	--	--
			Nitroglycerin	7.E-10	--	6.E-11	8.E-10	Nitroglycerin	vascular	3.E-03	--	2.E-04	3.E-03
				1.3E-07	--	7.E-08	2.E-07			3.E-02	--	2.E-02	5.E-02
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	3.E-05	--	3.E-05
			Arsenic	--	1.E-11	--	1.E-11	Arsenic	cardiovascular, CNS	--	7.E-07	--	7.E-07
			Cobalt	--	1.E-10	--	1.E-10	Cobalt	respiratory	--	2.E-05	--	2.E-05
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	2.E-04	--	2.E-04
			Thallium	--	--	--	--	Thallium	NA	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Benzo(a)anthracene*	--	3.E-14	--	3.E-14	Benzo(a)anthracene*	NA	--	--	--	--
			Benzo(a)pyrene*	--	2.E-13	--	2.E-13	Benzo(a)pyrene*	NA	--	--	--	--
			Benzo(b)fluoranthene*	--	5.E-14	--	5.E-14	Benzo(b)fluoranthene*	NA	--	--	--	--
			Carbazole	--	--	--	--	Carbazole	NA	--	--	--	--
			Dibenz(a,h)anthracene*	--	6.E-14	--	6.E-14	Dibenz(a,h)anthracene*	NA	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	NA	--	--	--	--
			Dimethyl Phthalate	--	--	--	--	Dimethyl Phthalate	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
				--	1.E-10	--	1.E-10			--	2.5E-04	--	2.5E-04
						Total Risk Across Soil	2.E-07					Total Hazard Index Across Soil	5.E-02

Total Risk Across All Media and All Exposure Routes	2.E-07
Total Hazard Index Across All Media and All Exposure Routes	5.E-02

Total blood HI across all media =	1.E-02
Total CNS HI across all media =	2.E-02
Total skin HI across all media =	2.E-03
Total respiratory HI across all media =	2.E-05
Total GI tract HI across all media =	8.E-03
Total kidney HI across all media =	3.E-03
Total liver HI across all media =	4.E-03
Total vascular HI across all media =	5.E-03
Total thyroid HI across all media =	7.E-03
Total hair HI across all media =	4.E-03

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.3).

TABLE E.1-9.12.RME
RME Summary of Cancer Risks and Non-Cancer Hazards for COPCs: Adolescent Trespasser
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Current/Future
Receptor Population:	Trespasser
Receptor Age:	Adolescent

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	Aluminum	--	--	--	--	Aluminum	developmental CNS	2.E-03	--	2.E-04	2.E-03
			Antimony	--	--	--	--	Antimony	blood	6.E-04	--	3.E-04	1.E-03
			Arsenic	8.E-08	--	2.E-08	1.E-07	Arsenic	skin, vascular	1.3E-03	--	3.E-04	1.6E-03
			Cobalt	--	--	--	--	Cobalt	blood, thyroid	5.9E-03	--	5.E-04	6.E-03
			Iron	--	--	--	--	Iron	GI tract	7.6E-03	--	6.E-04	8.E-03
			Manganese	--	--	--	--	Manganese	CNS	7.E-03	--	1.4E-02	2.E-02
			Thallium	--	--	--	--	Thallium	liver, blood, hair	2.E-03	--	1.E-04	2.E-03
			Vanadium	--	--	--	--	Vanadium	kidney	6.E-04	--	2.E-03	2.E-03
			Benzo(a)anthracene*	5.E-09	--	5.E-09	1.E-08	Benzo(a)anthracene*	NA	--	--	--	--
			Benzo(a)pyrene*	3.E-08	--	4.E-08	7.E-08	Benzo(a)pyrene*	NA	--	--	--	--
			Benzo(b)fluoranthene*	7.E-09	--	7.E-09	1.E-08	Benzo(b)fluoranthene*	NA	--	--	--	--
			Carbazole	3.E-12	--	3.E-12	6.E-12	Carbazole	NA	--	--	--	--
			Dibenz(a,h)anthracene*	5.E-09	--	6.E-09	1.E-08	Dibenz(a,h)anthracene*	NA	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	NA	--	--	--	--
			Dimethyl Phthalate	--	--	--	--	Dimethyl Phthalate	NA	--	--	--	--
			Nitroglycerin	8.E-10	--	7.E-11	9.E-10	Nitroglycerin	vascular	3.5E-03	--	3.E-04	3.7E-03
				1.E-07	--	8.E-08	2.E-07			3.E-02	--	2.E-02	5.E-02
	Air	Air (Fugitive Dust)	Aluminum	--	--	--	--	Aluminum	CNS	--	3.E-05	--	3.E-05
			Antimony	--	--	--	--	Antimony	NA	--	--	--	--
			Arsenic	--	1.E-11	--	1.E-11	Arsenic	cardiovascular, CNS	--	7.E-07	--	7.E-07
			Cobalt	--	1.E-10	--	1.E-10	Cobalt	respiratory	--	2.E-05	--	2.E-05
			Iron	--	--	--	--	Iron	NA	--	--	--	--
			Manganese	--	--	--	--	Manganese	CNS	--	1.8E-04	--	1.8E-04
			Thallium	--	--	--	--	Thallium	NA	--	--	--	--
			Vanadium	--	--	--	--	Vanadium	NA	--	--	--	--
			Benzo(a)anthracene*	--	4.E-14	--	4.E-14	Benzo(a)anthracene*	NA	--	--	--	--
			Benzo(a)pyrene*	--	3.E-13	--	3.E-13	Benzo(a)pyrene*	NA	--	--	--	--
			Benzo(b)fluoranthene*	--	6.E-14	--	6.E-14	Benzo(b)fluoranthene*	NA	--	--	--	--
			Carbazole	--	--	--	--	Carbazole	NA	--	--	--	--
			Dibenz(a,h)anthracene*	--	5.E-14	--	5.E-14	Dibenz(a,h)anthracene*	NA	--	--	--	--
			Dibenzofuran	--	--	--	--	Dibenzofuran	NA	--	--	--	--
			Dimethyl Phthalate	--	--	--	--	Dimethyl Phthalate	NA	--	--	--	--
			Nitroglycerin	--	--	--	--	Nitroglycerin	NA	--	--	--	--
				--	1.E-10	--	1.E-10			--	2.E-04	--	2.E-04
						Total Risk Across Soil	2.E-07					Total Hazard Index Across Soil	5.E-02

Total Risk Across All Media and All Exposure Routes	2.E-07
Total Hazard Index Across All Media and All Exposure Routes	5.E-02

Total blood HI across all media =	9.E-03
Total CNS HI across all media =	2.E-02
Total skin HI across all media =	2.E-03
Total respiratory HI across all media =	2.E-05
Total GI tract HI across all media =	8.E-03
Total kidney HI across all media =	2.E-03
Total liver HI across all media =	2.E-03
Total vascular HI across all media =	5.E-03
Total thyroid HI across all media =	6.E-03
Total hair HI across all media =	2.E-03

* Compounds are carcinogens that act via a mutagenic mode of action; therefore, carcinogenic risk for these compounds were calculated in accordance with "Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens" (USEPA 2005) and example calculations from "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.3).

TABLE E.1-10.1.RME
RME Risk Assessment Summary: Construction Worker
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Non-Carcinogenic Hazard Quotient				
				Ingestion	Inhalation	Dermal	Exposure Routes Total		Primary Target Organ	Ingestion	Inhalation	Dermal	Exposure Routes Total
Total Soil	Soil	Soil	None Identified					Aluminum	developmental CNS	5.3.E-02	--	2.E-03	5.E-02
								Manganese	CNS	1.5.E-01	--	1.E-01	3.E-01
			Total	--	--	--	--	Total		2.1.E-01	--	1.E-01	3.E-01
	Air	Air	None Identified					Aluminum	CNS	--	6.E-01	--	6.E-01
								Manganese	CNS	--	4.E+00	--	4.E+00
			Total	--	--	--	--	Total		--	5.E+00	--	5.E+00
Groundwater	Groundwater	Groundwater	None Identified					None Identified					
			Total	--	--	--	--	Total		--	--	--	--
							Total Risk Across Soil						Total Hazard Index Across Soil
							--						5.E+00

Total Risk Across All Media and All Exposure Routes: --

Total Hazard Index Across All Media and All Exposure Routes: 5.E+00

Total CNS HI across all media = 5.E+00

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APPENDIX E.2

IEUBK AND ADULT LEAD MODEL RESULTS

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Table 1
Calculation of Blood Lead Concentrations using ALM - Maintenance Worker - Surface Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee

Version date 05/19/05 **EDIT RED CELLS**

Exposure Variable	Description of Exposure Variable	Units	Region OR Ethnic GSDi and PbBo Data from NHANES III Analysis							
			All/All	All/White	All/Black	All/Mexican	Northeast/All	Midwest/All	South/All	West/All
PbS	Soil lead concentration	ug/g or ppm	313.9	313.9	313.9	313.9	313.9	313.9	313.9	313.9
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
BKSF	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
GSD_i	Geometric standard deviation PbB	--	2.1	2.1	2.2	2.3	2.0	2.2	2.1	2.1
PbB_0	Baseline PbB	ug/dL	1.5	1.5	1.8	1.7	2.0	1.5	1.4	1.4
IR_S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
IR_{S+D}	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	--	--	--	--	--	--
W_S	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--	--	--	--	--	--	--
K_{SD}	Mass fraction of soil in dust	--	--	--	--	--	--	--	--	--
$AF_{S, D}$	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
$EF_{S, D}$	Exposure frequency (same for soil and dust)	days/yr	219	219	219	219	219	219	219	219
$AT_{S, D}$	Averaging time (same for soil and dust)	days/yr	365	365	365	365	365	365	365	365
PbB_{adult}	**PbB of adult worker, geometric mean**	**ug/dL**	**2.4**	**2.4**	**2.7**	**2.6**	**2.9**	**2.4**	**2.3**	**2.3**
$PbB_{fetal, 0.95}$	95th percentile PbB among fetuses of adult workers	ug/dL	7.5	7.1	8.6	9.2	8.1	7.9	6.8	7.1
PbB_t	Target PbB level of concern (e.g., 10 ug/dL)	ug/dL	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**	**%**	**2.1%**	**1.8%**	**3.3%**	**4.0%**	**2.6%**	**2.6%**	**1.5%**	**1.8%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Table 2
Calculation of Blood Lead Concentrations using ALM - Maintenance Worker - Total Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee
Version date 05/19/05 **EDIT RED CELLS**

Exposure Variable	Description of Exposure Variable	Units	Region OR Ethnic GSDi and PbBo Data from NHANES III Analysis							
			All/All	All/White	All/Black	All/Mexican	Northeast/All	Midwest/All	South/All	West/All
PbS	Soil lead concentration	ug/g or ppm	414.9	414.9	414.9	414.9	414.9	414.9	414.9	414.9
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
BKSF	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
GSD_i	Geometric standard deviation PbB	--	2.1	2.1	2.2	2.3	2.0	2.2	2.1	2.1
PbB_0	Baseline PbB	ug/dL	1.5	1.5	1.8	1.7	2.0	1.5	1.4	1.4
IR_S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
IR_{S+D}	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	--	--	--	--	--	--
W_S	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--	--	--	--	--	--	--
K_{SD}	Mass fraction of soil in dust	--	--	--	--	--	--	--	--	--
$AF_{S, D}$	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
$EF_{S, D}$	Exposure frequency (same for soil and dust)	days/yr	219	219	219	219	219	219	219	219
$AT_{S, D}$	Averaging time (same for soil and dust)	days/yr	365	365	365	365	365	365	365	365
PbB_{adult}	**PbB of adult worker, geometric mean**	**ug/dL**	**2.7**	**2.6**	**3.0**	**2.9**	**3.2**	**2.7**	**2.6**	**2.6**
$PbB_{fetal, 0.95}$	95th percentile PbB among fetuses of adult workers	ug/dL	8.4	8.0	9.5	10.2	8.9	8.8	7.7	8.0
PbB_t	Target PbB level of concern (e.g., 10 ug/dL)	ug/dL	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**	**%**	**3.0%**	**2.6%**	**4.4%**	**5.2%**	**3.5%**	**3.6%**	**2.3%**	**2.6%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Table 3
Calculation of Blood Lead Concentrations using ALM - Commercial Worker - Total Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee
Version date 05/19/05 **EDIT RED CELLS**

Exposure Variable	Description of Exposure Variable	Units	Region OR Ethnic GSDi and PbBo Data from NHANES III Analysis							
			All/All	All/White	All/Black	All/Mexican	Northeast/All	Midwest/All	South/All	West/All
PbS	Soil lead concentration	ug/g or ppm	414.9	414.9	414.9	414.9	414.9	414.9	414.9	414.9
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
BKSF	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
GSD_i	Geometric standard deviation PbB	--	2.1	2.1	2.2	2.3	2.0	2.2	2.1	2.1
PbB_0	Baseline PbB	ug/dL	1.5	1.5	1.8	1.7	2.0	1.5	1.4	1.4
IR_S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050
IR_{S+D}	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	--	--	--	--	--	--
W_S	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--	--	--	--	--	--	--
K_{SD}	Mass fraction of soil in dust	--	--	--	--	--	--	--	--	--
$AF_{S, D}$	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
$EF_{S, D}$	Exposure frequency (same for soil and dust)	days/yr	219	219	219	219	219	219	219	219
$AT_{S, D}$	Averaging time (same for soil and dust)	days/yr	365	365	365	365	365	365	365	365
PbB_{adult}	**PbB of adult worker, geometric mean**	**ug/dL**	**2.1**	**2.0**	**2.4**	**2.3**	**2.6**	**2.1**	**2.0**	**2.0**
$PbB_{fetal, 0.95}$	95th percentile PbB among fetuses of adult workers	ug/dL	6.5	6.2	7.6	8.1	7.3	6.9	5.9	6.1
PbB_t	Target PbB level of concern (e.g., 10 ug/dL)	ug/dL	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**	**%**	**1.3%**	**1.1%**	**2.3%**	**2.9%**	**1.8%**	**1.7%**	**0.9%**	**1.1%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

Table 4
Calculation of Blood Lead Concentrations using ALM - Construction Worker - Total Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Calculations of Blood Lead Concentrations (PbBs)

U.S. EPA Technical Review Workgroup for Lead, Adult Lead Committee
Version date 05/19/05 **EDIT RED CELLS**

Exposure Variable	Description of Exposure Variable	Units	Region OR Ethnic GSDi and PbBo Data from NHANES III Analysis							
			All/All	All/White	All/Black	All/Mexican	Northeast/All	Midwest/All	South/All	West/All
PbS	Soil lead concentration	ug/g or ppm	414.9	414.9	414.9	414.9	414.9	414.9	414.9	414.9
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
BKSF	Biokinetic Slope Factor	ug/dL per ug/day	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
GSD_i	Geometric standard deviation PbB	--	2.1	2.1	2.2	2.3	2.0	2.2	2.1	2.1
PbB_0	Baseline PbB	ug/dL	1.5	1.5	1.8	1.7	2.0	1.5	1.4	1.4
IR_S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
IR_{S+D}	Total ingestion rate of outdoor soil and indoor dust	g/day	--	--	--	--	--	--	--	--
W_S	Weighting factor; fraction of IR_{S+D} ingested as outdoor soil	--	--	--	--	--	--	--	--	--
K_{SD}	Mass fraction of soil in dust	--	--	--	--	--	--	--	--	--
$AF_{S, D}$	Absorption fraction (same for soil and dust)	--	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
$EF_{S, D}$	Exposure frequency (same for soil and dust)	days/yr	250	250	250	250	250	250	250	250
$AT_{S, D}$	Averaging time (same for soil and dust)	days/yr	365	365	365	365	365	365	365	365
PbB_{adult}	**PbB of adult worker, geometric mean**	**ug/dL**	**2.9**	**2.8**	**3.1**	**3.1**	**3.3**	**2.9**	**2.8**	**2.8**
$PbB_{fetal, 0.95}$	95th percentile PbB among fetuses of adult workers	ug/dL	8.9	8.5	10.0	10.8	9.4	9.4	8.2	8.5
PbB_t	Target PbB level of concern (e.g., 10 ug/dL)	ug/dL	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
$P(PbB_{fetal} > PbB_t)$	**Probability that fetal PbB > PbB_t, assuming lognormal distribution**	**%**	**3.6%**	**3.1%**	**5.1%**	**6.0%**	**4.2%**	**4.2%**	**2.8%**	**3.1%**

[1] Equation 1 does not apportion exposure between soil and dust ingestion (excludes W_S, K_{SD}).
When $IR_S = IR_{S+D}$ and $W_S = 1.0$, the equations yield the same $PbB_{fetal,0.95}$.

Source: U.S. EPA (1996). Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil

LEAD MODEL FOR WINDOWS Version 1.0 - **Child Resident - Surface Soil**

Model Version: 1.0 Build 264
User Name: Tina Devine
Date: 05/20/2009
Site Name: RFAAP
Operable Unit: Study Area at SWMU 13
Run Mode: Site Risk Assessment

Soil/Dust Data

Mean Lead Concentration in Surface Soil

Water Data

RL for lead in groundwater at SWMU 13 (lead not detected in groundwater)

The time step used in this model run: 1 - Every 4 Hours (6 times a day).

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (ug Pb/m^3)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

****** Diet ******

Age	Diet Intake(ug/day)
.5-1	2.260
1-2	1.960
2-3	2.130
3-4	2.040
4-5	1.950
5-6	2.050
6-7	2.220

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 1.000 ug Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used

Average multiple source concentration: 229.730 ug/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
.5-1	313.900	229.730
1-2	313.900	229.730
2-3	313.900	229.730
3-4	313.900	229.730
4-5	313.900	229.730
5-6	313.900	229.730
6-7	313.900	229.730

****** Alternate Intake ******

Age	Alternate (ug Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

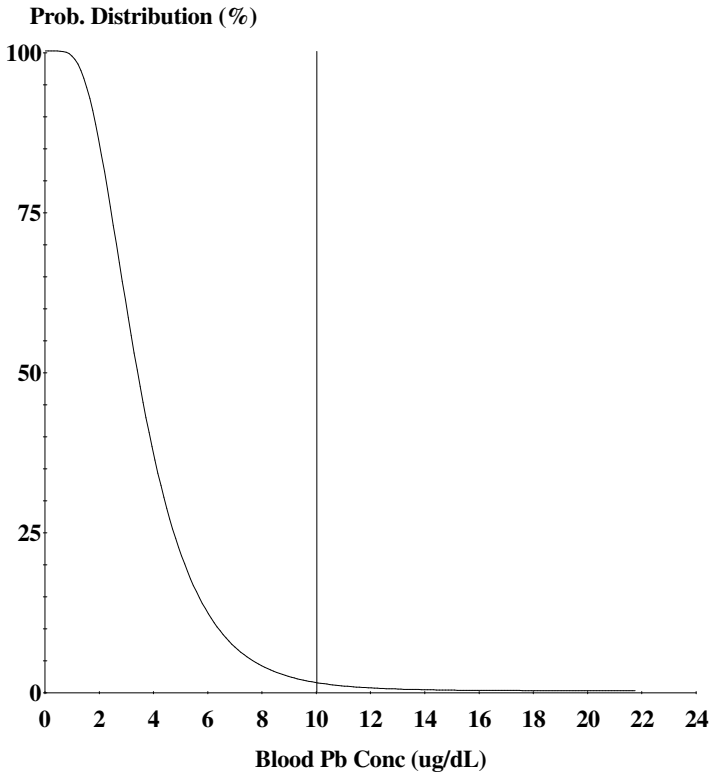
Maternal Blood Concentration: 2.500 ug Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (ug/day)	Diet (ug/day)	Alternate (ug/day)	Water (ug/day)
.5-1	0.021	1.038	0.000	0.092
1-2	0.034	0.890	0.000	0.227
2-3	0.062	0.979	0.000	0.239
3-4	0.067	0.949	0.000	0.247
4-5	0.067	0.929	0.000	0.262
5-6	0.093	0.985	0.000	0.279
6-7	0.093	1.071	0.000	0.285

Year	Soil+Dust (ug/day)	Total (ug/day)	Blood (ug/dL)
.5-1	6.270	7.421	4.0
1-2	9.839	10.990	4.5
2-3	9.968	11.248	4.2
3-4	10.085	11.348	4.0
4-5	7.649	8.906	3.2
5-6	6.943	8.300	2.7
6-7	6.587	8.037	2.3

Child Resident - Surface Soil



Cutoff = 10.000 ug/dl
Geo Mean = 3.552
GSD = 1.600
% Above = 1.382

Age Range = 0 to 84 months
Time Step = Every 4 Hours
Run Mode = Site Risk Assessment

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LEAD MODEL FOR WINDOWS Version 1.0 - **Child Resident - Total Soil**

Model Version: 1.0 Build 264
User Name: Tina Devine
Date: 5/20/2009
Site Name: RFAAP
Operable Unit: Study Area at SWMU 13
Run Mode: Site Risk Assessment

Water Data
RL for Groundwater at SWMU 13 (Lead not detected in GW)
Soil/Dust Data
Mean Lead for Total Soil

The time step used in this model run: 1 - Every 4 Hours (6 times a day).

****** Air ******

Indoor Air Pb Concentration: 30.000 percent of outdoor.
Other Air Parameters:

Age	Time Outdoors (hours)	Ventilation Rate (m^3/day)	Lung Absorption (%)	Outdoor Air Pb Conc (ug Pb/m^3)
.5-1	1.000	2.000	32.000	0.100
1-2	2.000	3.000	32.000	0.100
2-3	3.000	5.000	32.000	0.100
3-4	4.000	5.000	32.000	0.100
4-5	4.000	5.000	32.000	0.100
5-6	4.000	7.000	32.000	0.100
6-7	4.000	7.000	32.000	0.100

****** Diet ******

Age	Diet Intake(ug/day)
.5-1	2.260
1-2	1.960
2-3	2.130
3-4	2.040
4-5	1.950
5-6	2.050
6-7	2.220

****** Drinking Water ******

Water Consumption:

Age	Water (L/day)
.5-1	0.200
1-2	0.500
2-3	0.520
3-4	0.530
4-5	0.550
5-6	0.580
6-7	0.590

Drinking Water Concentration: 1.000 ug Pb/L

****** Soil & Dust ******

Multiple Source Analysis Used

Average multiple source concentration: 300.430 ug/g

Mass fraction of outdoor soil to indoor dust conversion factor: 0.700
Outdoor airborne lead to indoor household dust lead concentration: 100.000
Use alternate indoor dust Pb sources? No

Age	Soil (ug Pb/g)	House Dust (ug Pb/g)
.5-1	414.900	300.430
1-2	414.900	300.430
2-3	414.900	300.430
3-4	414.900	300.430
4-5	414.900	300.430
5-6	414.900	300.430
6-7	414.900	300.430

****** Alternate Intake ******

Age	Alternate (ug Pb/day)
.5-1	0.000
1-2	0.000
2-3	0.000
3-4	0.000
4-5	0.000
5-6	0.000
6-7	0.000

****** Maternal Contribution: Infant Model ******

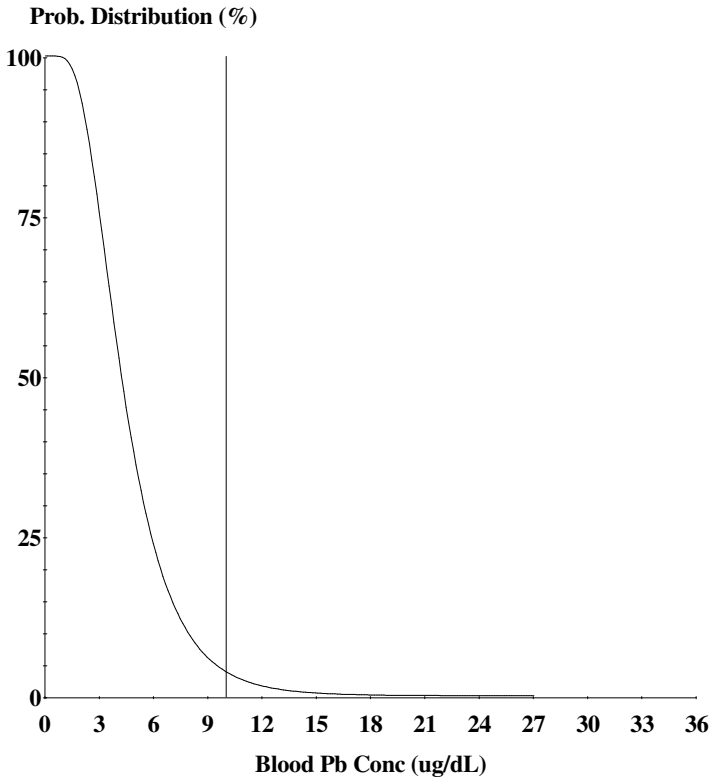
Maternal Blood Concentration: 2.500 ug Pb/dL

****
CALCULATED BLOOD LEAD AND LEAD UPTAKES:
****

Year	Air (ug/day)	Diet (ug/day)	Alternate (ug/day)	Water (ug/day)
.5-1	0.021	1.017	0.000	0.090
1-2	0.034	0.868	0.000	0.221
2-3	0.062	0.958	0.000	0.234
3-4	0.067	0.931	0.000	0.242
4-5	0.067	0.917	0.000	0.259
5-6	0.093	0.975	0.000	0.276
6-7	0.093	1.062	0.000	0.282

Year	Soil+Dust (ug/day)	Total (ug/day)	Blood (ug/dL)
.5-1	8.076	9.204	5.0
1-2	12.621	13.745	5.7
2-3	12.828	14.082	5.2
3-4	13.015	14.255	5.0
4-5	9.933	11.176	4.0
5-6	9.038	10.382	3.3
6-7	8.586	10.023	2.9

Child Resident - Total Soil



Cutoff = 10.000 ug/dl
Geo Mean = 4.413
GSD = 1.600
% Above = 4.089

Age Range = 0 to 84 months
Time Step = Every 4 Hours
Run Mode = Site Risk Assessment

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APPENDIX E.3

EXAMPLE RISK CALCULATIONS FOR CARCINOGENS THAT ACT VIA A MUTAGENIC MODE OF ACTION AND INCORPORATE DEFAULT ADAFs

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Table E.3-1
Example Site-Specific Risk Calculation for Carcinogens that Act Via Mutagenic Mode of Action - Lifetime Resident - Benzo(a)pyrene
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Example Site Specific Risk Calculation for Carcinogens that act via mutagenic mode of action - Lifetime Resident - Benzo(a)pyrene

Ingestion
Carcinogens

$$Risk_o = C_s * CSF_o * \left[\left(\frac{EF * ED * IR - S * FI * CF_1 * ADAF_1}{BW * AT - C} \right)_{(age\ 0-2yrs)} + \left(\frac{EF * ED * IR - S * FI * CF_1 * ADAF_2}{BW * AT - C} \right)_{(age\ 2-6yrs)} + \left(\frac{EF * ED * IR - S * FI * CF_1 * ADAF_2}{BW * AT - C} \right)_{(age\ 6-16yrs)} + \left(\frac{EF * ED * IR - S * FI * CF_1 * ADAF_3}{BW * AT - C} \right)_{(age\ 16-30yrs)} \right]$$

$$(0.0922 mg/kg) * (7.3 (mg/kg-d)^{-1}) * \left[\left(\frac{(350 d/y) * (2y) * (200 mg/d) * (1) * (1E-06 kg/mg) * (10)}{(15 kg) * (25{,}550 d)} \right)_{(age\ 0-2yrs)} + \left(\frac{(350 d/y) * (4y) * (200 mg/d) * (1) * (1E-06 kg/mg) * (3)}{(15 kg) * (25{,}550 d)} \right)_{(age\ 2-6\ yrs)} + \left(\frac{(350 d/y) * (10y) * (100 mg/d) * (1) * (1E-06 kg/mg) * (3)}{(70 kg) * (25{,}550 d)} \right)_{(age\ 6-16yrs)} + \left(\frac{(350 d/y) * (14y) * (100 mg/d) * (1) * (1E-06 kg/mg) * (1)}{(70 kg) * (25{,}550 d)} \right)_{(age\ 16-30yrs)} \right] = \mathbf{4.5E-06}$$

Dermal
Carcinogens

$$Risk_d = C_s * CSF_d * \left[\left(\frac{EF * ED * CF_1 * AF * ABS_d * SA * EV * ADAF_1}{BW * AT - C} \right)_{(age\ 0-2yrs)} + \left(\frac{EF * ED * CF_1 * AF * ABS_d * SA * EV * ADAF_2}{BW * AT - C} \right)_{(age\ 2-6yrs)} + \left(\frac{EF * ED * CF_1 * AF * ABS_d * SA * EV * ADAF_2}{BW * AT - C} \right)_{(age\ 6-16yrs)} + \left(\frac{EF * ED * CF_1 * AF * ABS_d * SA * EV * ADAF_3}{BW * AT - C} \right)_{(age\ 16-30yrs)} \right]$$

$$Risk_d = (0.0922 mg/kg) * (7.3 (mg/kg-d)^{-1}) * \left[\left(\frac{(350 d/y) * (2y) * (1E-06 kg/mg) * (0.2 mg/cm^2-event) * (0.13) * (2{,}800 cm^2) * (1 event/d) * (10)}{(15 kg) * (25{,}550 d)} \right)_{(age\ 0-2yrs)} + \left(\frac{(350 d/y) * (4y) * (1E-06 kg/mg) * (0.2 mg/cm^2-event) * (0.13) * (2{,}800 cm^2) * (1 event/d) * (3)}{(15 kg) * (25{,}550 d)} \right)_{(age\ 2-6yrs)} + \left(\frac{(350 d/y) * (10y) * (1E-06 kg/mg) * (0.07 mg/cm^2-event) * (0.13) * (5{,}700 cm^2) * (1 event/d) * (3)}{(70 kg) * (25{,}550 d)} \right)_{(age\ 6-16yrs)} + \left(\frac{(350 d/y) * (14y) * (1E-06 kg/mg) * (0.07 mg/cm^2-event) * (0.13) * (5{,}700 cm^2) * (1 event/d) * (1)}{(70 kg) * (25{,}550 d)} \right)_{(age\ 16-30yrs)} \right] = \mathbf{1.7E-06}$$

Inhalation

$$Risk_i = C_s * IUR * \left[\left(\frac{1/PEF * ET * EF * ED * ADAF_1}{AT - C * CF_2} \right)_{(age\ 0-2yrs)} + \left(\frac{1/PEF * ET * EF * ED * ADAF_2}{AT - C * CF_2} \right)_{(age\ 2-6yrs)} + \left(\frac{1/PEF * ET * EF * ED * ADAF_2}{AT - C * CF_2} \right)_{(age\ 6-16yrs)} + \left(\frac{1/PEF * ET * EF * ED * ADAF_3}{AT - C * CF_2} \right)_{(age\ 16-30yrs)} \right]$$

$$Risk_i = (0.0922 mg/kg) * (1.1 (mg/m^3)^{-1}) * \left[\left(\frac{(1/6.86E+08 m^3/kg) * (6h/d) * (350 d/y) * (2y) * (10)}{(25{,}550 d) * (24h/d)} \right)_{(age\ 0-2yrs)} + \left(\frac{(1/6.86E+08 m^3/kg) * (6h/d) * (350 d/y) * (4y) * (3)}{(25{,}550 d) * (24h/d)} \right)_{(age\ 2-6yrs)} + \left(\frac{(1/6.86E+08 m^3/kg) * (2h/d) * (350 d/y) * (10y) * (3)}{(25{,}550 d) * (24h/d)} \right)_{(age\ 6-16yrs)} + \left(\frac{(1/6.86E+08 m^3/kg) * (2h/d) * (350 d/y) * (14y) * (1)}{(25{,}550 d) * (24h/d)} \right)_{(age\ 16-30yrs)} \right] = \mathbf{2.4E-11}$$

Overall Risk Equation

Total Risk : $Risk_o + Risk_d + Risk_i$ = 4.5E-06 + 1.7E-06 + 2.4E-11 = **6E-06**

Table E.3-1
Example Site-Specific Risk Calculation for Carcinogens that Act Via Mutagenic Mode of Action - Lifetime Resident - Benzo(a)pyrene
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

NOTES:

C_s =	soil concentration	mg/kg
BW =	body weight (receptor specific)	kg
	BW (age 0-2 yrs) = 15 kg	
	BW (age 2-6 yrs) = 15 kg	
	BW (age 6-16 yrs) = 70 kg	
	BW (age 16-30 yrs) = 70 kg	
AT-C =	averaging time (25,550 days)	d
EF =	exposure frequency (350 days/year)	d/y
ED =	exposure duration (years)	y
	in accordance with USEPA Region III ADAF Guidance (11/08/2006)	
	ED (age 0-2 yrs) = 2 years	
	ED (age 2-6 yrs) = 4 years	
	ED (age 6-16 yrs) = 10 years	
	ED (age 16-30 yrs) = 14 years	
ADAF =	age-dependant adjustment factors	unitless
	in accordance with USEPA Region III ADAF Guidance (11/08/2006)	
	$ADAF_1$ =10, $ADAF_2$ = 3, $ADAF_3$ = 1	
ET =	exposure time (receptor specific)	h/d
	ET (age 0-2 yrs) = 6 hours/day	
	ET (age 2-6 yrs) = 6 hours/day	
	ET (age 6-16 yrs) = 2 hours/day	
	ET (age 16-30 yrs) = 2 hours/day	
EV =	event frequency (1 event/day)	events/d
ABS_d=	dermal absorption factor	unitless
AF=	adherence factor (receptor specific - see Table E.1-4.2)	mg/cm^2-event
	AF (age 0-2 yrs) = 0.2 mg/cm^2-event	
	AF (age 2-6 yrs) = 0.2 mg/cm^2-event	
	AF (age 6-16 yrs) = 0.07 mg/cm^2-event	
	AF (age 16-30 yrs) = 0.07 mg/cm^2-event	
CSF_o =	oral carcinogenic slope factor (chemical specific - see Table E.1-6.1)	$(mg/kg\text{-}day)^{-1}$
CSF_d =	dermal carcinogenic slope factor (chemical specific - see Table E.1-6.1)	$(mg/kg\text{-}day)^{-1}$
IUR =	inhalation unit risk (chemical specific - see Table E.1-6.2)	$(mg/m^3)^{-1}$
CF_1 =	conversion factor (1E-06)	kg/mg
CF_2 =	conversion factor (24 hours/day)	h/d
SA =	skin surface contact area (receptor specific)	cm^2
	SA (age 0-2 yrs) = 2,800 cm^2	
	SA (age 2-6 yrs) = 2,800 cm^2	
	SA (age 6-16 yrs) = 5,700 cm^2	
	SA (age 0-2 yrs) = 5,700 cm^2	
IR-S =	ingestion rate - soil (receptor specific)	mg/day
	IR-S (age 0-2 yrs) = 200 mg/day	
	IR-S (age 2-6 yrs) = 200 mg/day	
	IR-S (age 6-16 yrs) = 100 mg/day	
	IR-S (age 16-30 yrs) = 100 mg/day	
FI =	fraction ingested (1.0)	unitless
PEF =	particulate emmision factor (6.86E+08 m^3/kg - see Table E.1-4.3)	

Receptor specific parameters provided in Table E.1-4.1c and E.1-4.1d

Child resident parameters are used for age 0-2 yrs and age 2-6 yrs exposure duration ranges, in accordance with "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.3

Adult resident parameters are used for age 6-16 yrs and age 16-30 yrs exposure duration ranges, in accordance with "Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFS" (USEPA 2006, Appendix E.3

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103

SUBJECT: Derivation of RBCs for Carcinogens that Act Via a Mutagenic Mode of Action and Incorporate Default ADAFs

FROM: Jennifer Hubbard, Toxicologist
Technical Support Branch (3HS41)

TO: RBC Table Users

DATE: October 19, 2006
*corrected November 8, 2006**

Because of the special considerations for carcinogens that act via a mutagenic mode of action, this memo includes a demonstration of the assumptions behind the Region III RBCs for those chemicals that incorporate the default age-dependent adjustment factors (ADAFs). A sample calculation for each medium is provided below.

On March 29, 2005, EPA Administrator Stephen Johnson provided general direction on implementing EPA's 2005 Guidelines for Carcinogen Risk Assessment and Supplemental Guidance for Assessing Susceptibility from Early-Life Exposure to Carcinogens. This was followed by an announcement in the April 7, 2005 Federal Register, and by the release of additional guidance documents concerning the implementation of the new cancer guidelines.

The aspect of the new guidelines that most directly affects Region III RBCs is the use of ADAFs to adjust cancer risk for receptors whose exposure includes early life. For chemicals that EPA has determined to be carcinogenic via a mutagenic mode of action, special adjustments are applied in estimating cancer risks. Vinyl chloride has a chemical-specific adjustment, described in its IRIS file. The impact of vinyl chloride's adjustment on Region III RBCs was discussed in the May 6, 2001 memo, "Derivation of Vinyl Chloride RBCs," found at http://www.epa.gov/reg3hwmd/risk/human/info/vcrbc.pdf. For the other chemicals, where no chemical-specific ADAFs have been developed, default ADAFs are used: 10 for age 0-2, 3 for age 2-16, and no adjustment for ages 16 and up. These chemicals are now marked with an "m" on the Region III RBC Table.

One example for each medium is provided below. The exposure factors are consistent with the defaults used in the other RBCs.

**The original October 19 version of this memo contained a typographical error in Section 2A: "mg/L" was used instead of "ug/L" for the concentration term in three of the equations. The units have now been corrected.*

SAMPLE EQUATIONS - RBCs

1. Soil, Residential

Sample Chemical: Benzo[a]pyrene
PRG = 0.022 mg/kg

Age 0-2

$$\frac{0.022 \text{ mg/kg} \times 200 \text{ mg/day} \times 350 \text{ days/yr} \times 2 \text{ yrs} \times 1\text{E-}6 \text{ kg/mg}}{365 \text{ days/yr} \times 70 \text{ yr} \times 15 \text{ kg}} \times \frac{7.3}{\text{mg/kg/day}} \times 10 = \mathbf{5.9E\text{-}7}$$

Age 2-6

$$\frac{0.022 \text{ mg/kg} \times 200 \text{ mg/day} \times 350 \text{ days/yr} \times 4 \text{ yrs} \times 1\text{E-}6 \text{ kg/mg}}{365 \text{ days/yr} \times 70 \text{ yr} \times 15 \text{ kg}} \times \frac{7.3}{\text{mg/kg/day}} \times 3 = \mathbf{3.5E\text{-}7}$$

Age 6-16

$$\frac{0.022 \text{ mg/kg} \times 100 \text{ mg/day} \times 350 \text{ days/yr} \times 10 \text{ yrs} \times 1\text{E-}6 \text{ kg/mg}}{365 \text{ days/yr} \times 70 \text{ yr} \times 70 \text{ kg}} \times \frac{7.3}{\text{mg/kg/day}} \times 3 = \mathbf{9.4E\text{-}8}$$

Age 16-30

$$\frac{0.022 \text{ mg/kg} \times 100 \text{ mg/day} \times 350 \text{ days/yr} \times 14 \text{ yrs} \times 1\text{E-}6 \text{ kg/mg}}{365 \text{ days/yr} \times 70 \text{ yr} \times 70 \text{ kg}} \times \frac{7.3}{\text{mg/kg/day}} \times 1 = \mathbf{4.4E\text{-}8}$$

Total Risk
5.9E-7 + 3.5E-7 + 9.4E-8 + 4.4E-8 = 1E-6

2. Tap water

Sample chemical = Dibromochloropropane (VOC)
PRG = 2E-4 ug/L

A. Ingestion risk

Age 0-2

$$\frac{0.0002 \text{ ug/L} \times 1 \text{ L/day} \times 350 \text{ days/yr} \times 2 \text{ yrs} \times 1\text{E-}3 \text{ mg/ug}}{365 \text{ days/yr} \times 70 \text{ yr} \times 15 \text{ kg}} \times \frac{0.8}{\text{mg/kg/day}} \times 10 = \mathbf{2.9E\text{-}9}$$

Age 2-6

$$\frac{0.0002 \text{ ug/L} \times 1 \text{ L/day} \times 350 \text{ days/yr} \times 4 \text{ yrs} \times 1\text{E-}3 \text{ mg/ug}}{365 \text{ days/yr} \times 70 \text{ yr} \times 15 \text{ kg}} \times \frac{0.8}{\text{mg/kg/day}} \times 3 = \mathbf{1.8E\text{-}9}$$

Age 6-16

$$\frac{0.0002 \text{ ug/L} \times 2 \text{ L/day} \times 350 \text{ days/yr} \times 10 \text{ yrs} \times 1\text{E-}3 \text{ mg/ug}}{365 \text{ days/yr} \times 70 \text{ yr} \times 70 \text{ kg}} \times \frac{0.8}{\text{mg/kg/day}} \times 3 = \mathbf{1.9E\text{-}9}$$

Age 16-30

$$\frac{0.0002 \text{ ug/L} \times 2 \text{ L/day} \times 350 \text{ days/yr} \times 14 \text{ yrs} \times 1\text{E-3 mg/ug}}{365 \text{ days/yr} \times 70 \text{ yr} \times 70 \text{ kg}} \times \frac{0.8}{\text{mg/kg/day}} \times 1 = \mathbf{8.8E\text{-}10}$$

Total Ingestion Risk

2.9E-9 + 1.8E-9 + 1.9E-9 + 8.8E-10 = 7.5E-9

B. Inhalation risk

Age 0-2

$$\frac{2\text{E-4 ug/L} \times 0.5 \text{ L/m}^3 \times 12 \text{ m}^3\text{/dy} \times 350 \text{ dy/yr} \times 2 \text{ yrs} \times 1\text{E-3 mg/ug}}{365 \text{ days/yr} \times 70 \text{ yr} \times 15 \text{ kg}} \times \frac{21}{\text{mg/kg/day}} \times 10 = \mathbf{4.6E\text{-}7}$$

Age 2-6

$$\frac{2\text{E-4 ug/L} \times 0.5 \text{ L/m}^3 \times 12 \text{ m}^3\text{/dy} \times 350 \text{ dy/yr} \times 4 \text{ yrs} \times 1\text{E-3 mg/ug}}{365 \text{ days/yr} \times 70 \text{ yr} \times 15 \text{ kg}} \times \frac{21}{\text{mg/kg/day}} \times 3 = \mathbf{2.8E\text{-}7}$$

Age 6-16

$$\frac{2\text{E-4 ug/L} \times 0.5 \text{ L/m}^3 \times 20 \text{ m}^3\text{/dy} \times 350 \text{ dy/yr} \times 10 \text{ yrs} \times 1\text{E-3 mg/ug}}{365 \text{ days/yr} \times 70 \text{ yr} \times 70 \text{ kg}} \times \frac{21}{\text{mg/kg/day}} \times 3 = \mathbf{2.5E\text{-}7}$$

Age 16-30

$$\frac{2\text{E-4 ug/L} \times 0.5 \text{ L/m}^3 \times 20 \text{ m}^3\text{/dy} \times 350 \text{ dy/yr} \times 14 \text{ yrs} \times 1\text{E-3 mg/ug}}{365 \text{ days/yr} \times 70 \text{ yr} \times 70 \text{ kg}} \times \frac{21}{\text{mg/kg/day}} \times 1 = \mathbf{1.2E\text{-}7}$$

Total Inhalation Risk

4.6E-7 + 2.8E-7 + 2.5E-7 + 1.2E-7 = 1E-6

Total Tap Water Risk

7.5E-9 + 1E-6 = 1E-6

3. Air

Sample chemical = Benzidine

A. Dose-Based Method (Using CSF in 1/mg/kg/day)

PRG = 1E-5 ug/m^3

Age 0-2

$$\frac{1\text{E-5 ug/m}^3 \times 12 \text{ m}^3\text{/day} \times 350 \text{ days/yr} \times 2 \text{ yrs} \times 1\text{E-3 mg/ug}}{365 \text{ days/yr} \times 70 \text{ yr} \times 15 \text{ kg}} \times \frac{230}{\text{mg/kg/day}} \times 10 = \mathbf{5E\text{-}7}$$

Age 2-6

$$\frac{1\text{E-5 ug/m}^3 \times 12 \text{ m}^3\text{/day} \times 350 \text{ days/yr} \times 4 \text{ yrs} \times 1\text{E-3 mg/ug}}{365 \text{ days/yr} \times 70 \text{ yr} \times 15 \text{ kg}} \times \frac{230}{\text{mg/kg/day}} \times 3 = \mathbf{3E\text{-}7}$$

Age 6-16

$$\frac{1E\text{-}5\ ug/m^3 \times 20\ m^3/day \times 350\ days/yr \times 10\ yrs \times 1E\text{-}3\ mg/ug}{365\ days/yr \times 70\ yr \times 70\ kg} \times \frac{230}{mg/kg/day} \times 3 = \mathbf{2.7E\text{-}7}$$

Age 16-30

$$\frac{1E\text{-}5\ ug/m^3 \times 20\ m^3/day \times 350\ days/yr \times 14\ yrs \times 1E\text{-}3\ mg/ug}{365\ days/yr \times 70\ yr \times 70\ kg} \times \frac{230}{mg/kg/day} \times 1 = \mathbf{1.3E\text{-}7}$$

Total Risk

5E-7 + 3E-7 + 2.7E-7 + 1.3E-7 = 1E-6

B. Concentration-Based Method (Using IUR in m^3/ug).

PRG = 1.5E-5 ug/m^3

Age 0-2

$$\frac{1.5E\text{-}5\ ug/m^3 \times 350\ days/yr \times 2\ yrs}{365\ days/yr \times 70\ yr} \times \frac{0.067}{ug/m^3} \times 10 = \mathbf{2.8E\text{-}7}$$

Age 2-6

$$\frac{1.5E\text{-}5\ ug/m^3 \times 350\ days/yr \times 4\ yrs}{365\ days/yr \times 70\ yr} \times \frac{0.067}{ug/m^3} \times 3 = \mathbf{1.7E\text{-}7}$$

Age 6-16

$$\frac{1.5E\text{-}5\ ug/m^3 \times 350\ days/yr \times 10\ yrs}{365\ days/yr \times 70\ yr} \times \frac{0.067}{ug/m^3} \times 3 = \mathbf{4.1E\text{-}7}$$

Age 16-30

$$\frac{1.5E\text{-}5\ ug/m^3 \times 350\ days/yr \times 14\ yrs}{365\ days/yr \times 70\ yr} \times \frac{0.067}{ug/m^3} \times 1 = \mathbf{1.9E\text{-}7}$$

Total Risk

2.8E-7 + 1.7E-7 + 4.1E-7 + 1.9E-7 = 1E-6

Fish Tissue and Industrial Soil RBCs:
Because these RBC scenarios involve adults only, the ADAFs for early-life exposure do not apply. Therefore, these RBCs are derived in the traditional manner and are not shown in this memo.

APPENDIX F

ECOLOGICAL RISK ASSESSMENT

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APPENDIX F.1

SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT PROCESS

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APPENDIX F.1
SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT PROCESS
STUDY AREA AT SWMU 13 RFI REPORT

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LIST OF ABBREVIATIONS AND ACRONYMS

% ..... Percent
ADD..... Average Daily Dose
AF ..... Area Use Factor
BAF..... Bioaccumulation Factor
BTAG..... Biological Technical Assistance Group
BW ..... Body Weight
C_{TRV}..... NOAEL- or LOAEL-based TRV concentration
COPC ..... Chemical of Potential Concern
COPEC..... Chemical of Potential Ecological Concern
DF ..... Dietary Fraction
DW:WW ..... Dry weight to wet weight
ECO-SSL ..... Ecological Soil Screening Level
EF..... Extrapolation Factor
EPC ..... Exposure Point Concentration
HQ..... Hazard Quotient
IR ..... Ingestion Rate
kg ..... Kilogram
LD_{50}..... Lethal Dose to 50% of the test population
LOAEL ..... Lowest Observable Adverse Effects Level
MDC ..... Maximum Detected Concentration
mg ..... Milligram
mg/kg ..... Milligrams Per Kilogram
NOAEL..... No Observable Adverse Effects Level
ORNL..... Oak Ridge National Laboratory
PAH ..... Polynuclear Aromatic Hydrocarbon
SLERA..... Screening Level Ecological Risk Assessment
TOC ..... Total Organic Carbon
TRV ..... Toxicity Reference Value
UF ..... Uncertainty Factor
UF_{plant} ..... Plant Uptake Factor
USACHPPM..... U.S. Army Center for Health Promotion and Preventive Medicine
USEPA..... U.S. Environmental Protection Agency

1.0 INTRODUCTION

The purpose of this appendix is to present and describe development of exposure assessment models for the receptors presented in Section 7.0, the Screening Level Ecological Risk Assessment (SLERA) at SWMU 13 RFI Study Area. The following sections provide a summary of parameters used in the models and a detailed description of the direct contact and dose rate modeling approachs used in the SLERA. The complete SLERA for SWMU 13 RFI study area is presented in Appendix F.2.

2.0 MODEL PARAMETERS

The direct contact and dose rate models include parameters relating to receptor-specific exposure, chemical of potential concern (COPC) toxicity, and bioaccumulation rates. The following sections describe the estimation of these parameters and major assumptions of parameterization.

2.1 TOXICITY REFERENCE VALUES

MDCs for detected chemicals in soil are used as the preliminary exposure estimate to evaluate a conservative risk scenario for the direct contact pathway to soil invertebrates. Other potentially complete exposure pathways to soil invertebrate and microbial communities include direct ingestion of soil and biota. Due to insufficient information to quantify these pathways, likely secondary to the direct contact/absorption pathway, their omission should not substantially alter the risk characterization.

To evaluate the preliminary exposure estimates, the Toxicity Reference Values (TRVs) that were protective of terrestrial plants and soil invertebrate/microbial communities, were selected from a review of toxicological benchmarks for soil. TRVs for direct contact of soil to invertebrates/microbes and soil to plants were determined from the following guidance:

- USEPA Ecological Soil Screening Level (ECO-SSL): soil invertebrate and plant;
- Oak Ridge National Laboratory (ORNL): plant, microbial community, earthworm values (Efroymson *et al*. 1997a, Efroymson *et al*. 1997b, Efroymson *et al*. 1997c); and
- USEPA Region III Biological Technical Assistance Group (BTAG) soil screening values (USEPA 1995), BTAG freshwater screening benchmarks (USEPA 2006a), and BTAG freshwater sediment screening levels (USEPA 2006b)

Selected screening levels and sources are reported on Table F.2-5 for terrestrial plants and Table F.2-7 for soil invertebrates and microbial communities.

2.2 RECEPTOR-SPECIFIC EXPOSURE PARAMETERS

Wildlife receptors selected to characterize exposure at the SWMU 13 study area include:

- Herbivorous mammals: Meadow Vole (*Microtus pennsylvanicus*);
- Invertivorous mammals: Short-tailed Shrew (*Blarina brevicauda*);
- Invertivorous birds: American Robin (*Turdus migratorius*);
- Carnivorous birds: Red-tailed Hawk (*Buteo jamaicensis*); and
- Carnivorous mammals: Red Fox (*Vulpes vulpes*).

Exposure parameters used to derive TRV-based substrate concentrations for each receptor include body weight (kg), food ingestion rate (kg dry weight/day), dietary fraction, incidental substrate ingestion rate (kg dry weight/day), and area use factor. Both preliminary and refinement level exposure parameters are presented in Table F.2-9.

2.3 LITERATURE-BASED NOAEL AND LOAEL VALUES

The dose-response relationships for chemicals of potential concern are expressed as NOAELs and LOAELs for wildlife receptors, which are defined as a daily ingested amount (mg/kg body weight-day) that is associated with a specified effect. This process involves the determination of a "test species dose" for a critical endpoint from a particular experimental combination of exposure concentration, exposure duration, test species, and chemical. Endpoints may be based on growth, reproductive, developmental, and survival effects. Such effects are important because they may affect the abundance or reproductive success of receptor populations. The test-species dose from the selected study is then modified using extrapolation and uncertainty factors (EFs and UFs).

For this evaluation, EFs and UFs are used to modify laboratory study results, based on the methodology of Sample et al. (1996). This process involves the determination of a "test species dose" for a critical endpoint from a particular experimental combination of exposure concentration, exposure duration, test species, and chemical. The test-species dose from the selected study is then modified to account for the various extrapolations and uncertainties inherent in applying results from a controlled setting to an ecologically relevant setting, as in:

$$\text{NOAEL or LOAEL} = \frac{\text{Test-Species Dose}}{\text{Duration UF} \times \text{Endpoint UF}} \times \text{Body-Weight EF}$$

EFs and UFs are based on: (1) the duration of exposure, (2) the endpoint measured, and (3) differences in body weights among test and receptor species (Calabrese and Baldwin 1993, Ford et al. 1992, Opresko et al. 1994, Sample et al. 1996, USEPA 1996, Wentsel et al. 1994). EFs and UFs derivation and use is described in the following subsections. The use of surrogate chemical data is also discussed. NOAEL and LOAELs for COPCs are summarized in Table F.2-10.

2.3.1 The Test-Species Dose

Critical toxicological values are identified from carefully qualified primary and secondary literature references. The selection of particular studies and endpoints used for the derivation of NOAELs and LOAELs is based on the evaluation of the applicable studies and the dose-response data contained therein. In cases where preferred toxicological endpoints are not available, other toxicity values are used, but additional uncertainty factors may be incorporated. All toxicological values chosen for NOAEL and LOAEL derivation are presented on a mg chemical per kg body weight per day (mg/kg BW-day) basis. These units allow comparisons among organisms of different body sizes (Sample et al. 1996).

2.3.2 Duration Uncertainty Factors

Exposure durations of interest include (1) chronic, (2) subchronic, and (3) acute. Chronic studies occur over the lifetime or a majority of the lifespan of the test organism, generally longer than one year for mammals and 10 weeks for birds. Additionally, studies in which the test organism is dosed during a critical life stage (e.g., gestation) are included with chronic duration studies. Subchronic studies include exposures of two weeks to one year in duration that do not occur during a critical life stage. Acute studies typically have exposures of less than two weeks. NOAELs and LOAELs are usually reported from chronic and subchronic studies, with acute studies often reporting LD_{50} levels (LD_{50}; doses corresponding to the overt expression of a serious adverse effect such as mortality in 50% of test animals). Test-species doses from chronic studies are used preferentially over data from acute and subchronic studies. In cases where chronic data are not available as test-species doses, studies involving less-than-chronic exposures are used to in NOAEL and LOAEL derivation with the addition of a duration uncertainty factor.

For this study, duration uncertainty factors are applied according to USACHPPM 2000:

- Subchronic NOAEL to Chronic NOAEL: 10
- Subchronic LOAEL to Chronic NOAEL: 20

- Subchronic LOAEL to Chronic LOAEL: 4
- Acute NOAEL to Chronic NOAEL: 30
- Acute LOAEL to Chronic NOAEL: 50
- Acute LOAEL to Chronic LOAEL: 10

2.3.3 Endpoint Uncertainty Factors

Additional UFs are used to account for uncertainties in extrapolation between effect- and no-effect levels. Specifically, a NOAEL test-species dose may be estimated from a LOAEL (or LD_{50}) value, or a LOAEL may be estimated from a LD_{50}.

Extrapolation from a LOAEL or LD_{50t} to a NOAEL: Consistent with USACHPPM 2000, a UF of 10 is used with chronic LOAEL values to estimate the chronic NOAEL, which is considered conservative (Sample et al. 1996, USEPA 1996). When a LOAEL value is not available, a LD_{50} is used, although chronic NOAELs may range from 1/10 to 1/10,000 of the corresponding acute LD_{50} value (Opresko et al. 1994). For this report, an uncertainty factor of 100 is used to estimate a NOAEL value from a LD_{50} value (USACHPPM 2000).

Extrapolation from an LD_{50} to a LOAEL: Consistent with USACHPPM 2000, an UF of 20 is used conservatively to estimate a LOAEL value from a LD_{50} value (USACHPPM 2000).

2.3.4 Body-Weight Extrapolation Factor

This extrapolation is accomplished using a body weight-scaling factor to account for differences in body size (Sample et al. 1996). Numerous studies have shown that many physiological functions such as metabolic rates and responses to chemicals are a function of body size for mammals. Smaller mammals have higher metabolic rates and are usually more resistant to chemicals because of more rapid rates of detoxification. It has been shown that the best measure of body size is one based on body surface-area, which can be expressed in terms of body weight raised to a fractional power (Opresko et al. 1994, Sample et al. 1996, USEPA 1980). Dosimetric differences between the mammalian test species and wildlife receptors are accounted for using:

$$\mathrm{NOAEL}_w = \mathrm{NOAEL}_t \times \left(\frac{\mathrm{BW}_t}{\mathrm{BW}_w} \right)^{0.25}$$

where:

$NOAEL_w$	= NOAEL for the mammalian wildlife receptor (mg/kg BW-day)
$NOAEL_t$	= NOAEL for the mammalian test species (mg/kg BW-day)
BW_t	= Test species body weight (kg)
BW_w	= Wildlife receptor body weight (kg)

Scaling factors may not be appropriate for avian interspecies extrapolations. Information has shown that adjustment factors based on body size for interspecies extrapolation among avian species range from 0.63 to 1.55 (Sample et al. 1996). Therefore, a body-weight extrapolation factor is not used to derive avian NOAELs and LOAELs.

Mammalian wildlife receptor body weights are presented on Table F.2-9 and laboratory test species body weights are presented on Table F.2-10.

2.4 BIOACCUMULATION FACTORS

Bioaccumulation factors (BAFs) provide quantitative indicators of the tendency for a chemical to partition into terrestrial organisms, relative to the concentrations present in terrestrial exposure media. Exposure-point concentrations of chemicals in terrestrial prey (soil invertebrates and small mammals) and terrestrial plants are estimated using BAFs derived from the literature. The derivation of BAFs is described for organic and inorganic chemicals in the following subsections.

2.4.1 Terrestrial Plants

Exposure-point concentrations of chemicals in terrestrial plants are estimated using soil-to-plant bioaccumulation factors (uptake factors for plants, UF_{plant}) derived from the literature. UF_{plant} values are used to estimate wet-weight chemical concentrations in terrestrial plants using the same equation for invertebrates and a dry weight to wet weight conversion factor assuming plants are 80% water (Salisbury and Ross 1992). Table F.2-11 presents the uptake factors for plants.

Organic Chemicals: Organic chemicals may enter the plant by partitioning from contaminated soil to the roots and then translocating throughout the plant via the xylem tissue. Most bioaccumulative, lipophilic organic chemicals partition to the epidermis of the root or adhere to soil particles and are not drawn into the inner root or xylem (Paterson et al. 1990). Uptake factors for estimating concentrations of organic chemicals in plant tissues are derived from the following equation:

$$UF_{plant} = 10^{[1.588-(0.578\times \log K_{ow})]}$$

where:

UF_{plant} = Plant uptake factor (kg soil, dry weight / kg plant, dry weight)

$\log K_{ow}$ = Logarithm of the octanol:water partition coefficient

This relationship is based on a linear regression of bioaccumulation factors for 29 organic chemicals (Travis and Arms 1988). The correlation coefficient for the regression is 0.73, indicating that a majority of the variability in bioaccumulation is explained by the log K_{ow}. UF_{plant} values are derived for organic chemicals using this equation.

Inorganic Chemicals: Concentrations of inorganic chemicals in plant tissues are estimated based on generalized soil-to-plant transfer coefficients reported in a literature review. The soil-to-plant transfer factors for inorganic chemicals are equivalent to UF_{plant} values for organic chemicals and represent the ratio of the dry weight concentrations in plant tissue to the dry weight concentration of the element in root-zone soils. Bechtel-Jacobs 1998 C_p regression equation: $C_p = e^{(slope*\ln(Cs) - intercept)}$

2.4.2 Terrestrial Prey

Organic Chemicals: BAFs for estimating concentrations of organic chemicals in prey tissues are derived from linear regression equations presented in Travis and Arms (1998) and Beyer and Stafford (1993). The dry weight to wet weight (DW:WW) conversion factor is 0.2 for soil invertebrates (kg soil invertebrate dry weight per soil invertebrate wet weight; assumes invertebrates are 80% water), based on data reported in USEPA (1993). No DW:WW conversion factor was applied for small mammals. The BAF values used in to estimate concentrations of organic chemicals in soil invertebrates and small mammals are shown in Tables F.2-12 and F.2-13.

Inorganic Chemicals: Inorganic bioaccumulation factors for terrestrial prey (Table F.2-13) are wet-weight-based and are used to predict concentrations in invertebrates and small mammals according to:

$$BAF_{si} = C_{si} / C_{soil}$$

where:

BAF_{si} = Soil invertebrate uptake factor for inorganic chemicals

C_{si} = Chemical concentration predicted in soil invertebrates (mg chemical / kg soil invertebrate, dry weight)

C_{soil} = Concentration of inorganic chemical in soil (mg chemical / kg soil, dry weight)

3.0 DIRECT CONTACT APPROACH

3.1 PRELIMINARY DIRECT CONTACT TOXICITY EVALUATION

Risk is assessed by comparing the preliminary exposure estimate (maximum detected concetrations - MDC) of each detected chemical to the established TRV (detailed in Section 2.1). The preliminary risk is characterized in terms of a hazard quotient (HQ), which is expressed as:

HQ = MDC/TRV

where:

HQ = Hazard Quotient for the contaminant (unitless)
MDC = Maximum Detected Concentration for contaminant (mg/kg)
TRV = Screening Level for contaminant (mg/kg)

3.2 REFINED DIRECT CONTACT TOXICITY EVALUATION

For the refined evaluation, risk is assessed by comparing the exposure point concentration (EPC) of each detected chemical to the TRV (Section 7.1.6 details EPC development). The refined risk HQ is expressed as:

HQ = EPC/TRV

where:

HQ = Hazard Quotient for the contaminant (unitless)
EPC = Calculated Exposure Point Concentration for contaminant (mg/kg)
TRV = Screening Level for contaminant (mg/kg)

An HQ of less than 1 indicates no or negligible risk. The potential for risk increases as the HQ increases above unity. However, this result should be considered in the context of other characteristics of the exposure area.

Results of the direct contact toxicity evaluation are presented in Tables F.2-6 (terrestrial plants) and F.2-8 (soil invertebrates and microbial communities).

4.0 DOSE RATE MODELING APPROACH

A simplified food web model is utilized to calculate TRVs for each chemical and wildlife receptor. TRVs quantify COPC concentrations in exposure media that may result in no observable adverse effects or low observable adverse effects. The NOAEL corresponds to the greatest exposure associated with no observed adverse effects on growth, reproduction, or survival. The LOAEL corresponds to the smallest exposure associated with observed adverse effects on growth, reproduction or survival. TRVs developed by dose rate models are used to evaluate ecological effects associated with COPEC concentrations in exposure media.

4.1 PRELIMINARY DOSE RATE MODEL

Preliminary risk characterization for wildlife receptors uses the conservative preliminary exposure estimate and ecological effects evaluation to characterize risk to potential terrestrial receptors.

The simplified food web model considers the ingestion of prey, the incidental ingestion of media, and the primary routes of exposure to wildlife receptors. Chemical concentrations in prey are expressed as a function of chemical concentrations in exposure media using BAFs for terrestrial prey items. Other important parameters in the model include receptor body weight and an estimate of receptor use. As shown in the equation below, literature-derived NOAEL and LOAEL values are input into the model as the ADD variable to calculate the concentration in exposure media (C_{TRV}) that would result in a dose equivalent to a NOAEL or LOAEL.

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \ (BAF_{food} \cdot DF) + IR_s \ )AF}$$

where:

C_{TRV} = NOAEL or LOAEL-based screening level (mg chemical/kg soil)

ADD = NOAEL or LOAEL (mg COPC/kg body weight-day)

BW = Minimum Body Weight of the receptor (kg)

IR_{food} = Maximum Ingestion Rate of food (kg food ingested per day, dry weight)

BAF_{food} = BAF of most contaminated dietary component used, specific to prey type and COPC (ratio of mg of COPC/kg fauna, wet weight to mg COPC/ kg substrate, dry weight)

DF = Dietary Fraction (most contaminated dietary component assumed to be 100% of diet)

IR_s = Maximum Incidental Ingestion Rate of soil (kg substrate ingested per day, dry weight)

AF = 100% Area Use Factor

Preliminary receptor parameters are presented on Table F.2-9. The resulting risk is characterized in terms of an HQ and is presented for wildlife receptors in Appendix F.2 and summarized in Table F.2-24.

4.2 REFINED EXPOSURE ESTIMATE AND RISK CHARACTERIZATION

The refined exposure and risk characterization, Step 3a of the ecological risk assessment guidance (ERAGS), reviews and refines the conservative assumptions used in the risk calculation (USEPA 1997). In Step 3a, conservative assumptions used in the preliminary exposure and risk characterization are replaced with more environmentally realistic assumptions to evaluate risk posed by COPECs identified in the preliminary risk characterization. The addition of Step 3a focuses the outcome of the ecological screening, streamlines the review process and functions as the initial basis for ecological risk management decision-making at each site.

4.3 REFINED DOSE RATE MODEL

This step replaces the conservative assumptions used in the preliminary exposure estimate and ecological effects evaluation with more environmentally realistic assumptions including the use of average body weight, average food and substrate ingestion rates, and the use of realistic area use factor, resulting in a more realistic estimate of potential risk.

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \ \sum \ (BAF_{food} \cdot DF) + IR_s \ )AF_{refined}}$$

where:

C_{TRV} = NOAEL or LOAEL-based screening level (mg chemical/kg soil)

ADD = NOAEL or LOAEL (mg COPC/kg body weight-day)

BW = Average Body Weight of the receptor (kg)

IR_{food} = Average Ingestion Rate of food (kg food ingested per day, dry weight)

BAF_{food} = BAF of dietary component used, specific to prey type and COPC (ratio of mg of COPC/kg fauna, wet weight to mg COPC/ kg substrate, dry weight)

DF = Dietary Fraction

IR_s = Average Incidental Ingestion Rate of soil (kg substrate ingested per day, dry weight)

$AF_{refined}$ = Refined Area Use Factor (detailed below)

In the refined model, a realistic area use factor ($AF_{refined}$) was used to calculate the ratio of the study area (1.6 acres) to the average home range of the receptor:

$AF_{refined}$ = Study Area/Home Range Area

Other receptor parameters in the refined model remain conservative. The conservative assumptions are summarized as follows:

- Receptors assimilate 100% of COPECs detected in the food and soil; and
- Receptors forage in the site area 100% of the time.

Refined receptor parameters are presented on Table F.2-9. The resulting risk is characterized in terms of an HQ and is presented for wildlife receptors in Appendix F.2 and summarized in Table F.2-24.

4.4 EXAMPLE C_{TRV} EQUATION CALCULATION – PRELIMINARY AND REFINED

The following example C_{TRV} equation details the arsenic NOAEL-based screening level (SL) calculated for the short-tailed shrew at the SWMU 13 RFI study area (Tables F.2-16 and F.2-17) and resulting HQs:

Preliminary

- ADD = 0.15 mg/kg bw-day (NOAEL)
- BW = 0.0125 kg (minimum body weight)
- IR_{food} = 0.003 kg dw/day (maximum ingestion rate)
- BAF_{food} = 1.1 (for the most contaminated dietary component, in this case plant)
- DF = 1 (100% most contaminated dietary component in this case 100% plants)
- IR_{soil} = 0.00039 kg dw/day (maximum soil ingestion rate)
- AF = 1 (default used)

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}\ (BAF_{food} \cdot DF) + IR_s)AF} = \frac{0.15 \cdot 0.0125}{(0.003\,(1.1 \cdot 1) + 0.00039) \cdot 1} = \textbf{5.1E-01 mg/kg}$$

NOAEL HQ = MDC (mg/kg)/NOAEL-based SL (mg/kg) = $\frac{5.6}{5.1E-01}$ = **1.1E+01**

EPC NOAEL HQ = NOAEL HQ * (EPC (mg/kg) / MDC (mg/kg)) = 1.1E+01*($\frac{2.794}{5.6}$) = **5.5E+00**

Refined

- ADD = 0.15 mg/kg bw-day
- BW = 0.015 kg
- IR_{food} = 0.002 kg dw/day
- BAF_{plant} = 0.038
- BAF_{inv} = 0.179
- DF_{plant} = 0.14

- DF_{inv} = 0.86
- IR_{soil} = 0.00026 kg dw/day
- $AF_{refined}$ = 1

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF_{food}) + IR_s)AF}$$

$$= \frac{0.15 \cdot 0.015}{(0.002\,(0.038 \cdot 0.14 + 0.179 \cdot 0.86) + 0.00026) \cdot 1} = \textbf{3.9+00 mg/kg}$$

NOAEL HQ = EPC (mg/kg)/NOAEL-based SL (mg/kg) = $\frac{2.794}{3.9E+00}$ = **7.2E-01**

Table F.2-24 provides a summary of preliminary and refined HQs developed for terrestrial receptors at the SWMU 13 RFI study area.

5.0 SUMMARY

Receptor-specific exposure parameters are obtained from life history studies found in the literature. Important receptor-specific exposure parameters input into the model include: body weight, food ingestion rate, diet composition, incidental substrate ingestion rate, and area use factor.

The dose-response relationships for chemicals of potential interest are expressed as NOAELs and LOAELs for wildlife receptors, which are defined as a daily ingested amount (mg COPC/kg body weight-day) that is associated with a specified growth, reproductive, developmental, or survival effect. Extrapolation and uncertainty factors are applied to literature-based toxicological endpoints to account for differences in a controlled laboratory setting and an ecologically relevant setting. Extrapolation and uncertainty factors are based on: (1) the duration of exposure, (2) the endpoint measured, and (3) differences in body weights among test and receptor species.

Bioaccumulation accumulation factors provide quantitative indicators of the tendency for a chemical to partition into organisms, relative to the concentrations present in exposure media. Exposure-point concentrations of chemicals in terrestrial prey (soil invertebrates and small mammals) are estimated using several BAFs derived from the literature.

COPC concentrations in prey and media, receptor-specific exposure parameters, literature-based NOAEL and LOAEL values, and bioaccumulation factors are used in the model to calculate the concentration in exposure media (C_{TRV}) that would result in a dose equivalent to a NOAEL or LOAEL. The dose rate modeling approach is used to evaluate the potential mobility of COPCs through varying trophic associations.

6.0 REFERENCES

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APPENDIX F.2

SWMU 13 SLERA

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Table F.2-1
SLERA Occurence/Distribution - Surface Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Minimum Concentration (mg/kg)	Maximum Concentration (mg/kg)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening
TAL Metals								
Aluminum	7429-90-5	10,000	35,000	mg/kg	13SB21A	15/15	1.83 - 2	35,000
Antimony	7440-36-0	0.069	2.9	mg/kg	13SB21A	14/15	0.026 - 0.0518	2.9
Arsenic	7440-38-2	0.98	5.6	mg/kg	13SB19A	15/15	0.0232 - 0.026	5.6
Barium	7440-39-3	87	290	mg/kg	13SB19A	15/15	0.106 - 0.33	290
Beryllium	7440-41-7	0.66	1.15	mg/kg	13SB9A DUP AVG	5/15	0.0333 - 0.167	1.2
Cadmium	7440-43-9	0.63	2.6	mg/kg	13SB19A	14/15	0.182 - 0.45	2.6
Calcium	7440-70-2	1,100	110,000	mg/kg	13SB14A	15/15	9.8 - 980	110,000
Chromium	7440-47-3	18	39	mg/kg	13SB21A	15/15	0.8 - 0.912	39
Cobalt	7440-48-4	7	19	mg/kg	13SB21A	15/15	0.208 - 0.53	19.0
Copper	7440-50-8	13	260	mg/kg	13SB18A	15/15	0.027 - 0.368	260
Iron	7439-89-6	16,000	78,000	mg/kg	13SB19A	15/15	0.98 - 98	78,000
Lead	7439-92-1	65	8,620	mg/kg	13SB8A	92/92	0.047 - 21.8	8,620
Magnesium	7439-95-4	2,200	25,000	mg/kg	13SB14A	15/15	2.8 - 3.21	25,000
Manganese	7439-96-5	380	2,200	mg/kg	13SB19A	15/15	0.18 - 1.32	2,200
Mercury	7439-97-6	0.02	0.14	mg/kg	13SB21A	15/15	0.0077 - 0.0093	0.14
Nickel	7440-02-0	9.5	22	mg/kg	13SB21A	15/15	0.035 - 0.0356	22
Potassium	7440-09-7	1,100	2,900	mg/kg	13SB14A	15/15	5 - 14	2,900
Selenium	7782-49-2	0.165	0.885	mg/kg	13SB9A DUP AVG	15/15	0.028 - 0.0502	0.89
Silver	7440-22-4	0.04	0.16	mg/kg	13SB19A	15/15	0.0044 - 0.0093	0.16
Sodium	7440-23-5	35	100	mg/kg	13SB14A	15/15	18 - 18.1	100
Thallium	7440-28-0	0.16	3.5	mg/kg	13SB19A	15/15	0.0068 - 0.027	3.5
Vanadium	7440-62-2	21	59	mg/kg	13SB21A	15/15	0.032 - 0.207	59
Zinc	7440-66-6	260	1,600	mg/kg	13SB19A	15/15	0.49 - 12.9	1,600
TCL VOCs								
1,2,4-Trichlorobenzene	120-82-1	0.00096	0.00096	mg/kg	13SB10A	1/5	0.000492 - 0.000574	0.00096
2-Butanone	78-93-3	0.03	0.045	mg/kg	13SB11A	5/5	0.006 - 0.007	0.045
Acetone	67-64-1	0.12	0.32	mg/kg	13SB10A	5/5	0.006 - 0.007	0.32
Benzene	71-43-2	0.00091	0.00091	mg/kg	13SB11A	1/5	0.000632 - 0.000738	0.00091
Methylene chloride	75-09-2	0.0041	0.011	mg/kg	13SB10A	5/5	0.00337 - 0.00393	0.011
Toluene	108-88-3	0.00066	0.0035	mg/kg	13SB10A	4/5	0.000557 - 0.00065	0.0035
Trichloroethene	79-01-6	0.0096	0.0096	mg/kg	13SB11A	1/5	0.000812 - 0.000948	0.0096
TCL SVOCs								
1,1'-Biphenyl	92-52-4	0.0016	0.002	mg/kg	13SB16A	3/15	0.00095 - 0.00344	0.002
2,4-Dichlorophenol	120-83-2	0.0068	0.0068	mg/kg	13SB13A	1/15	0.0023 - 0.00493	0.0068
2,4-Dinitrotoluene	121-14-2	0.0069	3.813	mg/kg	13SB15A DUP AVG	6/15	0.00378 - 0.09	3.813
2,6-Dinitrotoluene	606-20-2	0.027	0.2985	mg/kg	13SB15A DUP AVG	2/15	0.0024 - 0.0388	0.2985
2-Methylnaphthalene	91-57-6	0.0011	0.022	mg/kg	13SB8A	10/15	0.00079 - 0.00384	0.022
4-Chloro-3-Methylphenol	59-50-7	0.009	0.019	mg/kg	13SB7A	4/15	0.0022 - 0.00729	0.019
Acenaphthene	83-32-9	0.0031	0.019	mg/kg	13SB8A	8/15	0.0017 - 0.00241	0.019
Acenaphthylene	208-96-8	0.0015	0.018	mg/kg	13SB18A	12/15	0.0011 - 0.0021	0.018
Acetophenone	98-86-2	0.0035	0.0039	mg/kg	13SB20A	4/15	0.00228 - 0.0041	0.0039
Anthracene	120-12-7	0.0065	0.037	mg/kg	13SB8A	10/15	0.0027 - 0.00647	0.037
Benzo(a)anthracene	56-55-3	0.0028	0.17	mg/kg	13SB9A DUP AVG	14/15	0.001 - 0.0186	0.17
Benzo(a)pyrene	50-32-8	0.0025	0.13	mg/kg	13SB9A DUP AVG	15/15	0.0012 - 0.00799	0.13
Benzo(b)fluoranthene	205-99-2	0.0035	0.205	mg/kg	13SB9A DUP AVG	15/15	0.001 - 0.0137	0.205
Benzo(g,h,i)perylene	191-24-2	0.0025	0.083	mg/kg	13SB20A	15/15	0.00095 - 0.0122	0.083
Benzo(k)fluoranthene	207-08-9	0.0021	0.089	mg/kg	13SB9A DUP AVG	13/15	0.0014 - 0.0188	0.089
Bis(2-ethylhexyl)phthalate	117-81-7	0.015	0.45	mg/kg	13SB10A	15/15	0.0021 - 0.0029	0.45
Butylbenzylphthalate	85-68-7	0.0039	0.038	mg/kg	13SB10A	13/15	0.0011 - 0.00627	0.038
Carbazole	86-74-8	0.0027375	0.0204825	mg/kg	13SB9A DUP AVG	10/15	0.00053 - 0.00854	0.0205
Chrysene	218-01-9	0.003	0.19	mg/kg	13SB9A DUP AVG	15/15	0.00077 - 0.0143	0.19
Di-n-butylphthalate	84-74-2	0.062	6.205	mg/kg	13SB15A DUP AVG	15/15	0.0025 - 0.053	6.205
Dibenz(a,h)anthracene	53-70-3	0.0082	0.035	mg/kg	13SB20A	8/15	0.0039 - 0.00826	0.035
Dibenzofuran	132-64-9	0.0022	0.013	mg/kg	13SB8A	6/15	0.0016 - 0.00442	0.013
Diethylphthalate	84-66-2	0.0012	1.675	mg/kg	13SB15A DUP AVG	15/15	0.00039 - 0.0083	1.675
Dimethylphthalate	131-11-3	0.0099925	0.5	mg/kg	13SB13A	4/15	0.00082 - 0.00463	0.5
Fluoranthene	206-44-0	0.0039	0.37	mg/kg	13SB8A	15/15	0.0016 - 0.00329	0.37
Fluorene	86-73-7	0.0025	0.02	mg/kg	13SB8A	9/15	0.0017 - 0.0024	0.02
Indeno(1,2,3-cd)pyrene	193-39-5	0.00295	0.074	mg/kg	13SB20A	14/15	0.0024 - 0.00549	0.074
Isophorone	78-59-1	0.0025	0.0049	mg/kg	13SB19A	9/15	0.00089 - 0.00242	0.0049
N-Nitrosodiphenylamine	86-30-6	0.017	0.61	mg/kg	13SB15A DUP AVG	11/15	0.00078 - 0.016	0.61
Naphthalene	91-20-3	0.0031	0.01	mg/kg	13SB8A	6/15	0.002 - 0.00385	0.01
Phenanthrene	85-01-8	0.004	0.17	mg/kg	13SB10A	13/15	0.0024 - 0.0033	0.17
Pyrene	129-00-0	0.003	0.26	mg/kg	13SB8A	15/15	0.00059 - 0.00207	0.26
Explosives								
1,3,5-Trinitrobenzene	99-35-4	0.1985	0.1985	mg/kg	13SB15A DUP AVG	1/15	0.074 - 0.14	0.1985
2,4,6-Trinitrotoluene	118-96-7	0.23	3	mg/kg	13SB13A	4/15	0.15 - 0.167	3
2,4-Dinitrotoluene	121-14-2	0.17	0.17	mg/kg	13SB13A	1/15	0.1 - 0.142	0.17
2,6-Dinitrotoluene	606-20-2	0.39	0.39	mg/kg	13SB15A DUP AVG	1/15	0.2 - 0.25	0.39
HMX	2691-41-0	0.1415	0.72	mg/kg	13SB13A	2/15	0.066 - 0.229	0.72
Nitroglycerin/PETN								
Nitroglycerin	55-63-0	0.45175	2.11	mg/kg	13SB11A	2/15	0.195 - 0.39	2.11
Cyanide								
Cyanide	57-12-5	0.07	0.305	mg/kg	13SB9A DUP AVG	5/5	0.0356 - 0.0356	0.305

Table F.2-1
SLERA Occurence/Distribution - Surface Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Minimum Concentration (mg/kg)	Maximum Concentration (mg/kg)	Units	Location of Maximum Concentration	Detection Frequency	Range of Detection Limits	Concentration Used for Screening
Dioxin/Furans								
1,2,3,4,6,7,8-HpCDD	35822-39-4	4.5E-05	4.5E-05	mg/kg	13SB9A DUP AVG	1/1	0.474 - 0.474	4.5E-05
1,2,3,4,6,7,8-HpCDF	67562-39-4	3.6E-06	3.6E-06	mg/kg	13SB9A DUP AVG	1/1	0.549 - 0.549	3.6E-06
1,2,3,4,7,8,9-HpCDF	55673-89-7	3.5E-07	3.5E-07	mg/kg	13SB9A DUP AVG	1/1	0.489 - 0.489	3.5E-07
1,2,3,4,7,8-HxCDD	39227-28-6	6.1E-07	6.1E-07	mg/kg	13SB9A DUP AVG	1/1	0.301 - 0.301	6.1E-07
1,2,3,4,7,8-HxCDF	70648-26-9	4.8E-07	4.8E-07	mg/kg	13SB9A DUP AVG	1/1	0.257 - 0.257	4.8E-07
1,2,3,6,7,8-HxCDD	57653-85-7	1.6E-06	1.6E-06	mg/kg	13SB9A DUP AVG	1/1	0.512 - 0.512	1.6E-06
1,2,3,6,7,8-HxCDF	57117-44-9	3.9E-07	3.9E-07	mg/kg	13SB9A DUP AVG	1/1	0.13 - 0.13	3.9E-07
1,2,3,7,8,9-HxCDD	19408-74-3	1.9E-06	1.9E-06	mg/kg	13SB9A DUP AVG	1/1	0.628 - 0.628	1.9E-06
1,2,3,7,8-PeCDD	40321-76-4	4.2E-07	4.2E-07	mg/kg	13SB9A DUP AVG	1/1	0.373 - 0.373	4.2E-07
1,2,3,7,8-PeCDF	57117-41-6	2.8E-07	2.8E-07	mg/kg	13SB9A DUP AVG	1/1	0.217 - 0.217	2.8E-07
2,3,4,6,7,8-HxCDF	60851-34-5	3.7E-07	3.7E-07	mg/kg	13SB9A DUP AVG	1/1	0.507 - 0.507	3.7E-07
2,3,4,7,8-PeCDF	57117-31-4	3.5E-07	3.5E-07	mg/kg	13SB9A DUP AVG	1/1	0.261 - 0.261	3.5E-07
2,3,7,8-TCDF	51207-31-9	4.9E-07	4.9E-07	mg/kg	13SB9A DUP AVG	1/1	0.132 - 0.132	4.9E-07
OCDD	3268-87-9	2.2E-03	2.2E-03	mg/kg	13SB9A DUP AVG	1/1	1.26 - 1.26	2.2E-03
OCDF	39001-02-0	7.8E-06	7.8E-06	mg/kg	13SB9A DUP AVG	1/1	0.796 - 0.796	7.8E-06
Total HpCDDs	37871-00-4	9.5E-05	9.5E-05	mg/kg	13SB9A DUP AVG	1/1	0.474 - 0.474	9.5E-05
Total HpCDFs	38998-75-3	8.9E-06	8.9E-06	mg/kg	13SB9A DUP AVG	1/1	0.489 - 0.489	8.9E-06
Total HxCDDs	34465-46-8	1.6E-05	1.6E-05	mg/kg	13SB9A DUP AVG	1/1	0.301 - 0.301	1.6E-05
Total HxCDFs	55684-94-1	5.2E-06	5.2E-06	mg/kg	13SB9A DUP AVG	1/1	0.13 - 0.13	5.2E-06
Total PeCDDs	36088-22-9	3.2E-06	3.2E-06	mg/kg	13SB9A DUP AVG	1/1	0.373 - 0.373	3.2E-06
Total PeCDFs	30402-15-4	2.9E-06	2.9E-06	mg/kg	13SB9A DUP AVG	1/1	0.217 - 0.217	2.9E-06
Total TCDDs	41903-57-5	6.1E-07	6.1E-07	mg/kg	13SB9A DUP AVG	1/1	0.132 - 0.132	6.1E-07
Total TCDFs	55722-27-5	4.1E-06	4.1E-06	mg/kg	13SB9A DUP AVG	1/1	0.172 - 0.172	4.1E-06
Total 2,3,7,8-TCDD TEQ (Mammalian)	--	--	--	mg/kg	13SB9A DUP AVG	1/1	--	2.28E+00
Total 2,3,7,8-TCDD TEQ (Avian)	--	--	--	mg/kg	13SB9A DUP AVG	1/1	--	1.6E+00

Notes:
CAS = Chemical Abstracts Service
mg/kg = Milligram Per Kilogram
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PETN = Pentaerythritol Tetranitrate

Table F.2-2
Non-detected Chemicals MDL Screening - Surface Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Plant SL	Source	Maximum MDL Exceeds SL	Inverte-brate SL	Source	Maximum MDL Exceeds SL	Avian ECO SSL	Source	Maximum MDL Exceeds SL	Mammalian ECO SSL	Source	Maximum MDL Exceeds SL
TAL Metals																		
Antimony	7440-43-9	mg/kg	1	15	0.0518	0.0518	32	A	N	140	A	N	0.77	A	N	0.36	A	N
Beryllium	7440-41-7	mg/kg	10	15	0.061	0.061	10	F	N	40	A	N	--	--	NS	21	A	N
Cadmium	7440-43-9	mg/kg	1	15	0.45	0.45	32	A	N	140	A	N	0.77	A	N	0.36	A	**Y**
Pesticides/PCBs																		
4,4'-DDD	72-54-8	ug/kg	1	1	0.309	0.309	100	G	N	100	C	N	--	--	NS	--	--	NS
4,4'-DDE	72-55-9	ug/kg	1	1	0.228	0.228	100	G	N	100	C	N	--	--	NS	--	--	NS
4,4'-DDT	50-29-3	ug/kg	1	1	0.234	0.234	100	G	N	100	C	N	93	A	N	21	A	N
Aldrin	309-00-2	ug/kg	1	1	0.395	0.395	100	G	N	100	C	N	--	--	NS	--	--	NS
alpha-BHC	319-84-6	ug/kg	1	1	0.394	0.394	100,000	G	N	--	--	NS	--	--	NS	--	--	NS
alpha-Chlordane	5103-71-9	ug/kg	1	1	0.564	0.564	100	G	N	100	C	N	--	--	NS	--	--	NS
beta-BHC	319-85-7	ug/kg	1	1	1.47	1.47	100,000	G	N	--	--	NS	--	--	NS	--	--	NS
delta-BHC	319-86-8	ug/kg	1	1	1.06	1.06	100,000	G	N	--	--	NS	--	--	NS	--	--	NS
Dieldrin	60-57-1	ug/kg	1	1	0.402	0.402	100	G	N	100	C	N	22	A	N	4.9	A	N
Endosulfan I	959-98-8	ug/kg	1	1	1.18	1.18	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Endosulfan II	33213-65-9	ug/kg	1	1	0.278	0.278	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Endosulfan Sulfate	1031-07-8	ug/kg	1	1	0.654	0.654	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Endrin	72-20-8	ug/kg	1	1	0.387	0.387	100	G	N	100	C	N	--	--	NS	--	--	NS
Endrin aldehyde	7421-93-4	ug/kg	1	1	1.44	1.44	100	G	N	100	C	N	--	--	NS	--	--	NS
Endrin ketone	53494-70-5	ug/kg	1	1	0.358	0.358	100	G	N	100	C	N	--	--	NS	--	--	NS
gamma-BHC (Lindane)	58-89-9	ug/kg	1	1	0.252	0.252	100	G	N	100	C	N	--	--	NS	--	--	NS
gamma-Chlordane	5103-74-2	ug/kg	1	1	0.914	0.914	100	G	N	100	C	N	--	--	NS	--	--	NS
Heptachlor	76-44-8	ug/kg	1	1	0.917	0.917	100	G	N	100	C	N	--	--	NS	--	--	NS
Heptachlor epoxide	1024-57-3	ug/kg	1	1	0.592	0.592	100	G	N	100	C	N	--	--	NS	--	--	NS
Methoxychlor	72-43-5	ug/kg	1	1	0.364	0.364	100	G	N	100	C	N	--	--	NS	--	--	NS
Toxaphene	8001-35-2	ug/kg	1	1	30.3	30.3	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Aroclor 1016	12674-11-2	ug/kg	1	1	20.8	20.8	40,000	F	N	--	--	NS	--	--	NS	--	--	NS
Aroclor 1221	11104-28-2	ug/kg	1	1	2.6	2.6	40,000	F	N	--	--	NS	--	--	NS	--	--	NS
Aroclor 1232	11141-16-5	ug/kg	1	1	6.5	6.5	40,000	F	N	--	--	NS	--	--	NS	--	--	NS
Aroclor 1242	53469-21-9	ug/kg	1	1	3.9	3.9	40,000	F	N	--	--	NS	--	--	NS	--	--	NS
Aroclor 1248	12672-29-6	ug/kg	1	1	6.5	6.5	40,000	F	N	--	--	NS	--	--	NS	--	--	NS
Aroclor 1254	11097-69-1	ug/kg	1	1	3.9	3.9	40,000	F	N	--	--	NS	--	--	NS	--	--	NS
Aroclor 1260	11096-82-5	ug/kg	1	1	9.1	9.1	40,000	F	N	--	--	NS	--	--	NS	--	--	NS
Herbicides																		
2,4,5-T	93-76-5	ug/kg	1	1	2.6	2.6	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,4,5-TP (Silvex)	93-72-1	ug/kg	1	1	5.2	5.2	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,4-D	94-75-7	ug/kg	1	1	20.8	20.8	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,4-DB	94-82-6	ug/kg	1	1	80.6	80.6	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Dalapon	75-99-0	ug/kg	1	1	74.1	74.1	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Dicamba	1918-00-9	ug/kg	1	1	2.6	2.6	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Dichlorprop	120-36-5	ug/kg	1	1	22.1	22.1	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Dinoseb	88-85-7	ug/kg	1	1	27.3	27.3	--	--	NS	--	--	NS	--	--	NS	--	--	NS
MCPA	94-74-6	ug/kg	1	1	1810	1810	--	--	NS	--	--	NS	--	--	NS	--	--	NS
MCPP	93-65-2	ug/kg	1	1	6570	6570	--	--	NS	--	--	NS	--	--	NS	--	--	NS
TCL VOCs																		
1,1,1-Trichloroethane	71-55-6	ug/kg	5	5	0.511	0.596	300	G	N	300	C	N	--	--	NS	--	--	NS
1,1,2,2-Tetrachloroethane	79-34-5	ug/kg	5	5	0.784	0.914	300	G	N	300	C	N	--	--	NS	--	--	NS
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	ug/kg	5	5	0.911	1.06	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,1,2-Trichloroethane	79-00-5	ug/kg	5	5	0.712	0.83	300	G	N	300	C	N	--	--	NS	--	--	NS
1,1-Dichloroethane	75-34-3	ug/kg	5	5	0.869	1.01	300	G	N	300	C	N	--	--	NS	--	--	NS
1,1-Dichloroethene	75-35-4	ug/kg	5	5	0.88	1.03	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,3-Trichlorobenzene	87-61-6	ug/kg	5	5	0.653	0.762	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,4-Trichlorobenzene	120-82-1	ug/kg	4	5	0.492	0.533	100	G	N	100	C	N	--	--	NS	--	--	NS
1,2-Dibromo-3-chloropropane	96-12-8	ug/kg	5	5	2.5	2.91	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2-Dibromoethane	106-93-4	ug/kg	5	5	0.822	0.959	--	--	NS	5,000	C	N	--	--	NS	--	--	NS
1,2-Dichlorobenzene	95-50-1	ug/kg	5	5	0.581	0.678	100	G	N	100	C	N	--	--	NS	--	--	NS
1,2-Dichloroethane	107-06-2	ug/kg	5	5	0.517	0.603	870,000	G	N	--	--	NS	--	--	NS	--	--	NS
1,2-Dichloropropane	78-87-5	ug/kg	5	5	0.703	0.82	300	G	N	300	C	N	--	--	NS	--	--	NS
1,3-Dichlorobenzene	541-73-1	ug/kg	5	5	0.322	0.375	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,4-Dichlorobenzene	106-46-7	ug/kg	5	5	0.852	0.994	100	G	N	20,000	B	N	--	--	NS	--	--	NS

Table F.2-2
Non-detected Chemicals MDL Screening - Surface Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Plant SL	Source	Maximum MDL Exceeds SL	Inverte-brate SL	Source	Maximum MDL Exceeds SL	Avian ECO SSL	Source	Maximum MDL Exceeds SL	Mammalian ECO SSL	Source	Maximum MDL Exceeds SL
2-Hexanone	591-78-6	ug/kg	5	5	2.71	3.16	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-Methyl-2-pentanone	108-10-1	ug/kg	5	5	1.75	2.04	100,000	G	N	--	--	NS	--	--	NS	--	--	NS
Benzene	71-43-2	ug/kg	4	5	0.632	0.738	100	G	N	100	C	N	--	--	NS	--	--	NS
Bromochloromethane	74-97-5	ug/kg	5	5	0.913	1.07	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Bromodichloromethane	75-27-4	ug/kg	5	5	0.601	0.701	450,000	G	N	--	--	NS	--	--	NS	--	--	NS
Bromoform	75-25-2	ug/kg	5	5	0.694	0.809	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Bromomethane	74-83-9	ug/kg	5	5	1.8	2.1	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Carbon disulfide	75-15-0	ug/kg	5	5	1.74	2.03	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Carbon tetrachloride	56-23-5	ug/kg	5	5	0.559	0.652	300	G	N	300	C	N	--	--	NS	--	--	NS
Chlorobenzene	108-90-7	ug/kg	5	5	0.793	0.925	100	G	N	40,000	B	N	--	--	NS	--	--	NS
Chloroethane	75-00-3	ug/kg	5	5	1.62	1.89	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Chloroform	67-66-3	ug/kg	5	5	0.535	0.624	300	G	N	300	C	N	--	--	NS	--	--	NS
Chloromethane	74-87-3	ug/kg	5	5	1	1.17	--	--	NS	--	--	NS	--	--	NS	--	--	NS
cis-1,2-Dichloroethene	156-59-2	ug/kg	5	5	0.852	0.994	300	G	N	300	C	N	--	--	NS	--	--	NS
cis-1,3-Dichloropropene	10061-01-5	ug/kg	5	5	0.589	0.687	300	G	N	300	C	N	--	--	NS	--	--	NS
Cyclohexane	110-82-7	ug/kg	5	5	0.379	0.442	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Dibromochloromethane	124-48-1	ug/kg	5	5	0.62	0.724	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Dichlorodifluoromethane	75-71-8	ug/kg	5	5	0.802	0.935	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Ethylbenzene	100-41-4	ug/kg	5	5	0.508	0.592	100	G	N	100	C	N	--	--	NS	--	--	NS
Isopropylbenzene	98-82-8	ug/kg	5	5	0.655	0.764	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Methyl acetate	79-20-9	ug/kg	5	5	4.16	4.86	--	--	NS	--	--	NS	--	--	NS	--	--	NS
methyl tert-Butyl ether	1634-04-4	ug/kg	5	5	0.769	0.897	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Methylcyclohexane	108-87-2	ug/kg	5	5	1.01	1.18	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Styrene	100-42-5	ug/kg	5	5	0.53	0.619	300,000	F	N	100	C	N	--	--	NS	--	--	NS
Tetrachloroethene	127-18-4	ug/kg	5	5	0.736	0.858	300	G	N	300	C	N	--	--	NS	--	--	NS
Toluene	108-88-3	ug/kg	1	5	0.557	0.557	200,000	F	N	100	C	N	--	--	NS	--	--	NS
trans-1,2-Dichloroethene	156-60-5	ug/kg	5	5	0.844	0.984	300	G	N	300	C	N	--	--	NS	--	--	NS
trans-1,3-Dichloropropene	10061-02-6	ug/kg	5	5	0.625	0.729	300	G	N	300	C	N	--	--	NS	--	--	NS
Trichloroethene	79-01-6	ug/kg	4	5	0.812	0.948	300	G	N	300	C	N	--	--	NS	--	--	NS
Trichlorofluoromethane	75-69-4	ug/kg	5	5	0.892	1.04	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Vinyl Chloride	75-01-4	ug/kg	5	5	0.444	0.518	300	G	N	300	C	N	--	--	NS	--	--	NS
Xylenes	1330-20-7	ug/kg	5	5	0.505	0.589	100	G	N	--	--	NS	--	--	NS	--	--	NS
TCL SVOCs																		
1,1'-Biphenyl	92-52-4	ug/kg	12	15	0.95	3.44	--	--	NS	--	--	NS	--	--	NS	--	--	NS
1,2,4,5-Tetrachlorobenzene	95-94-3	ug/kg	15	15	1.1	40.2	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,2'-oxybis(1-Chloropropane)	108-60-1	ug/kg	5	15	1.58	1.85	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,3,4,6-Tetrachlorophenol	58-90-2	ug/kg	10	15	4	5.5	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,4,5-Trichlorophenol	95-95-4	ug/kg	15	15	3.5	4.9	4,000	F	N	9,000	B	N	--	--	NS	--	--	NS
2,4,6-Trichlorophenol	88-06-2	ug/kg	15	15	1.4	3.67	100	G	N	10,000	B	N	--	--	NS	--	--	NS
2,4-Dichlorophenol	120-83-2	ug/kg	14	15	2.3	4.93	100	G	N	100	C	N	--	--	NS	--	--	NS
2,4-Dimethylphenol	105-67-9	ug/kg	15	15	6	11.1	100	G	N	100	C	N	--	--	NS	--	--	NS
2,4-Dinitrophenol	51-28-5	ug/kg	15	15	3.84	49	20,000	F	N	100	C	N	--	--	NS	--	--	NS
2,4-Dinitrotoluene	121-14-2	ug/kg	9	15	3.78	6	5,300	I	N	19,800	I	N	--	--	NS	--	--	NS
2,6-Dinitrotoluene	606-20-2	ug/kg	13	15	2.4	38.8	4,500	I	N	6,900	I	N	--	--	NS	--	--	NS
2-Chloronaphthalene	91-58-7	ug/kg	15	15	1.2	3.22	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-Chlorophenol	95-57-8	ug/kg	15	15	0.63	2.81	7,000	F	N	10,000	B	N	--	--	NS	--	--	NS
2-Methylnaphthalene	91-57-6	ug/kg	5	15	0.79	3.56	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-Methylphenol	95-48-7	ug/kg	15	15	2.4	6.78	100	G	N	100	C	N	--	--	NS	--	--	NS
2-Nitroaniline	88-74-4	ug/kg	15	15	2.4	6.44	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2-Nitrophenol	88-75-5	ug/kg	15	15	2.04	10	--	--	NS	--	--	NS	--	--	NS	--	--	NS
3,3'-Dichlorobenzidine	91-94-1	ug/kg	15	15	66.5	120	--	--	NS	--	--	NS	--	--	NS	--	--	NS
3-Nitroaniline	99-09-2	ug/kg	15	15	12	25.6	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4,6-Dinitro-2-methylphenol	534-52-1	ug/kg	15	15	3.9	6.31	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-Bromophenyl-phenylether	101-55-3	ug/kg	15	15	1.3	4.73	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-Chloro-3-Methylphenol	59-50-7	ug/kg	11	15	2.2	6.77	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-Chloroaniline	106-47-8	ug/kg	15	15	1.51	29	20,000	F	N	--	--	NS	--	--	NS	--	--	NS
4-Chlorophenyl-phenylether	7005-72-3	ug/kg	15	15	0.48	4.58	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-Methylphenol	106-44-5	ug/kg	15	15	1.4	8.92	100	G	N	100	C	N	--	--	NS	--	--	NS
4-Nitroaniline	100-01-6	ug/kg	15	15	8.7	34	--	--	NS	--	--	NS	--	--	NS	--	--	NS

Table F.2-2
Non-detected Chemicals MDL Screening - Surface Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Plant SL	Source	Maximum MDL Exceeds SL	Inverte-brate SL	Source	Maximum MDL Exceeds SL	Avian ECO SSL	Source	Maximum MDL Exceeds SL	Mammalian ECO SSL	Source	Maximum MDL Exceeds SL
4-Nitrophenol	100-02-7	ug/kg	15	15	3.4	17	100	G	N	7000	B	N	--	--	NS	--	--	NS
Acenaphthene	83-32-9	ug/kg	7	15	1.7	2.4	100	G	N	100	C	N	--	--	NS	--	--	NS
Acenaphthylene	208-96-8	ug/kg	3	15	1.1	1.8	100	G	N	100	C	N	--	--	NS	--	--	NS
Acetophenone	98-86-2	ug/kg	11	15	2.28	4.1	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Anthracene	120-12-7	ug/kg	5	15	2.7	5.54	100	G	N	100	C	N	--	--	NS	--	--	NS
Atrazine	1912-24-9	ug/kg	15	15	1.6	9.63	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Benzaldehyde	100-52-7	ug/kg	15	15	4.86	39	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Benzo(a)anthracene	56-55-3	ug/kg	1	15	16	16	100	G	N	100	C	N	--	--	NS	--	--	NS
Benzo(k)fluoranthene	207-08-9	ug/kg	2	15	2	16.1	100	G	N	100	C	N	--	--	NS	--	--	NS
Bis(2-chloroethoxy)methane	111-91-1	ug/kg	15	15	0.89	4.4	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Bis(2-chloroethyl)ether	111-44-4	ug/kg	15	15	1.1	2.42	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Bis(2-chloroisopropyl)ether	39638-32-9	ug/kg	10	15	1.2	1.7	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Butylbenzylphthalate	85-68-7	ug/kg	2	15	5.82	5.82	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Caprolactam	105-60-2	ug/kg	15	15	7.66	34	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Carbazole	86-74-8	ug/kg	5	15	0.74	8.54	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Di-n-octylphthalate	117-84-0	ug/kg	15	15	3.72	15	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Dibenz(a,h)anthracene	53-70-3	ug/kg	7	15	3.9	8.26	100	G	N	100	C	N	--	--	NS	--	--	NS
Dibenzofuran	132-64-9	ug/kg	9	15	1.6	4.11	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Dimethylphthalate	131-11-3	ug/kg	11	15	0.82	4.3	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Fluorene	86-73-7	ug/kg	6	15	1.7	2.4	100	G	N	100	C	N	--	--	NS	--	--	NS
Hexachlorobenzene	118-74-1	ug/kg	15	15	3.01	5	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Hexachlorobutadiene	87-68-3	ug/kg	15	15	1.1	5.42	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Hexachlorocyclopentadiene	77-47-4	ug/kg	15	15	2.38	3.7	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Hexachloroethane	67-72-1	ug/kg	15	15	0.83	3.27	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	1	15	3.3	3.3	100	G	N	100	C	N	--	--	NS	--	--	NS
Isophorone	78-59-1	ug/kg	6	15	1.1	2.42	--	--	NS	--	--	NS	--	--	NS	--	--	NS
N-Nitrosodi-n-propylamine	621-64-7	ug/kg	15	15	1.3	4.61	--	--	NS	--	--	NS	--	--	NS	--	--	NS
N-Nitrosodiphenylamine	86-30-6	ug/kg	4	15	0.96	6.65	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Naphthalene	91-20-3	ug/kg	9	15	2	3.85	100	G	N	100	C	N	--	--	NS	--	--	NS
Nitrobenzene	98-95-3	ug/kg	15	15	2.1	4.48	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Pentachlorophenol	87-86-5	ug/kg	15	15	3.9	6.15	5,000	A	N	31,000	A	N	2,100	--	N	2,800	A	N
Phenanthrene	85-01-8	ug/kg	2	15	2.4	3.3	100	G	N	100	C	N	--	--	NS	--	--	NS
Phenol	108-95-2	ug/kg	15	15	4.75	7.3	100	G	N	30,000	B	N	--	--	NS	--	--	NS
Dioxin/Furans																		
1,2,3,7,8,9-HxCDF	72918-21-9	pg/g	1	1	0.622	0.622	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,3,7,8-TCDD	1746-01-6	pg/g	1	1	0.132	0.132	--	--	NS	--	--	NS	--	--	NS	--	--	NS
PAHs																		
Acenaphthene	83-32-9	ug/kg	3	5	11.3	12.2	100	G	N	100	C	N	--	--	NS	--	--	NS
Acenaphthylene	208-96-8	ug/kg	5	5	13.9	16.2	100	G	N	100	C	N	--	--	NS	--	--	NS
Anthracene	120-12-7	ug/kg	1	5	0.84	0.84	100	G	N	100	C	N	--	--	NS	--	--	NS
Benzo(a)pyrene	50-32-8	ug/kg	1	5	1.2	1.2	100	G	N	--	--	NS	--	--	NS	--	--	NS
Benzo(b)fluoranthene	205-99-2	ug/kg	1	5	1.56	1.56	100	G	N	100	C	N	--	--	NS	--	--	NS
Benzo(g,h,i)perylene	191-24-2	ug/kg	1	5	15	15	100	G	N	100	C	N	--	--	NS	--	--	NS
Benzo(k)fluoranthene	207-08-9	ug/kg	1	5	1.2	1.2	100	G	N	100	C	N	--	--	NS	--	--	NS
Dibenz(a,h)anthracene	53-70-3	ug/kg	3	5	1.68	1.82	100	G	N	100	C	N	--	--	NS	--	--	NS
Fluorene	86-73-7	ug/kg	3	5	1.56	1.69	100	G	N	100	C	N	--	--	NS	--	--	NS
Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	1	5	0.84	0.84	100	G	N	100	C	N	--	--	NS	--	--	NS
Naphthalene	91-20-3	ug/kg	5	5	9.48	11.1	100	G	N	100	C	N	--	--	NS	--	--	NS
Explosives																		
1,3,5-Trinitrobenzene	99-35-4	mg/kg	14	15	0.074	0.14	8.6	I	N	18.1	I	N	--	--	NS	--	--	NS
1,3-Dinitrobenzene	99-65-0	mg/kg	15	15	0.076	0.159	--	--	NS	--	--	NS	--	--	NS	--	--	NS
2,4,6-Trinitrotoluene	118-96-7	mg/kg	11	15	0.15	0.167	2.4	H	N	1.2	H	N	--	--	NS	--	--	NS
2,4-Dinitrotoluene	121-14-2	mg/kg	14	15	0.1	0.142	5.3	I	N	19.8	I	N	--	--	NS	--	--	NS
2,6-Dinitrotoluene	606-20-2	mg/kg	14	15	0.2	0.25	4.5	I	N	6.9	I	N	--	--	NS	--	--	NS
2-Amino-4,6-dinitrotoluene	35572-78-2	mg/kg	15	15	0.151	0.22	80	J	N	--	--	NS	--	--	NS	--	--	NS
2-Nitrotoluene	88-72-2	mg/kg	15	15	0.17	0.266	--	--	NS	--	--	NS	--	--	NS	--	--	NS
3-Nitrotoluene	99-08-1	mg/kg	15	15	0.184	0.21	--	--	NS	--	--	NS	--	--	NS	--	--	NS
4-Amino-2,6-dinitrotoluene	1946-51-0	mg/kg	15	15	0.162	0.3	80	J	N	--	--	NS	--	--	NS	--	--	NS
4-Nitrotoluene	99-99-0	mg/kg	15	15	0.2	0.251	--	--	NS	--	--	NS	--	--	NS	--	--	NS

Table F.2-2
Non-detected Chemicals MDL Screening - Surface Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Parameter Name	CAS #	Units	Number of Non-Detects	Number of Samples	Minimum MDL	Maximum MDL	Plant SL	Source	Maximum MDL Exceeds SL	Inverte-brate SL	Source	Maximum MDL Exceeds SL	Avian ECO SSL	Source	Maximum MDL Exceeds SL	Mammalian ECO SSL	Source	Maximum MDL Exceeds SL
HMX	2691-41-0	mg/kg	13	15	0.066	0.229	--	--	NS	6.3	I	N	--	--	NS	--	--	NS
Nitrobenzene	98-95-3	mg/kg	15	15	0.03	0.102	--	--	NS	--	--	NS	--	--	NS	--	--	NS
RDX	121-82-4	mg/kg	15	15	0.048	0.131	100	K	N	98.6	I	N	--	--	NS	--	--	NS
Tetryl	479-45-8	mg/kg	15	15	0.065	0.169	--	--	NS	--	--	NS	--	--	NS	--	--	NS
Nitroglycerin/PETN																		
Nitroglycerin	55-63-0	mg/kg	13	15	0.195	0.39	--	--	NS	--	--	NS	--	--	NS	--	--	NS
PETN	78-11-5	mg/kg	15	15	0.23	0.381	--	--	NS	--	--	NS	--	--	NS	--	--	NS

Notes:

CAS = Chemical Abstracts Service
MDL = Method Detection Limit
SL = Screening Level
Eco SSL = Ecological Soil Screening Level
mg/kg = Milligram Per Kilogram
ug/kg = Microgram Per Kilogram
pg/g = Picogram Per Gram
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
PETN = Pentaerythritol Tetranitrate
-- = No Value Available

Sources:
A = USEPA Eco SSL - Soil Invertebrates, Plants, Avian, Mammalian (http://www.epa.gov/ecotox/ecossl)
B = ORNL - Earthworms - (Toxilogical Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision, Efroymson et al.)
C = BTAG - Fauna - (Region III Biological Technical Assistance Group - Draft Screening Levels - 1995)
D = CCME 2006
E = ORNL - Microbial Processes - (Toxilogical Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision, Efroymson et al.)
F = ORNL - Plants - Toxilogical Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision Efroymson et al.)
G = BTAG - Flora - (Region III Biological Technical Assistance Group - Draft Screening Levels - 1995)
H = Best, E.P.H., H.E. Tatem, K.N. Geter, M.L. Wells and B.K. Lane. 2004. Toxicity and Metabolites of 2,4,6 Trinitrotoluene (TNT) in Plants and Worms from Exposure to Aged Soil.
I = Kuperman. R. 2003. Development of Ecological Toxicity and Biomagnification Data for Explosives Contaminants in Soil.
J = Pennington, Judith C. 1988. Plant Uptake of 2,4,6-Trinitrotoluene, 4-Amino-2,6-Dinitrotoluene, and 2-Amino-4,6-Dinitrotoluene Using 14C-Labeled and Unlabeled Compounds.
K = Simini, M., R.S. Wentsel, R.T. Checkai, C.T. Phillips, N.A. Chester, M.A. Major, and J.C. Amos. 1995. Evaluation of Soil Toxicity at Joliet Army Ammunition Plant.

Y = MDL exceeds screening level
N = MDL does not exceed screening level
NS = No screening level available

Table F.2-3a
Dioxin/Furan Equivalent Calculation
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID Sample Date Sample Depth (ft bgs)	CAS #	Mammalian TEF	Avian TEF	13SB9A DUP AVG 9/30/2003 0-1	
				Result	LQ, VQ, r
Dioxin/Furans (pg/g)					
1,2,3,4,6,7,8,9-OCDD (OCDD)	3268-87-9	0.0003	0.0001	2,210	J
1,2,3,4,6,7,8,9-OCDF (OCDF)	39001-02-0	0.0003	0.0001	7.775	J
1,2,3,4,6,7,8-HpCDD	35822-39-4	0.01	0.001	45.3	
1,2,3,4,6,7,8-HpCDF	67562-39-4	0.01	0.01	3.625	J
1,2,3,4,7,8,9-HpCDF	55673-89-7	0.01	0.01	0.3522	J
1,2,3,4,7,8-HxCDD	39227-28-6	0.1	0.05	0.606	J
1,2,3,4,7,8-HxCDF	70648-26-9	0.1	0.1	0.4785	J
1,2,3,6,7,8-HxCDD	57653-85-7	0.1	0.01	1.64	J
1,2,3,6,7,8-HxCDF	57117-44-9	0.1	0.1	0.3885	J
1,2,3,7,8,9-HxCDD	19408-74-3	0.1	0.1	1.85	
1,2,3,7,8,9-HxCDF	72918-21-9	0.1	0.1	<0.588	
1,2,3,7,8-PeCDD	40321-76-4	1	1	0.421	J
1,2,3,7,8-PeCDF	57117-41-6	0.03	0.1	0.279	J
2,3,4,6,7,8-HxCDF	60851-34-5	0.1	0.1	0.373	J
2,3,4,7,8-PeCDF	57117-31-4	0.3	1	0.37	J
2,3,7,8-TCDD	1746-01-6	1	1	<0.132	
2,3,7,8-TCDF	51207-31-9	0.1	1	0.489	A
Total 2,3,7,8-TCDD Equivalents (Mammalian)				2.281	
Total 2,3,7,8-TCDD Equivalents (Avian)				1.600	

Notes:
pg/g = Picogram Per Gram
ft bgs = Feet Below Ground Surface
TEF = Toxicity Equivalency Factor
LQ = Laboratory Qualifier
VQ = Validation Qualifier
r = Reason Code

Total 2,3,7,8-TCDD Equivalents are calculated by summing the detected concentration times the TEF for each chemical. Non-detects, R-flagged data, and B-flagged data are excluded from summed total.

Qualifiers:
J = Analyte present. Reported value may not be accurate or precise.
A = Amount detected below lower calibration limit

Table F.2-3b
Summary of Low and High Molecular Weight PAHs
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID Sample Date Sample Depth (ft bgs)	CAS #	13SB7A 10/9/2003 0-1		13SB8A 10/9/2003 0-1		13SB9A DUP AVG 10/9/2003 0-1		13SB10A 10/9/2003 0-1		13SB11A 10/9/2003 0-1		13SB13A 11/12/2008 0-0.5		13SB14A 11/12/2008 0-0.5		13SB15A DUP AVG 11/14/2008 0-0.5	
		Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r
TCL PAHs (ug/kg)																	
Acenaphthene	83-32-9	<210	U	19	J	8.5	J	9	J	8	J	<19	U	<18	U	<19	U
Acenaphthylene	208-96-8	<210	U	2	J	5	J	4	J	2	J	1.5	J	<18	U	<19	U
Anthracene	120-12-7	<210	U	37	J	21.5	J	26	J	15	J	<19	U	<18	U	<19	U
Fluorene	86-73-7	<210	U	20	J	5	J	12	J	6	J	<19	U	<18	U	<19	U
Naphthalene	91-20-3	<210	U	10	J	<220	U	<240	U	4	J	<19	U	<18	U	<19	U
Phenanthrene	85-01-8	4	J	130	J	69.5	J	170	J	63	J	6.4	J,B,x	<18	U	5.95	J
Low Molecular Weight PAHs	--	4		218		109.5		221		98		7.9		ND		5.95	
Benzo(a)anthracene	56-55-3	<210	U	100	J	170	J	89	J	51	J	14	J	2.8	J,B,z	9.5	J
Benzo(a)pyrene	50-32-8	18	J	120	J	130	J	72	J	44	J	15	J,B,x	3.5	J,B,z	8.9	J,B,z
Benzo(b)fluoranthene	205-99-2	25	J,J,l	180	J	205	J	120	J	78	J	20		4.6	J,B,z	18	J
Benzo(g,h,i)perylene	191-24-2	11	J,J,l	72	J	52	J	34	J	25	J	13	J	5.7	J	6.65	J,B,z
Benzo(k)fluoranthene	207-08-9	<210	U	68	J	89	J	49	J	28	J	7.1	J,B,z	2.1	J,B,z	6.3	J,B,z
Chrysene	218-01-9	24	J	140	J	190	J	120	J	57	J	12	J	4.2	J,B,z	8.35	J,B,z
Dibenz(a,h)anthracene	53-70-3	<210	U	18	J	15.5	J	<240	J	<220	U	<75	U	<71	U	<75	U
Fluoranthene	206-44-0	9	J	370		225		350		150	J	15	J,B,z	3.9	J,B,z	13.5	J,B,z
Indeno(1,2,3-cd)pyrene	193-39-5	10	J,J,l	73	J	47.5	J	32	J	22	J	11	J	5.3	J,B,x	2.95	J
Pyrene	129-00-0	6	J	260		200	J	260		110	J	14	J,B,z	4.2	J,B,z	13.5	J,B,z
High Molecular Weight PAHs	--	103		1,401		1,324		1,126		565		121.1		36.3		87.65	

Table F.2-3b
Summary of Low and High Molecular Weight PAHs
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID Sample Date Sample Depth (ft bgs)	CAS #	13SB16A 11/14/2008 0-0.5		13SB17A 11/14/2008 0-0.5		13SB18A 11/13/2008 0.0-5		13SB19A 11/13/2008 0-0.5		13SB20A 11/12/2008 0-0.5		13SB21A 11/12/2008 0-0.5		13SB22A 11/12/2008 0-0.5	
		Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r	Result	LQ, VQ, r
TCL PAHs (ug/kg)															
Acenaphthene	83-32-9	3.7	J	3.1	J	<21	U	<25	U	5.5	J	<22	U	3.5	J
Acenaphthylene	208-96-8	2.9	J	3.6	J	18	J	2	J	5.1	J	2.6	J	3.5	J
Anthracene	120-12-7	14	J	11	J	12	J	<25	U	19	J	6.5	J,B,x	11	J
Fluorene	86-73-7	2.5	J	4.9	J	6.5	J	<25	U	5.9	J	<22	U	4.7	J
Naphthalene	91-20-3	8.2	J	3.1	J	<21	U	<25	U	4.7	J	<22	U	5.9	J
Phenanthrene	85-01-8	41		66		60		<25	U	69		12	J	60	
Low Molecular Weight PAHs	--	72.3		91.7		96.5		2		109.2		21.1		88.6	
Benzo(a)anthracene	56-55-3	86		130		74		3.5	J,B,z	120		17	J	110	
Benzo(a)pyrene	50-32-8	69		80		51		2.5	J,B,z	100		28		83	
Benzo(b)fluoranthene	205-99-2	140		190		68		3.5	J,B,z	180		47		180	
Benzo(g,h,i)perylene	191-24-2	59	J	47	J	21	J	2.5	J,B,z	83		15	J	63	J
Benzo(k)fluoranthene	207-08-9	35		54		24		<25	U	55		21	J	42	
Chrysene	218-01-9	68		99		81		3	J,B,z	140		29		95	
Dibenz(a,h)anthracene	53-70-3	23	J	12	J	10	J	<99	U	35	J	8.2	J,B,x	20	J
Fluoranthene	206-44-0	81		160		99		3.9	J,B,z	170		21	J,B,z	140	
Indeno(1,2,3-cd)pyrene	193-39-5	50	J	44	J	20	J	<99	U	74	J	17	J	56	J
Pyrene	129-00-0	81		170		150		3	J,B,z	150		18	J,B,z	130	
High Molecular Weight PAHs	--	692		986		598		21.9		1,107		221.2		919	

Notes:

CAS = Chemical Abstract Service
ft bgs = Feet Below Ground Surface
ug/kg = Microgram per kilogram
TAL = Target Analyte List
PAH = Polynuclear Aromatic Hydrocarbon
ND = Not Detected
LQ = Laboratory Qualifier
VQ = Validation Qualifier
r = Reason Code
See Table 4-1 for flag definitions

Table F.2-4
Exposure Point Concentration Summary for Surface Soil
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Exposure Point		Chemical of Potential Concern	Units	Arithmetic Mean of Detects	UCL	Maximum Concentration	Exposure Point Concentration			
							Value	Units	Statistic	Rationale
Surface Soil	7429-90-5	Aluminum	mg/kg	15,410	18,614	35,000	18,614	mg/kg	95% Student's t UCL	ProUCL 4.0
	7440-38-2	Arsenic	mg/kg	2.315	2.794	5.6	2.794	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	7440-43-9	Cadmium	mg/kg	1.194	1.401	2.6	1.401	mg/kg	95% KM (BCA) UCL	ProUCL 4.0
	7440-70-2	Calcium	mg/kg	10,043	81,166	110,000	81,166	mg/kg	99% Chebyshev (Mean, Sd) UCL	ProUCL 4.0
	7440-47-3	Chromium	mg/kg	26.07	29.38	39	29.38	mg/kg	95% Student's t UCL	ProUCL 4.0
	7440-48-4	Cobalt	mg/kg	11.37	12.97	19	12.97	mg/kg	95% Student's t UCL	ProUCL 4.0
	7440-50-8	Copper	mg/kg	36.4	106.3	260	106.3	mg/kg	95% Chebyshev (Mean, Sd) UCL	ProUCL 4.0
	7439-89-6	Iron	mg/kg	31,547	38,358	78,000	38,358	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	7439-92-1	Lead	mg/kg	313.9	721.8	8,620	721.8	mg/kg	95% Chebyshev (Mean, Sd) UCL	ProUCL 4.0
	7439-96-5	Manganese	mg/kg	1,036	1,239	2,200	1,239	mg/kg	95% Student's t UCL	ProUCL 4.0
	7439-97-6	Mercury	mg/kg	0.0539	0.0698	0.14	0.0698	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	7782-49-2	Selenium	mg/kg	0.475	0.582	0.885	0.582	mg/kg	95% Student's t UCL	ProUCL 4.0
	7440-28-0	Thallium	mg/kg	0.586	1.514	3.5	1.514	mg/kg	95% Chebyshev (Mean, Sd) UCL	ProUCL 4.0
	7440-62-2	Vanadium	mg/kg	29.3	34.02	59	34.02	mg/kg	95% Student's t UCL	ProUCL 4.0
	7440-66-6	Zinc	mg/kg	510.6	668	1,600	668	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	56-55-3	Benzo(a)anthracene	mg/kg	0.0698	0.0905	0.170	0.0905	mg/kg	95% KM (t) UCL	ProUCL 4.0
	50-32-8	Benzo(a)pyrene	mg/kg	0.0550	0.0743	0.130	0.0743	mg/kg	95% Student's t UCL	ProUCL 4.0
	205-99-2	Benzo(b)fluoranthene	mg/kg	0.0973	0.1648	0.205	0.1648	mg/kg	95% Approximate Gamma UCL	ProUCL 4.0
	191-24-2	Benzo(g,h,i)perylene	mg/kg	0.0340	0.0461	0.083	0.0461	mg/kg	95% Student's t UCL	ProUCL 4.0
	53-70-3	Dibenz(a,h)anthracene	mg/kg	0.01771	0.01695	0.035	0.01695	mg/kg	95% KM (t) UCL	ProUCL 4.0
	132-64-9	Dibenzofuran	mg/kg	0.0054	0.00493	0.013	0.004934	mg/kg	95% KM (t) UCL	ProUCL 4.0
	131-11-3	Dimethyl Phthalate	mg/kg	0.1659	0.1168	0.500	0.1168	mg/kg	95% KM (t) UCL	ProUCL 4.0
	118-96-7	2,4,6-Trinitrotoluene*	mg/kg	0.981	0.792	3	0.792	mg/kg	95% KM (t) UCL	ProUCL 4.0
	121-14-2	2,4-Dinitrotoluene*	mg/kg	--	--	0.17	0.17	mg/kg	Maximum Detected Concentration	--
	606-20-2	2,6-Dinitrotoluene*	mg/kg	--	--	0.39	0.39	mg/kg	Maximum Detected Concentration	--
	55-63-0	Nitroglycerin*	mg/kg	1.28	--	2.11	2.11	mg/kg	Maximum Detected Concentration	--

Notes:

UCL = Upper Confidence Limit

mg/kg = Milligram Per Kilogram

* Due to the low frequency of detection, a mean and/or UCL were not calculated.

EPC = Exposure Point Concentration

MDC = Maximum Detected Concentration

Table F.2-5
Plant Screening Level Sources - Soil
Screening Level Ecological Risk Assessment
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Screening Level (mg/kg)	Source
TAL Metals			
Aluminum	7429-90-5	50	ORNL-Plants
Antimony	7440-36-0	5	ORNL-Plants
Arsenic	7440-38-2	18	ECO SSL
Barium	7440-39-3	500	ORNL-Plants
Beryllium	7440-41-7	10	ORNL-Plants
Cadmium	7440-43-9	32	ECO SSL
Calcium	7440-70-2	4	ORNL-Plants
Chromium	7440-47-3	1	ORNL-Plants
Cobalt	7440-48-4	13	ECO SSL
Copper	7440-50-8	70	ECO SSL
Iron	7439-89-6	NV	--
Lead	7439-92-1	120	ECO SSL
Magnesium	7439-95-4	NV	--
Manganese	7439-96-5	220	ECO SSL
Mercury	7439-97-6	0.3	ORNL-Plants
Nickel	7440-02-0	38	ECO SSL
Potassium	7440-09-7	NV	--
Selenium	7782-49-2	0.52	ECO SSL
Silver	7440-22-4	560	ECO SSL
Sodium	7440-23-5	NV	--
Thallium	7440-28-0	1	ORNL-Plants
Vanadium	7440-62-2	2	ORNL-Plants
Zinc	7440-66-6	160	ECO SSL
TCL VOCs			
1,2,4-Trichlorobenzene	120-82-1	0.1	BTAG - Flora
2-Butanone	78-93-3	NV	--
Acetone	67-64-1	NV	--
Benzene	71-43-2	0.1	BTAG - Flora
Methylene chloride	75-09-2	0.3	BTAG - Flora
Toluene	108-88-3	200	ORNL-Plants
Trichloroethene	79-01-6	0.3	BTAG - Flora
TCL SVOCs			
1,1'-Biphenyl	92-52-4	NV	--
2,4-Dichlorophenol	120-83-2	0.1	BTAG - Flora
2-Methylnaphthalene	91-57-6	NV	--
4-Chloro-3-Methylphenol	59-50-7	NV	--
Acetophenone	98-86-2	NV	--
Bis(2-ethylhexyl)phthalate	117-81-7	NV	--
Butylbenzylphthalate	85-68-7	NV	--
Carbazole	86-74-8	NV	--
Di-n-butylphthalate	84-74-2	200	ORNL-Plants
Dibenzofuran	132-64-9	NV	--
Diethylphthalate	84-66-2	NV	--
Dimethylphthalate	131-11-3	NV	--
Isophorone	78-59-1	NV	--
N-Nitrosodiphenylamine	86-30-6	NV	--
Low Molecular Weight PAHs	--	NV	--
High Molecular Weight PAHs	--	NV	--
Explosives			
1,3,5-Trinitrobenzene	99-35-4	8.6	Kuperman 2003
2,4,6-Trinitrotoluene	118-96-7	2.4	Best et al. 2004
2,4-Dinitrotoluene	121-14-2	5.3	Kuperman 2003
2,6-Dinitrotoluene	606-20-2	4.5	Kuperman 2003
HMX	2691-41-0	NV	--
Nitroglycerin/PETN			
Nitroglycerin	55-63-0	NV	--
Cyanide			
Cyanide	57-12-5	NV	--
Dioxin/Furans			
2,3,7,8-TCDD TEQ	1746-01-6	NV	--

Table F.2-5
Plant Screening Level Sources - Soil
Screening Level Ecological Risk Assessment
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Notes:
CAS = Chemical Abstract Service
mg/kg = Milligram per Kilogram
NV = No Value Available
TAL = Target Analyte List
TCL = Target Compound List
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PETN = Pentaerythritol Tetranitrate

USEPA Eco SSL - Soil Invertebrates, Plants, Avian, Mammalian (http://www.epa.gov/ecotox/ecossl)
ORNL - Plants - Toxilogical Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision Efroymson et al.
BTAG - Flora - (Region III Biological Technical Assistance Group - Draft Screening Levels - 1995)
Best, E.P.H., H.E. Tatem, K.N. Geter, M.L. Wells and B.K. Lane. 2004. Toxicity and Metabolites of 2,4,6 Trinitrotoluene (TNT) in Plants and Worms from Exposure to Aged Soil. U.S. Army Corps of Engineers, Engineer Research and Development Center. ERDC/EL TR-04-18.
Kuperman. R. 2003. Development of Ecological Toxicity and Biomagnification Data for Explosives Contaminants in Soil. U.S. Army Edgewood Chemical Biological Center. Final Techinical Report. Project CU-1221.

Table F.2-6
Plant Screening - Soil
Screening Level Ecological Risk Assessment
Study Area at SWU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Constituent of Potential Ecological Concern	CAS #	Maximum Soil Concentration (mg/kg)	Screening Level (mg/kg)	Hazard Quotient (unitless)	EPC (mg/kg)	EPC Hazard Quotient (unitless)
Inorganics						
Aluminum	7429-90-5	35,000	50	**7.0E+02**	18,614	**3.7E+02**
Antimony	7440-36-0	2.9	5	5.8E-01	NC	NC
Arsenic	7440-38-2	5.6	18	3.1E-01	NC	NC
Barium	7440-39-3	290	500	5.8E-01	NC	NC
Beryllium	7440-41-7	1.15	10	1.2E-01	NC	NC
Cadmium	7440-43-9	2.6	32	8.1E-02	NC	NC
Chromium	7440-47-3	39	1	**3.9E+01**	29.38	**2.9E+01**
Cobalt	7440-48-4	19	13	**1.5E+00**	12.97	1.0E+00
Copper	7440-50-8	260	70	**3.7E+00**	106.3	**1.5E+00**
Iron	7439-89-6	78,000	NV	NC	NC	NC
Lead	7439-92-1	8,620	120	**7.2E+01**	721.8	**6.0E+00**
Manganese	7439-96-5	2,200	220	**1.0E+01**	1,239	**5.6E+00**
Mercury	7439-97-6	0.14	0.3	4.7E-01	NC	NC
Nickel	7440-02-0	22	38	5.8E-01	NC	NC
Selenium	7782-49-2	0.885	0.52	**1.7E+00**	0.582	**1.1E+00**
Silver	7440-22-4	0.16	560	2.9E-04	NC	NC
Thallium	7440-28-0	3.5	1	**3.5E+00**	1.514	**1.5E+00**
Vanadium	7440-62-2	59	2	**3.0E+01**	34.02	**1.7E+01**
Zinc	7440-66-6	1,600	160	**1.0E+01**	668	**4.2E+00**
TCL VOCs						
1,2,4-Trichlorobenzene	120-82-1	0.00096	0.1	9.6E-03	NC	NC
2-Butanone	78-93-3	0.045	NV	NC	NC	NC
Acetone	67-64-1	0.32	NV	NC	NC	NC
Benzene	71-43-2	0.00091	0.1	9.1E-03	NC	NC
Methylene chloride	75-09-2	0.011	0.3	3.7E-02	NC	NC
Toluene	108-88-3	0.0035	200	1.8E-05	NC	NC
Trichloroethene	79-01-6	0.0096	0.3	3.2E-02	NC	NC
TCL SVOCs						
1,1'-Biphenyl	92-52-4	0.002	NV	NC	NC	NC
2,4-Dichlorophenol	120-83-2	0.0068	0.1	6.8E-02	NC	NC
2-Methylnaphthalene	91-57-6	0.022	NV	NC	NC	NC
4-Chloro-3-Methylphenol	59-50-7	0.019	NV	NC	NC	NC
Acetophenone	98-86-2	0.0039	NV	NC	NC	NC
Bis(2-ethylhexyl)phthalate	117-81-7	0.45	NV	NC	NC	NC
Butylbenzylphthalate	85-68-7	0.038	NV	NC	NC	NC
Carbazole	86-74-8	0.0205	NV	NC	NC	NC
Di-n-butylphthalate	84-74-2	6.205	200	3.1E-02	NC	NC
Dibenzofuran	132-64-9	0.013	NV	NC	NC	NC
Diethylphthalate	84-66-2	1.675	NV	NC	NC	NC
Dimethylphthalate	131-11-3	0.5	NV	NC	NC	NC
Isophorone	78-59-1	0.0049	NV	NC	NC	NC
N-Nitrosodiphenylamine	86-30-6	0.61	NV	NC	NC	NC
Low Molecular Weight PAHs	--	0.221	NV	NC	NC	NC
High Molecular Weight PAHs	--	1.401	NV	NC	NC	NC
Explosives						
1,3,5-Trinitrobenzene	99-35-4	0.1985	8.6	2.3E-02	NC	NC
2,4,6-Trinitrotoluene	118-96-7	3	2.4	**1.3E+00**	0.792	3.3E-01
2,4-Dinitrotoluene	121-14-2	0.17	5.3	3.2E-02	NC	NC
2,6-Dinitrotoluene	606-20-2	0.39	4.5	8.7E-02	NC	NC
HMX	2691-41-0	0.72	NV	NC	NC	NC
Nitroglycerin/PETN						
Nitroglycerin	55-63-0	2.11	NV	NC	NC	NC
Cyanide						
Cyanide	57-12-5	0.305	NV	NC	NC	NC
Dioxin/Furans						
2,3,7,8-TCDD TEQ	1746-01-6	0.00000228	NV	NC	NC	NC

Notes:

CAS = Chemical Abstract Service
mg/kg = Milligram per Kilogram
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
PETN = Pentaerythritol Tetranitrate
NV = No Value Available
NC = Not Calculated
Hazard Quotient = Soil Concentration/Screening Level
EPC = Exposure Point Concentration
See Table F.2-3 for Total Low and High Molecular Weight PAHs

Table F.2-7
Invertebrate and Microbial Screening Level Sources - Soil
Screening Level Ecological Risk Assessment
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS #	Screening Level (mg/kg)	Source
TAL Metals			
Aluminum	7429-90-5	NV	--
Antimony	7440-36-0	78	ECO SSL
Arsenic	7440-38-2	60	ORNL-Earthworm
Barium	7440-39-3	330	ECO SSL
Beryllium	7440-41-7	40	ECO SSL
Cadmium	7440-43-9	140	ECO SSL
Calcium	7440-70-2	NV	--
Chromium	7440-47-3	0.4	ORNL-Earthworm
Cobalt	7440-48-4	200	BTAG - Fauna
Copper	7440-50-8	80	ECO SSL
Iron	7439-89-6	200	ORNL - Microbial
Lead	7439-92-1	1,700	ECO SSL
Magnesium	7439-95-4	NV	--
Manganese	7439-96-5	450	ECO SSL
Mercury	7439-97-6	0.1	ORNL-Earthworm
Nickel	7440-02-0	280	ECO SSL
Potassium	7440-09-7	NV	--
Selenium	7782-49-2	4.1	ECO SSL
Silver	7440-22-4	50	ORNL - Microbial
Sodium	7440-23-5	NV	--
Thallium	7440-28-0	NV	--
Vanadium	7440-62-2	20	ORNL - Microbial
Zinc	7440-66-6	120	Eco SSL
TCL VOCs			
1,2,4-Trichlorobenzene	120-82-1	0.1	BTAG - Fauna
2-Butanone	78-93-3	NV	--
Acetone	67-64-1	NV	--
Benzene	71-43-2	0.1	BTAG - Fauna
Methylene chloride	75-09-2	0.3	BTAG - Fauna
Toluene	108-88-3	0.1	BTAG - Fauna
Trichloroethene	79-01-6	0.3	BTAG - Fauna
TCL SVOCs			
1,1'-Biphenyl	92-52-4	NV	--
2,4-Dichlorophenol	120-83-2	0.1	BTAG - Fauna
2-Methylnaphthalene	91-57-6	NV	--
4-Chloro-3-Methylphenol	59-50-7	NV	--
Acetophenone	98-86-2	NV	--
Bis(2-ethylhexyl)phthalate	117-81-7	NV	--
Butylbenzylphthalate	85-68-7	NV	--
Carbazole	86-74-8	NV	--
Di-n-butylphthalate	84-74-2	NV	--
Dibenzofuran	132-64-9	NV	--
Diethylphthalate	84-66-2	NV	--
Dimethylphthalate	131-11-3	NV	--
Isophorone	78-59-1	NV	--
N-Nitrosodiphenylamine	86-30-6	NV	--
Low Molecular Weight PAHs	--	29	ECO SSL
High Molecular Weight PAHs	--	18	ECO SSL
Explosives			
1,3,5-Trinitrobenzene	99-35-4	18.1	Kuperman 2003
2,4,6-Trinitrotoluene	118-96-7	1.2	Best et al. 2004
2,4-Dinitrotoluene	121-14-2	19.8	Kuperman 2003
2,6-Dinitrotoluene	606-20-2	6.9	Kuperman 2003
HMX	2691-41-0	6.3	Kuperman 2003
Nitroglycerin/PETN			
Nitroglycerin	55-63-0	NV	--
Cyanide			
Cyanide	57-12-5	0.9	CCME-2006
Dioxin/Furans			
2,3,7,8-TCDD TEQ	1746-01-6	NV	--

Table F.2-7
Invertebrate and Microbial Screening Level Sources - Soil
Screening Level Ecological Risk Assessment
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Notes:

CAS = Chemical Abstract Service
mg/kg = Milligram per Kilogram
NV = No Value Available
TAL = Target Analyte List
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
PETN = Pentaerythritol Tetranitrate

USEPA Eco SSL - Soil Invertebrates, Plants, Avian, Mammalian (http://www.epa.gov/ecotox/ecossl)
ORNL - Earthworms - (Toxilogical Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision, Efroymson et al.)
ORNL - Microbial Processes - (Toxilogical Benchmarks for Contaminants of Potential Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Process: 1997 Revision, Efroymson et al.)
BTAG - Fauna - (Region III Biological Technical Assistance Group - Draft Screening Levels - 1995)
Best, E.P.H., H.E. Tatem, K.N. Geter, M.L. Wells and B.K. Lane. 2004. Toxicity and Metabolites of 2,4,6 Trinitrotoluene (TNT) in Plants and Worms from Exposure to Aged Soil. U.S. Army Corps of Engineers, Engineer Research and Development Center. ERDC/EL TR-04-18.
Kuperman. R. 2003. Development of Ecological Toxicity and Biomagnification Data for Explosives Contaminants in Soil. U.S. Army Edgewood Chemical Biological Center. Final Techinical Report. Project CU-1221.

Table F.2-8
Invertebrate and Microbial Screening - Soil
Screening Level Ecological Risk Assessment
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Constituent of Potential Ecological Concern	CAS #	Maximum Soil Concentration (mg/kg)	Screening Level (mg/kg)	Hazard Quotient (unitless)	EPC (mg/kg)	EPC Hazard Quotient (unitless)
Inorganics						
Aluminum	7429-90-5	35,000	NV	NC	NC	NC
Antimony	7440-36-0	2.9	78	3.7E-02	NC	NC
Arsenic	7440-38-2	5.6	60	9.3E-02	NC	NC
Barium	7440-39-3	290	330	8.8E-01	NC	NC
Beryllium	7440-41-7	1.15	40	2.9E-02	NC	NC
Cadmium	7440-43-9	2.6	140	1.9E-02	NC	NC
Calcium	7440-70-2	110,000	NV	NC	NC	NC
Chromium	7440-47-3	39	0.4	**9.8E+01**	29.38	**7.3E+01**
Cobalt	7440-48-4	19	200	9.5E-02	NC	NC
Copper	7440-50-8	260	80	**3.3E+00**	106.3	**1.3E+00**
Iron	7439-89-6	78,000	200	**3.9E+02**	38,358	**1.9E+02**
Lead	7439-92-1	8,620	1,700	**5.1E+00**	721.8	4.2E-01
Magnesium	7439-95-4	25,000	NV	NC	NC	NC
Manganese	7439-96-5	2200	450	**4.9E+00**	1,239	**2.8E+00**
Mercury	7439-97-6	0.14	0.1	**1.4E+00**	0.0698	7.0E-01
Nickel	7440-02-0	22	280	7.9E-02	NC	NC
Potassium	7440-09-7	2,900	NV	NC	NC	NC
Selenium	7782-49-2	0.885	4	2.2E-01	NC	NC
Silver	7440-22-4	0.16	50	3.2E-03	NC	NC
Sodium	7440-23-5	100	NV	NC	NC	NC
Thallium	7440-28-0	3.5	NV	NC	NC	NC
Vanadium	7440-62-2	59	20	**3.0E+00**	34.02	**1.7E+00**
Zinc	7440-66-6	1,600	120	**1.3E+01**	668	**5.6E+00**
TCL VOCs						
1,2,4-Trichlorobenzene	120-82-1	0.00096	0.1	9.6E-03	NC	NC
2-Butanone	78-93-3	0.045	NV	NC	NC	NC
Acetone	67-64-1	0.32	NV	NC	NC	NC
Benzene	71-43-2	0.00091	0.1	9.1E-03	NC	NC
Methylene chloride	75-09-2	0.011	0.3	3.7E-02	NC	NC
Toluene	108-88-3	0.0035	0.1	3.5E-02	NC	NC
Trichloroethene	79-01-6	0.0096	0.3	3.2E-02	NC	NC
TCL SVOCs						
1,1'-Biphenyl	92-52-4	0.002	NV	NC	NC	NC
2,4-Dichlorophenol	120-83-2	0.0068	0.1	6.8E-02	NC	NC
2-Methylnaphthalene	91-57-6	0.022	NV	NC	NC	NC
4-Chloro-3-Methylphenol	59-50-7	0.019	NV	NC	NC	NC
Acetophenone	98-86-2	0.0039	NV	NC	NC	NC
Bis(2-ethylhexyl)phthalate	117-81-7	0.45	NV	NC	NC	NC
Butylbenzylphthalate	85-68-7	0.038	NV	NC	NC	NC
Carbazole	86-74-8	0.0205	NV	NC	NC	NC
Di-n-butylphthalate	84-74-2	6.205	NV	NC	NC	NC
Dibenzofuran	132-64-9	0.013	NV	NC	NC	NC
Diethylphthalate	84-66-2	1.675	NV	NC	NC	NC
Dimethylphthalate	131-11-3	0.5	NV	NC	NC	NC
Isophorone	78-59-1	0.0049	NV	NC	NC	NC
N-Nitrosodiphenylamine	86-30-6	0.61	NV	NC	NC	NC
Low Molecular Weight PAHs	--	0.221	29	7.6E-03	NC	NC
High Molecular Weight PAHs	--	1.401	18	7.8E-02	NC	NC
Explosives						
1,3,5-Trinitrobenzene	99-35-4	0.1985	18.1	1.1E-02	NC	NC
2,4,6-Trinitrotoluene	118-96-7	3	1.2	**2.5E+00**	0.792	6.6E-01
2,4-Dinitrotoluene	121-14-2	0.17	19.8	8.6E-03	NC	NC
2,6-Dinitrotoluene	606-20-2	0.39	6.9	5.7E-02	NC	NC
HMX	2691-41-0	0.72	6.3	1.1E-01	NC	NC
Nitroglycerin/PETN						
Nitroglycerin	55-63-0	2.11	NV	NC	NC	NC
Cyanide						
Cyanide	57-12-5	0.305	0.9	3.4E-01	NC	NC
Dioxin/Furans						
2,3,7,8-TCDD TEQ	1746-01-6	0.00000228	NV	NC	NC	NC

Table F.2-8
Invertebrate and Microbial Screening - Soil
Screening Level Ecological Risk Assessment
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Notes:
CAS = Chemical Abstract Service
mg/kg = Milligram per Kilogram
TCL = Target Compound List
PCB = Polychlorinated Biphenyl
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
PAH = Polynuclear Aromatic Hydrocarbon
PETN = Pentaerythritol Tetranitrate
NV = No Value Available
NC = Not Calculated
Hazard Quotient = Soil Concentration/Screening Level
EPC = Exposure Point Concentration
See Table F.2-3 for Total Low and High Molecular Weight PAHs

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Table F.2-9
Wildlife Profiles
Screening Level Ecological Risk Assessment
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Representative Species			Composition of Diet [1] (%)				Preliminary Assessment					Refined Assessment					
							Minimum Body Weight [1]	Maximum Body Weight [1]	Maximum Food Ingestion Rate[2]	Maximum Substrate Ingestion Rate [3]		Average Body Weight [1]	Average Food Ingestion Rate [2]	Average Substrate Ingestion Rate [3]	Home Range (ha)	Proportion of Year Species Active	AUFs
Food-web Classification	Common Name	Scientific Name	Plants (incl. fungi)	Inverte-brates	Small mammals	Fish	kg	kg	kg dw/day	% of dry intake	kg dry wt./day	kg	kg dw/day	kg dry wt./day			Study Area (0.65) hectares
Birds																	
soil-probing invertivore	American robin	*Turdus migratorius*	62%	38%			0.0635	0.103	0.020	5%	0.001	0.077	0.016	0.0008	0.48	1	1
large carnivore	Red-tailed hawk	*Buteo jamaicensis*			100%		0.957	1.235	0.063	0%	0	1.134	0.059	0	250	1	0.0026
Mammals																	
small herbivore	Meadow vole	*Microtus pennsylvanicus*	100%				0.017	0.0524	0.010	2.4%	0.00024	0.037	0.008	0.00019	0.037	1	1
medium carnivore	Red fox	*Vulpes vulpes*	17%	4%	79%		2.95	7.04	0.342	2.8%	0.0096	4.53	0.238	0.0067	96	1	0.0068
small invertivore	Short-tailed shrew	*Blarina brevicauda*	14%	86%			0.0125	0.0225	0.003	13%	0.00039	0.015	0.002	0.00026	0.39	1	1

Notes:
kg = Kilogram
kg dw/day = Kilogram Dry-weight per Day
L/day = Liter per Day

[1]Wildlife Exposure Factors Handbook. U.S. Environmental Protection Agency (EPA). 1993. Office of Research and Development. 2 Volumes. EPA/600/R93/187a&b. December.
[2] Estimated food intake rate (kg [dw]/day) calculated as follows:
FI ((kg/day) = 0.0687 $Wt.^{0.882}$ for mammals (red fox and short-tailed shrew)
FI ((g/day) = 0.577 $Wt.^{0.727}$ for herbivores (meadow vole)
FI ((g/day) = 0.301 $Wt.^{0.751}$ for non-passerine birds (red-tailed hawk)
FI ((g/day) = 0.398 $Wt.^{0.850}$ for passerine birds (american robin)
[3]Estimating Exposure to Terrestrial Wildlife to Contaminants. Sample and Sutter. 1994. ES/ER/TM-125.
The soil ingestion rate for the american robin set equal to 38% of the american woodcock value (0.34*10.4%=4%), based on a robin diet of 38% invertbrates.

Table F.2-10
Wildlife TRVs
Screening Level Ecological Risk Assessment
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

		AVIAN TEST SPECIES				MAMMALIAN TEST SPECIES					AVIAN RECEPTORS				MAMMALIAN RECEPTORS					
											American Robin		Red-tailed Hawk		Meadow Vole		Red Fox		Short-tailed Shrew	
	CAS #	Chronic LOAEL	Chronic NOAEL	Test Animal	Source	Chronic LOAEL	Chronic NOAEL	Test Animal	Test Animal Body Weight (kg)	Source	Chronic LOAEL	Chronic NOAEL	Chronic LOAEL	Chronic NOAEL	Chronic LOAEL	Chronic NOAEL	Chronic LOAEL	Chronic NOAEL	Chronic LOAEL	Chronic NOAEL
		(mg/kg-bw/d)				(mg/kg-bw/d)					(mg/kg-bw/d)		(mg/kg-bw/d)		(mg/kg-bw/d)		(mg/kg-bw/d)		(mg/kg-bw/d)	
Arsenic	7440-38-2	1.28E+01	5.14E+00	mallard duck	ORNL 1996	1.26	0.126	mouse	0.03	ORNL 1996	1.28E+01	5.14E+00	1.28E+01	5.14E+00	1.20E+00	1.20E-01	3.59E-01	3.59E-02	1.50E+00	1.50E-01
Cadmium	7440-43-9	2.00E+01	1.45E+00	mallard duck	ORNL 1996	10	1	rat	0.3	ORNL 1996	2.00E+01	1.45E+00	2.00E+01	1.45E+00	1.69E+01	1.69E+00	5.07E+00	5.07E-01	2.11E+01	2.11E+00
Chromium	7440-47-3	5.00E+00	1.00E+00	black duck	ORNL 1996	32.8	3.28	rat	0.35	ORNL 1996	5.00E+00	1.00E+00	5.00E+00	1.00E+00	5.75E+01	5.75E+00	1.73E+01	1.73E+00	7.21E+01	7.21E+00
Copper	7440-50-8	6.17E+01	4.70E+01	1 day old chicks	ORNL 1996	15.4	11.7	mink	1	ORNL 1996	6.17E+01	4.70E+01	6.17E+01	4.70E+01	3.51E+01	2.67E+01	1.06E+01	8.02E+00	4.40E+01	3.34E+01
Lead	7439-92-1	1.13E+01	1.13E+00	Japanese quail	ORNL 1996	80	8	rat	0.35	ORNL 1996	1.13E+01	1.13E+00	1.13E+01	1.13E+00	1.40E+02	1.40E+01	4.22E+01	4.22E+00	1.76E+02	1.76E+01
Mercury	7439-97-6	9.00E-01	4.50E-01	Japanese Quail	ORNL 1996	132	13.2	mink	1	ORNL 1996	9.00E-01	4.50E-01	9.00E-01	4.50E-01	3.01E+02	3.01E+01	9.05E+01	9.05E+00	3.77E+02	3.77E+01
Nickel	7440-02-0	1.07E+02	7.74E+01	mallard duckling	ORNL 1996	80	40	rat	0.35	ORNL 1996	1.07E+02	7.74E+01	1.07E+02	7.74E+01	1.40E+02	7.01E+01	4.22E+01	2.11E+01	1.76E+02	8.79E+01
Selenium	7782-49-2	8.00E-01	4.00E-01	mallard duck	ORNL 1996	0.33	0.2	rat	0.35	ORNL 1996	8.00E-01	4.00E-01	8.00E-01	4.00E-01	5.79E-01	3.51E-01	1.74E-01	1.05E-01	7.25E-01	4.40E-01
Silver	7440-22-4	1.24E+02	1.66E+01	turkey	Matuk et al. 1981	222	22.2	rat	0.35	Matuk et al. 1981	1.24E+02	1.66E+01	1.24E+02	1.66E+01	3.89E+02	3.89E+01	1.17E+02	1.17E+01	4.88E+02	4.88E+01
Zinc	7440-66-6	1.31E+02	1.45E+01	white leghorn hen	ORNL 1996	320	160	rat	0.35	ORNL 1996	1.31E+02	1.45E+01	1.31E+02	1.45E+01	5.61E+02	2.81E+02	1.69E+02	8.44E+01	7.03E+02	3.52E+02
Low-Molec Wt PAHs																				
Anthracene	120-12-7	--	--	--	USACE 1998	3300	330	rodents	0.165	USACE 1998	NV	NV	NV	NV	4.80E+03	4.80E+02	1.44E+03	1.44E+02	6.01E+03	6.01E+02
PAHs																				
Acenaphthene	83-32-9	5.05E+00	1.01E+00	red-winged blackbird	USACE 1998	87.5	17.5	mouse	0.03	USACE 1998	5.05E+00	1.01E+00	5.05E+00	1.01E+00	8.30E+01	1.66E+01	2.50E+01	4.99E+00	1.04E+02	2.08E+01
Acenaphthylene	208-96-8	--	--	--	USACE 1998	500	100	rat	0.35	USACE 1998	NV	NV	NV	NV	8.77E+02	1.75E+02	2.64E+02	5.27E+01	1.10E+03	2.20E+02
Benzo(a)anthracene	56-55-3	--	--	--	USACE 1998	2	0.2	rodents	0.165	USACE 1998	NV	NV	NV	NV	2.91E+00	2.91E-01	8.74E-01	8.74E-02	3.64E+00	3.64E-01
Benzo(a)pyrene	50-32-8	2.50E+00	5.00E-01	duck	ORNL 1996	10	1	mouse	0.03	ORNL 1996	2.50E+00	5.00E-01	2.50E+00	5.00E-01	9.49E+00	9.49E-01	2.85E+00	2.85E-01	1.19E+01	1.19E+00
Benzo(b)fluoranthene	205-99-2	--	--	--	ORNL 1996	10	1	mouse	0.03	ORNL 1996	NV	NV	NV	NV	9.49E+00	9.49E-01	2.85E+00	2.85E-01	1.19E+01	1.19E+00
Benzo(g,h,i)perylene	191-24-2	--	--	--	USACE 1998	2.5	0.5	mouse	0.03	USACE 1998	NV	NV	NV	NV	2.37E+00	4.74E-01	7.13E-01	1.43E-01	2.97E+00	5.95E-01
Benzo(k)fluoranthene	207-08-9	--	--	--	USACE 1998	72	7.2	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.05E+02	1.05E+01	3.15E+01	3.15E+00	1.31E+02	1.31E+01
Chrysene	218-01-9	--	--	--	USACE 1998	99	9.9	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.44E+02	1.44E+01	4.32E+01	4.32E+00	1.80E+02	1.80E+01
Dibenzo(a,h)anthracene	53-70-3	--	--	--	USACE 1998	13.33	1.333	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.94E+01	1.94E+00	5.82E+00	5.82E-01	2.43E+01	2.43E+00
Fluoranthene	206-44-0	--	--	--	USACE 1998	100	20	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.45E+02	2.91E+01	4.37E+01	8.74E+00	1.82E+02	3.64E+01
Fluorene	86-73-7	5.05E+00	1.01E+00	red-winged blackbird	USACE 1998	2.5	0.5	mouse	0.03	USACE 1998	5.05E+00	1.01E+00	5.05E+00	1.01E+00	2.37E+00	4.74E-01	7.13E-01	1.43E-01	2.97E+00	5.95E-01
Indeno(1,2,3-cd)pyrene	193-39-5	--	--	--	USACE 1998	72	7.2	rodents	0.165	USACE 1998	NV	NV	NV	NV	1.05E+02	1.05E+01	3.15E+01	3.15E+00	1.31E+02	1.31E+01
Phenanthrene	85-01-8	5.65E+00	1.13E+00	red-winged blackbird	USACE 1998	35	7	mouse	0.03	USACE 1998	5.65E+00	1.13E+00	5.65E+00	1.13E+00	3.32E+01	6.64E+00	9.98E+00	2.00E+00	4.16E+01	8.32E+00
Pyrene	129-00-0	--	--	--	USACE 1998	40	8	mouse	0.03	USACE 1998	NV	NV	NV	NV	3.80E+01	7.59E+00	1.14E+01	2.28E+00	4.76E+01	9.51E+00
Exposives																				
1,3,5-Trinitrobenzene[4]	99-35-4	--	--	--	--	13.31	2.68	Rat	0.325	USCHPPM 2001a	NV	NV	NV	NV	2.29E+01	4.61E+00	6.89E+00	1.39E+00	2.87E+01	5.78E+00
2,4,6-Trinitrotoluene[5,7]	118-96-7	1.8	0.07	Northern Bobwhite	USCHPPM 2001b	8	2	Dog (beagle)	14	USCHPPM 2001b (Levine et al. 1990)	1.80E+00	7.00E-02	1.80E+00	7.00E-02	3.53E+01	8.82E+00	1.06E+01	2.65E+00	4.42E+01	1.11E+01
2,4-Dinitrotoluene[1]	121-14-2	1.25	0.1	Northern Bobwhite	Johnson et al. 2005a	--	--	--	--	--	1.25E+00	1.00E-01	1.25E+00	1.00E-01	NV	NV	NV	NV	NV	NV
2,6-Dinitrotoluene[2]	606-20-2	1.25	0.1	Northern Bobwhite	Johnson et al. 2005a	--	--	--	--	--	1.25E+00	1.00E-01	1.25E+00	1.00E-01	NV	NV	NV	NV	NV	NV
HMX[6]	2691-41-0	--	--	--	--	62.5	9	Mouse	0.035	USCHPPM 2001c	NV	NV	NV	NV	6.16E+01	8.88E+00	1.85E+01	2.67E+00	7.72E+01	1.11E+01
Nitroglycerin[4]	55-63-0	--	--	--	--	32	3	Rat	0.325	USCHPPM 2007	NV	NV	NV	NV	5.51E+01	5.16E+00	1.66E+01	1.55E+00	6.90E+01	6.47E+00
Dioxin/Furans																				
2,3,7,8-TCDD	1746-01-6	1.40E-04	1.40E-05	ring-necked pheasant	ORNL 1996	0.00001	0.000001	mouse	0.03	ORNL 1996	1.40E-04	1.40E-05	1.40E-04	1.40E-05	9.49E-06	9.49E-07	2.85E-06	2.85E-07	1.19E-05	1.19E-06

Notes:

CAS = Chemical Abstract Service
TRV = Toxic Reference Value
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
mg/kg = Milligram Per Kilogram
bw/d = Body Weight Per Day
kg = kilogram
PAH = Polynuclear Aromatic Hydrocarbon
USACE = U.S. Army Corps of Engineers
ORNL = Oak Ridge National Laboratory
NOAEL and LOAEL values were derived from acute values by applying an uncertainty factor of 150.
LD_{50} = Lethal Dose for 50% of test organisms

Sources:

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USACE 1998. U.S. Army Corps of Engineers (USACE). 1998. Final Ecological Risk Assessment, RCRA Facility Investigation, for Sunflower Army Ammunition Plant, De Soto, Kansas. USACE Kansas City District.
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U.S. EPA 1988. Recommendations for and documentation of biological values for use in risk assessment. Environmental Criteria and Assessment Office. Cincinnati, OH. EPA/600/6-87/008.

[1] - Avian TRVs derived from subchronic NOAEL value of 1 and subchronic LOAEL value of 5 from a northern bobwhite and applying an uncertainty factor of 10 and 4 to derive NOAEL-based and LOAEL-based TRVs.
[2] - Used 2,4-dinitrotoluene avian TRVs as surrogate.
[3] - Avian chronic NOAEL TRV derived from subchronic NOAEL value of 26 from a northern bobwhite and applying an uncertainty factor of 10. Mammalian chronic NOAEL TRV derived from Chronic LOAEL value of 40 from a rat and applying an uncertainty factor of 5.
[4]- Mature rat body weight (average male & female) = 0.325 kg (U.S. EPA, 1988).
[5]- Mature Bobwhite Body Weight (seasonal average) = 0.191 kg (U.S. EPA, 1993).
[6]- Mature mouse body weight (female) = 0.035 kg (U.S.EPA, 1988).
[7]- Mature dog body weight (average male & female) = 14 kg (U.S. EPA, 1988).

Table F.2-11
Soil Biocaccumulation/Bioconcentration Factors- Soil to Plant Pathway
Screening Level Ecological Risk Assessment
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

					Preliminary Assessment		Refined Assessment			
Chemical	**CAS**	**Log K_{ow} Range**	**Selected K_{ow}**	**Source**	**BAF**	**Basis**	**C_s EPC (mg/kg)**	**BAF[1]**	**Basis**	**Source**
Inorganics										
ARSENIC	7440-38-2	-- - --	--	--	1.103	90th percentile	2.794	0.0375	Median	Bechtel Jacobs 1998
CADMIUM	7440-43-9	-- - --	--	--	3.25	90th percentile	1.401	0.5336	$C_p = e^{(0.546*ln(Cs) - 0.475)}$	Bechtel Jacobs 1998
CHROMIUM	7440-47-3	-- - --	--	--	0.084	90th percentile	29.38	0.0410	Median	Bechtel Jacobs 1998
COPPER	7440-50-8	-- - --	--	--	0.625	90th percentile	106.3	0.1154	$C_p = e^{(0.394*ln(Cs) + 0.668)}$	Bechtel Jacobs 1998
LEAD	7439-92-1	-- - --	--	--	0.468	90th percentile	721.8	0.0147	$C_p = e^{(0.561*ln(Cs) - 1.328)}$	Bechtel Jacobs 1998
MERCURY	7439-97-6	-- - --	--	--	5	90th percentile	0.0698	1.2447	$C_p = e^{(0.544*ln(Cs) - 0.995)}$	Bechtel Jacobs 1998
NICKEL	7440-02-0	-- - --	--	--	1.411	90th percentile	NC	NC	$C_p = e^{(0.748*ln(Cs) + 2.223)}$	Bechtel Jacobs 1998
SELENIUM	7782-49-2	-- - --	--	--	3.012	90th percentile	0.582	0.4803	$C_p = e^{(1.104*ln(Cs) - 0.677)}$	Bechtel Jacobs 1998
SILVER	7440-22-4	-- - --	--	--	0.037	90th percentile	NC	0.0140	Median	Bechtel Jacobs 1998
ZINC	7440-66-6	-- - --	--	--	1.82	90th percentile	668	0.2656	$C_p = e^{(0.554*ln(Cs) + 1.575)}$	Bechtel Jacobs 1998
VOCs and SVOCs										
ACENAPHTHENE	83-32-9	3.77 - 4.49	3.92	USEPA 1995	4.6	Anthracene as Surrogate	NC	NC	$C_p = e^{(-0.8556*ln(Cs) - 5.562)}$	USEPA 2005
ACENAPHTHYLENE	208-96-8	-- - --	4.1	USEPA 1995	4.6	Anthracene as Surrogate	NC	NC	$C_p = e^{(0.791*ln(Cs) - 1.144)}$	USEPA 2005
ANTHRACENE	120-12-7	4.44 - 4.8	4.55	USEPA 1995	4.6	Maximum	NC	NC	$C_p = e^{(0.778*ln(Cs) - 0.989)}$	USEPA 2005
BENZO(A)ANTHRACENE	56-55-3	5.61 - 5.79	5.7	USEPA 1995	0.54	Maximum	0.0905	0.1767	$C_p = e^{(0.5944*ln(Cs) - 2.708)}$	USEPA 2005
BENZO(A)PYRENE	50-32-8	5.98 - 6.34	6.11	USEPA 1995	3.3	Maximum	0.0743	0.1358	$C_p = e^{(0.975*ln(Cs) - 2.0615)}$	USEPA 2005
BENZO(B)FLUORANTHENE	205-99-2	5.79 - 6.4	6.2	USEPA 1995	0.48	Maximum	0.1648	0.31	Median BAF	USEPA 2005
BENZO(G,H,I)PERYLENE	191-24-2	6.58 - 7.05	6.7	USEPA 1995	1.6	Maximum	0.0461	0.2245	$C_p = e^{(1.183*ln(Cs) - 0.931)}$	USEPA 2005
BENZO(K)FLUORANTHENE	207-08-9	6.12 - 6.27	6.2	USEPA 1995	1	Maximum	NC	NC	$C_p = e^{(0.860*ln(Cs) - 2.158)}$	USEPA 2005
CHRYSENE	218-01-9	5.41 - 5.79	5.7	USEPA 1995	1.05	Maximum	NC	NC	$C_p = e^{(0.594*ln(Cs) - 2.708)}$	USEPA 2005
DIBENZO(A,H)ANTHRACENE	53-70-3	6.5 - 6.88	6.69	USEPA 1995	0.23	Maximum	NC	0.13	Median BAF	USEPA 2005
FLUORANTHENE	206-44-0	4.84 - 5.39	5.12	USEPA 1995	6	Maximum	NC	0.50	Median BAF	USEPA 2005
FLUORENE	86-73-7	4.04 - 4.4	4.21	USEPA 1995	0.057	Maximum	NC	NC	$C_p = e^{(-0.856*ln(Cs) - 5.562)}$	USEPA 2005
INDENO(1,2,3-CD)PYRENE	193-39-5	6.58 - 6.72	6.65	USEPA 1995	0.15	Maximum	NC	0.11	Median BAF	USEPA 2005
PHENANTHRENE	85-01-8	4.37 - 4.57	4.55	USEPA 1995	11	Maximum	NC	NC	$C_p = e^{(0.620*ln(Cs) - 0.167)}$	USEPA 2005
PYRENE	129-00-0	4.76 - 5.52	5.11	USEPA 1995	3.7	Maximum	NC	0.72	Median BAF	USEPA 2005
Explosives										
1,3,5-TNB	99-35-4	-- - --	1.6	SRC	8.46	TNT as surrogate	NC	4.23	TNT as surrogate	--
2,4-DNT	121-14-2	-- - --	1.6	SRC	8.46	TNT as surrogate	0.17	4.23	TNT as surrogate	--
2,6-DNT	606-20-2	-- - --	1.6	SRC	8.46	TNT as surrogate	0.39	4.23	TNT as surrogate	--
2,4,6-TNT	118-96-7	-- - --	1.6	SRC	8.46	Maximum	0.792	4.23	Median BAF	USEPA 2005
HMX	2691-41-0	-- - --	0.87	SRC	5.26	RDX as surrogate	NC	0.43	RDX as surrogate	--
NITROGLYCERIN	55-63-0	-- - --	1.6	SRC	1	Default Value	NC	1	Default Value	--
Dioxin/Furans										
2,3,7,8-TCDD	1746-01-6	6.42 - 7.02	6.53	USEPA 1995	0.0075	K_{ow} Regression Eq.	0.00000228	0.0065	K_{ow} Regression Eq.	Travis and Arms 1988

Notes:
CAS = Chemical Abstract Services
BAF = Bioaccumulation Factor
K_{ow} = Chemical octanol-water coefficient
NC = Not Calculated
C_s = Chemical Concentration in Soil
C_p = Chemical Concentration in Plant Matter (dry weight)
[1] = BAFs for chemical using Cp regression equation calculated by as follows: BAF = C_p/C_s

Source(s):

USEPA 1995: United States Environmental Protection Agency. 1995. Karickhoff, S.W. , and J.M. Long. Summary of Measured, Calculated, and Recommended Log K_{ow} Values. Environmental Research Laboratory. Athens, Georgia.
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K_{ow} Regression Equation: BAF =10^((-0.578*K_{ow})+1.588))

Table F.2-12
Soil Biocaccumulation/Bioconcentration Factors - Soil to Invertebrate Pathway
Screening Level Ecological Risk Assessment
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

							Preliminary Assessment		Refined Assessment			
Chemical	CAS	Log K_{ow} Range	Selected Log K_{ow}	Reference	K_{oc}	Reference	Value	Basis	C_s EPC (mg/kg)	BAF[1]	Basis	Source
Inorganics												
ARSENIC	7440-38-2	-- - --	--	--	--	--	0.52	90th percentile	2.794	0.1785	$C_e = e^{(0.706*\ln(Cs) - 1.421)}$	Sample et al. 1998
CADMIUM	7440-43-9	-- - --	--	--	--	--	40.7	90th percentile	1.401	7.7282	$C_e = e^{(0.795*\ln(Cs) + 2.114)}$	Sample et al. 1998
CHROMIUM	7440-47-3	-- - --	--	--	--	--	3.16	90th percentile	29.38	0.306	Median	Sample et al. 1998
COPPER	7440-50-8	-- - --	--	--	--	--	1.53	90th percentile	106.3	0.515	Median	Sample et al. 1998
LEAD	7439-92-1	-- - --	--	--	--	--	1.52	90th percentile	721.8	0.2258	$C_e = e^{(0.807*\ln(Cs) - 0.218)}$	Sample et al. 1998
MERCURY	7439-97-6	-- - --	--	--	--	--	20.6	90th percentile	0.0698	1.693	Median	Sample et al. 1998
NICKEL	7440-02-0	-- - --	--	--	--	--	4.73	90th percentile	NC	1.059	Median	Sample et al. 1998
SELENIUM	7782-49-2	-- - --	--	--	--	--	1.34	90th percentile	0.582	1.072	$C_e = e^{(0.733*\ln(Cs) - 0.075)}$	Sample et al. 1998
SILVER	7440-22-4	-- - --	--	--	--	--	15.3	90th percentile	NC	2.045	Median	Sample et al. 1998
ZINC	7440-66-6	-- - --	--	--	--	--	12.9	90th percentile	668	1.0813	$C_e = e^{(0.328*\ln(Cs) + 4.449)}$	Sample et al. 1998
VOCs and SVOCs												
ACENAPHTHENE	83-32-9	3.77 - 4.49	3.92	USEPA 1995	1.09E+04	USEPA 2005	6.33	Jager Model	NC	2.02	Jager Model	USEPA 2005
ACENAPHTHYLENE	208-96-8	-- - --	4.07	USEPA 1995	9.47E+02	USEPA 2005	31.41	Jager Model	NC	31.41	Jager Model	USEPA 2005
ANTHRACENE	120-12-7	4.44 - 4.8	4.55	USEPA 1995	2.35E+04	USEPA 2005	5.46	Jager Model	NC	3.31	Jager Model	USEPA 2005
BENZO(A)ANTHRACENE	56-55-3	5.61 - 5.79	5.7	USEPA 1995	3.58E+05	USEPA 2005	2.61	Jager Model	0.0905	2.18	Jager Model	USEPA 2005
BENZO(A)PYRENE	50-32-8	5.98 - 6.34	6.11	USEPA 1995	9.69E+05	USEPA 2005	2.90	Jager Model	0.0743	1.83	Jager Model	USEPA 2005
BENZO(B)FLUORANTHENE	205-99-2	5.79 - 6.4	6.2	USEPA 1995	5.96E+05	USEPA 2005	5.31	Jager Model	0.1648	3.56	Jager Model	USEPA 2005
BENZO(G,H,I)PERYLENE	191-24-2	6.58 - 7.05	6.7	USEPA 1995	1.43E+06	USEPA 2005	8.14	Jager Model	0.0461	4.04	Jager Model	USEPA 2005
BENZO(K)FLUORANTHENE	207-08-9	6.12 - 6.27	6.2	USEPA 1995	5.96E+05	USEPA 2005	4.09	Jager Model	NC	3.56	Jager Model	USEPA 2005
CHRYSENE	218-01-9	5.41 - 5.79	5.7	USEPA 1995	2.48E+05	USEPA 2005	3.76	Jager Model	NC	3.14	Jager Model	USEPA 2005
DIBENZO(A,H)ANTHRACENE	53-70-3	6.5 - 6.88	6.69	USEPA 1995	1.79E+06	USEPA 2005	4.63	Jager Model	NC	3.16	Jager Model	USEPA 2005
FLUORANTHENE	206-44-0	4.84 - 5.39	4.95	USEPA 1995	4.17E+04	USEPA 2005	10.04	Jager Model	NC	4.16	Jager Model	USEPA 2005
FLUORENE	86-73-7	4.04 - 4.4	4.18	USEPA 1995	2.83E+03	USEPA 2005	20.36	Jager Model	NC	13.1	Jager Model	USEPA 2005
INDENO(1,2,3-CD)PYRENE	193-39-5	6.58 - 6.72	6.58	USEPA 1995	1.17E+06	USEPA 2005	5.14	Jager Model	NC	3.91	Jager Model	USEPA 2005
PHENANTHRENE	85-01-8	4.37 - 4.57	4.55	USEPA 1995	3.30E+04	USEPA 2005	2.45	Jager Model	NC	2.36	Jager Model	USEPA 2005
PYRENE	129-00-0	4.76 - 5.52	4.88	USEPA 1995	6.27E+04	USEPA 2005	8.66	Jager Model	NC	2.4	Jager Model	USEPA 2005
Explosives												
1,3,5-TNB	99-35-4	-- - --	--	--	--	--	1	Default Value	NC	1	Default Value	--
2,4-DNT	121-14-2	-- - --	--	--	--	--	1	Default Value	0.17	1	Default Value	--
2,6-DNT	606-20-2	-- - --	--	--	--	--	1	Default Value	0.39	1	Default Value	--
2,4,6-TNT	118-96-7	-- - --	--	--	--	--	1	Default Value	0.792	1	Default Value	--
HMX	2691-41-0	-- - --	--	--	--	--	1	Default Value	NC	1	Default Value	--
NITROGLYCERIN	55-63-0	-- - --	--	--	--	--	1	Default Value	NC	1	Default Value	--
Dioxin/Furans												
2,3,7,8-TCDD	1746-01-6	6.42 - 7.02	6.53	USEPA 1995	--	--	22.2	90th percentile	0.00000228	11.0	Median	Sample et al. 1998

Notes:
CAS = Chemical Abstract Services
C_s = Chemical Concentration in Soil
C_e = Chemical Concentration in Earthworm (dry weight)
K_{ow} = Chemical octanol-water coefficient
K_{oc} = Chemical water to soil partitioning coefficient
K_{ww} = Chemical worm to soil partitioning coefficient
foc = mean fraction organic content in soil (0.0073 mean from physical samples - see Appendix C.1)
[1] = BAFs for chemical using Ce regression equation calculated by as follows: BAF = C_e/C_s

Source(s):

USEPA 1995: United States Environmental Protection Agency. Karickhoff, S.W. , and J.M. Long. 1995. Summary of Measured, Calculated, and Recommended Log K_{ow} Values. Environmental Research Laboratory. Athens, Georgia.
Jones et al. 1997: Jones et al. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment-Associated Biota: 1997 Revision
Sample et al. 1998: Sample, B.E., Beauchamp, J.J., Efroymson, R.A., Sutter, G.W., Ashwood, T.L., February 1998. Development and Validation of Bioaccumulation Models for Earthworms.
Jager Model: As presented in USEPA 2005, Guidance for Developing Ecological Screening Levels, Appendix 4-1, Table 5.
BAF = K_{ww}(L/kg worl dw)/K_d (L/kg soil dw)
K_{ww} (dry weight) = 10^(0.87*logK_{ow} - 2.0) / 0.16
Wet weight to dry weight assuming 16% solids
$K_d = f_{oc} * K_{oc}$
foc = 0.0073 from site-specific physical soil data
Note: The maximum Kow utilized for the preliminary calculation and the Selected Kow utilized for the refined calculation.
Edwards and Bohlen 1992: Edwards, C.A. and Bohlen, P.J. 1992. The effects of toxic chemicals on earthworms. Reviews of Environmental Contamination and Toxicology, 125: 23-99.
USEPA 2005: United States Environmental Protection Agency (USEPA). February 2005. Guidance for Developing Ecological Soil Screening Levels.
SRC/CF: Syracuse Research Corporation (SRC). Physical Properties Database. http://www.syrres.com/esc/physdemo.htm

Table F.2-13
Soil Bioaccumulation/Bioconcentration Factors - Soil to Mammal Pathway
Screening Level Ecological Risk Assessment
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

					Preliminary Assessment		Refined Assessment			
Chemical	**CAS**	**Log K_{ow} Range**	**Selected K_{ow}**	**Reference**	**Value**	**Basis**	**C_s (mg/kg)**	**BAF[1]**	**Basis**	**Source**
Inorganics										
ARSENIC	7440-38-2	-- - --	--	--	0.0149	90th percentile	2.794	0.0065	$C_m = e^{(0.819*\ln(Cs) - 4.847)}$	Sample et al. 1998
CADMIUM	7440-43-9	-- - --	--	--	3.991	90th percentile	1.401	0.2381	$C_m = e^{(0.472*\ln(Cs) - 1.257)}$	Sample et al. 1998
CHROMIUM	7440-47-3	-- - --	--	--	0.333	90th percentile	29.38	0.0944	$C_m = e^{(0.734*\ln(Cs) - 1.46)}$	Sample et al. 1998
COPPER	7440-50-8	-- - --	--	--	1.045	90th percentile	106.3	0.1422	$C_m = e^{(0.144*\ln(Cs) + 2.042)}$	Sample et al. 1998
LEAD	7439-92-1	-- - --	--	--	0.286	90th percentile	721.8	0.0275	$C_m = e^{(0.442*\ln(Cs) + 0.0761)}$	Sample et al. 1998
MERCURY	7439-97-6	-- - --	--	--	0.192	90th percentile	0.0698	0.0543	Median	Sample et al. 1998
NICKEL	7440-02-0	-- - --	--	--	0.589	90th percentile	NC	NC	$C_m = e^{(0.466*\ln(Cs) - 0.246)}$	Sample et al. 1998
SELENIUM	7782-49-2	-- - --	--	--	1.187	90th percentile	0.582	0.9247	$C_m = e^{(0.376*\ln(Cs) -0.416)}$	Sample et al. 1998
SILVER	7440-22-4	-- - --	--	--	0.501	90th percentile	NC	0.0040	Median	Sample et al. 1998
ZINC	7440-66-6	-- - --	--	--	2.69	90th percentile	668	0.1860	$C_m = e^{(0.071*\ln(Cs) + 4.363)}$	Sample et al. 1998
VOCs and SVOCs										
ACENAPHTHENE	83-32-9	3.77 - 4.49	3.92	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
ACENAPHTHYLENE	208-96-8	-- - --	4.07	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
ANTHRACENE	120-12-7	4.44 - 4.8	4.55	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
BENZO(A)ANTHRACENE	56-55-3	5.61 - 5.79	5.7	USEPA 1995	1	Default Value	0.0905	0	--	USEPA 2005
BENZO(A)PYRENE	50-32-8	5.98 - 6.34	6.11	USEPA 1995	1	Default Value	0.0743	0	--	USEPA 2005
BENZO(B)FLUORANTHENE	205-99-2	5.79 - 6.4	6.2	USEPA 1995	1	Default Value	0.1648	0	--	USEPA 2005
BENZO(G,H,I)PERYLENE	191-24-2	6.58 - 7.05	6.7	USEPA 1995	1	Default Value	0.0461	0	--	USEPA 2005
BENZO(K)FLUORANTHENE	207-08-9	6.12 - 6.27	6.2	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
CHRYSENE	218-01-9	5.41 - 5.79	5.7	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
DIBENZO(A,H)ANTHRACENE	53-70-3	6.5 - 6.88	6.69	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
FLUORANTHENE	206-44-0	4.84 - 5.39	5.12	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
FLUORENE	86-73-7	4.04 - 4.4	4.21	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
INDENO(1,2,3-CD)PYRENE	193-39-5	6.58 - 6.72	6.65	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
PHENANTHRENE	85-01-8	4.37 - 4.57	4.55	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
PYRENE	129-00-0	4.76 - 5.52	5.11	USEPA 1995	1	Default Value	NC	0	--	USEPA 2005
Explosives										
1,3,5-TNB	99-35-4	-- - --	--	--	1	Default Value	NC	0	TNT as surrogate	--
2,4-DNT	121-14-2	-- - --	--	--	1	Default Value	0.17	0	TNT as surrogate	--
2,6-DNT	606-20-2	-- - --	--	--	1	Default Value	0.39	0	TNT as surrogate	--
2,4,6-TNT	118-96-7	-- - --	--	--	1	Default Value	0.792	0	Cm = 0	USEPA 2005
HMX	2691-41-0	-- - --	--	--	1	Default Value	NC	0	RDX as surrogate	--
NITROGLYCERIN	55-63-0	-- - --	--	--	1	Default Value	NC	0	TNT as surrogate	--
Dioxin/Furans										
2,3,7,8-TCDD	1746-01-6	6.42 - 7.02	6.53	USEPA 1995	2.2	90th percentile	0.00000959	0.7199	$C_m = e^{(0.1089*\ln(Cs) + 0.7044)}$	Sample et al. 1998

Notes:
CAS = Chemical Abstract Services
C_s = Chemical Concentration in Soil
C_d = Chemical Concentration in Prey (assumed to be 100% earthworms (dry weight))
C_m = Chemical Concentration in Mammal (dry weight)
K_{ow} = Chemical octanol to water partitioning coefficient
[1] = BAFs for chemical using Ce regression equation calculated by as follows: BAF = C_m/C_s

Source(s):

USEPA 1995: United States Environmental Protection Agency. Karickhoff, S.W. , and J.M. Long. 1995. Summary of Measured, Calculated, and Recommended Log K_{ow} Values. Environmental Research Laboratory. Athens, Georgia.
Sample et al. 1998: Sample et al. 1998. Development and Validation of Bioaccumulation Models for Small Mammals.
Jones et al. 1997: Jones et al. 1997. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment-Associated Biota: 1997 Revision
USEPA 2005: United States Environmental Protection Agency (USEPA). February 2005. Guidance for Developing Ecological Soil Screening Levels.

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Table F.2-14
Preliminary Wildlife Risk Characterization - Meadow Vole
Screening Level Ecological Risk Assessment
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment – Soil: Maximum Detected Concentration (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics													
Arsenic	7440-38-2	1.20E-01	1.20E+00	5.6	1.1E+00	6.2E+00	1.8E-01	1.8E+00	**3.1E+01**	**3.1E+00**	**Y**	2.794	**1.5E+01**
Cadmium	7440-43-9	1.69E+00	1.69E+01	2.6	3.3E+00	8.5E+00	8.8E-01	8.8E+00	**3.0E+00**	3.0E-01	**Y**	1.401	**1.6E+00**
Chromium	7440-47-3	5.75E+00	5.75E+01	39	8.4E-02	3.3E+00	9.1E+01	9.1E+02	4.3E-01	4.3E-02	N	--	--
Copper	7440-50-8	2.67E+01	3.51E+01	260	6.3E-01	1.6E+02	7.0E+01	9.2E+01	**3.7E+00**	**2.8E+00**	**Y**	106.3	**1.5E+00**
Lead	7439-92-1	1.40E+01	1.40E+02	8,620	4.7E-01	4.0E+03	4.8E+01	4.8E+02	**1.8E+02**	**1.8E+01**	**Y**	721.8	**1.5E+01**
Mercury	7439-97-6	3.01E+01	3.01E+02	0.14	5.0E+00	7.0E-01	1.0E+01	1.0E+02	1.4E-02	1.4E-03	N	--	--
Nickel	7440-02-0	7.01E+01	1.40E+02	22	1.4E+00	3.1E+01	8.3E+01	1.7E+02	2.6E-01	1.3E-01	N	--	--
Selenium	7782-49-2	3.51E-01	5.79E-01	0.885	3.0E+00	2.7E+00	2.0E-01	3.2E-01	**4.5E+00**	**2.7E+00**	**Y**	0.582	**3.0E+00**
Silver	7440-22-4	3.89E+01	3.89E+02	0.16	3.7E-02	5.9E-03	1.1E+03	1.1E+04	1.5E-04	1.5E-05	N	--	--
Zinc	7440-66-6	2.81E+02	5.61E+02	1,600	1.8E+00	2.9E+03	2.6E+02	5.2E+02	**6.2E+00**	**3.1E+00**	**Y**	668	**2.6E+00**
TCL SVOCs													
Acenaphthene	83-32-9	1.66E+01	8.30E+01	0.019	4.6E+00	8.7E-02	6.1E+00	3.1E+01	3.1E-03	6.2E-04	N	--	--
Acenaphthylene	208-96-8	1.75E+02	8.77E+02	0.018	4.6E+00	8.3E-02	6.4E+01	3.2E+02	2.8E-04	5.6E-05	N	--	--
Anthracene	120-12-7	4.80E+02	4.80E+03	0.037	4.6E+00	1.7E-01	1.8E+02	1.8E+03	2.1E-04	2.1E-05	N	--	--
Benzo(a)anthracene	56-55-3	2.91E-01	2.91E+00	0.17	5.4E-01	9.2E-02	8.8E-01	8.8E+00	1.9E-01	1.9E-02	N	--	--
Benzo(a)pyrene	50-32-8	9.49E-01	9.49E+00	0.13	3.3E+00	4.3E-01	4.9E-01	4.9E+00	2.7E-01	2.7E-02	N	--	--
Benzo(b)fluoranthene	205-99-2	9.49E-01	9.49E+00	0.205	4.8E-01	9.8E-02	3.2E+00	3.2E+01	6.4E-02	6.4E-03	N	--	--
Benzo(g,h,i)perylene	191-24-2	4.74E-01	2.37E+00	0.083	1.6E+00	1.3E-01	5.0E-01	2.5E+00	1.7E-01	3.3E-02	N	--	--
Benzo(k)fluoranthene	207-08-9	1.05E+01	1.05E+02	0.089	1.0E+00	8.9E-02	1.7E+01	1.7E+02	5.1E-03	5.1E-04	N	--	--
Chrysene	218-01-9	1.44E+01	1.44E+02	0.19	1.1E+00	2.0E-01	2.3E+01	2.3E+02	8.3E-03	8.3E-04	N	--	--
Dibenz(a,h)anthracene	53-70-3	1.94E+00	1.94E+01	0.035	2.3E-01	8.1E-03	1.3E+01	1.3E+02	2.7E-03	2.7E-04	N	--	--
Fluoranthene	206-44-0	2.91E+01	1.45E+02	0.37	6.0E+00	2.2E+00	8.2E+00	4.1E+01	4.5E-02	9.0E-03	N	--	--
Fluorene	86-73-7	4.74E-01	2.37E+00	0.02	5.7E-02	1.1E-03	1.0E+01	5.0E+01	2.0E-03	4.0E-04	N	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	1.05E+01	1.05E+02	0.074	1.5E-01	1.1E-02	1.0E+02	1.0E+03	7.2E-04	7.2E-05	N	--	--
Phenanthrene	85-01-8	6.64E+00	3.32E+01	0.17	1.1E+01	1.9E+00	1.0E+00	5.1E+00	1.7E-01	3.3E-02	N	--	--
Pyrene	129-00-0	7.59E+00	3.80E+01	0.26	3.7E+00	9.6E-01	3.5E+00	1.7E+01	7.5E-02	1.5E-02	N	--	--
Explosives													
1,3,5-Trinitrobenzene	99-35-4	4.61E+00	2.29E+01	0.1985	8.5E+00	1.7E+00	9.2E-01	4.6E+00	2.1E-01	4.3E-02	N	--	--
2,4,6-Trinitrotoluene	118-96-7	8.82E+00	3.53E+01	3	8.5E+00	2.5E+01	1.8E+00	7.1E+00	**1.7E+00**	4.2E-01	**Y**	0.792	4.5E-01
2,4-Dinitrotoluene	121-14-2	NV	NV	0.17	8.5E+00	1.4E+00	--	--	**--**	**--**	--	--	--
2,6-Dinitrotoluene	606-20-2	NV	NV	0.39	8.5E+00	3.3E+00	--	--	**--**	**--**	--	--	--
HMX	2691-41-0	8.88E+00	6.16E+01	0.72	5.3E+00	3.8E+00	2.9E+00	2.0E+01	2.5E-01	3.6E-02	N	--	--
Nitroglycerin/PETN													
Nitroglycerin	55-63-0	5.16E+00	5.51E+01	2.11	1.0E+00	2.1E+00	8.6E+00	9.1E+01	2.5E-01	2.3E-02	N	--	--
Dioxin/Furans													
2,3,7,8-TCDD TEQ	1746-01-6	9.49E-07	9.49E-06	0.00000228	7.5E-03	1.7E-08	5.1E-05	5.1E-04	4.5E-02	4.5E-03	N	--	--

Notes:

CAS = Chemical Abstract Services
C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)
ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10
BW = Minimum Body Weigth of Receptor (kg)
IR_{food} = Maximum Ingestion Rate for Food
BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)
DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)
IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)
AF = 100% Area Use Factor
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
mg/kg = Milligram Per Kilogram
bw - day = Body Weight - Day
HQ = Hazard Quotient
TRV = Toxicity Reference Value
EPC = Exposure Point Concentration

Meadow Vole Specific Data from Table F.2-9

BW=	0.017	kg
IR_{food} =	0.010	kg dw/day
BAF_{food}=	Chem Specific	unitless
IR_{soil} =	0.00024	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Concentration
LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Concentration
EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.2-15
Refined Wildlife Risk Characterization - Meadow Vole
Screening Level Ecological Risk Assessment
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment						
				Soil						
				EPC (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics										
Arsenic	7440-38-2	1.20E-01	1.20E+00	2.794	3.8E-02	1.0E-01	9.0E+00	9.0E+01	3.1E-01	3.1E-02
Cadmium	7440-43-9	1.69E+00	1.69E+01	1.401	5.3E-01	7.5E-01	1.4E+01	1.4E+02	1.0E-01	1.0E-02
Copper	7440-50-8	2.67E+01	3.51E+01	106.3	1.2E-01	1.2E+01	8.9E+02	1.2E+03	1.2E-01	9.1E-02
Lead	7439-92-1	1.40E+01	1.40E+02	721.8	1.5E-02	1.1E+01	1.7E+03	1.7E+04	4.3E-01	4.3E-02
Selenium	7782-49-2	3.51E-01	5.79E-01	0.582	4.8E-01	2.8E-01	3.2E+00	5.3E+00	1.8E-01	1.1E-01
Zinc	7440-66-6	2.81E+02	5.61E+02	668	2.7E-01	1.8E+02	4.5E+03	9.0E+03	1.5E-01	7.4E-02
Explosives										
2,4,6-Trinitrotoluene	118-96-7	8.82E+00	3.53E+01	0.792	4.2E+00	3.4E+00	9.6E+00	3.8E+01	8.3E-02	2.1E-02

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soi)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10

BW = Average Body Weigth of Receptor (kg)

IR_{food} = Average Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor, specific to prey type and chemical

DF = Dietary fraction

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

BDL = Below Detection Limit

EPC = Exposure Point Concentration

Meadow Vole Specific Data from Table F.2-9

BW=	0.037	kg
IR_{food} =	0.008	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{plants} =	1.00	unitless
IR_{soil} =	0.00019	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level

LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Table F.2-16
Preliminary Wildlife Risk Characterization - Short-tailed Shrew
Screening Level Ecological Risk Assessment
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment – Soil: Maximum Detected Concentration (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Most Contaminated Dietary Component	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics																
Arsenic	7440-38-2	1.50E-01	1.50E+00	5.6	1.1E+00	6.2E+00	5.2E-01	2.9E+00	Plant	5.1E-01	5.1E+00	**1.1E+01**	**1.1E+00**	**Y**	2.794	**5.5E+00**
Cadmium	7440-43-9	2.11E+00	2.11E+01	2.6	3.3E+00	8.5E+00	4.1E+01	1.1E+02	Invertebrate	2.2E-01	2.2E+00	**1.2E+01**	**1.2E+00**	**Y**	1.401	**6.5E+00**
Chromium	7440-47-3	7.21E+00	7.21E+01	39	8.4E-02	3.3E+00	3.2E+00	1.2E+02	Invertebrate	9.1E+00	9.1E+01	**4.3E+00**	4.3E-01	**Y**	29.38	**3.2E+00**
Copper	7440-50-8	3.34E+01	4.40E+01	260	6.3E-01	1.6E+02	1.5E+00	4.0E+02	Invertebrate	8.4E+01	1.1E+02	**3.1E+00**	**2.4E+00**	**Y**	106.3	**1.3E+00**
Lead	7439-92-1	1.76E+01	1.76E+02	8,620	4.7E-01	4.0E+03	1.5E+00	1.3E+04	Invertebrate	4.4E+01	4.4E+02	**1.9E+02**	**1.9E+01**	**Y**	721.8	**1.6E+01**
Mercury	7439-97-6	3.77E+01	3.77E+02	0.14	5.0E+00	7.0E-01	2.1E+01	2.9E+00	Invertebrate	7.6E+00	7.6E+01	1.8E-02	1.8E-03	N	--	--
Nickel	7440-02-0	8.79E+01	1.76E+02	22	1.4E+00	3.1E+01	4.7E+00	1.0E+02	Invertebrate	7.5E+01	1.5E+02	2.9E-01	1.5E-01	N	--	--
Selenium	7782-49-2	4.40E-01	7.25E-01	0.885	3.0E+00	2.7E+00	1.3E+00	1.2E+00	Plant	5.8E-01	9.6E-01	**1.5E+00**	9.2E-01	**Y**	0.582	1.0E+00
Silver	7440-22-4	4.88E+01	4.88E+02	0.16	3.7E-02	5.9E-03	1.5E+01	2.4E+00	Invertebrate	1.3E+01	1.3E+02	1.2E-02	1.2E-03	N	--	--
Zinc	7440-66-6	3.52E+02	7.03E+02	1,600	1.8E+00	2.9E+03	1.3E+01	2.1E+04	Invertebrate	1.1E+02	2.3E+02	**1.4E+01**	**7.1E+00**	**Y**	668	**5.9E+00**
TCL SVOCs																
Acenaphthene	83-32-9	2.08E+01	1.04E+02	0.019	4.6E+00	8.7E-02	6.3E+00	1.2E-01	Invertebrate	1.3E+01	6.7E+01	1.4E-03	2.8E-04	N	--	--
Acenaphthylene	208-96-8	2.20E+02	1.10E+03	0.018	4.6E+00	8.3E-02	3.1E+01	5.7E-01	Invertebrate	2.9E+01	1.5E+02	6.2E-04	1.2E-04	N	--	--
Anthracene	120-12-7	6.01E+02	6.01E+03	0.037	4.6E+00	1.7E-01	5.5E+00	2.0E-01	Invertebrate	4.5E+02	4.5E+03	8.3E-05	8.3E-06	N	--	--
Benzo(a)anthracene	56-55-3	3.64E-01	3.64E+00	0.17	5.4E-01	9.2E-02	2.6E+00	4.4E-01	Invertebrate	5.5E-01	5.5E+00	3.1E-01	3.1E-02	N	--	--
Benzo(a)pyrene	50-32-8	1.19E+00	1.19E+01	0.13	3.3E+00	4.3E-01	2.9E+00	3.8E-01	Plant	1.4E+00	1.4E+01	9.0E-02	9.0E-03	N	--	--
Benzo(b)fluoranthene	205-99-2	1.19E+00	1.19E+01	0.205	4.8E-01	9.8E-02	5.3E+00	1.1E+00	Invertebrate	9.1E-01	9.1E+00	2.3E-01	2.3E-02	N	--	--
Benzo(g,h,i)perylene	191-24-2	5.95E-01	2.97E+00	0.083	1.6E+00	1.3E-01	8.1E+00	6.8E-01	Invertebrate	3.0E-01	1.5E+00	2.8E-01	5.5E-02	N	--	--
Benzo(k)fluoranthene	207-08-9	1.31E+01	1.31E+02	0.089	1.0E+00	8.9E-02	4.1E+00	3.6E-01	Invertebrate	1.3E+01	1.3E+02	6.9E-03	6.9E-04	N	--	--
Chrysene	218-01-9	1.80E+01	1.80E+02	0.19	1.1E+00	2.0E-01	3.8E+00	7.1E-01	Invertebrate	1.9E+01	1.9E+02	9.8E-03	9.8E-04	N	--	--
Dibenz(a,h)anthracene	53-70-3	2.43E+00	2.43E+01	0.035	2.3E-01	8.1E-03	4.6E+00	1.6E-01	Invertebrate	2.1E+00	2.1E+01	1.6E-02	1.6E-03	N	--	--
Fluoranthene	206-44-0	3.64E+01	1.82E+02	0.37	6.0E+00	2.2E+00	1.0E+01	3.7E+00	Invertebrate	1.5E+01	7.5E+01	2.5E-02	5.0E-03	N	--	--
Fluorene	86-73-7	5.95E-01	2.97E+00	0.02	5.7E-02	1.1E-03	2.0E+01	4.1E-01	Invertebrate	1.2E-01	6.0E-01	1.7E-01	3.3E-02	N	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	1.31E+01	1.31E+02	0.074	1.5E-01	1.1E-02	5.1E+00	3.8E-01	Invertebrate	1.0E+01	1.0E+02	7.1E-03	7.1E-04	N	--	--
Phenanthrene	85-01-8	8.32E+00	4.16E+01	0.17	1.1E+01	1.9E+00	2.5E+00	4.2E-01	Plant	3.1E+00	1.6E+01	5.5E-02	1.1E-02	N	--	--
Pyrene	129-00-0	9.51E+00	4.76E+01	0.26	3.7E+00	9.6E-01	8.7E+00	2.3E+00	Invertebrate	4.5E+00	2.3E+01	5.8E-02	1.2E-02	N	--	--
Explosives																
1,3,5-Trinitrobenzene	99-35-4	5.78E+00	2.87E+01	0.1985	8.5E+00	1.7E+00	1.0E+00	2.0E-01	Plant	2.8E+00	1.4E+01	7.1E-02	1.4E-02	N	--	--
2,4,6-Trinitrotoluene	118-96-7	1.11E+01	4.42E+01	3	8.5E+00	2.5E+01	1.0E+00	3.0E+00	Plant	5.4E+00	2.1E+01	5.6E-01	1.4E-01	N	--	--
2,4-Dinitrotoluene	121-14-2	NV	NV	0.17	8.5E+00	1.4E+00	1.0E+00	1.7E-01	Plant	--	--	--	--	--	--	--
2,6-Dinitrotoluene	606-20-2	NV	NV	0.39	8.5E+00	3.3E+00	1.0E+00	3.9E-01	Plant	--	--	--	--	--	--	--
HMX	2691-41-0	1.11E+01	7.72E+01	0.72	5.3E+00	3.8E+00	1.0E+00	7.2E-01	Plant	8.6E+00	6.0E+01	8.4E-02	1.2E-02	N	--	--
Nitroglycerin/PETN																
Nitroglycerin	55-63-0	6.47E+00	6.90E+01	2.11	1.0E+00	2.1E+00	1.0E+00	2.1E+00	Plant	2.4E+01	2.5E+02	8.8E-02	8.3E-03	N	--	--
Dioxin/Furans																
2,3,7,8-TCDD TEQ	1746-01-6	1.19E-06	1.19E-05	0.00000228	7.5E-03	1.7E-08	2.2E+01	5.1E-05	Invertebrate	2.2E-07	2.2E-06	**1.0E+01**	**1.0E+00**	**Y**	0.00000228	**1.0E+01**

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soil)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10

BW = Minimum Body Weigth of Receptor (kg)

IR_{food} = Maximum Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)

DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = 100% Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

EPC = Exposure Point Concentration

Short-tailed Shrew Specific Data from Table F.2-9

BW=	0.0125	kg
IR_{food} =	0.003	kg dw/day
BAF_{food}=	Chem Specific	unitless
IR_{soil} =	0.00039	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate soil screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Screening Level

LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Screening Level

EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.2-17
Refined Wildlife Risk Characterization - Short-tailed Shrew
Screening Level Ecological Risk Assessment
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment								
				Soil								
				EPC (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics												
Arsenic	7440-38-2	1.50E-01	1.50E+00	2.794	3.8E-02	1.0E-01	1.79E-01	5.0E-01	3.9E+00	3.9E+01	7.2E-01	7.2E-02
Cadmium	7440-43-9	2.11E+00	2.11E+01	1.401	5.3E-01	7.5E-01	7.73E+00	1.1E+01	2.3E+00	2.3E+01	6.1E-01	6.1E-02
Chromium	7440-47-3	7.21E+00	7.21E+01	29.38	4.1E-02	1.2E+00	3.06E-01	9.0E+00	1.4E+02	1.4E+03	2.2E-01	2.2E-02
Copper	7440-50-8	3.34E+01	4.40E+01	106.3	1.2E-01	1.2E+01	5.15E-01	5.5E+01	4.3E+02	5.6E+02	2.5E-01	1.9E-01
Lead	7439-92-1	1.76E+01	1.76E+02	721.8	1.5E-02	1.1E+01	2.26E-01	1.6E+02	4.0E+02	4.0E+03	**1.8E+00**	1.8E-01
Selenium	7782-49-2	4.40E-01	7.25E-01	0.582	4.8E-01	2.8E-01	1.07E+00	6.2E-01	2.9E+00	4.9E+00	2.0E-01	1.2E-01
Zinc	7440-66-6	3.52E+02	7.03E+02	668	2.7E-01	1.8E+02	1.08E+00	7.2E+02	2.4E+03	4.8E+03	2.8E-01	1.4E-01
Dioxin/Furans												
2,3,7,8-TCDD TEQ	1746-01-6	1.19E-06	1.19E-05	0.00000228	6.5E-03	1.5E-08	1.10E+01	2.5E-05	9.3E-07	9.3E-06	**2.5E+00**	2.5E-01

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soil)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10

BW = Average Body Weigth of Receptor (kg)

IR_{food} = Average Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor, specific to prey type and chemical

DF = Dietary fraction

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

BDL = Below Detection Limit

EPC = Exposure Point Concentration

Short-tailed Shrew Specific Data from Table F.2-9

BW=	0.015	kg
IR_{food} =	0.002	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{plants} =	0.14	unitless
DF_{inv} =	0.86	unitless
IR_{soil} =	0.00026	kg dw/day
AF =	1.000	unitless

[a] = The following equation was used to calculate soil screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_S)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level

LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Table F.2-18
Preliminary Wildlife Risk Characterization - Red Fox
Screening Level Ecological Risk Assessment
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment – Soil: Maximum Detected Concentration (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Mammal BAF (unitless)	Mammal Concentration (mg/kg)	Most Contaminated Dietary Component	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics																		
Arsenic	7440-38-2	3.59E-02	3.59E-01	5.6	1.1E+00	6.2E+00	5.2E-01	2.9E+00	1.5E-02	8.3E-02	Plant	2.7E-01	2.7E+00	**2.0E+01**	**2.0E+00**	**Y**	2.794	**1.0E+01**
Cadmium	7440-43-9	5.07E-01	5.07E+00	2.6	3.3E+00	8.5E+00	4.1E+01	1.1E+02	4.0E+00	1.0E+01	Invertebrate	1.1E-01	1.1E+00	**2.4E+01**	**2.4E+00**	**Y**	1.401	**1.3E+01**
Chromium	7440-47-3	1.73E+00	1.73E+01	39	8.4E-02	3.3E+00	3.2E+00	1.2E+02	3.3E-01	1.3E+01	Invertebrate	4.7E+00	4.7E+01	**8.3E+00**	8.3E-01	**Y**	29.38	**6.3E+00**
Copper	7440-50-8	8.02E+00	1.06E+01	260	6.3E-01	1.6E+02	1.5E+00	4.0E+02	1.0E+00	2.7E+02	Invertebrate	4.4E+01	5.8E+01	**5.9E+00**	**4.5E+00**	**Y**	106.3	**2.4E+00**
Lead	7439-92-1	4.22E+00	4.22E+01	8,620	4.7E-01	4.0E+03	1.5E+00	1.3E+04	2.9E-01	2.5E+03	Invertebrate	2.3E+01	2.3E+02	**3.7E+02**	**3.7E+01**	**Y**	721.8	**3.1E+01**
Mercury	7439-97-6	9.05E+00	9.05E+01	0.14	5.0E+00	7.0E-01	2.1E+01	2.9E+00	1.9E-01	2.7E-02	Invertebrate	3.8E+00	3.8E+01	3.7E-02	3.7E-03	N	--	--
Nickel	7440-02-0	2.11E+01	4.22E+01	22	1.4E+00	3.1E+01	4.7E+00	1.0E+02	5.9E-01	1.3E+01	Invertebrate	3.8E+01	7.6E+01	5.8E-01	2.9E-01	N	--	--
Selenium	7782-49-2	1.05E-01	1.74E-01	0.885	3.0E+00	2.7E+00	1.3E+00	1.2E+00	1.2E+00	1.1E+00	Plant	3.0E-01	4.9E-01	**3.0E+00**	**1.8E+00**	**Y**	0.582	**1.9E+00**
Silver	7440-22-4	1.17E+01	1.17E+02	0.16	3.7E-02	5.9E-03	1.5E+01	2.4E+00	5.0E-01	8.0E-02	Invertebrate	6.6E+00	6.6E+01	2.4E-02	2.4E-03	N	--	--
Zinc	7440-66-6	8.44E+01	1.69E+02	1,600	1.8E+00	2.9E+03	1.3E+01	2.1E+04	2.7E+00	4.3E+03	Invertebrate	5.6E+01	1.1E+02	**2.8E+01**	**1.4E+01**	**Y**	668	**1.2E+01**
TCL SVOCs																		
Acenaphthene	83-32-9	4.99E+00	2.50E+01	0.019	4.6E+00	8.7E-02	6.3E+00	1.2E-01	1.0E+00	1.9E-02	Invertebrate	6.8E+00	3.4E+01	2.8E-03	5.6E-04	N	--	--
Acenaphthylene	208-96-8	5.27E+01	2.64E+02	0.018	4.6E+00	8.3E-02	3.1E+01	5.7E-01	1.0E+00	1.8E-02	Invertebrate	1.4E+01	7.2E+01	1.2E-03	2.5E-04	N	--	--
Anthracene	120-12-7	1.44E+02	1.44E+03	0.037	4.6E+00	1.7E-01	5.5E+00	2.0E-01	1.0E+00	3.7E-02	Invertebrate	2.3E+02	2.3E+03	1.6E-04	1.6E-05	N	--	--
Benzo(a)anthracene	56-55-3	8.74E-02	8.74E-01	0.17	5.4E-01	9.2E-02	2.6E+00	4.4E-01	1.0E+00	1.7E-01	Invertebrate	2.9E-01	2.9E+00	5.9E-01	5.9E-02	N	--	--
Benzo(a)pyrene	50-32-8	2.85E-01	2.85E+00	0.13	3.3E+00	4.3E-01	2.9E+00	3.8E-01	1.0E+00	1.3E-01	Plant	7.4E-01	7.4E+00	1.8E-01	1.8E-02	N	--	--
Benzo(b)fluoranthene	205-99-2	2.85E-01	2.85E+00	0.205	4.8E-01	9.8E-02	5.3E+00	1.1E+00	1.0E+00	2.1E-01	Invertebrate	4.6E-01	4.6E+00	4.4E-01	4.4E-02	N	--	--
Benzo(g,h,i)perylene	191-24-2	1.43E-01	7.13E-01	0.083	1.6E+00	1.3E-01	8.1E+00	6.8E-01	1.0E+00	8.3E-02	Invertebrate	1.5E-01	7.5E-01	5.5E-01	1.1E-01	N	--	--
Benzo(k)fluoranthene	207-08-9	3.15E+00	3.15E+01	0.089	1.0E+00	8.9E-02	4.1E+00	3.6E-01	1.0E+00	8.9E-02	Invertebrate	6.6E+00	6.6E+01	1.4E-02	1.4E-03	N	--	--
Chrysene	218-01-9	4.32E+00	4.32E+01	0.19	1.1E+00	2.0E-01	3.8E+00	7.1E-01	1.0E+00	1.9E-01	Invertebrate	9.8E+00	9.8E+01	1.9E-02	1.9E-03	N	--	--
Dibenz(a,h)anthracene	53-70-3	5.82E-01	5.82E+00	0.035	2.3E-01	8.1E-03	4.6E+00	1.6E-01	1.0E+00	3.5E-02	Invertebrate	1.1E+00	1.1E+01	3.2E-02	3.2E-03	N	--	--
Fluoranthene	206-44-0	8.74E+00	4.37E+01	0.37	6.0E+00	2.2E+00	1.0E+01	3.7E+00	1.0E+00	3.7E-01	Invertebrate	7.5E+00	3.7E+01	4.9E-02	9.9E-03	N	--	--
Fluorene	86-73-7	1.43E-01	7.13E-01	0.02	5.7E-02	1.1E-03	2.0E+01	4.1E-01	1.0E+00	2.0E-02	Invertebrate	6.0E-02	3.0E-01	3.3E-01	6.6E-02	N	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	3.15E+00	3.15E+01	0.074	1.5E-01	1.1E-02	5.1E+00	3.8E-01	1.0E+00	7.4E-02	Invertebrate	5.3E+00	5.3E+01	1.4E-02	1.4E-03	N	--	--
Phenanthrene	85-01-8	2.00E+00	9.98E+00	0.17	1.1E+01	1.9E+00	2.5E+00	4.2E-01	1.0E+00	1.7E-01	Plant	1.6E+00	7.8E+00	1.1E-01	2.2E-02	N	--	--
Pyrene	129-00-0	2.28E+00	1.14E+01	0.26	3.7E+00	9.6E-01	8.7E+00	2.3E+00	1.0E+00	2.6E-01	Invertebrate	2.3E+00	1.1E+01	1.1E-01	2.3E-02	N	--	--
Explosives																		
1,3,5-Trinitrobenzene	99-35-4	1.39E+00	6.89E+00	0.1985	8.5E+00	1.7E+00	1.0E+00	2.0E-01	1.0E+00	2.0E-01	Plant	1.4E+00	7.0E+00	1.4E-01	2.8E-02	N	--	--
2,4,6-Trinitrotoluene	118-96-7	2.65E+00	1.06E+01	3	8.5E+00	2.5E+01	1.0E+00	3.0E+00	1.0E+00	3.0E+00	Plant	2.7E+00	1.1E+01	**1.1E+00**	2.8E-01	**Y**	0.792	2.9E-01
2,4-Dinitrotoluene	121-14-2	NV	NV	0.17	8.5E+00	1.4E+00	1.0E+00	1.7E-01	1.0E+00	1.7E-01	Plant	--	--	**--**	**--**	--	--	--
2,6-Dinitrotoluene	606-20-2	NV	NV	0.39	8.5E+00	3.3E+00	1.0E+00	3.9E-01	1.0E+00	3.9E-01	Plant	--	--	**--**	**--**	--	--	--
HMX	2691-41-0	2.67E+00	1.85E+01	0.72	5.3E+00	3.8E+00	1.0E+00	7.2E-01	1.0E+00	7.2E-01	Plant	4.4E+00	3.0E+01	1.7E-01	2.4E-02	N	--	--
Nitroglycerin/PETN																		
Nitroglycerin	55-63-0	1.55E+00	1.66E+01	2.11	1.0E+00	2.1E+00	1.0E+00	2.1E+00	1.0E+00	2.1E+00	Mammal	1.3E+01	1.4E+02	1.6E-01	1.5E-02	N	--	--
Dioxin/Furans																		
2,3,7,8-TCDD TEQ	1746-01-6	2.85E-07	2.85E-06	0.00000228	7.5E-03	1.7E-08	2.2E+01	5.1E-05	2.2E+00	5.0E-06	Invertebrate	1.1E-07	1.1E-06	**2.1E+01**	**2.1E+00**	**Y**	0.00000228	**2.1E+01**

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soil)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10

BW = Minimum Body Weigth of Receptor (kg)

IR_{food} = Maximum Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)

DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = 100% Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

EPC = Exposure Point Concentration

Red FoxSpecific Data from Table F.2-9

BW=	2.9500	kg
IR_{food} =	0.342	kg dw/day
BAF_{food}=	Chem Specific	unitless
IR_{soil} =	0.00960	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Screening Level

LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Screening Level

EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.2-19
Refined Wildlife Risk Characterization - Red Fox
Screening Level Ecological Risk Assessment
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment										
				Soil										
				EPC (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Mammal BAF (unitless)	Mammal Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics														
Arsenic	7440-38-2	3.59E-02	3.59E-01	2.794	3.8E-02	1.0E-01	1.8E-01	5.0E-01	6.5E-03	1.8E-02	2.1E+03	2.1E+04	1.3E-03	1.3E-04
Cadmium	7440-43-9	5.07E-01	5.07E+00	1.401	5.3E-01	7.5E-01	7.7E+00	1.1E+01	2.4E-01	3.3E-01	2.3E+03	2.3E+04	6.1E-04	6.1E-05
Chromium	7440-47-3	1.73E+00	1.73E+01	29.38	4.1E-02	1.2E+00	3.1E-01	9.0E+00	9.4E-02	2.8E+00	4.0E+04	4.0E+05	7.4E-04	7.4E-05
Copper	7440-50-8	8.02E+00	1.06E+01	106.3	1.2E-01	1.2E+01	5.2E-01	5.5E+01	1.4E-01	1.5E+01	1.2E+05	1.6E+05	8.6E-04	6.5E-04
Lead	7439-92-1	4.22E+00	4.22E+01	721.8	1.5E-02	1.1E+01	2.3E-01	1.6E+02	2.7E-02	2.0E+01	1.9E+05	1.9E+06	3.8E-03	3.8E-04
Selenium	7782-49-2	1.05E-01	1.74E-01	0.582	4.8E-01	2.8E-01	1.1E+00	6.2E-01	9.2E-01	5.4E-01	3.3E+02	5.5E+02	1.7E-03	1.1E-03
Zinc	7440-66-6	8.44E+01	1.69E+02	668	2.7E-01	1.8E+02	1.1E+00	7.2E+02	1.9E-01	1.2E+02	9.0E+05	1.8E+06	7.5E-04	3.7E-04
TCL SVOCs														
Benzo(a)anthracene	56-55-3	8.74E-02	8.74E-01	0.0905	1.8E-01	1.6E-02	2.2E+00	2.0E-01	0.0E+00	0.0E+00	1.7E+03	1.7E+04	5.4E-05	5.4E-06
Benzo(b)fluoranthene	205-99-2	2.85E-01	2.85E+00	0.1648	3.1E-01	5.1E-02	3.6E+00	5.9E-01	0.0E+00	0.0E+00	3.6E+03	3.6E+04	4.6E-05	4.6E-06
Benzo(g,h,i)perylene	191-24-2	1.43E-01	7.13E-01	0.0461	2.2E-01	1.0E-02	4.0E+00	1.9E-01	0.0E+00	0.0E+00	1.8E+03	8.8E+03	2.6E-05	5.3E-06
Explosives														
2,4,6-Trinitrotoluene	118-96-7	2.65E+00	1.06E+01	0.792	4.2E+00	3.4E+00	1.0E+00	7.9E-01	0.0E+00	0.0E+00	9.4E+03	3.8E+04	8.4E-05	2.1E-05
Dioxin/Furans														
2,3,7,8-TCDD TEQ	1746-01-6	2.85E-07	2.85E-06	0.00000228	6.5E-03	1.5E-08	1.1E+01	2.5E-05	7.2E-01	1.6E-06	7.7E-04	7.7E-03	3.0E-03	3.0E-04

Notes:

CAS = Chemical Abstract Services
C_{TRV}= NOAEL-based screening level (mg chemical/kg soil)
ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10
BW = Average Body Weigth of Receptor (kg)
IR_{food} = Average Ingestion Rate for Food
BAF_{food} = Bioaccumulation factor, specific to prey type and chemical
DF = Dietary fraction
IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)
AF = Area Use Factor
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
mg/kg = Milligram Per Kilogram
bw - day = Body Weight - Day
HQ = Hazard Quotient
TRV = Toxicity Reference Value
BDL = Below Detection Limit
EPC = Exposure Point Concentration

Red FoxSpecific Data from Table F.2-9

BW=	4.5300	kg
IR_{food} =	0.238	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{plants} =	0.17	unitless
DF_{inv} =	0.04	unitless
DF_{mam} =	0.79	unitless
IR_{soil} =	0.00670	kg dw/day
AF =	0.0068	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level
LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Table F.2-20
Preliminary Wildlife Risk Characterization - American Robin
Screening Level Ecological Risk Assessment
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment												
				Soil												
				Maximum Detected Concentration (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Most Contaminated Dietary Component	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics																
Arsenic	7440-38-2	5.14E+00	1.28E+01	5.6	1.1E+00	6.2E+00	5.2E-01	2.9E+00	Plant	1.4E+01	3.5E+01	4.0E-01	1.6E-01	N	--	--
Cadmium	7440-43-9	1.45E+00	2.00E+01	2.6	3.3E+00	8.5E+00	4.1E+01	1.1E+02	Invertebrate	1.1E-01	1.6E+00	**2.3E+01**	**1.7E+00**	**Y**	1.401	**1.2E+01**
Chromium	7440-47-3	1.00E+00	5.00E+00	39	8.4E-02	3.3E+00	3.2E+00	1.2E+02	Invertebrate	9.9E-01	4.9E+00	**3.9E+01**	**7.9E+00**	**Y**	29.38	**3.0E+01**
Copper	7440-50-8	4.70E+01	6.17E+01	260	6.3E-01	1.6E+02	1.5E+00	4.0E+02	Invertebrate	9.4E+01	1.2E+02	**2.8E+00**	**2.1E+00**	**Y**	106.3	**1.1E+00**
Lead	7439-92-1	1.13E+00	1.13E+01	8,620	4.7E-01	4.0E+03	1.5E+00	1.3E+04	Invertebrate	2.3E+00	2.3E+01	**3.8E+03**	**3.8E+02**	**Y**	721.8	**3.2E+02**
Mercury	7439-97-6	4.50E-01	9.00E-01	0.14	5.0E+00	7.0E-01	2.1E+01	2.9E+00	Invertebrate	6.9E-02	1.4E-01	**2.0E+00**	**1.0E+00**	**Y**	0.0698	**1.0E+00**
Nickel	7440-02-0	7.74E+01	1.07E+02	22	1.4E+00	3.1E+01	4.7E+00	1.0E+02	Invertebrate	5.1E+01	7.1E+01	4.3E-01	3.1E-01	N	--	--
Selenium	7782-49-2	4.00E-01	8.00E-01	0.885	3.0E+00	2.7E+00	1.3E+00	1.2E+00	Plant	4.1E-01	8.3E-01	**2.1E+00**	**1.1E+00**	**Y**	0.582	**1.4E+00**
Silver	7440-22-4	1.66E+01	1.24E+02	0.16	3.7E-02	5.9E-03	1.5E+01	2.4E+00	Invertebrate	3.4E+00	2.6E+01	4.7E-02	6.2E-03	N	--	--
Zinc	7440-66-6	1.45E+01	1.31E+02	1,600	1.8E+00	2.9E+03	1.3E+01	2.1E+04	Invertebrate	3.6E+00	3.2E+01	**4.5E+02**	**5.0E+01**	**Y**	668	**1.9E+02**
TCL SVOCs																
Acenaphthene	83-32-9	1.01E+00	5.05E+00	0.019	4.6E+00	8.7E-02	6.3E+00	1.2E-01	Invertebrate	5.0E-01	2.5E+00	3.8E-02	7.6E-03	N	--	--
Acenaphthylene	208-96-8	NV	NV	0.018	--	--	--	--	--	--	--	**--**	**--**	--	--	--
Anthracene	120-12-7	NV	NV	0.037	--	--	--	--	--	--	--	**--**	**--**	--	--	--
Benzo(a)anthracene	56-55-3	NV	NV	0.17	--	--	--	--	--	--	--	**--**	**--**	--	--	--
Benzo(a)pyrene	50-32-8	5.00E-01	2.50E+00	0.13	3.3E+00	4.3E-01	2.9E+00	3.8E-01	Plant	4.7E-01	2.4E+00	2.7E-01	5.5E-02	N	--	--
Benzo(b)fluoranthene	205-99-2	NV	NV	0.205	--	--	--	--	--	--	--	**--**	**--**	--	--	--
Benzo(g,h,i)perylene	191-24-2	NV	NV	0.083	--	--	--	--	--	--	--	**--**	**--**	--	--	--
Benzo(k)fluoranthene	207-08-9	NV	NV	0.089	--	--	--	--	--	--	--	**--**	**--**	--	--	--
Chrysene	218-01-9	NV	NV	0.19	--	--	--	--	--	--	--	**--**	**--**	--	--	--
Dibenz(a,h)anthracene	53-70-3	NV	NV	0.035	--	--	--	--	--	--	--	**--**	**--**	--	--	--
Fluoranthene	206-44-0	NV	NV	0.37	--	--	--	--	--	--	--	**--**	**--**	--	--	--
Fluorene	86-73-7	1.01E+00	5.05E+00	0.02	5.7E-02	1.1E-03	2.0E+01	4.1E-01	Invertebrate	1.6E-01	7.9E-01	1.3E-01	2.5E-02	N	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	NV	NV	0.074	--	--	--	--	--	--	--	**--**	**--**	--	--	--
Phenanthrene	85-01-8	1.13E+00	5.65E+00	0.17	1.1E+01	1.9E+00	2.5E+00	4.2E-01	Plant	3.2E-01	1.6E+00	5.2E-01	1.0E-01	N	--	--
Pyrene	129-00-0	NV	NV	0.26	--	--	--	--	--	--	--	**--**	**--**	--	--	--
Explosives																
1,3,5-Trinitrobenzene	99-35-4	NV	NV	0.1985	--	--	--	--	--	--	--	**--**	**--**	--	--	--
2,4,6-Trinitrotoluene	118-96-7	7.00E-02	1.80E+00	3	8.5E+00	2.5E+01	1.0E+00	3.0E+00	Plant	2.6E-02	6.7E-01	**1.1E+02**	**4.5E+00**	**Y**	0.792	**3.0E+01**
2,4-Dinitrotoluene	121-14-2	1.00E-01	1.25E+00	0.17	8.5E+00	1.4E+00	1.0E+00	1.7E-01	Plant	3.7E-02	4.7E-01	**4.6E+00**	3.6E-01	**Y**	0.17	**4.6E+00**
2,6-Dinitrotoluene	606-20-2	1.00E-01	1.25E+00	0.39	8.5E+00	3.3E+00	1.0E+00	3.9E-01	Plant	3.7E-02	4.7E-01	**1.0E+01**	8.4E-01	**Y**	0.39	**1.0E+01**
HMX	2691-41-0	NV	NV	0.72	--	--	--	--	--	--	--	**--**	**--**	--	--	--
Nitroglycerin/PETN																
Nitroglycerin	55-63-0	NV	NV	2.11	--	--	--	--	--	--	--	**--**	**--**	--	--	--
Dioxin/Furans																
2,3,7,8-TCDD TEQ	1746-01-6	1.40E-05	1.40E-04	0.0000016	7.5E-03	1.2E-08	2.2E+01	3.6E-05	Invertebrate	2.0E-06	2.0E-05	8.0E-01	8.0E-02	N	--	--

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soil)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10

BW = Minimum Body Weigth of Receptor (kg)

IR_{food} = Maximum Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)

DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = 100% Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

EPC = Exposure Point Concentration

American Robin Specific Data from Table F.2-9

BW=	0.0635	kg
IR_{food} =	0.020	kg dw/day
BAF_{food}=	Chem Specific	unitless
IR_{soil} =	0.00100	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate soil screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Concentration

LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Concentration

EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.2-21
Refined Wildlife Risk Characterization - American Robin
Screening Level Ecological Risk Assessment
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment								
				Soil								
				EPC (mg/kg)	Plant BAF (unitless)	Plant Concentration (mg/kg)	Invertebrate BAF (unitless)	Invertebrate Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics												
Cadmium	7440-43-9	1.45E+00	2.00E+01	1.401	5.3E-01	7.5E-01	7.7E+00	1.1E+01	2.1E+00	2.9E+01	6.6E-01	4.8E-02
Chromium	7440-47-3	1.00E+00	5.00E+00	29.38	4.1E-02	1.2E+00	3.1E-01	9.0E+00	2.5E+01	1.3E+02	**1.2E+00**	2.3E-01
Copper	7440-50-8	4.70E+01	6.17E+01	106.3	1.2E-01	1.2E+01	5.2E-01	5.5E+01	7.2E+02	9.4E+02	1.5E-01	1.1E-01
Lead	7439-92-1	1.13E+00	1.13E+01	721.8	1.5E-02	1.1E+01	2.3E-01	1.6E+02	3.8E+01	3.8E+02	**1.9E+01**	**1.9E+00**
Mercury	7439-97-6	4.50E-01	9.00E-01	0.0698	1.2E+00	8.7E-02	1.7E+00	1.2E-01	1.5E+00	3.0E+00	4.7E-02	2.4E-02
Selenium	7782-49-2	4.00E-01	8.00E-01	0.582	4.8E-01	2.8E-01	1.1E+00	6.2E-01	2.6E+00	5.1E+00	2.3E-01	1.1E-01
Zinc	7440-66-6	1.45E+01	1.31E+02	668	2.7E-01	1.8E+02	1.1E+00	7.2E+02	1.1E+02	1.0E+03	**6.0E+00**	6.6E-01
Explosives												
2,4,6-Trinitrotoluene	118-96-7	7.00E-02	1.80E+00	0.792	4.2E+00	3.4E+00	1.0E+00	7.9E-01	1.1E-01	2.8E+00	**7.1E+00**	2.8E-01
2,4-Dinitrotoluene	121-14-2	1.00E-01	1.25E+00	0.17	4.2E+00	7.2E-01	1.0E+00	1.7E-01	1.6E-01	2.0E+00	**1.1E+00**	8.6E-02
2,6-Dinitrotoluene	606-20-2	1.00E-01	1.25E+00	0.39	4.2E+00	1.6E+00	1.0E+00	3.9E-01	1.6E-01	2.0E+00	**2.5E+00**	2.0E-01

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soil)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10

BW = Average Body Weigth of Receptor (kg)

IR_{food} = Average Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor, specific to prey type and chemical

DF = Dietary fraction

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

BDL = Below Detection Limit

EPC = Exposure Point Concentration

American Robin Specific Data from Table F.2-9

BW=	0.0773	kg
IR_{food} =	0.016	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{plants} =	0.62	unitless
DF_{inv} =	0.38	unitless
IR_{soil} =	0.0008	kg dw/day
AF =	1.000	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level

LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Table F.2-22
Preliminary Wildlife Risk Characterization - Red-tailed Hawk
Screening Level Ecological Risk Assessment
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Preliminary Assessment – Soil: Maximum Detected Concentration (mg/kg)	Mammal BAF (unitless)	Mammal Concentration (mg/kg)	Calculated NOAEL-Based Screening Level[a] (mg/kg)	Calculated LOAEL-Based Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)	NOAEL HQ >1 (Y/N)	EPC (mg/kg)	EPC NOAEL HQ (unitless)
Inorganics													
Arsenic	7440-38-2	5.14E+00	1.28E+01	5.6	1.5E-02	8.3E-02	5.2E+03	2.1E+03	1.1E-03	4.3E-04	N	--	--
Cadmium	7440-43-9	1.45E+00	2.00E+01	2.6	4.0E+00	1.0E+01	5.5E+00	4.0E-01	4.7E-01	3.4E-02	N	--	--
Chromium	7440-47-3	1.00E+00	5.00E+00	39	3.3E-01	1.3E+01	4.6E+01	9.1E+00	8.5E-01	1.7E-01	N	--	--
Copper	7440-50-8	4.70E+01	6.17E+01	260	1.0E+00	2.7E+02	6.8E+02	5.2E+02	3.8E-01	2.9E-01	N	--	--
Lead	7439-92-1	1.13E+00	1.13E+01	8,620	2.9E-01	2.5E+03	6.0E+01	6.0E+00	**1.4E+02**	**1.4E+01**	**Y**	721.8	**1.2E+01**
Mercury	7439-97-6	4.50E-01	9.00E-01	0.14	1.9E-01	2.7E-02	3.6E+01	1.8E+01	3.9E-03	2.0E-03	N	--	--
Nickel	7440-02-0	7.74E+01	1.07E+02	22	5.9E-01	1.3E+01	2.0E+03	1.4E+03	1.1E-02	8.0E-03	N	--	--
Selenium	7782-49-2	4.00E-01	8.00E-01	0.885	1.2E+00	1.1E+00	5.1E+00	2.6E+00	1.7E-01	8.6E-02	N	--	--
Silver	7440-22-4	1.66E+01	1.24E+02	0.16	5.0E-01	8.0E-02	5.0E+02	6.7E+01	3.2E-04	4.3E-05	N	--	--
Zinc	7440-66-6	1.45E+01	1.31E+02	1,600	2.7E+00	4.3E+03	8.2E+01	9.1E+00	**2.0E+01**	**2.2E+00**	**Y**	668	**8.2E+00**
TCL SVOCs													
Acenaphthene	83-32-9	1.01E+00	5.05E+00	0.019	1.0E+00	1.9E-02	1.5E+01	3.1E+00	1.2E-03	2.5E-04	N	--	--
Acenaphthylene	208-96-8	NV	NV	0.018	--	--	--	--	--	--	--	--	--
Anthracene	120-12-7	NV	NV	0.037	--	--	--	--	--	--	--	--	--
Benzo(a)anthracene	56-55-3	NV	NV	0.17	--	--	--	--	--	--	--	--	--
Benzo(a)pyrene	50-32-8	5.00E-01	2.50E+00	0.13	1.0E+00	1.3E-01	7.6E+00	1.5E+00	1.7E-02	3.4E-03	N	--	--
Benzo(b)fluoranthene	205-99-2	NV	NV	0.205	--	--	--	--	--	--	--	--	--
Benzo(g,h,i)perylene	191-24-2	NV	NV	0.083	--	--	--	--	--	--	--	--	--
Benzo(k)fluoranthene	207-08-9	NV	NV	0.089	--	--	--	--	--	--	--	--	--
Chrysene	218-01-9	NV	NV	0.19	--	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene	53-70-3	NV	NV	0.035	--	--	--	--	--	--	--	--	--
Fluoranthene	206-44-0	NV	NV	0.37	--	--	--	--	--	--	--	--	--
Fluorene	86-73-7	1.01E+00	5.05E+00	0.02	1.0E+00	2.0E-02	1.5E+01	3.1E+00	1.3E-03	2.6E-04	N	--	--
Indeno(1,2,3-cd)pyrene	193-39-5	NV	NV	0.074	--	--	--	--	--	--	--	--	--
Phenanthrene	85-01-8	1.13E+00	5.65E+00	0.17	1.0E+00	1.7E-01	1.7E+01	3.4E+00	9.9E-03	2.0E-03	N	--	--
Pyrene	129-00-0	NV	NV	0.26	--	--	--	--	--	--	--	--	--
Explosives													
1,3,5-Trinitrobenzene	99-35-4	NV	NV	0.1985	--	--	--	--	--	--	--	--	--
2,4,6-Trinitrotoluene	118-96-7	7.00E-02	1.80E+00	3	1.0E+00	3.0E+00	1.1E+00	4.1E-02	**2.8E+00**	1.1E-01	**Y**	0.792	7.4E-01
2,4-Dinitrotoluene	121-14-2	1.00E-01	1.25E+00	0.17	1.0E+00	1.7E-01	1.5E+00	1.2E-01	1.1E-01	9.0E-03	N	--	--
2,6-Dinitrotoluene	606-20-2	1.00E-01	1.25E+00	0.39	1.0E+00	3.9E-01	1.5E+00	1.2E-01	2.6E-01	2.1E-02	N	--	--
HMX	2691-41-0	NV	NV	0.72	--	--	--	--	--	--	--	--	--
Nitroglycerin/PETN													
Nitroglycerin	55-63-0	NV	NV	2.11	--	--	--	--	--	--	--	--	--
Dioxin/Furans													
2,3,7,8-TCDD TEQ	1746-01-6	1.40E-05	1.40E-04	0.0000016	2.2E+00	3.5E-06	9.7E-05	9.7E-06	1.7E-02	1.7E-03	N	--	--

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soil)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10

BW_i = Minimum Body Weigth of Receptor (kg)

IR_{food} = Maximum Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor (Most contaminated dietary component BSAF used)

DF = Dietary fraction (Most contaminated dietary component assumed to be 100% of diet)

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = 100% Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

EPC = Exposure Point Concentration

Red-tailed Hawk Specific Data from Table F.2-9

BW=	0.957	kg
IR_{food} =	0.063	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{mam} =	1.00	unitless
IR_{soil} =	0.00	kg dw/day
AF =	1	unitless

[a] = The following equation was used to calculate screenning levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food}(BAF_{food} \cdot DF) + IR_s)AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = Maximum Detected Concentration/Calculated NOAEL-Based Concentration

LOAEL HQ = Maximum Detected Concentration/Calculated LOAEL-Based Concentration

EPC NOAEL HQ = NOAEL HQ * (EPC/Maximum Detected Concentration)

Table F.2-23
Refined Wildlife Risk Characterization - Red-tailed Hawk
Screening Level Ecological Risk Assessment
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

PARAMETER	CAS #	NOAEL (mg/kg bw-day)	LOAEL (mg/kg bw-day)	Refined Assessment						
				Soil						
				EPC (mg/kg)	Mammal BAF (unitless)	Mammal Concentration (mg/kg)	Calculated NOAEL-Based Soil Screening Level[a] (mg/kg)	Calculated LOAEL-Based Soil Screening Level[a] (mg/kg)	NOAEL HQ (unitless)	LOAEL HQ (unitless)
Inorganics										
Lead	7439-92-1	1.13E+00	1.13E+01	721.8	2.7E-02	2.0E+01	3.0E+05	3.0E+06	2.4E-03	2.4E-04
Zinc	7440-66-6	1.45E+01	1.31E+02	668	1.9E-01	1.2E+02	5.8E+05	5.2E+06	1.2E-03	1.3E-04
Explosives										
2,4,6-Trinitrotoluene	118-96-7	7.00E-02	1.80E+00	1	0.0E+00	0.0E+00	--	--	--	--

Notes:

CAS = Chemical Abstract Services

C_{TRV}= NOAEL-based screening level (mg chemical/kg soil)

ADD = NOAEL or LOAEL (mg chemical/kg body weight-day) from Table F.2-10

BW = Average Body Weigth of Receptor (kg)

IR_{food} = Average Ingestion Rate for Food

BAF_{food} = Bioaccumulation factor, specific to prey type and chemical

DF = Dietary fraction

IRs = Incidental Ingestion Rate of soil (kg soil ingested per day, dry weight)

AF = Area Use Factor

NOAEL = No observable adverse effects level

LOAEL = Lowest observable adverse effects level

mg/kg = Milligram Per Kilogram

bw - day = Body Weight - Day

HQ = Hazard Quotient

TRV = Toxicity Reference Value

BDL = Below Detection Limit

EPC = Exposure Point Concentration

Red-tailed Hawk Specific Data from Table F.2-9

BW=	1.134	kg
IR_{food} =	0.059	kg dw/day
BAF_{food}=	Chem Specific	unitless
DF_{mam} =	1.00	unitless
IR_{soil} =	0.0	kg dw/day
AF =	0.0026	unitless

[a] = The following equation was used to calculate screening levels:

$$C_{TRV} = \frac{ADD \cdot BW}{(IR_{food} \sum (BAF_{food} \cdot DF) + (IR_s)) \cdot AF}$$

See Appendix F.1 for an example C_{TRV} calculation.

NOAEL HQ = EPC/Calculated NOAEL-Based Screening Level

LOAEL HQ = EPC/Calculated LOAEL-Based Screening Level

Table F.2-24
Wildlife Summary
Screening Level Ecological Risk Assessment
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Chemical	CAS#	Meadow Vole					Short-tailed Shrew					Red Fox					American Robin					Red-tailed Hawk				
		Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ	Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ	Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ	Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ	Preliminary NOAEL-based HQ	Preliminary LOAEL-based HQ	Preliminary EPC NOAEL HQ	Refined NOAEL-based HQ	Refined LOAEL-based HQ
Inorganics																										
Arsenic	7440-38-2	**3.1E+01**	**3.1E+00**	**1.5E+01**	3.1E-01	3.1E-02	**1.1E+01**	**1.1E+00**	**5.5E+00**	7.2E-01	7.2E-02	**2.0E+01**	**2.0E+00**	**1.0E+01**	1.3E-03	1.3E-04	4.0E-01	1.6E-01	NC	NC	NC	1.1E-03	4.3E-04	NC	NC	NC
Cadmium	7440-43-9	**3.0E+00**	3.0E-01	**1.6E+00**	1.0E-01	1.0E-02	**1.2E+01**	**1.2E+00**	**6.5E+00**	6.1E-01	6.1E-02	**2.4E+01**	**2.4E+00**	**1.3E+01**	6.1E-04	6.1E-05	**2.3E+01**	**1.7E+00**	**1.2E+01**	6.6E-01	4.8E-02	4.7E-01	3.4E-02	NC	NC	NC
Chromium	7440-47-3	4.3E-01	4.3E-02	NC	NC	NC	**4.3E+00**	4.3E-01	**3.2E+00**	2.2E-01	2.2E-02	**8.3E+00**	8.3E-01	**6.3E+00**	7.4E-04	7.4E-05	**3.9E+01**	**7.9E+00**	**3.0E+01**	**1.2E+00**	2.3E-01	8.5E-01	1.7E-01	NC	NC	NC
Copper	7440-50-8	**3.7E+00**	**2.8E+00**	**1.5E+00**	1.2E-01	9.1E-02	**3.1E+00**	**2.4E+00**	**1.3E+00**	2.5E-01	1.9E-01	**5.9E+00**	**4.5E+00**	**2.4E+00**	8.6E-04	6.5E-04	**2.8E+00**	**2.1E+00**	**1.1E+00**	1.5E-01	1.1E-01	3.8E-01	2.9E-01	NC	NC	NC
Lead	7439-92-1	**1.8E+02**	**1.8E+01**	**1.5E+01**	4.3E-01	4.3E-02	**1.9E+02**	**1.9E+01**	**1.6E+01**	**1.8E+00**	1.8E-01	**3.7E+02**	**3.7E+01**	**3.1E+01**	3.8E-03	3.8E-04	**3.8E+03**	**3.8E+02**	**3.2E+02**	**1.9E+01**	**1.9E+00**	**1.4E+02**	**1.4E+01**	**1.2E+01**	2.4E-03	2.4E-04
Mercury	7439-97-6	1.4E-02	1.4E-03	NC	NC	NC	1.8E-02	1.8E-03	NC	NC	NC	3.7E-02	3.7E-03	NC	NC	NC	**2.0E+00**	**1.0E+00**	**1.0E+00**	4.7E-02	2.4E-02	3.9E-03	2.0E-03	NC	NC	NC
Nickel	7440-02-0	2.6E-01	1.3E-01	NC	NC	NC	2.9E-01	1.5E-01	NC	NC	NC	5.8E-01	2.9E-01	NC	NC	NC	4.3E-01	3.1E-01	NC	NC	NC	1.1E-02	8.0E-03	NC	NC	NC
Selenium	7782-49-2	**4.5E+00**	**2.7E+00**	**3.0E+00**	1.8E-01	1.1E-01	**1.5E+00**	9.2E-01	1.0E+00	2.0E-01	1.2E-01	**3.0E+00**	**1.8E+00**	**1.9E+00**	1.7E-03	1.1E-03	**2.1E+00**	**1.1E+00**	**1.4E+00**	2.3E-01	1.1E-01	1.7E-01	8.6E-02	NC	NC	NC
Silver	7440-22-4	1.5E-04	1.5E-05	NC	NC	NC	1.2E-02	1.2E-03	NC	NC	NC	2.4E-02	2.4E-03	NC	NC	NC	4.7E-02	6.2E-03	NC	NC	NC	3.2E-04	4.3E-05	NC	NC	NC
Zinc	7440-66-6	**6.2E+00**	**3.1E+00**	**2.6E+00**	1.5E-01	7.4E-02	**1.4E+01**	**7.1E+00**	**5.9E+00**	2.8E-01	1.4E-01	**2.8E+01**	**1.4E+01**	**1.2E+01**	7.5E-04	3.7E-04	**4.5E+02**	**5.0E+01**	**1.9E+02**	**6.0E+00**	6.6E-01	**2.0E+01**	**2.2E+00**	**8.2E+00**	1.2E-03	1.3E-04
TCL SVOCs																										
Acenaphthene	83-32-9	3.1E-03	6.2E-04	NC	NC	NC	1.4E-03	2.8E-04	NC	NC	NC	2.8E-03	5.6E-04	NC	NC	NC	3.8E-02	7.6E-03	NC	NC	NC	1.2E-03	2.5E-04	NC	NC	NC
Acenaphthylene	208-96-8	2.8E-04	5.6E-05	NC	NC	NC	6.2E-04	1.2E-04	NC	NC	NC	1.2E-03	2.5E-04	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Anthracene	120-12-7	2.1E-04	2.1E-05	NC	NC	NC	8.3E-05	8.3E-06	NC	NC	NC	1.6E-04	1.6E-05	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Benzo(a)anthracene	56-55-3	1.9E-01	1.9E-02	NC	NC	NC	3.1E-01	3.1E-02	NC	NC	NC	5.9E-01	5.9E-02	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Benzo(a)pyrene	50-32-8	2.7E-01	2.7E-02	NC	NC	NC	9.0E-02	9.0E-03	NC	NC	NC	1.8E-01	1.8E-02	NC	NC	NC	2.7E-01	5.5E-02	NC	NC	NC	1.7E-02	3.4E-03	NC	NC	NC
Benzo(b)fluoranthene	205-99-2	6.4E-02	6.4E-03	NC	NC	NC	2.3E-01	2.3E-02	NC	NC	NC	4.4E-01	4.4E-02	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Benzo(g,h,i)perylene	191-24-2	1.7E-01	3.3E-02	NC	NC	NC	2.8E-01	5.5E-02	NC	NC	NC	5.5E-01	1.1E-01	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Benzo(k)fluoranthene	207-08-9	5.1E-03	5.1E-04	NC	NC	NC	6.9E-03	6.9E-04	NC	NC	NC	1.4E-02	1.4E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Chrysene	218-01-9	8.3E-03	8.3E-04	NC	NC	NC	9.8E-03	9.8E-04	NC	NC	NC	1.9E-02	1.9E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Dibenz(a,h)anthracene	53-70-3	2.7E-03	2.7E-04	NC	NC	NC	1.6E-02	1.6E-03	NC	NC	NC	3.2E-02	3.2E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Fluoranthene	206-44-0	4.5E-02	9.0E-03	NC	NC	NC	2.5E-02	5.0E-03	NC	NC	NC	4.9E-02	9.9E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Fluorene	86-73-7	2.0E-03	4.0E-04	NC	NC	NC	1.7E-01	3.3E-02	NC	NC	NC	3.3E-01	6.6E-02	NC	NC	NC	1.3E-01	2.5E-02	NC	NC	NC	1.3E-03	2.6E-04	NC	NC	NC
Indeno(1,2,3-cd)pyrene	193-39-5	7.2E-04	7.2E-05	NC	NC	NC	7.1E-03	7.1E-04	NC	NC	NC	1.4E-02	1.4E-03	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Phenanthrene	85-01-8	1.7E-01	3.3E-02	NC	NC	NC	5.5E-02	1.1E-02	NC	NC	NC	1.1E-01	2.2E-02	NC	NC	NC	5.2E-01	1.0E-01	NC	NC	NC	9.9E-03	2.0E-03	NC	NC	NC
Pyrene	129-00-0	7.5E-02	1.5E-02	NC	NC	NC	5.8E-02	1.2E-02	NC	NC	NC	1.1E-01	2.3E-02	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Explosives																										
1,3,5-Trinitrobenzene	99-35-4	2.1E-01	4.3E-02	NC	NC	NC	7.1E-02	1.4E-02	NC	NC	NC	1.4E-01	2.8E-02	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
2,4,6-Trinitrotoluene	118-96-7	**1.7E+00**	4.2E-01	4.5E-01	8.3E-02	2.1E-02	5.6E-01	1.4E-01	NC	NC	NC	**1.1E+00**	2.8E-01	2.9E-01	8.4E-05	2.1E-05	**1.1E+02**	**4.5E+00**	**3.0E+01**	**7.1E+00**	2.8E-01	**2.8E+00**	1.1E-01	7.4E-01	--	--
2,4-Dinitrotoluene	121-14-2	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	**4.6E+00**	3.6E-01	**4.6E+00**	**1.1E+00**	8.6E-02	1.1E-01	9.0E-03	NC	NC	NC
2,6-Dinitrotoluene	606-20-2	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	**1.0E+01**	8.4E-01	**1.0E+01**	**2.5E+00**	2.0E-01	2.6E-01	2.1E-02	NC	NC	NC
HMX	2691-41-0	2.5E-01	3.6E-02	NC	NC	NC	8.4E-02	1.2E-02	NC	NC	NC	1.7E-01	2.4E-02	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Nitroglycerin/PETN																										
Nitroglycerin	55-63-0	2.5E-01	2.3E-02	NC	NC	NC	8.8E-02	8.3E-03	NC	NC	NC	1.6E-01	1.5E-02	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Dioxin/Furans																										
2,3,7,8-TCDD TEQ	1746-01-6	4.5E-02	4.5E-03	NC	NC	NC	**1.0E+01**	1.0E+00	**1.0E+01**	**2.5E+00**	2.5E-01	**2.1E+01**	**2.1E+00**	**2.1E+01**	3.0E-03	3.0E-04	8.0E-01	8.0E-02	NC	NC	NC	1.7E-02	1.7E-03	NC	NC	NC

Notes:
CAS = Chemical Abstract Services
NC = Not Calculated
NOAEL = No observable adverse effects level
LOAEL = Lowest observable adverse effects level
HQ = Hazard Quotient
EPC = Exposure Point Concentration
-- = Refined Mammal BAF is 0; therefore, bioaccumulation of these chemicals not a concern for the red-tailed hav

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APPENDIX F.3

THREATENED AND ENDANGERED SPECIES CORRESPONDENCE

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URS

April 13, 2004

Ms. René Hypes, Project Review Coordinator
Division of Natural Heritage
Virginia Department of Conservation and Recreation
217 Governor Street
Richmond, VA 23219

Subject: Natural Heritage Project Review

Dear Ms. Hypes:

I am writing to request information concerning threatened and endangered species potentially inhabiting the area in the vicinity of an industrial site located near the town of Radford, VA. URS is performing an ecological risk assessment of the site. This information is needed to update information we received from a prior request (Invoice Number: H-3243, 4/10/03).

The site is located in the Valley and Ridge Province in western Montgomery County and eastern Pulaski County, VA. Land use surrounding the site is largely undeveloped due to steep terrain, although less rugged areas are primarily used for agriculture.

A portion of a topographic map (Radford North,VA quad) is attached which specifies the location of the site. Please perform a search of the area within a one-mile radius of this location and notify us of any threatened or endangered species and/or critical or protected habitats known to occur in this vicinity.

If you should have any questions concerning this request, please contact me at 215-542-3800. I thank you for your assistance in this matter.

Sincerely,

Dorcen LaPorta

Dorcen LaPorta
Biologist

Enclosures(2)

URS Corporation
1400 Union Meeting Road, Suite 202
Blue Bell, PA 19422-1972
Tel: 215.542.3800
Fax: 215.542.3888

W. Tayloe Murphy, Jr.
Secretary of Natural Resources

Joseph H. Maroon
Director

COMMONWEALTH of VIRGINIA

DEPARTMENT OF CONSERVATION AND RECREATION

217 Governor Street
Richmond, Virginia 23219-2010
Telephone (804) 786-7951 FAX (804) 371-2674 TDD (804) 786-2121

Doreen LaPorta
URS
1400 Union Meeting Road, Suite 202
Blue Bell, PA 19422-1972

May 17, 2004

Re: Industrial Site, Valley and Ridge in western Montgomery County

Dear Ms. LaPorta:

The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animal species, unique or exemplary natural communities, and significant geologic formations.

According to the topographic map, this project either overlies or is adjacent to a karst landscape characterized by sinkholes, caves, disappearing streams, and large springs. The project has been sent to the Virginia Karst Program and to the Virginia Speleological Survey for review for documented sensitive karst features and caves. A significant cave has been documented in the project vicinity. Please coordinate with the Virginia Karst Program at 540-831-4056 (worndorff@dcr.state.va.us) to avoid, minimize, or mitigate impacts.

Our files also do not indicate the presence of any State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the Virginia Department of Conservation and Recreation (DCR), DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects.

New and updated information is continually added to Biotics. Please contact DCR for an update on this natural heritage information if a significant amount of time passes before it is utilized.

A fee of $ 95.00 has been assessed for the service of providing this information. Please find enclosed an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, Department of Conservation and Recreation, 203 Governor Street, Suite 414, Richmond, VA 23219, ATTN: Cashier. Payment is due within thirty days of the invoice date.

Should you have any questions or concerns, feel free to contact me at 804-371-2708. Thank you for the opportunity to comment on this project.

Sincerely,

S. René Hypes
Project Review Coordinator

CC: Wil Orndorff, DCR

URS

April 13, 2004

Ms. Roberta Hylton
Project Leader, Southwest Virginia Field Office
U.S. Fish and Wildlife Service
330 Cummings Street
Abingdon, VA 24210

Subject: Threatened and Endangered Species Review

Dear Ms. Hylton:

I am writing to request information concerning threatened and endangered species potentially inhabiting the area in the vicinity of an industrial site located near the town of Radford, VA. URS is performing an ecological risk assessment of the site. This information is needed to update information we received from a prior request (Project #2918, 4/21/03).

The site is located in the Valley and Ridge Province in western Montgomery County and eastern Pulaski County, VA. Land use surrounding the site is largely undeveloped due to steep terrain, although less rugged areas are primarily used for agriculture.

A portion of a topographic map (Radford North,VA quad) is attached which specifies the location of the site. Please perform a search of the area within a one-mile radius of this location and notify us of any threatened or endangered species and/or critical or protected habitats known to occur in this vicinity.

If you should have any questions concerning this request, please contact me at 215-542-3800. I thank you for your assistance in this matter.

Sincerely,

Doreen LaPorta

Doreen LaPorta
Biologist

Enclosure

URS Corporation
1400 Union Meeting Road, Suite 202
Blue Bell, PA 19422-1972
Tel: 215.542.3800
Fax: 215.542.3888

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
6669 Short Lane
Gloucester, VA 23061

May 10, 2004

Ms. Doreen LaPorta
URS Corporation
1400 Union Meeting Road, Suite 202
Blue Bell, Pennsylvania 19422

Re: Project #3348

Greetings:

The U.S. Fish and Wildlife Service (Service) has received your request to review the attached project for potential impacts to federally listed or proposed endangered and threatened species and designated critical habitat in Virginia pursuant to the Endangered Species Act (ESA) of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*). Attached is a list of species with Federal status and species of concern that have been documented or may occur in the county where your project is located. This list was prepared by this office and is based on information obtained from previous surveys for rare and endangered species.

In order to ensure coordination with the State agencies, we consistently recommend that individuals contact the Virginia Department of Conservation and Recreation, Division of Natural Heritage **and** the Virginia Department of Game and Inland Fisheries, since each agency maintains a different database and has differing expertise and/or regulatory responsibility. You can contact these agencies at the following addresses:

Virginia Department of Game and Inland Fisheries
Environmental Services Section
P.O. Box 11104
Richmond, VA 23230
(804) 367-1000

Virginia Department of Conservation and Recreation
Division of Natural Heritage
217 Governor Street, 2nd Floor
Richmond, VA 23219
(804) 786-7951

If either of these agencies determines that your project may impact a federally listed, proposed, or candidate species OR federally designated critical habitat, please contact this office and provide a copy of the response letter from each agency and the above referenced project number; otherwise, further contact with this office is not necessary.

If you have any questions or need further assistance, please contact Ms. Jolie Harrison at (804) 693-6694, extension 208.

Sincerely,

Karen L. Mayne

Karen L. Mayne
Supervisor
Virginia Field Office

Enclosures

PULASKI COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
INVERTEBRATES		
Polygyriscus virginianus	Virginia fringed mountain snail	LE
MAMMALS		
Corynorhinus townsendii virginianus[1]	Virginia big-eared bat	LE
Myotis sodalis[1]	Indiana bat	LE
VASCULAR PLANTS		
Echinacea laevigata	Smooth coneflower	LE

Species of Concern

FISH		
Ethcostoma osburni	Candy darter	G3
INVERTEBRATES		
Caecidotea henroti	Henrot's cave isopod	G2
Glyphyalinia raderi	Maryland glyph	G2
Lasmigona subviridis	Green floater	G3
Pseudanophthalmus sp. 7	A cave beetle	G1
Pyrgus wyandot	Appalachian grizzled skipper	G2
Rhagidia varia	A cave mite	G3
Speyeria diana	Diana fritillary	G3
Speyeria idalia	Regal fritillary	G3
Stygobromus abditus	James cave amphipod	G1
VASCULAR PLANTS		
Buckleya distichophylla	Piratebush	G2
Cardamine flagellifera	A bittercress	G3
Carex schweinitzii[1]	Schweinitz's sedge	G3
Clematis coactilis	Virginia white-haired leatherflower	G3
Delphinium exaltatum	Tall larkspur	G3
Paxistima canbyi	Canby's mountain-lover	G2
Phlox beckleyi	Sword-leaved phlox	G2
Poa paludigena[1]	Bog bluegrass	G3

[1]This species has been documented in an adjacent county and may occur in this county.

June 25, 2002
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

MONTGOMERY COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
FISH		
Percina rex	Roanoke logperch	LE
MAMMALS		
Corynorhinus townsendii virginianus[1]	Virginia big-eared bat	LE
Myotis sodalis[1]	Indiana bat	LE
VASCULAR PLANTS		
Echinacea laevigata	Smooth coneflower	LE

Species of Concern

FISH		
Noturus gilberti	Orangefin madtom	G2
Phenacobius teretulus	Kanawha minnow	G3
Scartomyzon ariommus	Bigeye jumprock	G2
INVERTEBRATES		
Allocapnia simmonsi	Simmons' slender winter stonefly	G2
Atrytone arogos arogos	Arogos skipper	G3G4T1T2
Caecidotea vandeli	Vandel's cave isopod	G2
Catocala dulciola	Sweet underwing	G3
Catocala herodias gerhardi	Herodias underwing	G3T3
Lasmigona holstonia	Tennessee heelsplitter	G2G3
Lasmigona subviridis	Green floater	G3
Pseudanophthalmus pusio	A cave beetle	G3
Pyrgus wyandot	Appalachian grizzled skipper	G2
Speyeria diana	Diana fritillary	G3
Speyeria idalia	Regal fritillary	G3
Stygobromus fergusoni	Montgomery County cave amphipod	G1
VASCULAR PLANTS		
Bucklcya distichophylla	Piratebush	G2
Carex schweinitzii	Schweinitz's sedge	G3
Clematis addisonii	Addison's leatherflower	G2
Clematis coactilis	Virginia white-haired leatherflower	G3

June 25, 2002
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

SCIENTIFIC NAME	COMMON NAME	STATUS
Delphinium exaltatum	Tall larkspur	G3
Monotropsis odorata	Sweet pine sap	G3
Paxistima canbyi	Canby's mountain-lover	G2
Phlox buckleyi	Sword-leaved phlox	G2
Poa paludigena[1]	Bog bluegrass	G3

[1]This species has been documented in an adjacent county and may occur in this county.

June 25, 2002
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

PULASKI COUNTY, VIRGINIA
Federally Listed, Proposed, and Candidate Species

SCIENTIFIC NAME	COMMON NAME	STATUS
INVERTEBRATES		
Polygyriscus virginianus	Virginia fringed mountain snail	LE
MAMMALS		
Corynorhinus townsendii virginianus[1]	Virginia big-eared bat	LE
Myotis sodalis[1]	Indiana bat	LE
VASCULAR PLANTS		
Echinacea laevigata	Smooth coneflower	LE

Species of Concern

FISH			
Etheostoma osburni	Candy darter	G3	
INVERTEBRATES			
Caecidotea henroti	Henrot's cave isopod	G2	
Glyphyalinia raderi	Maryland glyph	G2	
Lasmigona subviridis	Green floater	G3	
Pseudanophthalmus sp. 7	A cave beetle	G1	
Pyrgus wyandot	Appalachian grizzled skipper	G2	
Rhagidia varia	A cave mite		G3
Speyeria diana	Diana fritillary		G3
Speyeria idalia	Regal fritillary		G3
Stygobromus abditus	James cave amphipod		G1
VASCULAR PLANTS			
Buckleya distichophylla	Piratebush	G2	
Cardamine flagellifera	A bittercress		G3
Carex schweinitzii[1]	Schweinitz's sedge	G3	
Clematis coactilis	Virginia white-haired leatherflower	G3	
Delphinium exaltatum	Tall larkspur		G3
Paxistima canbyi	Canby's mountain-lover	G2	
Phlox beckleyi	Sword-leaved phlox		G2
Poa paludigena[1]	Bog bluegrass	G3	

[1]This species has been documented in an adjacent county and may occur in this county.

June 25, 2002
Prepared by U.S. Fish and Wildlife Service, Virginia Field Office

APPENDIX G
(See CD at back of report)

DRAPER ADEN ASSOCIATES OPEN BURNING GROUND
(HAZARDOUS WASTE MANAGEMENT UNIT 13) ANNUAL REPORTS

APPENDIX G.1

ANNUAL GROUNDWATER MONITORING REPORT
OPEN BURNING GROUND (HAZARDOUS WASTE MANAGEMENT UNIT 13)
CALENDAR YEAR 2008
FEBRUARY 2009

APPENDIX G.2

2007-2008 ANNUAL SOIL MONITORING REPORT
FOR THE OPEN BURNING GROUND
MARCH 2009

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APPENDIX G.1
ANNUAL GROUNDWATER MONITORING REPORT
OPEN BURNING GROUND (HAZARDOUS WASTE MANAGEMENT UNIT 13)
CALENDAR YEAR 2008
FEBRUARY 2009

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ANNUAL GROUNDWATER

MONITORING REPORT

OPEN BURNING GROUND
(HAZARDOUS WASTE MANAGEMENT UNIT 13)
CALENDAR YEAR 2008

RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

Submitted to:

Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219
(800) 592-5482

Prepared for:

Alliant Techsystems Inc.
Radford Army Ammunition Plant
Route 114
Radford, Virginia 24141-0100

February 2009

Prepared By:

Draper Aden Associates
Engineering • Surveying • Environmental Services

DAA Project Number: B03204-06

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1.0 INTRODUCTION

This document serves as the Annual Groundwater Monitoring Report for calendar year 2008 for the Open Burning Ground (OBG; also known as Hazardous Waste Management Unit [HWMU] 13) located at the Radford Army Ammunition Plant (Radford AAP) in Radford, Virginia. The Annual Groundwater Monitoring Report was compiled in accordance with the requirements specified in the *Permit for the Treatment of Hazardous Waste by Open Burning* (Permit) dated October 28, 2005. The Annual Groundwater Monitoring Report presents the following set of information: basic information and unit identification, a description of the groundwater monitoring plan, a discussion of groundwater movement, updated potentiometric maps, a table of groundwater elevations, and detailed statistical evaluations of the analytical data. The report evaluates the analytical data from two semiannual sampling events performed during calendar year 2008. Copies of field notes recorded during sample collection are included in **Appendix A**. The laboratory analytical results for the calendar year 2008 semiannual monitoring events are included in **Appendix B**.

The OBG is the waste propellant burning ground. Material that cannot be burned in the Explosive Waste Incinerators is open burned at this Unit. Groundwater monitoring activities for calendar year 2008 were conducted in accordance with the proposed *Groundwater Compliance Monitoring Plan* which is pending final review for incorporation into the Permit.

2.0 ANNUAL GROUNDWATER MONITORING REPORT

2.1 Waste Management Unit Information

Unit Name: Open Burning Ground (OBG)
(Hazardous Waste Management Unit 13 [HWMU-13])
Owner/Operator: United States Army/Alliant Techsystems Inc.

Unit Location: Radford AAP Horseshoe Area, Radford, Virginia

Class: Hazardous Waste Management Unit
Type: Waste Propellant Burning Ground

2.2 Groundwater Monitoring Plan

Monitoring Network
Upgradient Well: 13MW1, 13MW2
Point of Compliance Wells: 13MW3, 13MW4, 13MW5, 13MW6, 13MW7

Monitoring Status: Compliance Monitoring Program

CY 2008 Monitoring Events:
Second Quarter 2008: April 21-23, 2008
Fourth Quarter 2008: October 20-21, 2008

2.3 Groundwater Movement

The static water level measurements gathered at the OBG during the 2008 monitoring events are summarized in **Table 1**. Annual groundwater fluctuations ranged from 0.3 to 2.6 feet. As shown on the Potentiometric Surface Maps (**Figures 1** and **2**), groundwater movement beneath the site is generally to the south toward the New River.

For the purposes of this report, Darcian flow conditions were assumed for the alluvium and carbonate bedrock beneath the OBG. As a result, the groundwater velocities were calculated by multiplying the hydraulic conductivity (determined from previously conducted slug tests) by the average hydraulic gradient across the site and dividing by an assumed effective porosity for the aquifer materials. The average hydraulic gradient was determined by superimposing three evenly spaced flow line vectors over the Fourth Quarter 2008 Potentiometric Surface Map, measuring their lengths, calculating the head differential over the distances measured, and dividing the head differential by the length of the flow line vectors. The three calculated gradients were then averaged to a single value. Using this method, the average groundwater hydraulic gradient across the site based on Fourth Quarter 2008 groundwater elevations was calculated to be 0.002 ft/ft. Historical slug test data for the site yielded an average hydraulic conductivity of 6.56×10^{-5} ft/second, which is consistent with literature values for carbonate rock and for clayey, silty sand, and gravel alluvium (Domenico and Schwartz, 1990).

The estimated groundwater velocity across the site was calculated to be approximately 2.83×10^{-2} ft/day or 10.3 ft/year, based on the following:

- An average hydraulic conductivity of 6.56×10^{-5} ft/second.
- An average hydraulic gradient of 0.002 ft/ft.
- An assumed effective porosity of 0.40, based on a representative range of porosities for carbonate rock and clayey, silty sand and gravel alluvium (Domenico and Schwartz, 1990).

The actual groundwater flow velocities in the carbonate bedrock may vary as much as one to two orders of magnitude from the average velocity presented above depending on water level conditions and the distribution of secondary porosity.

2.4 2008 Groundwater Monitoring Activities

Radford AAP began semiannual Detection monitoring at the OBG after the Permit went into effect in October 2005. During Fourth Quarter 2005, carbon tetrachloride and perchlorate were detected at concentrations above their respective background concentrations, which prompted the need to develop a Compliance monitoring program. As a result, during First Quarter 2006, all wells were sampled for the constituents listed in Appendix IX of 40 CFR Part 264 to determine the Compliance Monitoring List. The hazardous constituents detected during the initial Appendix IX analysis formed the basis for the Compliance Groundwater Monitoring List for the Unit.

Groundwater monitoring activities for calendar year 2008 were conducted in accordance with the proposed *Groundwater Compliance Monitoring Plan* dated February 2007, including the annual monitoring of the point of compliance (POC) wells for the constituents listed in Appendix IX of 40 CFR Part 264. Copies of field notes recorded during sample collection activities are included in **Appendix A**. The groundwater analytical data for the calendar year 2008 semiannual monitoring events were evaluated in accordance with the procedures specified in the proposed *Groundwater Compliance Monitoring Plan*, including comparison to the proposed Groundwater Protection Standards (GPS). As the proposed *Groundwater Compliance Monitoring Plan* is pending final review for incorporation into the Permit, the groundwater analytical data for calendar year 2008 were also compared to the background concentrations for the OBG previously calculated in the *Constituent Background Values for the Compliance Groundwater Monitoring Program Constituents* dated December 20, 2006 (a copy of which is included in **Appendix C**).

2.5 Groundwater Analytical Data Evaluation

The groundwater samples collected during the calendar year 2008 events were analyzed for the constituents listed in Attachment V.B (Compliance Groundwater Monitoring List) of the proposed *Groundwater Compliance Monitoring Plan*. Additionally, the groundwater samples collected from the POC wells during Second Quarter 2008 were analyzed for the constituents listed in Appendix IX of 40 CFR Part 264. The constituents detected during the semiannual events and their corresponding concentrations, background values, and proposed GPS are listed

in **Table 2**. The laboratory analytical results for the calendar year 2008 semiannual monitoring events are included in **Appendix B**. The analytical data were validated in accordance with SW-846, *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*, and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*. Data validation reports are included in **Appendix B**. No data were rejected.

2.5.1 Second Quarter 2008

Total barium was detected in all monitoring wells; however, all concentrations were below their respective background concentrations and proposed GPS. Total zinc was detected in POC wells 13MW6 and 13MW7 at concentrations below the quantitation limit (QL); however, the detected total zinc concentrations were below background concentrations and the proposed GPS.

Total nickel was detected in POC well 13MW7 at a concentration of 292 µg/l, which was greater than the background concentration of 5 µg/l. However, the detected nickel concentration was below the proposed GPS for nickel of 313 µg/l.

Carbon tetrachloride was detected in POC well 13MW3 at a concentration of 4.3 µg/l, which was below the background concentration and proposed GPS of 5 µg/l.

Trichloroethene (TCE) was detected in POC wells 13MW4, 13MW6 and 13MW7 at concentrations of 1.5 µg/l, 1.2 µg/l and 1.1 µg/l, respectively. These concentrations were greater than the site-specific background concentration of 1 µg/l. However, detection of TCE in wells 13MW4 and 13MW7 is consistent with previous data, and the concentrations were below the proposed GPS of 5 µg/l.

Perchlorate was detected in POC well 13MW4 at a concentration of 81.9 µg/l, which was greater than the background concentration of 4 µg/l and the proposed GPS of 26 µg/l. This detection of perchlorate is consistent with previous data; however, due to the fact that the detected concentration is greater than the proposed GPS, Radford AAP is required to establish a Corrective Action Program for perchlorate that meets the requirements of 40 CFR Part 264.100. Radford AAP has submitted a Corrective Action Program for carbon tetrachloride and perchlorate, which is pending final review for incorporation into the Permit.

2.5.2 Fourth Quarter 2008

Total barium was detected in all monitoring wells; however, all concentrations were below the background concentration and proposed GPS.

Total nickel was detected in POC well 13MW7 at a concentration of 224 µg/l, which was greater than the background concentration of 5 µg/l. However, the detected nickel concentration was below the proposed GPS for nickel of 313 µg/l.

Total zinc was detected in upgradient wells 13MW1 and 13MW2 at concentrations of 26.3 µg/l and 39.9 µg/l, respectively, which were greater than the background concentration of 5 µg/l. However, the detected concentrations were below the proposed GPS for zinc of 4,695 µg/l.

Chloroform was detected in POC well 13MW3 at a concentration of 0.7 µg/l, which was below the background concentration of 1 µg/l and the proposed GPS of 80 µg/l.

TCE was detected in POC wells 13MW4 and 13MW7 at concentrations of 1.6 µg/l and 2.6 µg/l, respectively, which were greater than the background concentration of 1 µg/l. Additionally, TCE was detected in POC well 13MW3 at a concentration of 0.8 µg/l, which was below the background concentration of 1 µg/l. However, detection of TCE in these POC wells is consistent with previous data, and the concentrations were below the proposed GPS of 5 µg/l.

Carbon tetrachloride was detected in POC well 13MW3 at a concentration of 5.4 µg/l, which was greater than the background concentration and proposed GPS of 5 µg/l. In addition, perchlorate was detected in POC well 13MW4 at a concentration of 82.7 µg/l, which was greater than the background concentration of 4 µg/l and the proposed GPS of 26 µg/l. These detections of carbon tetrachloride and perchlorate are consistent with previous data; however, due to the fact that the detected concentrations are greater than their respective proposed GPS, Radford AAP is required to establish a Corrective Action Program for carbon tetrachloride and perchlorate that meets the requirements of 40 CFR Part 264.100. Radford AAP has submitted a Corrective Action Program for carbon tetrachloride and perchlorate, which is pending final review for incorporation into the Permit.

3.0 RECOMMENDATIONS

During the calendar year 2008 semiannual groundwater monitoring events, perchlorate was detected in POC well 13MW4 at concentrations greater than the proposed GPS of 26 µg/l. Additionally, carbon tetrachloride was detected in POC well 13MW3 at a concentration greater than the proposed GPS of 5 µg/l during Fourth Quarter 2008. As a result, Radford AAP is required to establish a Corrective Action Program for carbon tetrachloride and perchlorate that meets the requirements of 40 CFR Part 264.100. Radford AAP has submitted a Corrective Action Program for carbon tetrachloride and perchlorate, which is pending final review for incorporation into the Permit.

Radford AAP will continue to monitoring groundwater at the OBG in accordance with the *Groundwater Compliance Monitoring Plan* until the Corrective Action Program is approved and implemented, at which time groundwater monitoring will be conducted in accordance with the Corrective Action and Groundwater Monitoring Program.

SIGNATURES/CERTIFICATIONS

Prepared by:

Name: Ross G. Miller, Senior Project Geologist

Signature:

Company: Draper Aden Associates

Address: 2206 South Main Street

City/State/Zip: Blacksburg, Virginia 24060-6600

Virginia Professional Certification:

I certify that I have prepared or supervised preparation of the attached report, that it has been prepared in accordance with industry standards and practices, and that the information contained herein is truthful and accurate to the best of my knowledge.

Name: Michael D. Lawless, Environmental Program Manager

Signature:

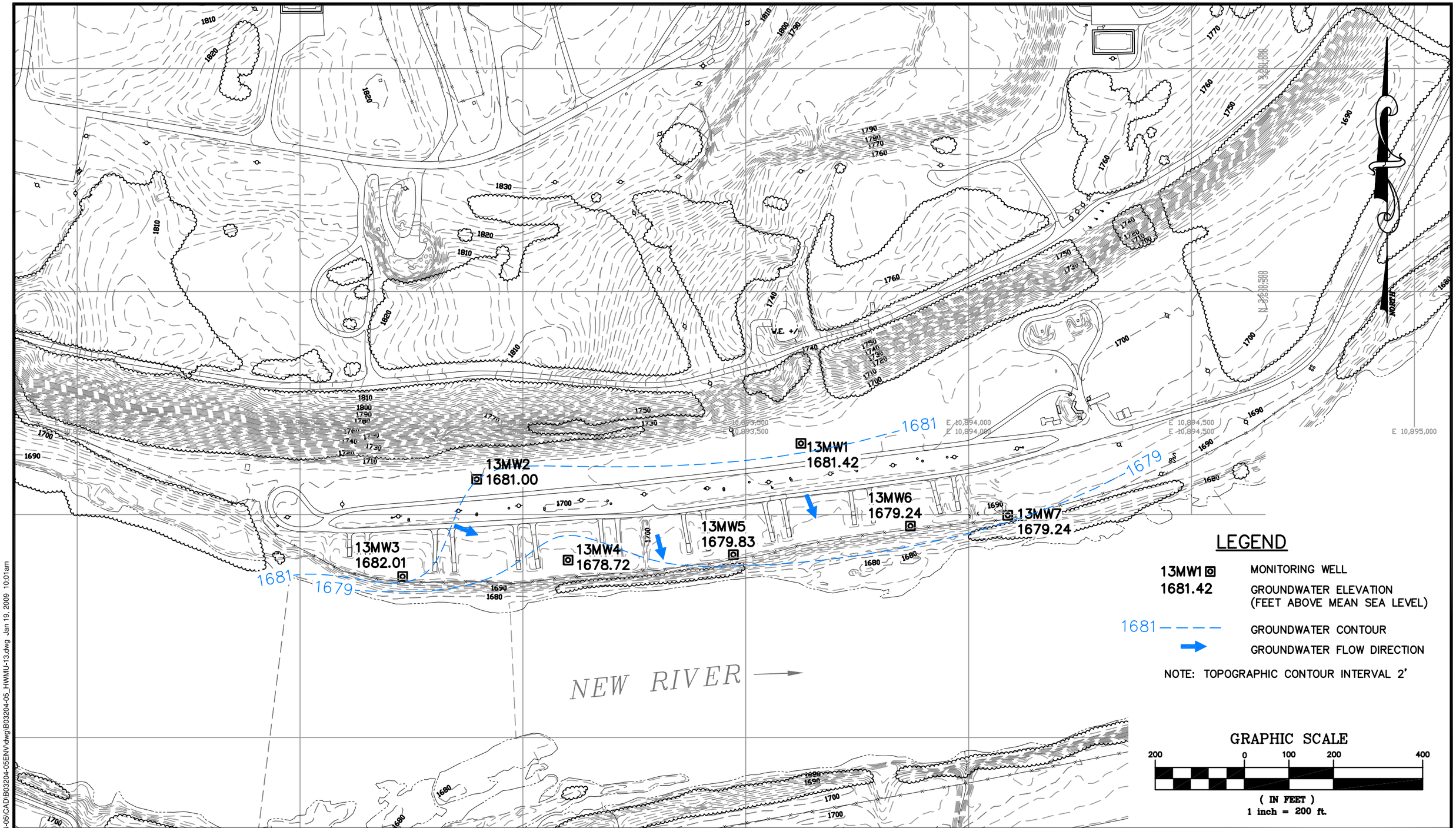
Virginia Professional Certification Type and Number: PG 832

Company: Draper Aden Associates

Address: 2206 South Main Street

City/State/Zip: Blacksburg, Virginia 24060-6600

FIGURES



LEGEND

13MW1 ⊡ 1681.42	MONITORING WELL GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
1681 – – – –	GROUNDWATER CONTOUR
→	GROUNDWATER FLOW DIRECTION

NOTE: TOPOGRAPHIC CONTOUR INTERVAL 2'

GRAPHIC SCALE

200 0 100 200 400

(IN FEET)
1 inch = 200 ft.

Draper Aden Associates
Engineering ◆ Surveying ◆ Environmental Services
2206 South Main Street
Blacksburg, VA 24060
540-552-0444 Fax: 540-552-0291
Richmond, VA
Charlottesville, VA
Hampton Roads, VA

DESIGNED	LCL
DRAWN	KKD
CHECKED	MDL
DATE	01/19/09

OPEN BURNING GROUND/HWMU-13 POTENTIOMETRIC SURFACE MAP (2ND QUARTER 2008)

RADFORD ARMY AMMUNITION PLANT

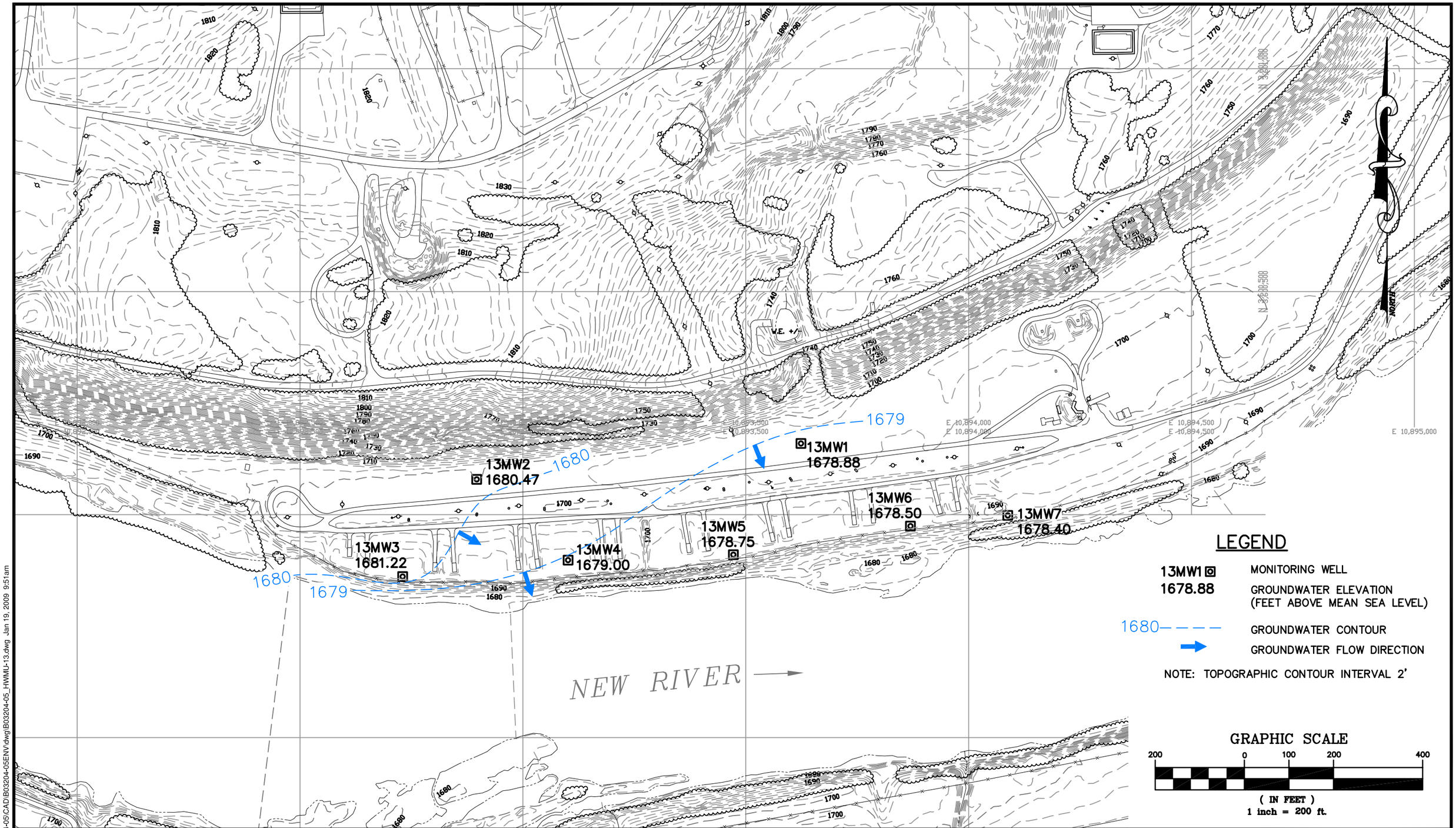
RADFORD, VIRGINIA

SCALE: 1"=200'

PLAN NO. B03204-06

FIGURE 1

P:\B03\200\B03204\B03204-05\CAD\B03204-05ENV.dwg\B03204-05_HWMU-13.dwg Jan 19, 2009 10:01am



LEGEND

13MW1 ⊡	MONITORING WELL
1678.88	GROUNDWATER ELEVATION (FEET ABOVE MEAN SEA LEVEL)
1680 – – –	GROUNDWATER CONTOUR
→	GROUNDWATER FLOW DIRECTION

NOTE: TOPOGRAPHIC CONTOUR INTERVAL 2'

GRAPHIC SCALE

200 0 100 200 400

(IN FEET)
1 inch = 200 ft.

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2206 South Main Street
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Richmond, VA
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Hampton Roads, VA

DESIGNED	LCL
DRAWN	KKD
CHECKED	MDL
DATE	01/19/09

OPEN BURNING GROUND/HWMU-13 POTENTIOMETRIC SURFACE MAP (4TH QUARTER 2008)

RADFORD ARMY AMMUNITION PLANT

RADFORD, VIRGINIA

SCALE: 1"=200'

PLAN NO. B03204-06

FIGURE 2

P:\B03\200\B03204\B03204-05\CAD\B03204-05ENV.dwg\B03204-05_HWMU-13.dwg Jan 19, 2009 9:51am

TABLES

TABLE 1
GROUNDWATER ELEVATIONS - 2008
OPEN BURNING GROUND (HWMU-13)
RADFORD ARMY AMMUNITION PLANT, RADFORD, VIRGINIA

MONITORING WELL ID	ELEVATION TOP OF WELL	SECOND QUARTER 2008		FOURTH QUARTER 2008	
		DTW	GW ELEV	DTW	GW ELEV
13MW1	1701.46	20.04	1681.42	22.58	1678.88
13MW2	1702.71	21.71	1681.00	22.24	1680.47
13MW3	1695.01	13.00	1682.01	13.79	1681.22
13MW4	1696.58	17.86	1678.72	17.58	1679.00
13MW5	1696.76	16.93	1679.83	18.01	1678.75
13MW6	1696.11	16.87	1679.24	17.61	1678.50
13MW7	1695.51	16.27	1679.24	17.11	1678.40

NOTES:
DTW: Depth to water from top of casing.
GW ELEV: Groundwater elevation.
All elevations in feet above mean sea level.
NM: Not measured.

Table 2: Target Analyte Monitoring Results - Calendar Year 2008
Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring
Upgradient wells = 13MW1 and 13MW2
All Results in ug/L.

Analyte/Quarter	*13MW1*	*Q*	*13MW2*	*Q*	*13MW3*	*Q*	*13MW4*	*Q*	*13MW5*	*Q*	*13MW6*	*Q*	*13MW7*	*Q*	*QL*	*Background*	*Method*	*GPS*
Antimony									*CAS #*	*7440-36-0*								
Second Quarter 2008	U		U		U		U		U		U		U		5	6	6010B	6
Fourth Quarter 2008	U		U		U		U		U		U		U		1	6	6020	6
Arsenic									*CAS #*	*7440-38-2*								
Second Quarter 2008	U	J	U	J	U	J	U	J	U	J	U	J	U	J	5	5	6010B	10
Fourth Quarter 2008	U		U		U		U		U		U		U		10	5	6020	10
Barium									*CAS #*	*7440-39-3*								
Second Quarter 2008	117		147		89		45.9		85.7		87.8		141		1	205.9	6010B	2000
Fourth Quarter 2008	115		130		103		49.6		112		92.5		155		10	205.9	6020	2000
Beryllium									*CAS #*	*7440-41-7*								
Second Quarter 2008	-		-		U	J	U	J	U	J	U	J	U	J	1		6010B	-
Cadmium									*CAS #*	*7440-43-9*								
Second Quarter 2008	U	J	U	J	U	J	U	J	U	J	U	J	U	J	1	1	6010B	5
Fourth Quarter 2008	U		U		U		U		U		U		U		1	1	6020	5
Chromium									*CAS #*	*7440-47-3*								
Second Quarter 2008	U		U		U		U		U		U		U		5	112	6010B	112
Fourth Quarter 2008	U		U		U		U		U		U		U		5	112	6020	112
Cobalt									*CAS #*	*7440-48-4*								
Second Quarter 2008	-		-		U		U		U		U		U		5		6010B	-
Copper									*CAS #*	*7440-50-8*								
Second Quarter 2008	-		-		U		U		U		U		U		5		6010B	-
Lead									*CAS #*	*7439-92-1*								
Second Quarter 2008	U		U		U		U		U		U		U		5	14	6010B	15
Fourth Quarter 2008	U		U		U		U		U		U		U		1	14	6020	15
Mercury									*CAS #*	*7439-97-6*								
Second Quarter 2008	U		U		U		U		U		U		U		0.5	2.52	7470A	2.52
Fourth Quarter 2008	U		U		U		U		U		U		U		0.5	2.52	7470A	2.52
Nickel									*CAS #*	*7440-02-0*								
Second Quarter 2008	U		U		U		U		U		U		292		5	5	6010B	313
Fourth Quarter 2008	U		U		U		U		U		U		224		10	5	6020	313
Selenium									*CAS #*	*7782-49-2*								
Second Quarter 2008	U		U		U		U		U		U		U		5	5	6010B	50
Fourth Quarter 2008	U		U		U		U		U		U		U		10	5	6020	50
Silver									*CAS #*	*7440-22-4*								
Second Quarter 2008	U		U		U		U		U		U		U		2	2.4	6010B	78.3
Fourth Quarter 2008	U		U		U		U		U		U		U		2	2.4	6020	78.3
Thallium									*CAS #*	*7440-28-0*								
Second Quarter 2008	-		-		U		U		U		U		U		2		7010	-
Tin									*CAS #*	*7440-31-5*								
Second Quarter 2008	-		-		U		U		U		U		U		10		6010B	-
Vanadium									*CAS #*	*7440-62-2*								
Second Quarter 2008	-		-		U		U		U		U		U		5		6010B	-
Zinc									*CAS #*	*7440-66-6*								
Second Quarter 2008	U		U		U		U		U		1.89	J	3.53	J	5	5	6010B	4695
Fourth Quarter 2008	26.3		39.9		U		U		U		U		U		10	5	6020	4695
Sulfide									*CAS #*	*18496-25-8*								
Second Quarter 2008	-		-		U		U		U		U		U		1000		9034	-

Table 2: Target Analyte Monitoring Results - Calendar Year 2008
Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring
Upgradient wells = 13MW1 and 13MW2
All Results in ug/L.

Analyte/Quarter	*13MW1*	*Q*	*13MW2*	*Q*	*13MW3*	*Q*	*13MW4*	*Q*	*13MW5*	*Q*	*13MW6*	*Q*	*13MW7*	*Q*	*QL*	*Background*	*Method*	*GPS*
Perchlorate									*CAS #*	*14797-73-0*								
Second Quarter 2008	U		U		U		81.9	J	U		U		U		4	4	E314.0	26
Fourth Quarter 2008	U		U		U		82.67		U		U		U		4	4	E314.0	26
Cyanide									*CAS #*	*57-12-5*								
Second Quarter 2008	-		-		U		U		U		U		U		5		9014	-
Acenaphthene									*CAS #*	*83-32-9*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Acenaphthylene									*CAS #*	*208-96-8*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Acetone									*CAS #*	*67-64-1*								
Second Quarter 2008	-		-		U		U		U		U		U		5		8260B	-
Acetonitrile									*CAS #*	*75-05-8*								
Second Quarter 2008	-		-		U		U		U		U		U		100		8260B	-
Acetophenone									*CAS #*	*98-86-2*								
Second Quarter 2008	U		U		U		U		U		U		U		10	10	8270C	224
Fourth Quarter 2008	U		U		U		U		U		U		U		5	10	8270C	224
2-Acetylaminofluorene									*CAS #*	*53-96-3*								
Second Quarter 2008	-		-		U	J	U	J	U	J	U	J	U	J	30		8270C	-
Acrolein									*CAS #*	*107-02-8*								
Second Quarter 2008	-		-		U	J	U	J	U	J	U	J	U	J	10		8260B	-
Acrylonitrile									*CAS #*	*107-13-1*								
Second Quarter 2008	-		-		U		U	J	U		U		U		1		8260B	-
Aldrin									*CAS #*	*309-00-2*								
Second Quarter 2008	-		-		U		U		U		U		U		0.03		8081A	-
Allyl chloride									*CAS #*	*107-05-1*								
Second Quarter 2008	-		-		U		U		U		U		U		1		8260B	-
4-Aminobiphenyl									*CAS #*	*92-67-1*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Aniline									*CAS #*	*62-53-3*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Anthracene									*CAS #*	*120-12-7*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Aramite									*CAS #*	*140-57-8*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Benzene									*CAS #*	*71-43-2*								
Second Quarter 2008	U		U		U		U		U		U		U		1	5	8260B	5
Fourth Quarter 2008	U		U	J	U	J	U	J	U	J	U	J	U	J	0.5	5	8260B	5
Benzyl chloride									*CAS #*	*100-44-7*								
Second Quarter 2008	U		U		U		U		U		U		U		1	5	8260B	5
Fourth Quarter 2008	U		U	J	U	J	U	J	U	J	U	J	U	J	0.5	5	8260B	5
Benzyl alcohol									*CAS #*	*100-51-6*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	
Benzo[a]anthracene									*CAS #*	*56-55-3*								
Second Quarter 2008	U		U		U		U		U		U		U		10	10	8270C	0.0917
Fourth Quarter 2008	U		U		U		U		U		U		U		5	10	8270C	0.0917

Table 2: Target Analyte Monitoring Results - Calendar Year 2008
Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring
Upgradient wells = 13MW1 and 13MW2
All Results in ug/L.

Analyte/Quarter	*13MW1 Q*	*13MW2 Q*	*13MW3 Q*	*13MW4 Q*	*13MW5 Q*	*13MW6 Q*	*13MW7 Q*	*QL*	*Background*	*Method*	*GPS*
Benzo[b]fluoranthene					*CAS # 205-99-2*						
Second Quarter 2008	U	U	U	U	U	U	U	10	10	8270C	0.0917
Fourth Quarter 2008	U	U	U	U	U	U	U	5	10	8270C	0.0917
Benzo[k]fluoranthene					*CAS # 207-08-9*						
Second Quarter 2008	U	U	U	U	U	U	U	10	10	8270C	0.917
Fourth Quarter 2008	U	U	U	U	U	U	U	5	10	8270C	0.917
Benzo[a]pyrene					*CAS # 50-32-8*						
Second Quarter 2008	U	U	U	U	U	U	U	10	10	8270C	0.2
Fourth Quarter 2008	U	U	U	U	U	U	U	5	10	8270C	0.2
Benzo[ghi]perylene					*CAS # 191-24-2*						
Second Quarter 2008	-	-	U	U	U	U	U	10		8270C	
alpha-BHC					*CAS # 319-84-6*						
Second Quarter 2008	-	-	U	U	U	U	U	0.03		8081A	-
beta-BHC					*CAS # 319-85-7*						
Second Quarter 2008	-	-	U	U	U	U	U	0.03		8081A	-
delta-BHC					*CAS # 319-86-8*						
Second Quarter 2008	-	-	U	U	U	U	U	0.03		8081A	-
gamma-BHC					*CAS # 58-89-9*						
Second Quarter 2008	-	-	U	U	U	U	U	0.03		8081A	-
bis(2-Chloro-1-methylethyl)ether					*CAS # 108-60-1*						
Second Quarter 2008	-	-	U	U	U	U	U	10		8270C	-
bis(2-Chloroethoxy)methane					*CAS # 111-91-1*						
Second Quarter 2008	-	-	U	U	U	U	U	10		8270C	
bis(2-Chloroethyl) ether					*CAS # 111-44-4*						
Second Quarter 2008	-	-	U	U	U	U	U	10		8270C	
bis(2-Ethylhexyl)phthalate					*CAS # 117-81-7*						
Second Quarter 2008	U	U	U	U	U	U	U	6	6	8270C	6
Fourth Quarter 2008	U	U	U	U	U	U	U	5	6	8270C	6
Bromochloromethane					*CAS # 74-97-5*						
Second Quarter 2008	-	-	U	U	U	U	U	1		8260B	-
Bromodichloromethane					*CAS # 75-27-4*						
Second Quarter 2008	-	-	U	U	U	U	U	1		8260B	
Bromoform					*CAS # 75-25-2*						
Second Quarter 2008	U	U	U	U J	U	U	U	1		8260B	
Bromomethane					*CAS # 74-83-9*						
Second Quarter 2008	U	U	U	U	U	U	U	1	1	8260B	3.13
Fourth Quarter 2008	U	U J	U J	U J	U J	U J	U J	0.5	1	8260B	3.13
4-Bromophenyl phenyl ether					*CAS # 101-55-3*						
Second Quarter 2008	-	-	U	U	U	U	U	10		8270C	-
2-Butanone					*CAS # 78-93-3*						
Second Quarter 2008	-	-	U	U	U	U	U	5		8260B	-
Butyl benzyl phthalate					*CAS # 85-68-7*						
Second Quarter 2008	U	U	U	U	U	U	U	10	10	8270C	3130
Fourth Quarter 2008	U	U	U	U	U	U	U	5	10	8270C	3130
Carbon disulfide					*CAS # 75-15-0*						
Second Quarter 2008	-	-	U	U	U	U	U	1		8260B	-

Table 2: Target Analyte Monitoring Results - Calendar Year 2008
Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring
Upgradient wells = 13MW1 and 13MW2
All Results in ug/L.

Analyte/Quarter	*13MW1*	*Q*	*13MW2*	*Q*	*13MW3*	*Q*	*13MW4*	*Q*	*13MW5*	*Q*	*13MW6*	*Q*	*13MW7*	*Q*	*QL*	*Background*	*Method*	*GPS*
Carbon tetrachloride									*CAS #*	*56-23-5*								
Second Quarter 2008	U		U		4.3		U		U		U		U		1	5	8260B	5
Fourth Quarter 2008	U		U	J	5.4	J	U	J	U	J	U	J	U	J	0.5	5	8260B	5
Chlordane									*CAS #*	*57-74-9*								
Second Quarter 2008	-		-		U		U		U		U		U		0.25		8081A	-
p-Chloroaniline									*CAS #*	*106-47-8*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Chlorobenzene									*CAS #*	*108-90-7*								
Second Quarter 2008	U		U		U		U		U		U		U		1	5	8260B	100
Fourth Quarter 2008	U		U	J	U	J	U	J	U	J	U	J	U	J	0.5	5	8260B	100
Chlorobenzilate									*CAS #*	*510-15-6*								
Second Quarter 2008	-		-		U		U		U		U		U		20		8270C	-
Chloromethane									*CAS #*	*74-87-3*								
Fourth Quarter 2008	U		U	J	U	J	U	J	U	J	U	J	U	J	0.5	5	8260B	58.1
p-Chloro-m-cresol									*CAS #*	*59-50-7*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Chloroethane									*CAS #*	*75-00-3*								
Second Quarter 2008	-		-		U		U		U		U		U		1		8260B	-
Chloroform									*CAS #*	*67-66-3*								
Second Quarter 2008	U		U		U		U		U		U		U		1	1	8260B	80
Fourth Quarter 2008	U		U	J	0.7	J	U	J	U	J	U	J	U	J	0.5	1	8260B	80
2-Chloronaphthalene									*CAS #*	*91-58-7*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
2-Chlorophenol									*CAS #*	*95-57-8*								
Second Quarter 2008	U		U		U		U		U		U		U		10	10	8270C	11.2
Fourth Quarter 2008	U	J	U	J	U	J	U	J	U	J	U	J	U	J	10	10	8270C	11.2
4-Chlorophenyl phenyl ether									*CAS #*	*7005-72-3*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Chloroprene									*CAS #*	*126-99-8*								
Second Quarter 2008	-		-		U		U		U		U		U		1		8260B	-
Chrysene									*CAS #*	*218-01-9*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Diethyl phthalate									*CAS #*	*84-66-2*								
Second Quarter 2008	U		U		U		U		U		U		U		10	10	8270C	12500
Fourth Quarter 2008	U		U		U		U		U		U		U		5	10	8270C	12500
2,4-Dinitrotoluene									*CAS #*	*121-14-2*								
Second Quarter 2008	U		U		U		U		U		U		U		5	10	8330	31.3
Fourth Quarter 2008	U		U		U		U		U		U		U		5	10	8330	31.3
p-Phenylenediamine									*CAS #*	*106-50-3*								
Second Quarter 2008	-		-		U		U		U		U		U		50		8270C	
Diphenylamine									*CAS #*	*122-39-4*								
Second Quarter 2008	U		U		U		U		U		U		U		10	10	8270C	391
Fourth Quarter 2008	U		U		U		U		U		U		U		5	10	8270C	391
2,4-Dichlorophenoxyacetic acid									*CAS #*	*94-75-7*								
Second Quarter 2008	-		-		U		U		U		U		U		5		8151A	-
4,4'-DDD									*CAS #*	*72-54-8*								
Second Quarter 2008	-		-		U		U		U		U		U		0.03		8081A	-

Table 2: Target Analyte Monitoring Results - Calendar Year 2008
Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring
Upgradient wells = 13MW1 and 13MW2
All Results in ug/L.

Analyte/Quarter	*13MW1 Q*	*13MW2 Q*	*13MW3 Q*	*13MW4 Q*	*13MW5 Q*	*13MW6 Q*	*13MW7 Q*	*QL*	*Background*	*Method*	*GPS*
4,4'-DDE					*CAS # 72-55-9*						
Second Quarter 2008	-	-	U	U	U	U	U	0.03		8081A	-
4,4'-DDT					*CAS # 50-29-3*						
Second Quarter 2008	-	-	U	U	U	U	U	0.03		8081A	-
Diallate					*CAS # 2303-16-4*						
Second Quarter 2008	-	-	U	U	U	U	U	10		8270C	-
Dibenz(a,h)anthracene					*CAS # 53-70-3*						
Second Quarter 2008	U	U	U	U	U	U	U	10	10	8270C	0.00917
Fourth Quarter 2008	U	U	U	U	U	U	U	5	10	8270C	0.00917
Dibenzofuran					*CAS # 132-64-9*						
Second Quarter 2008	U	U	U	U	U	U	U	10	10	8270C	10
Fourth Quarter 2008	U	U	U	U	U	U	U	5	10	8270C	10
Dibromochloromethane					*CAS # 124-48-1*						
Second Quarter 2008	-	-	U	U	U	U	U	1		8260B	
1,2-Dibromo-3-chloropropane					*CAS # 96-12-8*						
Second Quarter 2008	-	-	U	U	U	U	U	1		8260B	-
1,2-Dibromoethane					*CAS # 106-93-4*						
Second Quarter 2008	-	-	U	U	U	U	U	1		8260B	-
Dibromomethane					*CAS # 74-95-3*						
Second Quarter 2008	-	-	U	U	U	U	U	1		8260B	-
1,2-Dichlorobenzene					*CAS # 95-50-1*						
Second Quarter 2008	-	-	U	U	U	U	U	1		8260B	-
1,3-Dichlorobenzene					*CAS # 541-73-1*						
Second Quarter 2008	-	-	U	U	U	U	U	1		8260B	-
1,4-Dichlorobenzene					*CAS # 106-46-7*						
Second Quarter 2008	-	-	U	U	U	U	U	1		8260B	-
3,3'-Dichlorobenzidine					*CAS # 91-94-1*						
Second Quarter 2008	-	-	U	U	U	U	U	10		8270C	-
trans-1,4-Dichloro-2-butene					*CAS # 110-57-6*						
Second Quarter 2008	-	-	U J	U J	U J	U J	U J	1		8260B	-
Dichlorodifluoromethane					*CAS # 75-71-8*						
Second Quarter 2008	-	-	U	U	U	U	U	1		8260B	-
1,1-Dichloroethane					*CAS # 75-34-3*						
Second Quarter 2008	-	-	U	U	U	U	U	1		8260B	-
1,2-Dichloroethane					*CAS # 107-06-2*						
Second Quarter 2008	U	U	U	U	U	U	U	1	1	8260B	5
Fourth Quarter 2008	U	U J	U J	U J	U J	U J	U J	0.5	1	8260B	5
1,1-Dichloroethene					*CAS # 75-35-4*						
Second Quarter 2008	U	U	U	U	U	U	U	1	1	8260B	7
Fourth Quarter 2008	U	U J	U J	U J	U J	U J	U J	0.5	1	8260B	7
trans-1,2-Dichloroethene					*CAS # 156-60-5*						
Second Quarter 2008	-	-	U	U	U	U	U	1		8260B	
2,4-Dichlorophenol					*CAS # 120-83-2*						
Second Quarter 2008	U	U	U	U	U	U	U	10	10	8270C	47
Fourth Quarter 2008	U J	U J	U J	U J	U J	U J	U J	5	10	8270C	47
2,6-Dichlorophenol					*CAS # 87-65-0*						
Second Quarter 2008	-	-	U	U	U	U	U	10		8270C	-

Table 2: Target Analyte Monitoring Results - Calendar Year 2008
Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring
Upgradient wells = 13MW1 and 13MW2

All Results in ug/L.

Analyte/Quarter	13MW1 Q	13MW2 Q	13MW3 Q	13MW4 Q	13MW5 Q	13MW6 Q	13MW7 Q	QL	Background	Method	GPS
cis-1,3-Dichloropropene					CAS # 10061-01-5						
Second Quarter 2008	-	-	U	U	U	U	U	1		8260B	-
trans-1,3-Dichloropropene					CAS # 10061-02-6						
Second Quarter 2008	-	-	U	U	U	U	U	1		8260B	-
Dieldrin					CAS # 60-57-1						
Second Quarter 2008	-	-	U	U	U	U	U	0.03		8081A	-
1,2-Dichloropropane					CAS # 78-87-5						
Second Quarter 2008	-	-	U	U	U	U	U	1		8260B	
O,O-Diethyl O-2-pyrazinyl					CAS # 297-97-2						
Second Quarter 2008	-	-	U	U	U	U	U	10		8270C	-
Dimethoate					CAS # 60-51-5						
Second Quarter 2008	-	-	U	U	U	U	U	20		8270C	-
p-(Dimethylamino)azobenzene					CAS # 60-11-7						
Second Quarter 2008	-	-	U	U	U	U	U	10		8270C	-
7,12-Dimethylbenz[a]anthracene					CAS # 57-97-6						
Second Quarter 2008	-	-	U	U	U	U	U	20		8270C	-
3,3'-Dimethylbenzidine					CAS # 119-93-7						
Second Quarter 2008	U	U	U	U	U	U	U	20	10	8270C	10
Fourth Quarter 2008	U J	U J	U J	U J	U J	U J	U J	5	10	8270C	10
a,a-Dimethylphenethylamine					CAS # 122-09-8						
Second Quarter 2008	-	-	U	U	U	U	U	50		8270C	-
2,4-Dimethylphenol					CAS # 105-67-9						
Second Quarter 2008	-	-	U J	U J	U J	U J	U J	10		8270C	-
Dimethyl phthalate					CAS # 131-11-3						
Second Quarter 2008	U	U	U	U	U	U	U	10	10	8270C	10
Fourth Quarter 2008	U	U	U	U	U	U	U	5	10	8270C	10
Di-n-butyl phthalate					CAS # 84-74-2						
Second Quarter 2008	U	U	U	U	U	U	U	10	10	8270C	1570
Fourth Quarter 2008	U	U	U	U	U	U	U	5	10	8270C	1570
m-Dinitrobenzene					CAS # 99-65-0						
Second Quarter 2008	U	U	U	U	U	U	U	2.5	2.5	8330	1.57
Fourth Quarter 2008	U	U	U	U	U	U	U	2.5	2.5	8330	1.57
4,6-Dinitro-o-cresol					CAS # 534-52-1						
Second Quarter 2008	-	-	U	U	U	U	U	20		8270C	-
2,4-Dinitrophenol					CAS # 51-28-5						
Second Quarter 2008	-	-	U	U	U	U	U	10		8270C	-
2,6-Dinitrotoluene					CAS # 606-20-2						
Second Quarter 2008	U	U	U	U	U	U	U	5	5	8330	15.7
Fourth Quarter 2008	U	U	U	U	U	U	U	5	5	8330	15.7
Dinoseb					CAS # 88-85-7						
Second Quarter 2008	-	-	U	U	U	U	U	2.5		8151A	
Di-n-octyl phthalate					CAS # 117-84-0						
Second Quarter 2008	U	U	U	U	U	U	U	10	10	8270C	313
Fourth Quarter 2008	U	U	U	U	U	U	U	5	10	8270C	313
1,4-Dioxane					CAS # 123-91-1						
Second Quarter 2008	-	-	U	U	U	U	U	200		8260B	-

Table 2: Target Analyte Monitoring Results - Calendar Year 2008
Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring
Upgradient wells = 13MW1 and 13MW2

All Results in ug/L.

Analyte/Quarter	13MW1 Q	13MW2 Q	13MW3 Q	13MW4 Q	13MW5 Q	13MW6 Q	13MW7 Q	QL	Background	Method	GPS
Disulfoton					CAS # 298-04-4						
Second Quarter 2008	-	-	U	U	U	U	U	10		8270C	-
Endosulfan I					CAS # 959-98-8						
Second Quarter 2008	-	-	U	U	U	U	U	0.03		8081A	-
Endosulfan II					CAS # 33213-65-9						
Second Quarter 2008	-	-	U	U	U	U	U	0.03		8081A	-
Endosulfan sulfate					CAS # 1031-07-8						
Second Quarter 2008	-	-	U	U	U	U	U	0.03		8081A	-
Endrin					CAS # 72-20-8						
Second Quarter 2008	-	-	U	U	U	U	U	0.03		8081A	-
Endrin aldehyde					CAS # 7421-93-4						
Second Quarter 2008	-	-	U	U	U	U	U	0.03		8081A	-
Ethylbenzene					CAS # 100-41-4						
Second Quarter 2008	-	-	U	U	U	U	U	1		8260B	-
Ethyl methacrylate					CAS # 97-63-2						
Second Quarter 2008	-	-	U	U	U	U	U	1		8260B	-
Ethyl methanesulfonate					CAS # 62-50-0						
Second Quarter 2008	-	-	U	U	U	U	U	10		8270C	-
Famphur					CAS # 52-85-7						
Second Quarter 2008	-	-	U	U	U	U	U	10		8270C	-
Fluoranthene					CAS # 206-44-0						
Second Quarter 2008	U	U	U	U	U	U	U	10	10	8270C	626
Fourth Quarter 2008	U	U	U	U	U	U	U	5	10	8270C	626
Fluorene					CAS # 86-73-7						
Second Quarter 2008	-	-	U	U	U	U	U	10		8270C	-
Heptachlor					CAS # 76-44-8						
Second Quarter 2008	-	-	U J	U J	U J	U J	U J	0.03		8081A	-
Heptachlor epoxide					CAS # 1024-57-3						
Second Quarter 2008	-	-	U	U	U	U	U	0.03		8081A	-
Hexachlorobenzene					CAS # 118-74-1						
Second Quarter 2008	-	-	U	U	U	U	U	10		8270C	-
Hexachlorobutadiene					CAS # 87-68-3						
Second Quarter 2008	-	-	U J	U	U J	U J	U J	1		8260B	-
Hexachlorocyclopentadiene					CAS # 77-47-4						
Second Quarter 2008	-	-	U J	U J	U J	U J	U J	20		8270C	
Hexachloroethane					CAS # 67-72-1						
Second Quarter 2008	U	U	U	U	U	U	U	1	10	8260B	4.78
Fourth Quarter 2008	U	U	U	U	U	U	U J	0.5	10	8260B	4.78
Fourth Quarter 2008	U	U	U	U	U	U	U J	5	10	8270C	4.78
Hexachlorophene					CAS # 70-30-4						
Second Quarter 2008	-	-	U	U	U	U	U	500		8270C	-
Hexachloropropene					CAS # 1888-71-7						
Second Quarter 2008	-	-	U	U	U	U	U	10		8270C	-
2-Hexanone					CAS # 591-78-6						
Second Quarter 2008	-	-	U	U	U	U	U	5		8260B	-

Table 2: Target Analyte Monitoring Results - Calendar Year 2008
Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring
Upgradient wells = 13MW1 and 13MW2
All Results in ug/L.

Analyte/Quarter	*13MW1*	*Q*	*13MW2*	*Q*	*13MW3*	*Q*	*13MW4*	*Q*	*13MW5*	*Q*	*13MW6*	*Q*	*13MW7*	*Q*	*QL*	*Background*	*Method*	*GPS*
Indeno[1,2,3-cd]pyrene									*CAS #*	*193-39-5*								
Second Quarter 2008	U		U		U		U		U		U		U		10	10	8270C	0.0917
Fourth Quarter 2008	U		U		U		U		U		U		U		5	10	8270C	0.0917
Iodomethane									*CAS #*	*74-88-4*								
Second Quarter 2008	-		-		U	J	U	J	U	J	U	J	U	J	1		8260B	-
Isobutyl alcohol									*CAS #*	*78-83-1*								
Second Quarter 2008	-		-		U		U	J	U		U		U		125		8260B	-
Isodrin									*CAS #*	*465-73-6*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Isophorone									*CAS #*	*78-59-1*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Isosafrole									*CAS #*	*120-58-1*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Kepone									*CAS #*	*143-50-0*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Methacrylonitrile									*CAS #*	*126-98-7*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8260B	-
Methylene chloride									*CAS #*	*75-09-2*								
Second Quarter 2008	U		U		U		U		U		U		U		1	5	8260B	5
Fourth Quarter 2008	U		U	J	U	J	U	J	U	J	U	J	U	J	0.5	5	8260B	5
Methapyrilene									*CAS #*	*91-80-5*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Methoxychlor									*CAS #*	*72-43-5*								
Second Quarter 2008	-		-		U		U		U		U		U		0.03		8081A	-
3-Methylcholanthrene									*CAS #*	*56-49-5*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Methyl methacrylate									*CAS #*	*80-62-6*								
Second Quarter 2008	-		-		U		U		U		U		U		1		8260B	-
Methyl methane sulfonate									*CAS #*	*66-27-3*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
2-Methylnaphthalene									*CAS #*	*91-57-6*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Methyl parathion									*CAS #*	*298-00-0*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
4-Methyl-2-pentanone									*CAS #*	*108-10-1*								
Second Quarter 2008	-		-		U		U		U		U		U		5		8260B	-
2-Methylphenol									*CAS #*	*95-48-7*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
3 & 4-Methylphenol									*CAS #*	*m 108-39-4 p 106-44-5*								
Second Quarter 2008	U		U		U		U		U		U		U		10	20	8270C	78.3
Fourth Quarter 2008	U		U		U		U		U		U		U		10	20	8270C	78.3
Naphthalene									*CAS #*	*91-20-3*								
Second Quarter 2008	U	J	U	J	U	J	U	J	U	J	U	J	U	J	1	1	8260B	2.33
Fourth Quarter 2008	U		U	J	U	J	U	J	U	J	U	J	U	J	0.5	1	8260B	2.33
1,4-Naphthoquinone									*CAS #*	*130-15-4*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-

Table 2: Target Analyte Monitoring Results - Calendar Year 2008
Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring
Upgradient wells = 13MW1 and 13MW2
All Results in ug/L.

Analyte/Quarter	*13MW1*	*Q*	*13MW2*	*Q*	*13MW3*	*Q*	*13MW4*	*Q*	*13MW5*	*Q*	*13MW6*	*Q*	*13MW7*	*Q*	*QL*	*Background*	*Method*	*GPS*
1-Naphthylamine									*CAS #*	*134-32-7*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
2-Naphthylamine									*CAS #*	*91-59-8*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
o-Nitroaniline									*CAS #*	*88-74-4*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
m-Nitroaniline									*CAS #*	*99-09-2*								
Second Quarter 2008	-		-		U		U		U		U		U		20		8270C	-
p-Nitroaniline									*CAS #*	*100-01-6*								
Second Quarter 2008	-		-		U	J	U	J	U	J	U	J	U	J	20		8270C	-
Nitrobenzene									*CAS #*	*98-95-3*								
Second Quarter 2008	U		U		U		U		U		U		U		10	10	8270C	1.3
Fourth Quarter 2008	U		U		U		U		U		U		U		5	10	8270C	1.3
Nitroglycerin									*CAS #*	*55-63-0*								
Second Quarter 2008	U		U		U		U		U		U		U		16	10000	8332	10000
Fourth Quarter 2008	U	J	U	J	U	J	U	J	U	J	U	J	U	J	16	10000	8332	10000
o-Nitrophenol									*CAS #*	*88-75-5*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
p-Nitrophenol									*CAS #*	*100-02-7*								
Second Quarter 2008	U		U		U		U		U		U		U		10	20	8270C	20
Fourth Quarter 2008	U	J	U	J	U	J	U	J	U	J	U	J	U	J	10	20	8270C	20
4-Nitroquinoline-1-oxide									*CAS #*	*56-57-5*								
Second Quarter 2008	-		-		U		U		U		U		U		50		8270C	-
N-Nitrosodi-n-butylamine									*CAS #*	*924-16-3*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
N-Nitrosodiethylamine									*CAS #*	*55-18-5*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
N-Nitrosodimethylamine									*CAS #*	*62-75-9*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
N-Nitrosodiphenylamine									*CAS #*	*86-30-6*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
N-Nitrosodipropylamine									*CAS #*	*621-64-7*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
N-Nitrosomethylethylamine									*CAS #*	*10595-95-6*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
N-Nitrosomorpholine									*CAS #*	*59-89-2*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
N-Nitrosopiperidine									*CAS #*	*100-75-4*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
N-Nitrosopyrrolidine									*CAS #*	*930-55-2*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
5-Nitroso-o-toluidine									*CAS #*	*99-55-8*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Parathion									*CAS #*	*56-38-2*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Pentachlorobenzene									*CAS #*	*608-93-5*								
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-

Table 2: Target Analyte Monitoring Results - Calendar Year 2008
Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring
Upgradient wells = 13MW1 and 13MW2
All Results in ug/L.

Analyte/Quarter	*13MW1*	*Q*	*13MW2*	*Q*	*13MW3*	*Q*	*13MW4*	*Q*	*13MW5*	*Q*	*13MW6*	*Q*	*13MW7*	*Q*	*QL*	*Background*	*Method*	*GPS*
Pentachloroethane									*CAS # 76-01-7*									
Second Quarter 2008	-		-		U	J	U	J	U	J	U	J	U	J	1		8260B	-
Pentachloronitrobenzene									*CAS # 82-68-8*									
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Pentachlorophenol									*CAS # 87-86-5*									
Second Quarter 2008	-		-		U		U		U		U		U		20		8270C	-
Phenacetin									*CAS # 62-44-2*									
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Phenanthrene									*CAS # 85-01-8*									
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Phenol									*CAS # 108-95-2*									
Second Quarter 2008	U		U		U		U		U		U		U		10	10	8270C	4700
Fourth Quarter 2008	U	J	U	J	U	J	U	J	U	J	U	J	U	J	5	10	8270C	4700
Phorate									*CAS # 298-02-2*									
Second Quarter 2008	-		-		U		U		U		U		U		20		8270C	-
2-Picoline									*CAS # 109-06-8*									
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
PCBs									*CAS # 1336-36-3*									
Second Quarter 2008	-		-		U	J	U	J	U	J	U	J	U	J	0.5		8082	
Pronamide									*CAS # 23950-58-5*									
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Propionitrile									*CAS # 107-12-0*									
Second Quarter 2008	-		-		U		U		U		U		U		10		8260B	-
Pyrene									*CAS # 129-00-0*									
Second Quarter 2008	U		U		U		U		U		U		U		10	10	8270C	67.1
Fourth Quarter 2008	U		U		U		U		U		U		U		5	10	8270C	67.1
Pyridine									*CAS # 110-86-1*									
Second Quarter 2008	-		-		U		U		U		U		U		20		8270C	-
Safrole									*CAS # 94-59-7*									
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Silvex									*CAS # 93-72-1*									
Second Quarter 2008	-		-		U		U		U		U		U		2.5		8151A	
Styrene									*CAS # 100-42-5*									
Second Quarter 2008	-		-		U		U		U		U		U		1		8260B	-
Sulfotep									*CAS # 3689-24-5*									
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Total TCDF									*CAS # 55722-27-5*									
Second Quarter 2008	-		-		U		U		U		U		U				8280A	
Total PeCDF									*CAS # 30402-15-4*									
Second Quarter 2008	-		-		U		U		U		U		U				8280A	
Total HxCDF									*CAS # 55684-94-1*									
Second Quarter 2008	-		-		U		U		U		U		U				8280A	
Total TCDD									*CAS # 41903-57-5*									
Second Quarter 2008	-		-		U		U		U		U		U				8280A	
2,3,7,8-TCDD									*CAS # 1746-01-6*									
Second Quarter 2008	-		-		U		U		U		U		U				8280A	

Table 2: Target Analyte Monitoring Results - Calendar Year 2008
Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring
Upgradient wells = 13MW1 and 13MW2
All Results in ug/L.

Analyte/Quarter	13MW1	Q	13MW2	Q	13MW3	Q	13MW4	Q	13MW5	Q	13MW6	Q	13MW7	Q	QL	Background	Method	GPS
Total PeCDD									CAS # 36088-22-9									
Second Quarter 2008	-		-		U		U		U		U		U				8280A	
Total HxCDD									CAS # 34465-46-8									
Second Quarter 2008	-		-		U		U		U		U		U				8280A	
2,4,5-Trichlorophenoxyacetic acid									CAS # 93-76-5									
Second Quarter 2008	-		-		U		U		U		U		U		2.5		8151A	-
1,2,4,5-Tetrachlorobenzene									CAS # 95-94-3									
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
1,1,1,2-Tetrachloroethane									CAS # 630-20-6									
Second Quarter 2008	-		-		U		U		U		U		U		1		8260B	-
1,1,2,2-Tetrachloroethane									CAS # 79-34-5									
Second Quarter 2008	-		-		U		U		U		U		U		1		8260B	-
Tetrachloroethene									CAS # 127-18-4									
Second Quarter 2008	U	J	U	J	U	J	U	J	U	J	U	J	U	J	1	1	8260B	5
Fourth Quarter 2008	U		U	J	U	J	U	J	U	J	U	J	U	J	0.5	1	8260B	5
2,3,4,6-Tetrachlorophenol									CAS # 58-90-2									
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Toluene									CAS # 108-88-3									
Second Quarter 2008	U		U		U		U		U		U		U		1	5	8260B	1000
Fourth Quarter 2008	U		U	J	U	J	U	J	U	J	U	J	U	J	0.5	5	8260B	1000
o-Toluidine									CAS # 95-53-4									
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
Toxaphene									CAS # 8001-35-2									
Second Quarter 2008	-		-		U		U		U		U		U		1		8081A	-
1,2,4-Trichlorobenzene									CAS # 120-82-1									
Second Quarter 2008	-		-		U	J	U		U	J	U	J	U	J	1		8260B	-
1,1,1-Trichloroethane									CAS # 71-55-6									
Second Quarter 2008	-		-		U		U		U		U		U		1		8260B	-
1,1,2-Trichloroethane									CAS # 79-00-5									
Second Quarter 2008	-		-		U		U		U		U		U		1		8260B	
Trichloroethene									CAS # 79-01-6									
Second Quarter 2008	U		U		U		1.5		U		1.2	J	1.1		1	1	8260B	5
Fourth Quarter 2008	U		U	J	0.8	J	1.6	J	U	J	U	J	2.6	J	0.5	1	8260B	5
Trichlorofluoromethane									CAS # 75-69-4									
Second Quarter 2008	-		-		U		U		U		U		U		1		8260B	-
2,4,5-Trichlorophenol									CAS # 95-95-4									
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
2,4,6-Trichlorophenol									CAS # 88-06-2									
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
1,2,3-Trichloropropane									CAS # 96-18-4									
Second Quarter 2008	-		-		U		U		U		U		U		1		8260B	-
O,O,O-Triethyl phosphorothioate									CAS # 126-68-1									
Second Quarter 2008	-		-		U		U		U		U		U		10		8270C	-
sym-Trinitrobenzene									CAS # 99-35-4									
Second Quarter 2008	U		U		U		U		U		U		U		2.5	2.5	8330	470
Fourth Quarter 2008	U		U		U		U		U		U		U		2.5	2.5	8330	470

Table 2: Target Analyte Monitoring Results - Calendar Year 2008
Radford Army Ammunition Plant - Open Burning Ground - Groundwater Monitoring
Upgradient wells = 13MW1 and 13MW2
All Results in ug/L.

Analyte/Quarter	*13MW1*	*Q*	*13MW2*	*Q*	*13MW3*	*Q*	*13MW4*	*Q*	*13MW5*	*Q*	*13MW6*	*Q*	*13MW7*	*Q*	*QL*	*Background*	*Method*	*GPS*
Vinyl acetate									*CAS #*	*108-05-4*								
Second Quarter 2008	-		-		U		U	J	U		U		U		5		8260B	-
Vinyl chloride									*CAS #*	*75-01-4*								
Second Quarter 2008	U	J	U	J	U	J	U	J	U	J	U	J	U	J	1	1	8260B	2
Fourth Quarter 2008	U		U	J	U	J	U	J	U	J	U	J	U	J	0.5	1	8260B	2
Xylenes (Total)									*CAS #*	*1330-20-7*								
Second Quarter 2008	-		-		U		U		U		U		U		3		8260B	

Definitions: QL Denotes quantitation limit. **U** Denotes analyte not detected at or above QL. **UA** Denotes analyte not detected at or above adjusted sample QL. **J** Denotes analyte reported at or above QL and associated result is estimated due to quality control reasons. When used with "U" (i.e., "**UJ**"), denotes analyte not detected at or above QL and QL is estimated due to quality control reasons. When used with "UA" (i.e., "**UAJ**"), denotes analyte not detected at or above adjusted QL and adjusted QL is estimated due to quality control reasons. **R** Denotes result rejected. **Q** Denotes data validation qualifier. **NS** denotes not sampled. **NA** denotes not analyzed.

Note: First Quarter 2006 – Appendix IX monitoring event. For Appendix IX monitoring events, results reported to at or above the detection limit. Results between the detection limit and QL are considered unquantifiable and estimated. See laboratory deliverable for presentation of detection limits.
Second Quarter 2006 – First semiannual sampling event, includes perchlorate confirmation via MS.
Third Quarter 2006 – Additional sampling event – background data collection.
Fourth Quarter 2006 – Second semiannual sampling event.
Second Quarter 2007 - Appendix IX monitoring event. For Appendix IX monitoring events, results reported to at or above the detection limit. Results between the detection limit and QL are considered unquantifiable and estimated. See laboratory deliverable for presentation of detection limits.
Second Quarter 2008 - Appendix IX monitoring event. For Appendix IX monitoring events, results reported to at or above the detection limit. Results between the detection limit and QL are considered unquantifiable and estimated. See laboratory deliverable for presentation of detection limits.

Hexachlorophene analyzed and reported as a tentatively identified compound (TIC- First Quarter 2006).
For Dioxin results (Method 8280A), see laboratory report for sample specific QLs (All results, not detected).

GPS Denotes Groundwater Protection Standard. GPS proposed (not final).
Bis-e(ethylhexyl)phthalate QL is 10 ug/l for the Fourth Quarter 2007 event (>background and proposed GPS, 6 ug/l). For this event, results evaluated to the detection limit and no detections were reported.

APPENDIX A

FIELD NOTES

4/21/08 RAAP FB#7

B03204-06
DAS/TQC

General Notes

Weather - Raining, 50's
PPE - Eye Protection, Nitrile gloves, Cotton suits,
Calibrations - YSI 650 MDS
pH - 4.00 = 4.00, 7.00 = 6.99, 10.00 = 10.00
Conductivity reads 1500 µs in 1500 µs std
DO% = 100

Static water Level Table - Unit 13

Well	DTW	Post Purge DTW	Notes
13MW1	20.04	21.66	
13MW2	21.71	22.39	
13MW3	13.00	13.87	
13MW4	17.86	17.88	
13MW5	16.93	17.34	
13MW6	16.87	17.08	
13MW7	16.27	16.55	

13MW4

DTW - 17.86 Begin Purge (817)
Post Purge DTW - 17.88 Initial Purge - clear

Time	Temp(C)	Cond(µs)	DO mg/L	pH	ORP(MV)	Purge L	Desc
(0820)	12.87	406	7.85	6.83	169.4	0.3 L/min	clear
(0825)	12.81	397	7.41	6.79	175.1	"	"
(0830)	12.71	392	7.37	6.79	176.9	"	"
(0835)	12.70	387	7.32	6.79	177.4	"	"
(0840)	12.73	385	7.29	6.79	177.4	"	"
(0845)	12.69	381	7.19	6.79	178.1	"	"

(0845) Readings Stable

Sample Time (0850)

Samples Collected: (2) 8332/3535, (2) 8330/3535
(2) 8151A, (1) Perchlorate, (3) 8260, (1) TM/Metc, (1) Cyanide, (1) Sulfide
(2) 8270, (2) 8081/8082, (2) 8260A

4/21/08 RMP FB#7
B03209-06
DAS/TGE

13DUP

Sample Time (0905)

Samples Collected: (2) 8332/3535, (2) 8330/3535, (2) 8151A, (1) Perchlorate, (3) 8260, (1) TM-MERC, (1) Cyanide, (1) Sulfide, (2) 8270, (2) 8081/8082, (2) 8280A

* Duplicate samples were collected from 13MW4

Static Water Level Table - UNIT 433

Well	DTW	Post Purge DTW	NOTES
74MW2	56.72	56.75	
74MW5	26.40	26.41	
74MW4	24.20	24.23	
74MW1	23.79	24.82	
74MW3	21.19	23.64	
74MW6	25.35	25.36	
74MW7	25.48	25.63	

74MW2

DTW - 56.72

Post Purge DTW - 56.75

Begin Purge (1040)

Initial Purge: clear

Time	Temp (°C)	Cond (µs)	DO mg/L	pH	ORP (mV)	Purge	Desc
(1045)	13.15	250	9.89	7.62	137.5	0.37/min	clear
(1050)	13.60	253	9.21	7.64	137.6	"	"
(1055)	13.43	255	9.18	7.62	138.4	"	"
(1100)	13.37	254	9.15	7.61	139.4	"	"
(1105)	13.30	254	9.14	7.60	140.1	"	"
(1110)	13.28	254	9.12	7.62	139.0	"	"

(1110) Readings Stable

~~(1115)~~

Sample Time (1115)

Samples Collected: (3) 8011, (3) 8260, (1) Inorganic

FB#7

4/22/08

RAAP
B032641.06
PAS/TQE

FB#7

General Notes

Weather -

PPE - Eye Protection, Nitrile gloves, Cotton suits

Calibrations - YSI 650 MDS

pH - 4.00 = 4.00, 7.00 = 7.00, 10.00 = 10.00

Conductivity reads 1500 us in 1500 us std

DO% = 100

- Dedicated tubing and well skirts used at each well, and disposed of after each use.
- All equipment deconed between each well
- Purge water contained and disposed of at dedicated location onsite
- Samples collected, stored and transported on ice in coolers

13MW16

DTW - 16.85

Begin Purge (0753)

Post Purge DTW - 17.08

Initial Purge - Clear

Time	Temp(C)	Cond(us)	DO mg/L	pH	ORP(mv)	Purge k	Desc
(0755)	13.34	782	5.28	6.92	196.4	0.3 L/min	Clear
(0800)	13.31	783	5.21	6.92	195.5	"	"
(0805)	13.20	783	5.22	6.91	193.9	"	"
(0810)	13.20	783	5.15	6.90	193.1	"	"
(0815)	13.23	782	5.06	6.89	192.2	"	"
(0820)	13.22	783	4.99	6.89	191.3	"	"
(0825)	13.22	783	4.94	6.89	190.8	"	"

(0825) Readings Stable

Sample Time (0830)

Samples Collected: (3)8260, (1)TM, (1)CN, (1)Sulfide, (2)8270, (2)8081A/8082, (2)8320, (2)8332, (2)8330, (2)8151, (1)per. 314.0

(1) T. Inorganics

Desc clear " " " " " " "

(1) T. Inorganics

Desc clear Clear " " " " " "

(1) Inorganics ~~T. Inorganics~~

4/22/08 RAAP FB#7
803204-06
DAS/TQE

13MW7

DTW - 16.27 Begin Purge (0854)
Post Purge DTW - 16.55 Initial Purge - Clear

Time	Temp(C)	Cond(us)	DO mg/L	pH	ORP(MV)	Purge K	Desc
(0855)	12.33	640	5.69	6.99	165.8	0.3 L/min	Clear
(0900)	12.48	638	4.57	6.93	170.3	"	"
(0905)	12.50	638	4.56	6.95	171.5	"	"
(0910)	12.51	638	4.60	6.96	172.3	"	"
(0915)	12.51	638	4.65	6.96	173.2	"	"
(0920)	12.54	637	4.59	6.96	174.5	"	"
(0925)	12.59	638	4.56	6.97	175.7	"	"
(0925)	Readings Stable						

Sample Time (0930)

Samples Collected: (3)8260, (1)TOC, (1)CN, (1)Sulfide, (2)8081/8082 (2)8270, (2)8280, (2)8332, (2)8330, (2)8151, (1)314.0

13MW5

DTW - 16.93 Begin Purge (1000)
Post Purge DTW - 17.34 Initial Purge - Clear

Time	Temp(C)	Cond(us)	DO mg/L	pH	ORP(MV)	Purge K	Desc
(1001)	13.42	625	6.71	6.86	178.8	0.3 L/min	Clear
(1005)	13.63	642	6.49	6.83	180.9	"	"
(1010)	13.66	644	6.56	6.83	180.8	"	"
(1015)	13.61	645	6.44	6.82	181.4	"	"
(1020)	13.57	645	6.44	6.82	181.9	"	"
(1025)	13.52	645	6.44	6.82	181.7	"	"
(1030)	13.54	645	6.43	6.82	181.9	"	"
(1030)	Readings Stable						

Sample Time (1035) ✓

Samples Collected: (9)8260, (3)TOC, (3)CN, (3)Sulfide, (6)8270 (6)8081/8082, (6)8280, (6)8332, (6)8330, (6)8151, (2)314.0

FB#7

4/22/08 RAAP FB#7

B032004-06
DAS/TGE

13MW01

DTW - 20.04 Begin Purge (1112)

Post Purge DTW - 21.66 Initial Purge - Clear

Time	Temp(C)	Cond(us)	DO mg/L	pH	ORP(mV)	Purge L	Desc
(1115)	13.27	648	6.45	6.86	178.0	0.3 L/min	Clear
(1120)	13.22	652	4.99	6.85	179.2	"	"
(1125)	13.23	654	4.31	6.85	178.3	"	"
(1130)	13.20	655	4.24	6.85	177.8	"	"
(1135)	13.17	655	4.21	6.85	177.2	"	"
(1140)	13.16	655	4.20	6.86	175.9	"	"

(1140) Readings Stable

Sample Time (1145) ✓

Samples Collected: (3) 8260, (1) TM, (2) 8270, (2) 8332, (2) 8330, (1) 314.0

74MW06

DTW - 25.35 Begin Purge (1230)

Post Purge DTW - 25.36 Initial Purge - Clear

Time	Temp(C)	Cond(us)	DO mg/L	pH	ORP(mV)	Purge L	Desc
(1231)	13.33	628	9.16	6.90	152.5	0.3 L/min	Clear
(1235)	13.38	567	7.88	6.63	165.6	"	"
(1240)	13.37	548	7.63	6.60	171.3	"	"
(1245)	13.54	543	7.64	6.62	171.1	"	"
(1250)	13.65	544	7.75	6.68	170.9	"	"
(1255)	13.56	544	7.80	6.70	170.0	"	"
(1300)	13.60	547	7.83	6.71	169.1	"	"
(1305)	13.68	549	7.90	6.73	172.4	"	"

(1305) Readings Stable

Sample Time (1310)

Samples Collected: (3) 8260, (3) 8011, (1) T. Inorganics ✓

Desc
in Clear
"
"
"
"
"

)8081/8082
314.0

Desc
Clear
"
"
"
"
"
"

✓

(6) 8270
(2) 314.0

FB#8 4/23/08 RAAP B03204-06 DAS/TOE FB#8-

General Notes

Weather -

PPE - Eye Protection, Nitrile gloves, Cotton Suits

Calibrations - YSI 650 MDS

pH - 4.00 = 4.00, 7.00 = 6.99, 10.00 = 9.98

Conductivity reads 700 us in 700 us std

DO% = 100

- Dedicated tubing and well skirts used at each well, and disposed of after each use
- All equipment deconed between each well
- Purge water contained and disposed of at dedicated location onsite.
- Samples Collected, stored and transported on ice in coolers

13MW3

DTW - 13.00 Begin Purge (0829)

Post Purge DTW - 13.87 Initial Purge - Clear

Time	Temp(C)	Cond(us)	DO mg/L	pH	ORP(MV)	Purge L	Desc
(0830)	13.21	571	8.52	6.95	206.0	0.3 L/min	Clear
(0835)	13.20	576	8.30	6.91	206.4	"	"
(0840)	13.18	575	7.70	6.91	205.9	"	"
(0845)	13.20	577	7.41	6.90	204.8	"	"
(0850)	13.17	579	7.10	6.89	202.7	"	"
(0855)	13.21	576	7.05	6.89	201.4	"	"
(0900)	13.28	572	7.01	6.89	200.2	"	"

(0900) Readings Stable

Sample Time (0905)

Samples Collected: (2)8280, (2)8332, (2)8330, (2)8151, (1)314.0 (3)8260, (1)TAL, (1)CN, (1)Sulfide, (2)8270, (2)8081/8082

4/23/08 RAAP FB#8
B03204-06
DAS/TQE

13MW2

DTW - 21.71 Begin Purge (0935)
Post Purge DTW - 22.39 Initial Purge - Clear

Time	Temp(C°)	Cond(us)	DO mg/L	pH	ORP(mv)	Purge L	Desc
0936	14.30	616	7.56	6.96	156.3	0.3 L/min	Clear
0940	14.15	620	5.16	6.77	173.1	"	"
0945	14.32	619	4.77	6.79	173.4	"	"
0950	14.41	619	4.63	6.84	172.7	"	"
0955	14.52	621	4.49	6.84	172.9	"	"
1000	14.50	622	4.45	6.85	174.0	"	"
1005	14.60	619	4.40	6.85	173.6	"	"
(1005)	Readings Stable						

Sample Time (1010)
Samples Collected: (2)8332, (2)8330, (1)314.0, (3)8260, (1)TM
(2)8270

7W13

DTW - 18.43 Begin Purge (1114)
Post Purge DTW - 22.09 Initial Purge - Clear

Time	Temp(C°)	Cond(us)	DO mg/L	pH	ORP(mv)	Purge L	Desc
1115	14.24	1250	6.24	7.40	132.4	0.3 L/min	Clear
1120	14.61	1252	4.65	7.24	112.3	"	"
1125	14.72	1262	3.98	7.18	85.4	"	"
1130	14.87	1284	3.37	7.16	63.1	"	"
1135	14.98	1291	2.53	7.18	40.5	"	"
1140	15.10	1292	2.54	7.22	39.4	"	"
1145	15.08	1300	2.59	7.28	40.8	"	"
(1145)	Readings Stable						

Sample Time (1150)
Samples Collected: (2)8270, (1)CN, (1)TM

4/23/08

7MW6

DTW -
Post Purge
Time
1210
1215
1220
1225
1230
1235
1240
1240

7W11B

DTW -
Post Purge D
Time
1315
1320
1325
1330
1335
1340
1345
1350
1355
1400
1400

FB# 8

5/21/08

RAAP
B03204-06
TCE/MeFL

FB#8

General Notes

Weather: Sunny 60s
PPE: Eye Protection, Nitrile Gloves
Calibrations - YSI 650 MDS
pH - 4.00 = 4.00, 7.00 = 7.00, 10.00 = 9.97
Conductivity reads 1413 µs in 1413 µs std
DO% = 100

- Dedicated tubing and well skirts used at each well, and disposed of after each use.
- All equipment deconed between each well
- Purge water contained and disposed of at dedicated location onsite.
- Samples collected, stored and transported on ice and in coolers

13MW4

DTW: 17.43
Post Purge DTW: 17.75

Begin Purge (0920)
Initial Purge: clear

Time	Temp(°)	Cond (µs)	DO mg/L	pH	ORP(mV)	Purge k	Desc
(0925)	14.15	471	6.40	6.75	159.8	0.3 L/min	clear
(0930)	14.27	482	5.74	6.81	159.6	"	clear
(0935)	14.30	486	5.27	6.83	159.9	"	clear
(0940)	14.54	485	5.13	6.84	160.2	"	clear
(0945)	14.60	489	5.05	6.82	162.5	"	clear
(0950)	14.61	487	5.03	6.81	163.4	"	clear
(0955)	14.58	488	5.02	6.80	165.7	"	clear
(0955)	Readings Stable						
Post Purge	14.10	477	5.11	6.82	162.0		clear

Sample Time (1000)
Samples Collected: (3) 8260

13DUP

Sample Time (1010)
Samples Collected: (3) 8260

* Samples Collected from 13MW4 (21)

10/20/08 RAAP FB# 8
B03204-06
DASTQE

General Notes

Weather - Overcast, 30's
PPE - Eye Protection, Nitrile gloves, Heady Duty Boots, Cotton Suits
Calibrations - YSI 650 MDS
pH - 4.00 = 4.00, 7.00 = 7.00, 10.00 = 9.97
Conductivity reads 1413 us in 1413 us std
DO % = 100

Static Water Level Table Unit 13

WELL	DTW	Post Purge DTW	Notes
13MW1	22.58	22.65 DS 10/21/08	
13MW2	22.24	~~22.65~~ 22.81	
13MW3	13.79	13.86	
13MW4	17.58	18.33	
13MW5	18.01	18.06	
13MW6	17.61	17.69	
13MW7	17.11	17.31	

13MW4
DTW - 17.58 Begin Purge (0723)
Post Purge DTW - 18.33 Initial Purge - Clear

Time	Temp (C)	Cond (us)	DO mg/L	pH	ORP (mV)	Purge (l/gpm)	Desc
(0725)	13.66	543	3.53	6.96	191.6	0.3 l/min	Clear
(0730)	13.57	566	2.23	7.01	189.5	"	Clear
(0735)	13.73	582	1.48	7.03	189.0	"	Clear
(0740)	13.95	594	1.45	7.03	188.3	"	Clear
(0745)	13.82	599	1.44	7.01	188.2	"	Clear
(0750)	13.98	602	1.46	7.00	188.0	"	Clear
(0755)	14.04	602	1.45	7.01	187.3	"	Clear
(0755)	Readings Stable						
( )	well purged dry during Collection						

Sample Time (0800)
Samples Collected: (3) 8260, (1) 8332, (1) 8330, (1) 314.0, (1) 8270, (1) TM

(40)

10/20/0
13MW
Sa
13MW
DTW
Post Purge
Time
(0835)
(0840)
(0845)
(0850)
(0855)
(0900)
(0900)
(0938)
S
13MW
DTW
Post Purge
Time
(0950)
(0955)
(1000)
(1005)
(1010)
(1015)
(1020)
(1020)
(1040)
Samp

FB# 8

10/20/08 RAAP BO 3204-06 DAS/TOE

13MW DUP

Sample Time (0815) * Collected at 13MW4

Samples Collected: (3) 8260, (1) 8330, (1) 8330, (1) 8270, (1) 314.0, (1) TM

13MW5

DTW - 18.01 Begin Purge (0834)

Post Purge DTW - 18.06 Initial Purge - Clear

Time	Temp(C)	Cond(us)	DO mg/L	pH	ORP(mV)	Purge Rate (gpm)	Desc
(0835)	13.92	733	6.90	6.84	205.3	0.3 L/min	Clear
(0840)	14.07	747	4.40	6.94	202.0	"	Clear
(0845)	14.29	761	3.63	6.99	199.2	"	Clear
(0850)	14.26	765	3.56	6.97	199.3	"	Clear
(0855)	14.37	760	3.69	6.89	201.2	"	Clear
(0900)	14.39	760	3.84	6.84	202.6	"	Clear
(0900) Readings Stable							
(0938)	14.74	696	4.42	6.75	216.3	post Purge	Clear

Sample Time (0905)

Samples Collected - (9) 8260, (6) 8332, (6) 8330, (6) 8270, (3) 314.0, (3) TM

13MW6

DTW - 17.61 Begin Purge (0948 ~~0848~~)

Post Purge DTW - 17.69 Initial Purge - Clear

Time	Temp(C)	Cond(us)	DO mg/L	pH	ORP(mV)	Purge Rate (gpm)	Desc
(0950)	13.85	873	3.73	6.87	211.9	0.3 L/min	Clear
(0955)	13.90	884	2.90	6.86	212.3	"	Clear
(1000)	13.93	899	2.78	6.85	211.7	"	Clear
(1005)	13.97	904	2.73	6.85	210.9	"	Clear
(1010)	13.98	907	2.71	6.85	210.3	"	Clear
(1015)	14.08	908	2.68	6.85	209.6	"	Clear
(1020)	14.06	909	2.67	6.85	209.0	"	Clear
(1020) Readings Stable							
(1040)	14.21	908	2.70	6.82	203.6	Post Purge	Clear

Sample Time (1025) Samples Collected: (3) 8260, (2) 8332, (2) 8330, (2) 8270 (1) 314.0, (1) TM

(41)

10/20/08 RAAP FB#8
B03204-06
DAS/TQE

13MW7

DTW - 17.11 Begin Purge (1058)
Post Purge DTW - 17.31 Initial Purge - Clear

Time	Temp(C°)	Cond(us)	DO mg/L	pH	ORP(mv)	Purge(gpm)	Desc
(1100)	14.20	717	4.83	6.80	217.5	0.3 L/min	Clear
(1105)	14.23	765	1.80	6.73	217.8	"	Clear
(1110)	14.42	797	1.01	6.73	214.0	"	Clear
(1115)	14.56	804	0.95	6.73	211.3	"	Clear
(1120)	14.60	806	0.95	6.74	208.8	"	Clear
(1125)	14.65	808	0.99	6.74	206.7	"	Clear
(1130)	14.62	809	1.00	6.74	206.5	"	Clear

(1130) Readings Stable
Sample Time (1135)
Samples Collected: (3) 8260, (2) 8332, (2) 8330, (2) 8270, (1) 314.0, (1) TM

(1140)	14.65	811	1.10	6.69	219.5	Post Purge	Clear

Static Water Level Table - Unit 433

WELL	DTW	Post Purge DTW	Notes
74MW1	24.50	24.66	
74MW2	56.52	56.56	
74MW3	21.94	24.87	
74MW4	24.86	24.86	
74MW6	25.31	Top of Pump	
74MW7	25.90	26.54	
74MW5	27.14	27.14	

74MW6

DTW - 25.31 Begin Purge (12:27)
Post Purge DTW - Top of Pump Initial Purge - Clear

Time	Temp(C°)	Cond(us)	DO mg/L	pH	ORP(mv)	Purge(gpm)	Desc
(1230)	14.91	644	8.39	6.82	227.4	≤0.3 L/min	Clear
(1235)	14.98	651	7.45	6.61	226.6	"	Clear
(1240)	15.06	669	6.59	6.53	223.5	"	Clear
(1245)	14.99	704	6.03	6.46	221.2	"	Clear

10/20/08

74MW6 (

Time 7
(1250) 1
(1255) 1
(1300) 1
(1305) 1
(1305) R
(1320) 1
(1310) S
Sa

74MW7

DTW -
Post Purge DT
Time Te
(1345) 1
(1350) 1
(1355) 1
(1400) 1
(1405) 1
(1410) 1
(1415) 1
(1420) 1
(1420) R
(1435) 1
S
Sam

10/21/08 RAAP FB#8

B03204-06
DAS/TQE

General Notes

Weather - Sunny, 40's

PPE - Eye Protection, Nitrile gloves, Heavy Duty Rubber boots, Cotton Suits

Calibrations - YSI 650 MDS

pH - 4.00 = 4.01, 7.00 = 7.00, 10.00 = 9.98

Conductivity reads 1413 us in 1413 us std

DO% = 100

- Dedicated tubing and well skirts used at each well, and disposed of after each use
- All equipment deconed between each well
- Purge water contained and disposed of at dedicated location onsite
- All samples collected, stored and transported on ice in coolers

13MW3

DTW - 13.79 Begin Purge (7:41)

Post Purge DTW - 13.86 Initial Purge - Clear

Time	Temp(C)	Cond(us)	DO mg/L	pH	ORP(mv)	Purge(gpm)	Desc
(0745)	14.89	598	7.57	6.63	220.7	0.3 L/min	Clear
(0750)	14.94	627	5.78	6.72	212.6	"	Clear
(0755)	15.45	644	5.00	6.74	208.8	"	Clear
(0800)	15.70	655	4.68	6.76	205.9	"	Clear
(0805)	15.78	657	4.62	6.75	204.7	"	Clear
(0810)	15.89	657	4.64	6.75	203.9	"	Clear
(0815)	15.93	657	4.65	6.75	204.0	"	Clear
(0815)	Readings Stable						
(0830)	16.37	650	5.16	6.72	215.9	Post Purge	Clear

Sample Time (0820)

Samples Collected: (3)8260, (2)8332, (2)8330, (2)8270, (1)314.0, (1)TM

10/21/08 RAAP FB#8
B03204-06
DAS/TAE

13MW2

DTW - 22.24 Begin Purge (0908)
Post Purge DTW - 22.81 Initial Purge - Clear

Time	Temp(°C)	Cond(us)	DO mg/L	pH	ORP(mv)	Purge K(gpm)	Desc
(0910)	14.33	664	7.45	6.86	210.5	0.3 L/min	Clear
(0915)	14.20	667	6.20	6.83	211.4	"	Clear
(0920)	14.23	664	4.47	6.80	211.8	"	Clear
(0925)	14.25	665	4.25	6.80	210.8	"	Clear
(0930)	14.35	663	4.21	6.82	208.2	"	Clear
(0935)	14.54	663	3.94	6.81	206.4	"	Clear
(0940)	14.70	662	3.89	6.82	203.7	"	Clear
(0945)	14.81	663	3.85	6.83	202.4	"	Clear
(0945)	Readings Stable						
(1003)	14.18	660	3.97	6.81	203.3	Post Purge	Clear

Sample Time (0950)
Samples Collected: (3)8260, (2)8332, (2)8330, (2)8270, (1)314.0, (1) TIC

13MW1

DTW - 22.46 Begin Purge (1028)
Post Purge DTW - 22.65 Initial Purge - Clear

Time	Temp(°C)	Cond(us)	DO mg/L	pH	ORP(mv)	Purge K(gpm)	Desc
(1030)	14.08	708	7.02	6.87	186.8	0.3 L/min	Clear
(1035)	14.23	710	6.10	6.85	191.4	"	Clear
(1040)	14.47	714	5.20	6.85	192.1	"	Clear
(1045)	14.60	719	4.38	6.83	194.0	"	Clear
(1050)	14.71	720	4.05	6.84	193.7	"	Clear
(1055)	14.75	725	3.71	6.84	194.4	"	Clear
(1100)	14.80	726	3.59	6.84	194.2	"	Clear
(1105)	14.78	729	3.48	6.85	194.2	"	Clear
(1105)	Readings Stable						
(1121)	13.86	729	3.69	6.90	186.3	Post Purge	Clear

Sample Time (1110)
Samples Collected: (3)8260, (2)8332, (2)8330, (2)8270, (1)314.0, (1) TIC

APPENDIX B

2008 LABORATORY ANALYTICAL RESULTS
(CD-ROM)

APPENDIX C

ESTABLISHED BACKGROUND VALUES AND COMPUTATIONS

RADFORD ARMY AMMUNITION PLANT – OPEN BURNING GROUND CALCULATION OF CONSTITUENT BACKGROUND VALUES FOR THE DETECTION GROUNDWATER MONITORING PROGRAM

Draper Aden Associates calculated background values for each constituent listed in the Detection Groundwater Monitoring Program (DGMP) dated September 2003 for the Open Burning Ground located at the Radford Army Ammunition Plant (Radford AAP) in Radford, Virginia. With the exceptions of carbon tetrachloride, chlorobenzene, hexachloroethane, methyl chloride, methlyene chloride, and perchlorate, the background values for each constituent listed in the DGMP were calculated using the analytical data for upgradient wells 13MW1 and 13MW2 from First Quarter 1996 through First Quarter 2005. Groundwater monitoring for carbon tetrachloride, chlorobenzene, hexachloroethane, methyl chloride, methlyene chloride, and perchlorate began in Fourth Quarter 2003; therefore, the background values for those six constituents were calculated using the analytical data for upgradient wells 13MW1 and 13MW2 from Fourth Quarter 2003 through First Quarter 2005. The background value calculations were based on site-wide 95% confidence, 95% coverage upper prediction intervals. The calculated background values are listed in **Table 1**.

Background Data and Statistical Calculations

Statistical calculations of background values were performed using the analytical data from upgradient wells 13MW1 and 13MW2 as background data. Based on the percentage of non-detects and the distribution of the background data, methods of statistical calculations varied. Background average, standard deviation and other descriptive statistical data were computed for all constituents and are presented in **Appendix A**.

The constituents listed below were 100% non-detected (<LOQ) in the background wells. The background values for these constituents were established as equal to their quantitation limits (QL).

Background Value = Quantitation Limit (QL)				
Parameter	**Sample Size**	**% Non-Detects**	**QL (µg/l)**	**Background Value (µg/l)**
Acetone	74	100	25	25
Benzene	74	100	5	5
Carbon tetrachloride	12	100	5	5
Chlorobenzene	12	100	5	5
Methyl chloride	12	100	5	5
Methylene chloride	12	100	5	5
Toluene	74	100	5	5
2,4-Dinitrotoluene	74	100	10	10
Di-n-butylphthalate	74	100	10	10
Diethyl phthalate	74	100	10	10
Diphenylamine	74	100	10	10
Hexachloroethane	12	100	10	10
Nitroglycerine	74	100	10 mg/l	10 mg/l
Perchlorate	12	100	4	4
Nitrite	61	100	100	100

Non-parametric prediction intervals were computed for all of the constituents for which the data from upgradient wells 13MW1 and 13MW2 satisfied one of the following two criteria, per VDEQ regulations and guidance as well as USEPA guidance:

- Percentage of non-detects was greater than or equal to 50 and less than 100; or
- Percentage of non-detects was less than 50, but data was not normally distributed in original or log-transformed mode.

The background values for these constituents were set as equal to their upper prediction limits (UPLs), with one exception. For pH, a two-sided parametric prediction interval was computed; therefore, the background value for pH consists of a range between the lower prediction limit (LPL) and the UPL. The background and relevant statistical data for these constituents are summarized below. Associated statistical computations are presented in **Appendix A**.

Background Value = UPL of Non-parametric Prediction Interval Background Value for pH = LPL – UPL of two-sided Prediction Interval				
Parameter	**Sample Size**	**% Non-Detects**	**QL (µg/l)**	**Background Value (µg/l)**
Antimony	74	99	5	6
Arsenic	74	93	5	5
Chromium	74	31	5	112
Lead	74	69	5	14.0
Mercury	74	99	2	2.52
Silver	74	92	2	2.4
Total Phenols	74	97	5	20.0
Total Organic Carbon	74	73	1,000	10,600
Total Organic Halides	74	85	20	54.5
Sulfate	61	0	1,000	88,000
pH	62	0	0.1 pH units	5.72 – 7.80 pH units
Specific Conductivity	62	0	1 µS/cm	6,870 µS/cm

The following constituents exhibited normally or ln-normally distributed background data with less than 25% non-detects. One sided parametric prediction intervals were computed on the background data for each of these constituents. The background values for these constituents were set as equal to their UPLs. The background concentration calculations were based on a site wide 95% confidence, 95% coverage upper prediction intervals. When adjusted for multiple comparisons of the background data, the false positive rate was 5% (0.05). The background and relevant statistical data for these constituents are summarized below. The prediction interval computations for these constituents are presented in **Appendix A**.

Background Value = UPL of one-sided Prediction Interval				
Parameter	**Sample Size**	**% Non-Detects**	**QL (µg/l)**	**Background Value (µg/l)**
Barium	74	0	10	228
Nitrate	61	3	100	1,311

TABLE 1

OPEN BURNING GROUND
CALCULATED BACKGROUND VALUES

Constituent	Background Value (µg/l unless otherwise noted)
Antimony	6
Arsenic	5
Barium	228
Chromium	112
Lead	14.0
Mercury	2.52
Silver	2.4
Acetone	25
Benzene	5
Carbon Tetrachloride	5
Chlorobenzene	5
Methyl chloride	5
Methylene chloride	5
Toluene	5
2,4-Dinitrotoluene	10
Di-n-butylphthalate	10
Diethyl phthalate	10
Diphenylamine	10
Hexachloroethane	10
Nitroglycerine	10 mg/l
Perchlorate	4
Total Phenols	20.0
Nitrate	1,311
Nitrite	100
Sulfate	88,000
Total Organic Carbon	10,600
Total Organic Halides	54.5
Specific Conductivity	6,870 µS/cm
pH	5.72 – 7.80 pH units

APPENDIX A

OPEN BURNING GROUND
BACKGROUND VALUE STATISTICAL CALCULATIONS

RAAP - Open Burning Ground (HWMU-13) - Statistical Analysis - Background Calculation

May 10, 2005

1) Y2K Correction dates on GRITS/STAT software are as shown in the table below.

Actual Event Date	Date Used in Stat Software	Notes
1st Quarter 2000	12/10/1999	
2nd Quarter 2000	12/11/1999	
3rd Quarter 2000	12/12/1999	
4th Quarter 2000	12/13/1999	
1st Quarter 2001	12/14/1999	
2nd Quarter 2001	12/15/1999	
3rd Quarter 2001	12/16/1999	
4th Quarter 2001	12/17/1999	
1st Quarter 2002	12/18/1999	
2nd Quarter 2002	12/19/1999	
3rd Quarter 2002	12/20/1999	
4th Quarter 2002	12/21/1999	
1st Quarter 2003	12/22/1999	
2nd Quarter 2003	12/23/1999	
3rd Quarter 2003	12/24/1999	
4th Quarter 2003	12/25/1999	
1st Quarter 2004	12/26/1999	
2nd Quarter 2004	12/27/1999	
3rd Quarter 2004	12/28/1999	
4th Quarter 2004	12/29/1999	
1st Quarter 2005	12/30/1999	

2) No adjustments for multiple comparisons could be made for non-parametric UPLs and where UPL=QL.
Any Statistically significant increase (SSI) must be confirmed by verification sampling.

3) No data available for pH and Specific conductivity from 2nd Qtr 1996 - 2nd Qtr 1997.

4) Background for chlorobenzene, Carbon tetrachloride, Methyl Chloride (Chloromethane), Methylene Chloride (Dichloromethane), Hexachloroethane and Perchlorate based on 4th Quarter 2003 to 1st Quarter 2005 data.

5) Background for all other target constituents based on 1st Quarter 1996 through 1st Quarter 2005 data.

P:\B03\200\B03204\B03204-03\WORK\[StatDate correction.xls]Statcorrection dates

Data Set Summary

Report Printed: 05-10-2005 20:01

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:CCl4 Carbon tetrachloride

CAS Number: 56-23-5
MCL: 5.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Dec 25 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 26 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 27 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 28 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 29 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 30 1999	5.000 ppb	1.609 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

Minimum:	5.000 ppb	Ln Minimum:	1.609
Maximum:	5.000 ppb	Ln Maximum:	1.609
Mean:	5.000 ppb	Ln Mean:	1.609
Std. Dev.:	0.000 ppb	Ln Std. Dev.:	0.000

Well ID:13MW2

Sample Date	Observation	Ln

Dec 25 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 26 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 27 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 28 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 29 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 30 1999	5.000 ppb	1.609 (* Nondetect *)

Well ID:13MW2 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

Minimum:	5.000 ppb	Ln Minimum:	1.609
Maximum:	5.000 ppb	Ln Maximum:	1.609
Mean:	5.000 ppb	Ln Mean:	1.609
Std. Dev.:	0.000 ppb	Ln Std. Dev.:	0.000

Data Set Summary

Report Printed: 05-10-2005 20:01

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:ChlBenz Chlorobenzene

CAS Number: 108-90-7
MCL: 100.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Dec 25 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 26 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 27 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 28 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 29 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 30 1999	5.000 ppb	1.609 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

Minimum:	5.000 ppb	Ln Minimum:	1.609
Maximum:	5.000 ppb	Ln Maximum:	1.609
Mean:	5.000 ppb	Ln Mean:	1.609
Std. Dev.:	0.000 ppb	Ln Std. Dev.:	0.000

Well ID:13MW2

Sample Date	Observation	Ln

Dec 25 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 26 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 27 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 28 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 29 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 30 1999	5.000 ppb	1.609 (* Nondetect *)

Well ID: 13MW2 Summary Statistics

Observations (N): 6
Nondetects (%ND): 100

Minimum:	5.000 ppb	Ln Minimum:	1.609
Maximum:	5.000 ppb	Ln Maximum:	1.609
Mean:	5.000 ppb	Ln Mean:	1.609
Std. Dev.:	0.000 ppb	Ln Std. Dev.:	0.000

Data Set Summary

Report Printed: 05-10-2005 20:01

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:ChlMeth Chloromethane

CAS Number: 74-87-3
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Dec 25 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 26 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 27 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 28 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 29 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 30 1999	5.000 ppb	1.609 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

Minimum:	5.000 ppb	Ln Minimum:	1.609
Maximum:	5.000 ppb	Ln Maximum:	1.609
Mean:	5.000 ppb	Ln Mean:	1.609
Std. Dev.:	0.000 ppb	Ln Std. Dev.:	0.000

Well ID:13MW2

Sample Date	Observation	Ln

Dec 25 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 26 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 27 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 28 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 29 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 30 1999	5.000 ppb	1.609 (* Nondetect *)

Well ID:13MW2 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

Minimum:	5.000 ppb	Ln Minimum:	1.609
Maximum:	5.000 ppb	Ln Maximum:	1.609
Mean:	5.000 ppb	Ln Mean:	1.609
Std. Dev.:	0.000 ppb	Ln Std. Dev.:	0.000

Data Set Summary

Report Printed: 05-10-2005 20:02

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:DiClMe Dichloromethane

CAS Number: 75-09-2
MCL: 5.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Dec 25 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 26 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 27 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 28 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 29 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 30 1999	5.000 ppb	1.609 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

Minimum:	5.000 ppb	Ln Minimum:	1.609
Maximum:	5.000 ppb	Ln Maximum:	1.609
Mean:	5.000 ppb	Ln Mean:	1.609
Std. Dev.:	0.000 ppb	Ln Std. Dev.:	0.000

Well ID:13MW2

Sample Date	Observation	Ln

Dec 25 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 26 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 27 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 28 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 29 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 30 1999	5.000 ppb	1.609 (* Nondetect *)

Well ID:13MW2 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

Minimum:	5.000 ppb	Ln Minimum:	1.609
Maximum:	5.000 ppb	Ln Maximum:	1.609
Mean:	5.000 ppb	Ln Mean:	1.609
Std. Dev.:	0.000 ppb	Ln Std. Dev.:	0.000

Data Set Summary

Report Printed: 05-10-2005 20:02

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:HClEth Hexachloroethane

CAS Number: 67-72-1
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 20.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Dec 25 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 26 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 27 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 28 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 29 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 30 1999	10.000 ppb	2.303 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

Minimum:	10.000 ppb	Ln Minimum:	2.303
Maximum:	10.000 ppb	Ln Maximum:	2.303
Mean:	10.000 ppb	Ln Mean:	2.303
Std. Dev.:	0.000 ppb	Ln Std. Dev.:	0.000

Well ID:13MW2

Sample Date	Observation	Ln

Dec 25 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 26 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 27 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 28 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 29 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 30 1999	10.000 ppb	2.303 (* Nondetect *)

Well ID:13MW2 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

Minimum:	10.000 ppb	Ln Minimum:	2.303
Maximum:	10.000 ppb	Ln Maximum:	2.303
Mean:	10.000 ppb	Ln Mean:	2.303
Std. Dev.:	0.000 ppb	Ln Std. Dev.:	0.000

Data Set Summary

Report Printed: 05-10-2005 20:02

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Perchlor Perchlorate

CAS Number: - -
MCL: 0.000 ug/l
ACL: 0.000 ug/l
Detect Limit: 8.000 ug/l

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Dec 25 1999	4.000 ug/l	1.386 (* Nondetect *)
Dec 26 1999	4.000 ug/l	1.386 (* Nondetect *)
Dec 27 1999	4.000 ug/l	1.386 (* Nondetect *)
Dec 28 1999	4.000 ug/l	1.386 (* Nondetect *)
Dec 29 1999	4.000 ug/l	1.386 (* Nondetect *)
Dec 30 1999	4.000 ug/l	1.386 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

Minimum:	4.000 ug/l	Ln Minimum:	1.386
Maximum:	4.000 ug/l	Ln Maximum:	1.386
Mean:	4.000 ug/l	Ln Mean:	1.386
Std. Dev.:	0.000 ug/l	Ln Std. Dev.:	0.000

Well ID:13MW2

Sample Date	Observation	Ln

Dec 25 1999	4.000 ug/l	1.386 (* Nondetect *)
Dec 26 1999	4.000 ug/l	1.386 (* Nondetect *)
Dec 27 1999	4.000 ug/l	1.386 (* Nondetect *)
Dec 28 1999	4.000 ug/l	1.386 (* Nondetect *)
Dec 29 1999	4.000 ug/l	1.386 (* Nondetect *)
Dec 30 1999	4.000 ug/l	1.386 (* Nondetect *)

Well ID:13MW2 Summary Statistics

Observations (N): 6
Nondetects (%ND):100

Minimum:	4.000 ug/l	Ln Minimum:	1.386
Maximum:	4.000 ug/l	Ln Maximum:	1.386
Mean:	4.000 ug/l	Ln Mean:	1.386
Std. Dev.:	0.000 ug/l	Ln Std. Dev.:	0.000

Data Set Summary

Report Printed: 05-10-2005 17:22

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Sb Antimony, total

CAS Number: 7440-36-0
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Mar 31 1996	1.500 ppb	0.405 (* Nondetect *)
Jun 30 1996	1.500 ppb	0.405 (* Nondetect *)
Sep 30 1996	1.500 ppb	0.405 (* Nondetect *)
Dec 31 1996	1.500 ppb	0.405 (* Nondetect *)
Mar 31 1997	1.500 ppb	0.405 (* Nondetect *)
Jun 30 1997	1.500 ppb	0.405 (* Nondetect *)
Sep 30 1997	1.500 ppb	0.405 (* Nondetect *)
Dec 31 1997	1.500 ppb	0.405 (* Nondetect *)
Mar 09 1998	1.500 ppb	0.405 (* Nondetect *)
May 14 1998	1.500 ppb	0.405 (* Nondetect *)
Aug 14 1998	1.500 ppb	0.405 (* Nondetect *)
Nov 23 1998	1.500 ppb	0.405 (* Nondetect *)
Mar 13 1999	1.500 ppb	0.405 (* Nondetect *)
May 27 1999	1.500 ppb	0.405 (* Nondetect *)
Jul 27 1999	1.500 ppb	0.405 (* Nondetect *)
Nov 08 1999	1.500 ppb	0.405 (* Nondetect *)
Dec 10 1999	1.500 ppb	0.405 (* Nondetect *)
Dec 11 1999	1.500 ppb	0.405 (* Nondetect *)
Dec 12 1999	1.500 ppb	0.405 (* Nondetect *)
Dec 13 1999	1.500 ppb	0.405 (* Nondetect *)
Dec 14 1999	1.500 ppb	0.405 (* Nondetect *)
Dec 15 1999	1.500 ppb	0.405 (* Nondetect *)
Dec 16 1999	1.500 ppb	0.405 (* Nondetect *)
Dec 17 1999	1.500 ppb	0.405 (* Nondetect *)

Dec 18 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 19 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 20 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 21 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 22 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 23 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 24 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 25 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 26 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 27 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 28 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 29 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 30 1999	5.000 ppb	1.609 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

Minimum:	1.500 ppb	Ln Minimum:	0.405
Maximum:	5.000 ppb	Ln Maximum:	1.609
Mean:	2.730 ppb	Ln Mean:	0.828
Std. Dev.:	1.694 ppb	Ln Std. Dev.:	0.583

Well ID:13MW2

Sample Date	Observation	Ln
Mar 31 1996	1.500 ppb	0.405 (* Nondetect *)
Jun 30 1996	1.500 ppb	0.405 (* Nondetect *)
Sep 30 1996	1.500 ppb	0.405 (* Nondetect *)
Dec 31 1996	6.000 ppb	1.792
Mar 31 1997	1.500 ppb	0.405 (* Nondetect *)
Jun 30 1997	1.500 ppb	0.405 (* Nondetect *)
Sep 30 1997	1.500 ppb	0.405 (* Nondetect *)
Dec 31 1997	1.500 ppb	0.405 (* Nondetect *)
Mar 09 1998	1.500 ppb	0.405 (* Nondetect *)
May 14 1998	1.500 ppb	0.405 (* Nondetect *)
Aug 14 1998	1.500 ppb	0.405 (* Nondetect *)
Nov 23 1998	1.500 ppb	0.405 (* Nondetect *)
Mar 13 1999	1.500 ppb	0.405 (* Nondetect *)
May 27 1999	1.500 ppb	0.405 (* Nondetect *)
Jul 27 1999	1.500 ppb	0.405 (* Nondetect *)
Nov 08 1999	1.500 ppb	0.405 (* Nondetect *)
Dec 10 1999	1.500 ppb	0.405 (* Nondetect *)
Dec 11 1999	1.500 ppb	0.405 (* Nondetect *)
Dec 12 1999	1.500 ppb	0.405 (* Nondetect *)
Dec 13 1999	1.500 ppb	0.405 (* Nondetect *)
Dec 14 1999	1.500 ppb	0.405 (* Nondetect *)
Dec 15 1999	1.500 ppb	0.405 (* Nondetect *)
Dec 16 1999	1.500 ppb	0.405 (* Nondetect *)
Dec 17 1999	1.500 ppb	0.405 (* Nondetect *)
Dec 18 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 19 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 20 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 21 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 22 1999	5.000 ppb	1.609 (* Nondetect *)

Dec 23 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 24 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 25 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 26 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 27 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 28 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 29 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 30 1999	5.000 ppb	1.609 (* Nondetect *)

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 97

Minimum:	1.500 ppb	Ln Minimum:	0.405
Maximum:	6.000 ppb	Ln Maximum:	1.792
Mean:	2.851 ppb	Ln Mean:	0.866
Std. Dev.:	1.763 ppb	Ln Std. Dev.:	0.599

Normality Tests

Report Printed: 05-10-2005 15:34

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Sb Antimony, total

CAS Number: 7440-36-0
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

Scale	Minimum	Maximum	Mean	Std Dev
Original:	1.500	5.000	2.730	1.694
Log:	0.405	1.609	0.828	0.583

Well:13MW2 Position:Upgradient Observations:37

Scale	Minimum	Maximum	Mean	Std Dev
Original:	1.500	6.000	2.851	1.763
Log:	0.405	1.792	0.866	0.599

Pooled Statistics
Observations: 74

Statistic	Original Scale	Log Scale
Mean:	2.791	0.847
Std Dev:	1.718	0.587
Skewness:	0.578	0.566
Kurtosis:	-1.636	-1.673
Minimum:	1.500	0.405
Maximum:	6.000	1.792

CV: 0.616 0.693

Shapiro-Francia Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.6407*	0.9690	0.9560
Log:	0.6351*	0.9690	0.9560

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

% ND = 99 %. ~~100~~

Nonparametric Prediction Interval
Report Printed May 10,2005

Facility:Haz. Waste Unit 13 - RAAP
Parameter:Antimony, total(CAS Number:7440-36-0)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

Observations (n):	74
Conf. Level (1-α):	***.***%

UL: ~~[illegible]~~ 6.0 ppb
LL: 0.000

%ND : 99%

Report Produced by GRITS/STAT 5.01

Data Set Summary

Report Printed: 05-10-2005 17:22

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:As Arsenic, total

CAS Number: 7440-38-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Mar 31 1996	0.500 ppb	-0.693 (* Nondetect *)
Jun 30 1996	0.500 ppb	-0.693 (* Nondetect *)
Sep 30 1996	0.500 ppb	-0.693 (* Nondetect *)
Dec 31 1996	0.500 ppb	-0.693 (* Nondetect *)
Mar 31 1997	0.500 ppb	-0.693 (* Nondetect *)
Jun 30 1997	0.500 ppb	-0.693 (* Nondetect *)
Sep 30 1997	0.500 ppb	-0.693 (* Nondetect *)
Dec 31 1997	0.500 ppb	-0.693 (* Nondetect *)
Mar 09 1998	0.500 ppb	-0.693 (* Nondetect *)
May 14 1998	0.500 ppb	-0.693 (* Nondetect *)
Aug 14 1998	0.500 ppb	-0.693 (* Nondetect *)
Nov 23 1998	3.000 ppb	1.099
Mar 13 1999	1.000 ppb	0.000
May 27 1999	0.500 ppb	-0.693 (* Nondetect *)
Jul 27 1999	0.500 ppb	-0.693 (* Nondetect *)
Nov 08 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 10 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 11 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 12 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 13 1999	2.000 ppb	0.693
Dec 14 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 15 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 16 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 17 1999	0.500 ppb	-0.693 (* Nondetect *)

Dec 18 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 19 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 20 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 21 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 22 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 23 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 24 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 25 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 26 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 27 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 28 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 29 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 30 1999	5.000 ppb	1.609 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 92

Minimum:	0.500 ppb	Ln Minimum:	-0.693
Maximum:	5.000 ppb	Ln Maximum:	1.609
Mean:	2.203 ppb	Ln Mean:	0.220
Std. Dev.:	2.139 ppb	Ln Std. Dev.:	1.101

Well ID:13MW2

Sample Date	Observation	Ln
Mar 31 1996	0.500 ppb	-0.693 (* Nondetect *)
Jun 30 1996	0.500 ppb	-0.693 (* Nondetect *)
Sep 30 1996	0.500 ppb	-0.693 (* Nondetect *)
Dec 31 1996	0.500 ppb	-0.693 (* Nondetect *)
Mar 31 1997	0.500 ppb	-0.693 (* Nondetect *)
Jun 30 1997	0.500 ppb	-0.693 (* Nondetect *)
Sep 30 1997	0.500 ppb	-0.693 (* Nondetect *)
Dec 31 1997	0.500 ppb	-0.693 (* Nondetect *)
Mar 09 1998	0.500 ppb	-0.693 (* Nondetect *)
May 14 1998	0.500 ppb	-0.693 (* Nondetect *)
Aug 14 1998	0.500 ppb	-0.693 (* Nondetect *)
Nov 23 1998	0.500 ppb	-0.693 (* Nondetect *)
Mar 13 1999	0.500 ppb	-0.693 (* Nondetect *)
May 27 1999	0.500 ppb	-0.693 (* Nondetect *)
Jul 27 1999	1.000 ppb	0.000
Nov 08 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 10 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 11 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 12 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 13 1999	2.000 ppb	0.693
Dec 14 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 15 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 16 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 17 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 18 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 19 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 20 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 21 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 22 1999	5.000 ppb	1.609 (* Nondetect *)

Dec 23 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 24 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 25 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 26 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 27 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 28 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 29 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 30 1999	5.000 ppb	1.609 (* Nondetect *)

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 95

Minimum:	0.500 ppb	Ln Minimum:	-0.693
Maximum:	5.000 ppb	Ln Maximum:	1.609
Mean:	2.135 ppb	Ln Mean:	0.172
Std. Dev.:	2.153 ppb	Ln Std. Dev.:	1.101

Normality Tests

Report Printed: 05-10-2005 15:45

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:As Arsenic, total

CAS Number: 7440-38-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

Scale	Minimum	Maximum	Mean	Std Dev
Original:	0.500	5.000	2.203	2.139
Log:	-0.693	1.609	0.220	1.101

Well:13MW2 Position:Upgradient Observations:37

Scale	Minimum	Maximum	Mean	Std Dev
Original:	0.500	5.000	2.135	2.153
Log:	-0.693	1.609	0.172	1.101

Pooled Statistics
Observations: 74

Statistic	Original Scale	Log Scale
Mean:	2.169	0.196
Std Dev:	2.131	1.094
Skewness:	0.552	0.465
Kurtosis:	-1.649	-1.725
Minimum:	0.500	-0.693
Maximum:	5.000	1.609

CV:	0.983	5.572

Shapiro-Francia Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.6615*	0.9690	0.9560
Log:	0.6742*	0.9690	0.9560

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

Nonparametric Prediction Interval
Report Printed May 10,2005

Facility:Haz. Waste Unit 13 - RAAP
Parameter:Arsenic, total(CAS Number:7440-38-2)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

Observations (n): 74
Conf. Level (1-α): ***.***%

UL: ~~0.500~~ 5.0 ppb
LL: 0.000

% ND: 100%.

BACKGROUND TO COMPLIANCE WELL COMPARISON

Well:13MW3

Sample Date	Observation
12/17/99	ND < 1.000 ppb

Report Produced by GRITS/STAT 5.01

Data Set Summary

Report Printed: 05-10-2005 17:23

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Ba Barium, total

CAS Number: 7440-39-3
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 20.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Mar 31 1996	87.000 ppb	4.466
Jun 30 1996	105.000 ppb	4.654
Sep 30 1996	90.000 ppb	4.500
Dec 31 1996	88.000 ppb	4.477
Mar 31 1997	127.000 ppb	4.844
Jun 30 1997	129.000 ppb	4.860
Sep 30 1997	154.000 ppb	5.037
Dec 31 1997	126.000 ppb	4.836
Mar 09 1998	117.000 ppb	4.762
May 14 1998	98.000 ppb	4.585
Aug 14 1998	107.000 ppb	4.673
Nov 23 1998	255.000 ppb	5.541
Mar 13 1999	178.000 ppb	5.182
May 27 1999	85.000 ppb	4.443
Jul 27 1999	103.000 ppb	4.635
Nov 08 1999	128.000 ppb	4.852
Dec 10 1999	96.000 ppb	4.564
Dec 11 1999	91.000 ppb	4.511
Dec 12 1999	81.000 ppb	4.394
Dec 13 1999	111.000 ppb	4.710
Dec 14 1999	115.000 ppb	4.745
Dec 15 1999	81.800 ppb	4.404
Dec 16 1999	112.000 ppb	4.718
Dec 17 1999	132.000 ppb	4.883

Dec 18 1999	127.000 ppb	4.844
Dec 19 1999	107.000 ppb	4.673
Dec 20 1999	132.000 ppb	4.883
Dec 21 1999	143.000 ppb	4.963
Dec 22 1999	110.000 ppb	4.700
Dec 23 1999	78.000 ppb	4.357
Dec 24 1999	89.500 ppb	4.494
Dec 25 1999	120.000 ppb	4.787
Dec 26 1999	98.800 ppb	4.593
Dec 27 1999	96.300 ppb	4.567
Dec 28 1999	97.100 ppb	4.576
Dec 29 1999	106.000 ppb	4.663
Dec 30 1999	101.000 ppb	4.615

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 0

Minimum:	78.000 ppb	Ln Minimum:	4.357
Maximum:	255.000 ppb	Ln Maximum:	5.541
Mean:	113.581 ppb	Ln Mean:	4.703
Std. Dev.:	32.212 ppb	Ln Std. Dev.:	0.235

Well ID:13MW2

Sample Date	Observation	Ln
Mar 31 1996	134.000 ppb	4.898
Jun 30 1996	139.000 ppb	4.934
Sep 30 1996	128.000 ppb	4.852
Dec 31 1996	110.000 ppb	4.700
Mar 31 1997	137.000 ppb	4.920
Jun 30 1997	125.000 ppb	4.828
Sep 30 1997	140.000 ppb	4.942
Dec 31 1997	141.000 ppb	4.949
Mar 09 1998	220.000 ppb	5.394
May 14 1998	159.000 ppb	5.069
Aug 14 1998	151.000 ppb	5.017
Nov 23 1998	172.000 ppb	5.147
Mar 13 1999	168.000 ppb	5.124
May 27 1999	153.000 ppb	5.030
Jul 27 1999	124.000 ppb	4.820
Nov 08 1999	146.000 ppb	4.984
Dec 10 1999	138.000 ppb	4.927
Dec 11 1999	145.000 ppb	4.977
Dec 12 1999	130.000 ppb	4.868
Dec 13 1999	135.000 ppb	4.905
Dec 14 1999	131.000 ppb	4.875
Dec 15 1999	147.000 ppb	4.990
Dec 16 1999	148.000 ppb	4.997
Dec 17 1999	155.000 ppb	5.043
Dec 18 1999	128.000 ppb	4.852
Dec 19 1999	148.000 ppb	4.997
Dec 20 1999	148.000 ppb	4.997
Dec 21 1999	142.000 ppb	4.956
Dec 22 1999	153.000 ppb	5.030

Dec 23 1999	172.000 ppb	5.147
Dec 24 1999	168.000 ppb	5.124
Dec 25 1999	152.000 ppb	5.024
Dec 26 1999	174.000 ppb	5.159
Dec 27 1999	168.000 ppb	5.124
Dec 28 1999	154.000 ppb	5.037
Dec 29 1999	171.000 ppb	5.142
Dec 30 1999	180.000 ppb	5.193

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 0

Minimum:	110.000 ppb	Ln Minimum:	4.700
Maximum:	220.000 ppb	Ln Maximum:	5.394
Mean:	149.568 ppb	Ln Mean:	4.999
Std. Dev.:	20.240 ppb	Ln Std. Dev.:	0.130

Normality Tests

Report Printed: 05-10-2005 15:54

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Ba Barium, total

CAS Number: 7440-39-3
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 20.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

Scale	Minimum	Maximum	Mean	Std Dev
Original:	78.000	255.000	113.581	32.212
Log:	4.357	5.541	4.703	0.235

Well:13MW2 Position:Upgradient Observations:37

Scale	Minimum	Maximum	Mean	Std Dev
Original:	110.000	220.000	149.568	20.240
Log:	4.700	5.394	4.999	0.130

Pooled Statistics
Observations: 74

Statistic	Original Scale	Log Scale
Mean:	131.574	4.851
Std Dev:	32.278	0.241
Skewness:	0.845	0.030
Kurtosis:	1.800	-0.118
Minimum:	78.000	4.357
Maximum:	255.000	5.541

CV: 0.245 0.050

Shapiro-Francia Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.9407*	0.9690	0.9560
Log:	0.9794	0.9690	0.9560

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

Parametric Prediction Interval
Report Printed May 10,2005

Facility:Haz. Waste Unit 13 - RAAP
Parameter:Barium, total(CAS Number:7440-39-3)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

Observations (n):	74
Shapiro-Francia (W):	0.9794
Critical W,α=0.01:	0.9560
Mean:	4.851 ln(ppb)
Std Dev:	0.241 ln(ppb)
DF:	73
Conf. Level (1-α):	0.9500
Future Samples (k):	5
$t_{\left[1-\frac{\alpha}{k}\right]}$:	2.3785
Kappa:	2.3945
UL:	227.572 ppb
LL:	0.000

%ND: 0 %

Report Produced by GRITS/STAT 5.01

Data Set Summary

Report Printed: 05-10-2005 17:23

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Cr Chromium, total

CAS Number: 7440-47-3
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Mar 31 1996	11.000 ppb	2.398
Jun 30 1996	13.000 ppb	2.565
Sep 30 1996	56.000 ppb	4.025
Dec 31 1996	20.000 ppb	2.996
Mar 31 1997	22.000 ppb	3.091
Jun 30 1997	19.000 ppb	2.944
Sep 30 1997	40.000 ppb	3.689
Dec 31 1997	23.000 ppb	3.135
Mar 09 1998	55.000 ppb	4.007
May 14 1998	6.000 ppb	1.792
Aug 14 1998	9.000 ppb	2.197
Nov 23 1998	112.000 ppb	4.718
Mar 13 1999	108.000 ppb	4.682
May 27 1999	3.000 ppb	1.099
Jul 27 1999	2.000 ppb	0.693
Nov 08 1999	15.000 ppb	2.708
Dec 10 1999	2.000 ppb	0.693
Dec 11 1999	2.000 ppb	0.693
Dec 12 1999	2.000 ppb	0.693
Dec 13 1999	4.000 ppb	1.386
Dec 14 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 15 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 16 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 17 1999	0.500 ppb	-0.693 (* Nondetect *)

Dec 18 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 19 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 20 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 21 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 22 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 23 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 24 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 25 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 26 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 27 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 28 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 29 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 30 1999	5.000 ppb	1.609 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 46

Minimum:	0.500 ppb	Ln Minimum:	-0.693
Maximum:	112.000 ppb	Ln Maximum:	4.718
Mean:	15.973 ppb	Ln Mean:	1.847
Std. Dev.:	26.511 ppb	Ln Std. Dev.:	1.386

Well ID:13MW2

Sample Date	Observation	Ln
Mar 31 1996	13.000 ppb	2.565
Jun 30 1996	10.000 ppb	2.303
Sep 30 1996	11.000 ppb	2.398
Dec 31 1996	14.000 ppb	2.639
Mar 31 1997	10.000 ppb	2.303
Jun 30 1997	10.000 ppb	2.303
Sep 30 1997	19.000 ppb	2.944
Dec 31 1997	12.000 ppb	2.485
Mar 09 1998	12.000 ppb	2.485
May 14 1998	7.000 ppb	1.946
Aug 14 1998	17.000 ppb	2.833
Nov 23 1998	20.000 ppb	2.996
Mar 13 1999	9.000 ppb	2.197
May 27 1999	6.000 ppb	1.792
Jul 27 1999	6.000 ppb	1.792
Nov 08 1999	6.000 ppb	1.792
Dec 10 1999	4.000 ppb	1.386
Dec 11 1999	6.000 ppb	1.792
Dec 12 1999	2.000 ppb	0.693
Dec 13 1999	5.000 ppb	1.609
Dec 14 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 15 1999	10.700 ppb	2.370
Dec 16 1999	9.210 ppb	2.220
Dec 17 1999	7.020 ppb	1.949
Dec 18 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 19 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 20 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 21 1999	57.600 ppb	4.054
Dec 22 1999	10.300 ppb	2.332

Dec 23 1999	6.300 ppb	1.841
Dec 24 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 25 1999	6.000 ppb	1.792
Dec 26 1999	7.600 ppb	2.028
Dec 27 1999	5.500 ppb	1.705
Dec 28 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 29 1999	7.400 ppb	2.001
Dec 30 1999	7.600 ppb	2.028

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 16

Minimum:	0.500 ppb	Ln Minimum:	-0.693
Maximum:	57.600 ppb	Ln Maximum:	4.054
Mean:	9.722 ppb	Ln Mean:	2.025
Std. Dev.:	9.158 ppb	Ln Std. Dev.:	0.733

Normality Tests

Report Printed: 05-10-2005 15:57

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Cr Chromium, total

CAS Number: 7440-47-3
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

Scale	Minimum	Maximum	Mean	Std Dev
Original:	0.500	112.000	15.973	26.511
Log:	-0.693	4.718	1.847	1.386

Well:13MW2 Position:Upgradient Observations:37

Scale	Minimum	Maximum	Mean	Std Dev
Original:	0.500	57.600	9.722	9.158
Log:	-0.693	4.054	2.025	0.733

Pooled Statistics
Observations: 74

Statistic	Original Scale	Log Scale
Mean:	12.848	1.936
Std Dev:	19.947	1.105
Skewness:	3.603*	-0.168
Kurtosis:	13.679	1.161
Minimum:	0.500	-0.693
Maximum:	112.000	4.718

CV:	1.553	0.570

Shapiro-Francia Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.4961*	0.9690	0.9560
Log:	0.9189*	0.9690	0.9560

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

Nonparametric Prediction Interval
Report Printed May 10,2005

Facility:Haz. Waste Unit 13 - RAAP
Parameter:Chromium, total(CAS Number:7440-47-3)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

Observations (n):	74
Conf. Level (1-α):	***.***%
UL:	~~0.500~~ 112.0 ppb
LL:	0.000

%ND: 31%.

Report Produced by GRITS/STAT 5.01

Data Set Summary

Report Printed: 05-10-2005 17:23

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Pb Lead, total

CAS Number: 7439-92-1
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Mar 31 1996	1.000 ppb	0.000
Jun 30 1996	1.000 ppb	0.000
Sep 30 1996	2.000 ppb	0.693
Dec 31 1996	4.000 ppb	1.386
Mar 31 1997	14.000 ppb	2.639
Jun 30 1997	9.000 ppb	2.197
Sep 30 1997	8.000 ppb	2.079
Dec 31 1997	5.000 ppb	1.609
Mar 09 1998	2.000 ppb	0.693
May 14 1998	0.500 ppb	-0.693 (* Nondetect *)
Aug 14 1998	0.500 ppb	-0.693 (* Nondetect *)
Nov 23 1998	6.000 ppb	1.792
Mar 13 1999	6.000 ppb	1.792
May 27 1999	0.500 ppb	-0.693 (* Nondetect *)
Jul 27 1999	0.500 ppb	-0.693 (* Nondetect *)
Nov 08 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 10 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 11 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 12 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 13 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 14 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 15 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 16 1999	3.200 ppb	1.163
Dec 17 1999	0.500 ppb	-0.693 (* Nondetect *)

Dec 18 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 19 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 20 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 21 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 22 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 23 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 24 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 25 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 26 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 27 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 28 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 29 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 30 1999	5.000 ppb	1.609 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 68

Minimum:	0.500 ppb	Ln Minimum:	-0.693
Maximum:	14.000 ppb	Ln Maximum:	2.639
Mean:	3.573 ppb	Ln Mean:	0.774
Std. Dev.:	3.027 ppb	Ln Std. Dev.:	1.138

Well ID:13MW2

Sample Date	Observation	Ln
Mar 31 1996	2.000 ppb	0.693
Jun 30 1996	4.000 ppb	1.386
Sep 30 1996	2.000 ppb	0.693
Dec 31 1996	6.000 ppb	1.792
Mar 31 1997	0.500 ppb	-0.693 (* Nondetect *)
Jun 30 1997	7.000 ppb	1.946
Sep 30 1997	6.000 ppb	1.792
Dec 31 1997	5.000 ppb	1.609
Mar 09 1998	3.000 ppb	1.099
May 14 1998	0.500 ppb	-0.693 (* Nondetect *)
Aug 14 1998	0.500 ppb	-0.693 (* Nondetect *)
Nov 23 1998	1.000 ppb	0.000
Mar 13 1999	2.000 ppb	0.693
May 27 1999	0.500 ppb	-0.693 (* Nondetect *)
Jul 27 1999	2.000 ppb	0.693
Nov 08 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 10 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 11 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 12 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 13 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 14 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 15 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 16 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 17 1999	0.500 ppb	-0.693 (* Nondetect *)
Dec 18 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 19 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 20 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 21 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 22 1999	5.000 ppb	1.609 (* Nondetect *)

Dec 23 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 24 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 25 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 26 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 27 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 28 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 29 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 30 1999	5.000 ppb	1.609 (* Nondetect *)

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 70

Minimum:	0.500 ppb	Ln Minimum:	-0.693
Maximum:	7.000 ppb	Ln Maximum:	1.946
Mean:	3.014 ppb	Ln Mean:	0.657
Std. Dev.:	2.238 ppb	Ln Std. Dev.:	1.078

Normality Tests

Report Printed: 05-10-2005 16:25

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Pb Lead, total

CAS Number: 7439-92-1
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

Scale	Minimum	Maximum	Mean	Std Dev
Original:	0.500	14.000	3.573	3.027
Log:	-0.693	2.639	0.774	1.138

Well:13MW2 Position:Upgradient Observations:37

Scale	Minimum	Maximum	Mean	Std Dev
Original:	0.500	7.000	3.014	2.238
Log:	-0.693	1.946	0.657	1.078

Pooled Statistics
Observations: 74

Statistic	Original Scale	Log Scale
Mean:	3.293	0.716
Std Dev:	2.658	1.102
Skewness:	0.876	-0.314
Kurtosis:	1.714	-1.614
Minimum:	0.500	-0.693
Maximum:	14.000	2.639

CV: 0.807 1.540

Shapiro-Francia Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.8098*	0.9690	0.9560
Log:	0.7963*	0.9690	0.9560

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

Nonparametric Prediction Interval
Report Printed May 10,2005

Facility:Haz. Waste Unit 13 - RAAP
Parameter:Lead, total(CAS Number:7439-92-1)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

Observations (n):	74
Conf. Level (1-α):	100.000%
UL:	14.0 ~~0.500~~ ppb
LL:	0.000

%ND: 69%.

Report Produced by GRITS/STAT 5.01

Data Set Summary

Report Printed: 05-10-2005 17:23

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Hg Mercury

CAS Number: 7439-97-6
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 4.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Mar 31 1996	0.100 ppb	-2.303 (* Nondetect *)
Jun 30 1996	0.100 ppb	-2.303 (* Nondetect *)
Sep 30 1996	0.100 ppb	-2.303 (* Nondetect *)
Dec 31 1996	0.100 ppb	-2.303 (* Nondetect *)
Mar 31 1997	0.100 ppb	-2.303 (* Nondetect *)
Jun 30 1997	0.100 ppb	-2.303 (* Nondetect *)
Sep 30 1997	0.100 ppb	-2.303 (* Nondetect *)
Dec 31 1997	0.100 ppb	-2.303 (* Nondetect *)
Mar 09 1998	0.100 ppb	-2.303 (* Nondetect *)
May 14 1998	0.100 ppb	-2.303 (* Nondetect *)
Aug 14 1998	0.100 ppb	-2.303 (* Nondetect *)
Nov 23 1998	0.100 ppb	-2.303 (* Nondetect *)
Mar 13 1999	0.100 ppb	-2.303 (* Nondetect *)
May 27 1999	0.100 ppb	-2.303 (* Nondetect *)
Jul 27 1999	0.100 ppb	-2.303 (* Nondetect *)
Nov 08 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 10 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 11 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 12 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 13 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 14 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 15 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 16 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 17 1999	0.100 ppb	-2.303 (* Nondetect *)

Dec 18 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 19 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 20 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 21 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 22 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 23 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 24 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 25 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 26 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 27 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 28 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 29 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 30 1999	2.000 ppb	0.693 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

Minimum:	0.100 ppb	Ln Minimum:	-2.303
Maximum:	2.000 ppb	Ln Maximum:	0.693
Mean:	0.768 ppb	Ln Mean:	-1.250
Std. Dev.:	0.920 ppb	Ln Std. Dev.:	1.450

Well ID:13MW2

Sample Date	Observation	Ln
Mar 31 1996	0.100 ppb	-2.303 (* Nondetect *)
Jun 30 1996	0.100 ppb	-2.303 (* Nondetect *)
Sep 30 1996	0.100 ppb	-2.303 (* Nondetect *)
Dec 31 1996	0.100 ppb	-2.303 (* Nondetect *)
Mar 31 1997	0.100 ppb	-2.303 (* Nondetect *)
Jun 30 1997	0.100 ppb	-2.303 (* Nondetect *)
Sep 30 1997	0.100 ppb	-2.303 (* Nondetect *)
Dec 31 1997	0.100 ppb	-2.303 (* Nondetect *)
Mar 09 1998	0.100 ppb	-2.303 (* Nondetect *)
May 14 1998	0.100 ppb	-2.303 (* Nondetect *)
Aug 14 1998	0.100 ppb	-2.303 (* Nondetect *)
Nov 23 1998	0.100 ppb	-2.303 (* Nondetect *)
Mar 13 1999	0.100 ppb	-2.303 (* Nondetect *)
May 27 1999	0.100 ppb	-2.303 (* Nondetect *)
Jul 27 1999	0.100 ppb	-2.303 (* Nondetect *)
Nov 08 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 10 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 11 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 12 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 13 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 14 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 15 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 16 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 17 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 18 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 19 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 20 1999	2.520 ppb	0.924
Dec 21 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 22 1999	2.000 ppb	0.693 (* Nondetect *)

Dec 23 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 24 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 25 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 26 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 27 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 28 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 29 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 30 1999	2.000 ppb	0.693 (* Nondetect *)

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 97

Minimum:	0.100 ppb	Ln Minimum:	-2.303
Maximum:	2.520 ppb	Ln Maximum:	0.924
Mean:	0.782 ppb	Ln Mean:	-1.244
Std. Dev.:	0.943 ppb	Ln Std. Dev.:	1.459

Normality Tests

Report Printed: 05-10-2005 16:28

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Hg Mercury

CAS Number: 7439-97-6
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 4.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

Scale	Minimum	Maximum	Mean	Std Dev
Original:	0.100	2.000	0.768	0.920
Log:	-2.303	0.693	-1.250	1.450

Well:13MW2 Position:Upgradient Observations:37

Scale	Minimum	Maximum	Mean	Std Dev
Original:	0.100	2.520	0.782	0.943
Log:	-2.303	0.924	-1.244	1.459

Pooled Statistics
Observations: 74

Statistic	Original Scale	Log Scale
Mean:	0.775	-1.247
Std Dev:	0.925	1.444
Skewness:	0.638	0.624
Kurtosis:	-1.565	-1.609
Minimum:	0.100	-2.303
Maximum:	2.520	0.924

CV: 1.194 -1.158

Shapiro-Francia Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.6336*	0.9690	0.9560
Log:	0.6250*	0.9690	0.9560

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

Nonparametric Prediction Interval
Report Printed May 10,2005

Facility:Haz. Waste Unit 13 - RAAP
Parameter:Mercury(CAS Number:7439-97-6)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

Observations (n):	74
Conf. Level (1-α):	100.000%
UL:	2.52 ~~0.100~~ ppb
LL:	0.000

%ND: ~99%.

Data Set Summary

Report Printed: 05-10-2005 17:24

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Ag Silver, total

CAS Number: 7440-22-4
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 4.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Mar 31 1996	0.300 ppb	-1.204
Jun 30 1996	0.100 ppb	-2.303 (* Nondetect *)
Sep 30 1996	2.400 ppb	0.875
Dec 31 1996	0.900 ppb	-0.105
Mar 31 1997	1.000 ppb	0.000
Jun 30 1997	0.100 ppb	-2.303 (* Nondetect *)
Sep 30 1997	0.100 ppb	-2.303 (* Nondetect *)
Dec 31 1997	0.100 ppb	-2.303 (* Nondetect *)
Mar 09 1998	0.100 ppb	-2.303 (* Nondetect *)
May 14 1998	0.100 ppb	-2.303 (* Nondetect *)
Aug 14 1998	0.100 ppb	-2.303 (* Nondetect *)
Nov 23 1998	0.100 ppb	-2.303 (* Nondetect *)
Mar 13 1999	0.100 ppb	-2.303 (* Nondetect *)
May 27 1999	0.100 ppb	-2.303 (* Nondetect *)
Jul 27 1999	0.100 ppb	-2.303 (* Nondetect *)
Nov 08 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 10 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 11 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 12 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 13 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 14 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 15 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 16 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 17 1999	0.100 ppb	-2.303 (* Nondetect *)

Dec 18 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 19 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 20 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 21 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 22 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 23 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 24 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 25 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 26 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 27 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 28 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 29 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 30 1999	2.000 ppb	0.693 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 89

Minimum:	0.100 ppb	Ln Minimum:	-2.303
Maximum:	2.400 ppb	Ln Maximum:	0.875
Mean:	0.881 ppb	Ln Mean:	-1.013
Std. Dev.:	0.930 ppb	Ln Std. Dev.:	1.458

Well ID:13MW2

Sample Date	Observation	Ln
Mar 31 1996	0.100 ppb	-2.303 (* Nondetect *)
Jun 30 1996	0.100 ppb	-2.303 (* Nondetect *)
Sep 30 1996	0.400 ppb	-0.916
Dec 31 1996	0.700 ppb	-0.357
Mar 31 1997	0.100 ppb	-2.303 (* Nondetect *)
Jun 30 1997	0.100 ppb	-2.303 (* Nondetect *)
Sep 30 1997	0.100 ppb	-2.303 (* Nondetect *)
Dec 31 1997	0.100 ppb	-2.303 (* Nondetect *)
Mar 09 1998	0.100 ppb	-2.303 (* Nondetect *)
May 14 1998	0.100 ppb	-2.303 (* Nondetect *)
Aug 14 1998	0.100 ppb	-2.303 (* Nondetect *)
Nov 23 1998	0.100 ppb	-2.303 (* Nondetect *)
Mar 13 1999	0.100 ppb	-2.303 (* Nondetect *)
May 27 1999	0.100 ppb	-2.303 (* Nondetect *)
Jul 27 1999	0.100 ppb	-2.303 (* Nondetect *)
Nov 08 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 10 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 11 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 12 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 13 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 14 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 15 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 16 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 17 1999	0.100 ppb	-2.303 (* Nondetect *)
Dec 18 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 19 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 20 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 21 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 22 1999	2.000 ppb	0.693 (* Nondetect *)

Dec 23 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 24 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 25 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 26 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 27 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 28 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 29 1999	2.000 ppb	0.693 (* Nondetect *)
Dec 30 1999	2.000 ppb	0.693 (* Nondetect *)

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 95

Minimum:	0.100 ppb	Ln Minimum:	-2.303
Maximum:	2.000 ppb	Ln Maximum:	0.693
Mean:	0.792 ppb	Ln Mean:	-1.160
Std. Dev.:	0.908 ppb	Ln Std. Dev.:	1.434

Normality Tests

Report Printed: 05-10-2005 16:37

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Ag Silver, total

CAS Number: 7440-22-4
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 4.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

Scale	Minimum	Maximum	Mean	Std Dev
Original:	0.100	2.400	0.881	0.930
Log:	-2.303	0.875	-1.013	1.458

Well:13MW2 Position:Upgradient Observations:37

Scale	Minimum	Maximum	Mean	Std Dev
Original:	0.100	2.000	0.792	0.908
Log:	-2.303	0.693	-1.160	1.434

Pooled Statistics
Observations: 74

Statistic	Original Scale	Log Scale
Mean:	0.836	-1.086
Std Dev:	0.914	1.438
Skewness:	0.502	0.376
Kurtosis:	-1.683	-1.799
Minimum:	0.100	-2.303
Maximum:	2.400	0.875

CV: 1.092 -1.324

Shapiro-Francia Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.6793*	0.9690	0.9560
Log:	0.6842*	0.9690	0.9560

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

Nonparametric Prediction Interval
Report Printed May 10,2005

Facility:Haz. Waste Unit 13 - RAAP
Parameter:Silver, total(CAS Number:7440-22-4)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

Observations (n):	74
Conf. Level (1-α):	***.***%
UL:	~~0.100~~ 2.4 ppb
LL:	0.000

%ND: 92%.

Report Produced by GRITS/STAT 5.01

Data Set Summary

Report Printed: 05-10-2005 16:44

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Acetone Acetone

CAS Number: 67-64-1
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 50.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Mar 31 1996	5.000 ppb	1.609 (* Nondetect *)
Jun 30 1996	5.000 ppb	1.609 (* Nondetect *)
Sep 30 1996	5.000 ppb	1.609 (* Nondetect *)
Dec 31 1996	5.000 ppb	1.609 (* Nondetect *)
Mar 31 1997	5.000 ppb	1.609 (* Nondetect *)
Jun 30 1997	5.000 ppb	1.609 (* Nondetect *)
Sep 30 1997	5.000 ppb	1.609 (* Nondetect *)
Dec 31 1997	5.000 ppb	1.609 (* Nondetect *)
Mar 09 1998	5.000 ppb	1.609 (* Nondetect *)
May 14 1998	5.000 ppb	1.609 (* Nondetect *)
Aug 14 1998	5.000 ppb	1.609 (* Nondetect *)
Nov 23 1998	5.000 ppb	1.609 (* Nondetect *)
Mar 13 1999	5.000 ppb	1.609 (* Nondetect *)
May 27 1999	5.000 ppb	1.609 (* Nondetect *)
Jul 27 1999	5.000 ppb	1.609 (* Nondetect *)
Nov 08 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 10 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 11 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 12 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 13 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 14 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 15 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 16 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 17 1999	5.000 ppb	1.609 (* Nondetect *)

Dec 18 1999	25.000 ppb	3.219 (* Nondetect *)
Dec 19 1999	25.000 ppb	3.219 (* Nondetect *)
Dec 20 1999	25.000 ppb	3.219 (* Nondetect *)
Dec 21 1999	25.000 ppb	3.219 (* Nondetect *)
Dec 22 1999	25.000 ppb	3.219 (* Nondetect *)
Dec 23 1999	25.000 ppb	3.219 (* Nondetect *)
Dec 24 1999	25.000 ppb	3.219 (* Nondetect *)
Dec 25 1999	25.000 ppb	3.219 (* Nondetect *)
Dec 26 1999	25.000 ppb	3.219 (* Nondetect *)
Dec 27 1999	25.000 ppb	3.219 (* Nondetect *)
Dec 28 1999	25.000 ppb	3.219 (* Nondetect *)
Dec 29 1999	25.000 ppb	3.219 (* Nondetect *)
Dec 30 1999	25.000 ppb	3.219 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

Minimum:	5.000 ppb	Ln Minimum:	1.609
Maximum:	25.000 ppb	Ln Maximum:	3.219
Mean:	12.027 ppb	Ln Mean:	2.175
Std. Dev.:	9.680 ppb	Ln Std. Dev.:	0.779

Well ID:13MW2

Sample Date	Observation	Ln
Mar 31 1996	5.000 ppb	1.609 (* Nondetect *)
Jun 30 1996	5.000 ppb	1.609 (* Nondetect *)
Sep 30 1996	5.000 ppb	1.609 (* Nondetect *)
Dec 31 1996	5.000 ppb	1.609 (* Nondetect *)
Mar 31 1997	5.000 ppb	1.609 (* Nondetect *)
Jun 30 1997	5.000 ppb	1.609 (* Nondetect *)
Sep 30 1997	5.000 ppb	1.609 (* Nondetect *)
Dec 31 1997	5.000 ppb	1.609 (* Nondetect *)
Mar 09 1998	5.000 ppb	1.609 (* Nondetect *)
May 14 1998	5.000 ppb	1.609 (* Nondetect *)
Aug 14 1998	5.000 ppb	1.609 (* Nondetect *)
Nov 23 1998	5.000 ppb	1.609 (* Nondetect *)
Mar 13 1999	5.000 ppb	1.609 (* Nondetect *)
May 27 1999	5.000 ppb	1.609 (* Nondetect *)
Jul 27 1999	5.000 ppb	1.609 (* Nondetect *)
Nov 08 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 10 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 11 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 12 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 13 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 14 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 15 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 16 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 17 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 18 1999	25.000 ppb	3.219 (* Nondetect *)
Dec 19 1999	25.000 ppb	3.219 (* Nondetect *)
Dec 20 1999	25.000 ppb	3.219 (* Nondetect *)
Dec 21 1999	25.000 ppb	3.219 (* Nondetect *)
Dec 22 1999	25.000 ppb	3.219 (* Nondetect *)

Dec 23 1999	25.000 ppb	3.219 (* Nondetect *)
Dec 24 1999	25.000 ppb	3.219 (* Nondetect *)
Dec 25 1999	25.000 ppb	3.219 (* Nondetect *)
Dec 26 1999	25.000 ppb	3.219 (* Nondetect *)
Dec 27 1999	25.000 ppb	3.219 (* Nondetect *)
Dec 28 1999	25.000 ppb	3.219 (* Nondetect *)
Dec 29 1999	25.000 ppb	3.219 (* Nondetect *)
Dec 30 1999	25.000 ppb	3.219 (* Nondetect *)

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 100

Minimum:	5.000 ppb	Ln Minimum:	1.609
Maximum:	25.000 ppb	Ln Maximum:	3.219
Mean:	12.027 ppb	Ln Mean:	2.175
Std. Dev.:	9.680 ppb	Ln Std. Dev.:	0.779

Data Set Summary

Report Printed: 05-10-2005 16:43

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Benzene Benzene

CAS Number: 71-43-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Mar 31 1996	0.050 ppb	-2.996 (* Nondetect *)
Jun 30 1996	0.050 ppb	-2.996 (* Nondetect *)
Sep 30 1996	0.050 ppb	-2.996 (* Nondetect *)
Dec 31 1996	0.050 ppb	-2.996 (* Nondetect *)
Mar 31 1997	0.050 ppb	-2.996 (* Nondetect *)
Jun 30 1997	0.050 ppb	-2.996 (* Nondetect *)
Sep 30 1997	0.050 ppb	-2.996 (* Nondetect *)
Dec 31 1997	0.050 ppb	-2.996 (* Nondetect *)
Mar 09 1998	0.050 ppb	-2.996 (* Nondetect *)
May 14 1998	0.050 ppb	-2.996 (* Nondetect *)
Aug 14 1998	0.050 ppb	-2.996 (* Nondetect *)
Nov 23 1998	0.050 ppb	-2.996 (* Nondetect *)
Mar 13 1999	0.050 ppb	-2.996 (* Nondetect *)
May 27 1999	0.050 ppb	-2.996 (* Nondetect *)
Jul 27 1999	0.050 ppb	-2.996 (* Nondetect *)
Nov 08 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 10 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 11 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 12 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 13 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 14 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 15 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 16 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 17 1999	0.050 ppb	-2.996 (* Nondetect *)

Dec 18 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 19 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 20 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 21 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 22 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 23 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 24 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 25 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 26 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 27 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 28 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 29 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 30 1999	5.000 ppb	1.609 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

Minimum:	0.050 ppb	Ln Minimum:	-2.996
Maximum:	5.000 ppb	Ln Maximum:	1.609
Mean:	1.789 ppb	Ln Mean:	-1.378
Std. Dev.:	2.396 ppb	Ln Std. Dev.:	2.229

Well ID:13MW2

Sample Date	Observation	Ln
Mar 31 1996	0.050 ppb	-2.996 (* Nondetect *)
Jun 30 1996	0.050 ppb	-2.996 (* Nondetect *)
Sep 30 1996	0.050 ppb	-2.996 (* Nondetect *)
Dec 31 1996	0.050 ppb	-2.996 (* Nondetect *)
Mar 31 1997	0.050 ppb	-2.996 (* Nondetect *)
Jun 30 1997	0.050 ppb	-2.996 (* Nondetect *)
Sep 30 1997	0.050 ppb	-2.996 (* Nondetect *)
Dec 31 1997	0.050 ppb	-2.996 (* Nondetect *)
Mar 09 1998	0.050 ppb	-2.996 (* Nondetect *)
May 14 1998	0.050 ppb	-2.996 (* Nondetect *)
Aug 14 1998	0.050 ppb	-2.996 (* Nondetect *)
Nov 23 1998	0.050 ppb	-2.996 (* Nondetect *)
Mar 13 1999	0.050 ppb	-2.996 (* Nondetect *)
May 27 1999	0.050 ppb	-2.996 (* Nondetect *)
Jul 27 1999	0.050 ppb	-2.996 (* Nondetect *)
Nov 08 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 10 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 11 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 12 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 13 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 14 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 15 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 16 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 17 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 18 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 19 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 20 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 21 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 22 1999	5.000 ppb	1.609 (* Nondetect *)

Dec 23 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 24 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 25 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 26 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 27 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 28 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 29 1999	5.000 ppb	

Data Set Summary

Report Printed: 05-10-2005 16:46

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Toluen Toluene

CAS Number: 108-88-3
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Mar 31 1996	0.050 ppb	-2.996 (* Nondetect *)
Jun 30 1996	0.200 ppb	-1.609
Sep 30 1996	0.050 ppb	-2.996 (* Nondetect *)
Dec 31 1996	0.050 ppb	-2.996 (* Nondetect *)
Mar 31 1997	0.050 ppb	-2.996 (* Nondetect *)
Jun 30 1997	0.050 ppb	-2.996 (* Nondetect *)
Sep 30 1997	0.050 ppb	-2.996 (* Nondetect *)
Dec 31 1997	0.050 ppb	-2.996 (* Nondetect *)
Mar 09 1998	0.050 ppb	-2.996 (* Nondetect *)
May 14 1998	0.050 ppb	-2.996 (* Nondetect *)
Aug 14 1998	0.050 ppb	-2.996 (* Nondetect *)
Nov 23 1998	0.050 ppb	-2.996 (* Nondetect *)
Mar 13 1999	0.050 ppb	-2.996 (* Nondetect *)
May 27 1999	0.050 ppb	-2.996 (* Nondetect *)
Jul 27 1999	0.050 ppb	-2.996 (* Nondetect *)
Nov 08 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 10 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 11 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 12 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 13 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 14 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 15 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 16 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 17 1999	0.050 ppb	-2.996 (* Nondetect *)

Dec 18 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 19 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 20 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 21 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 22 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 23 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 24 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 25 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 26 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 27 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 28 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 29 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 30 1999	5.000 ppb	1.609 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 97

Minimum:	0.050 ppb	Ln Minimum:	-2.996
Maximum:	5.000 ppb	Ln Maximum:	1.609
Mean:	1.793 ppb	Ln Mean:	-1.340
Std. Dev.:	2.393 ppb	Ln Std. Dev.:	2.212

Well ID:13MW2

Sample Date	Observation	Ln
Mar 31 1996	0.050 ppb	-2.996 (* Nondetect *)
Jun 30 1996	0.200 ppb	-1.609
Sep 30 1996	0.050 ppb	-2.996 (* Nondetect *)
Dec 31 1996	0.050 ppb	-2.996 (* Nondetect *)
Mar 31 1997	0.050 ppb	-2.996 (* Nondetect *)
Jun 30 1997	0.050 ppb	-2.996 (* Nondetect *)
Sep 30 1997	0.050 ppb	-2.996 (* Nondetect *)
Dec 31 1997	0.050 ppb	-2.996 (* Nondetect *)
Mar 09 1998	0.050 ppb	-2.996 (* Nondetect *)
May 14 1998	0.050 ppb	-2.996 (* Nondetect *)
Aug 14 1998	0.050 ppb	-2.996 (* Nondetect *)
Nov 23 1998	0.050 ppb	-2.996 (* Nondetect *)
Mar 13 1999	0.050 ppb	-2.996 (* Nondetect *)
May 27 1999	0.050 ppb	-2.996 (* Nondetect *)
Jul 27 1999	0.050 ppb	-2.996 (* Nondetect *)
Nov 08 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 10 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 11 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 12 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 13 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 14 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 15 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 16 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 17 1999	0.050 ppb	-2.996 (* Nondetect *)
Dec 18 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 19 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 20 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 21 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 22 1999	5.000 ppb	1.609 (* Nondetect *)

Dec 23 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 24 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 25 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 26 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 27 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 28 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 29 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 30 1999	5.000 ppb	1.609 (* Nondetect *)

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 97

Minimum:	0.050 ppb	Ln Minimum:	-2.996
Maximum:	5.000 ppb	Ln Maximum:	1.609
Mean:	1.793 ppb	Ln Mean:	-1.340
Std. Dev.:	2.393 ppb	Ln Std. Dev.:	2.212

Data Set Summary

Report Printed: 05-10-2005 16:46

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:2,4-DNT 2,4-Dinitrotoluene

CAS Number: 121-14-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 20.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Mar 31 1996	0.040 ppb	-3.219 (* Nondetect *)
Jun 30 1996	0.040 ppb	-3.219 (* Nondetect *)
Sep 30 1996	0.040 ppb	-3.219 (* Nondetect *)
Dec 31 1996	0.040 ppb	-3.219 (* Nondetect *)
Mar 31 1997	0.040 ppb	-3.219 (* Nondetect *)
Jun 30 1997	0.040 ppb	-3.219 (* Nondetect *)
Sep 30 1997	0.040 ppb	-3.219 (* Nondetect *)
Dec 31 1997	0.040 ppb	-3.219 (* Nondetect *)
Mar 09 1998	0.040 ppb	-3.219 (* Nondetect *)
May 14 1998	0.040 ppb	-3.219 (* Nondetect *)
Aug 14 1998	0.040 ppb	-3.219 (* Nondetect *)
Nov 23 1998	0.040 ppb	-3.219 (* Nondetect *)
Mar 13 1999	0.040 ppb	-3.219 (* Nondetect *)
May 27 1999	0.040 ppb	-3.219 (* Nondetect *)
Jul 27 1999	0.040 ppb	-3.219 (* Nondetect *)
Nov 08 1999	0.040 ppb	-3.219 (* Nondetect *)
Dec 10 1999	0.040 ppb	-3.219 (* Nondetect *)
Dec 11 1999	0.040 ppb	-3.219 (* Nondetect *)
Dec 12 1999	0.040 ppb	-3.219 (* Nondetect *)
Dec 13 1999	0.040 ppb	-3.219 (* Nondetect *)
Dec 14 1999	0.040 ppb	-3.219 (* Nondetect *)
Dec 15 1999	0.040 ppb	-3.219 (* Nondetect *)
Dec 16 1999	0.040 ppb	-3.219 (* Nondetect *)
Dec 17 1999	0.040 ppb	-3.219 (* Nondetect *)

Dec 18 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 19 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 20 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 21 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 22 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 23 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 24 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 25 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 26 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 27 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 28 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 29 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 30 1999	10.000 ppb	2.303 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

Minimum:	0.040 ppb	Ln Minimum:	-3.219
Maximum:	10.000 ppb	Ln Maximum:	2.303
Mean:	3.539 ppb	Ln Mean:	-1.279
Std. Dev.:	4.820 ppb	Ln Std. Dev.:	2.672

Well ID:13MW2

Sample Date	Observation	Ln
Mar 31 1996	0.040 ppb	-3.219 (* Nondetect *)
Jun 30 1996	0.040 ppb	-3.219 (* Nondetect *)
Sep 30 1996	0.040 ppb	-3.219 (* Nondetect *)
Dec 31 1996	0.040 ppb	-3.219 (* Nondetect *)
Mar 31 1997	0.040 ppb	-3.219 (* Nondetect *)
Jun 30 1997	0.040 ppb	-3.219 (* Nondetect *)
Sep 30 1997	0.040 ppb	-3.219 (* Nondetect *)
Dec 31 1997	0.040 ppb	-3.219 (* Nondetect *)
Mar 09 1998	0.040 ppb	-3.219 (* Nondetect *)
May 14 1998	0.040 ppb	-3.219 (* Nondetect *)
Aug 14 1998	0.040 ppb	-3.219 (* Nondetect *)
Nov 23 1998	0.040 ppb	-3.219 (* Nondetect *)
Mar 13 1999	0.040 ppb	-3.219 (* Nondetect *)
May 27 1999	0.040 ppb	-3.219 (* Nondetect *)
Jul 27 1999	0.040 ppb	-3.219 (* Nondetect *)
Nov 08 1999	0.040 ppb	-3.219 (* Nondetect *)
Dec 10 1999	0.040 ppb	-3.219 (* Nondetect *)
Dec 11 1999	0.040 ppb	-3.219 (* Nondetect *)
Dec 12 1999	0.040 ppb	-3.219 (* Nondetect *)
Dec 13 1999	0.040 ppb	-3.219 (* Nondetect *)
Dec 14 1999	0.040 ppb	-3.219 (* Nondetect *)
Dec 15 1999	0.040 ppb	-3.219 (* Nondetect *)
Dec 16 1999	0.040 ppb	-3.219 (* Nondetect *)
Dec 17 1999	0.040 ppb	-3.219 (* Nondetect *)
Dec 18 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 19 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 20 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 21 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 22 1999	10.000 ppb	2.303 (* Nondetect *)

Dec 23 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 24 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 25 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 26 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 27 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 28 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 29 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 30 1999	10.000 ppb	2.303 (* Nondetect *)

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 100

Minimum:	0.040 ppb	Ln Minimum:	-3.219
Maximum:	10.000 ppb	Ln Maximum:	2.303
Mean:	3.539 ppb	Ln Mean:	-1.279
Std. Dev.:	4.820 ppb	Ln Std. Dev.:	2.672

Data Set Summary

Report Printed: 05-10-2005 16:47

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Di-N-Bu Di-n-Butylphthalate

CAS Number: 84-74-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 20.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Mar 31 1996	2.500 ppb	0.916 (* Nondetect *)
Jun 30 1996	2.500 ppb	0.916 (* Nondetect *)
Sep 30 1996	2.500 ppb	0.916 (* Nondetect *)
Dec 31 1996	2.500 ppb	0.916 (* Nondetect *)
Mar 31 1997	2.500 ppb	0.916 (* Nondetect *)
Jun 30 1997	2.500 ppb	0.916 (* Nondetect *)
Sep 30 1997	2.500 ppb	0.916 (* Nondetect *)
Dec 31 1997	2.500 ppb	0.916 (* Nondetect *)
Mar 09 1998	2.500 ppb	0.916 (* Nondetect *)
May 14 1998	2.500 ppb	0.916 (* Nondetect *)
Aug 14 1998	2.500 ppb	0.916 (* Nondetect *)
Nov 23 1998	2.500 ppb	0.916 (* Nondetect *)
Mar 13 1999	2.500 ppb	0.916 (* Nondetect *)
May 27 1999	2.500 ppb	0.916 (* Nondetect *)
Jul 27 1999	2.500 ppb	0.916 (* Nondetect *)
Nov 08 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 10 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 11 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 12 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 13 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 14 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 15 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 16 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 17 1999	2.500 ppb	0.916 (* Nondetect *)

Dec 18 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 19 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 20 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 21 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 22 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 23 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 24 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 25 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 26 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 27 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 28 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 29 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 30 1999	10.000 ppb	2.303 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

Minimum:	2.500 ppb	Ln Minimum:	0.916
Maximum:	10.000 ppb	Ln Maximum:	2.303
Mean:	5.135 ppb	Ln Mean:	1.403
Std. Dev.:	3.630 ppb	Ln Std. Dev.:	0.671

Well ID:13MW2

Sample Date	Observation	Ln
Mar 31 1996	2.500 ppb	0.916 (* Nondetect *)
Jun 30 1996	2.500 ppb	0.916 (* Nondetect *)
Sep 30 1996	2.500 ppb	0.916 (* Nondetect *)
Dec 31 1996	2.500 ppb	0.916 (* Nondetect *)
Mar 31 1997	2.500 ppb	0.916 (* Nondetect *)
Jun 30 1997	2.500 ppb	0.916 (* Nondetect *)
Sep 30 1997	2.500 ppb	0.916 (* Nondetect *)
Dec 31 1997	2.500 ppb	0.916 (* Nondetect *)
Mar 09 1998	2.500 ppb	0.916 (* Nondetect *)
May 14 1998	2.500 ppb	0.916 (* Nondetect *)
Aug 14 1998	2.500 ppb	0.916 (* Nondetect *)
Nov 23 1998	2.500 ppb	0.916 (* Nondetect *)
Mar 13 1999	2.500 ppb	0.916 (* Nondetect *)
May 27 1999	2.500 ppb	0.916 (* Nondetect *)
Jul 27 1999	2.500 ppb	0.916 (* Nondetect *)
Nov 08 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 10 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 11 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 12 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 13 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 14 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 15 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 16 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 17 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 18 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 19 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 20 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 21 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 22 1999	10.000 ppb	2.303 (* Nondetect *)

Dec 23 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 24 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 25 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 26 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 27 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 28 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 29 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 30 1999	10.000 ppb	2.303 (* Nondetect *)

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 100

Minimum:	2.500 ppb	Ln Minimum:	0.916
Maximum:	10.000 ppb	Ln Maximum:	2.303
Mean:	5.135 ppb	Ln Mean:	1.403
Std. Dev.:	3.630 ppb	Ln Std. Dev.:	0.671

Data Set Summary

Report Printed: 05-10-2005 16:47

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:DEthPhth Diethylphthalate

CAS Number: 84-66-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 20.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Mar 31 1996	2.500 ppb	0.916 (* Nondetect *)
Jun 30 1996	2.500 ppb	0.916 (* Nondetect *)
Sep 30 1996	2.500 ppb	0.916 (* Nondetect *)
Dec 31 1996	2.500 ppb	0.916 (* Nondetect *)
Mar 31 1997	2.500 ppb	0.916 (* Nondetect *)
Jun 30 1997	2.500 ppb	0.916 (* Nondetect *)
Sep 30 1997	2.500 ppb	0.916 (* Nondetect *)
Dec 31 1997	2.500 ppb	0.916 (* Nondetect *)
Mar 09 1998	2.500 ppb	0.916 (* Nondetect *)
May 14 1998	2.500 ppb	0.916 (* Nondetect *)
Aug 14 1998	2.500 ppb	0.916 (* Nondetect *)
Nov 23 1998	2.500 ppb	0.916 (* Nondetect *)
Mar 13 1999	2.500 ppb	0.916 (* Nondetect *)
May 27 1999	2.500 ppb	0.916 (* Nondetect *)
Jul 27 1999	2.500 ppb	0.916 (* Nondetect *)
Nov 08 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 10 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 11 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 12 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 13 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 14 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 15 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 16 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 17 1999	2.500 ppb	0.916 (* Nondetect *)

Dec 18 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 19 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 20 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 21 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 22 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 23 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 24 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 25 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 26 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 27 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 28 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 29 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 30 1999	10.000 ppb	2.303 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

Minimum:	2.500 ppb	Ln Minimum:	0.916
Maximum:	10.000 ppb	Ln Maximum:	2.303
Mean:	5.135 ppb	Ln Mean:	1.403
Std. Dev.:	3.630 ppb	Ln Std. Dev.:	0.671

Well ID:13MW2

Sample Date	Observation	Ln
Mar 31 1996	2.500 ppb	0.916 (* Nondetect *)
Jun 30 1996	2.500 ppb	0.916 (* Nondetect *)
Sep 30 1996	2.500 ppb	0.916 (* Nondetect *)
Dec 31 1996	2.500 ppb	0.916 (* Nondetect *)
Mar 31 1997	2.500 ppb	0.916 (* Nondetect *)
Jun 30 1997	2.500 ppb	0.916 (* Nondetect *)
Sep 30 1997	2.500 ppb	0.916 (* Nondetect *)
Dec 31 1997	2.500 ppb	0.916 (* Nondetect *)
Mar 09 1998	2.500 ppb	0.916 (* Nondetect *)
May 14 1998	2.500 ppb	0.916 (* Nondetect *)
Aug 14 1998	2.500 ppb	0.916 (* Nondetect *)
Nov 23 1998	2.500 ppb	0.916 (* Nondetect *)
Mar 13 1999	2.500 ppb	0.916 (* Nondetect *)
May 27 1999	2.500 ppb	0.916 (* Nondetect *)
Jul 27 1999	2.500 ppb	0.916 (* Nondetect *)
Nov 08 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 10 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 11 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 12 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 13 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 14 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 15 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 16 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 17 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 18 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 19 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 20 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 21 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 22 1999	10.000 ppb	2.303 (* Nondetect *)

Dec 23 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 24 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 25 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 26 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 27 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 28 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 29 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 30 1999	10.000 ppb	2.303 (* Nondetect *)

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 100

Minimum:	2.500 ppb	Ln Minimum:	0.916
Maximum:	10.000 ppb	Ln Maximum:	2.303
Mean:	5.135 ppb	Ln Mean:	1.403
Std. Dev.:	3.630 ppb	Ln Std. Dev.:	0.671

Data Set Summary

Report Printed: 05-10-2005 16:47

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:DPA Diphenylamine

CAS Number: 122-39-4
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 20.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Mar 31 1996	5.000 ppb	1.609 (* Nondetect *)
Jun 30 1996	5.000 ppb	1.609 (* Nondetect *)
Sep 30 1996	5.000 ppb	1.609 (* Nondetect *)
Dec 31 1996	5.000 ppb	1.609 (* Nondetect *)
Mar 31 1997	5.000 ppb	1.609 (* Nondetect *)
Jun 30 1997	5.000 ppb	1.609 (* Nondetect *)
Sep 30 1997	5.000 ppb	1.609 (* Nondetect *)
Dec 31 1997	5.000 ppb	1.609 (* Nondetect *)
Mar 09 1998	5.000 ppb	1.609 (* Nondetect *)
May 14 1998	5.000 ppb	1.609 (* Nondetect *)
Aug 14 1998	5.000 ppb	1.609 (* Nondetect *)
Nov 23 1998	5.000 ppb	1.609 (* Nondetect *)
Mar 13 1999	5.000 ppb	1.609 (* Nondetect *)
May 27 1999	5.000 ppb	1.609 (* Nondetect *)
Jul 27 1999	5.000 ppb	1.609 (* Nondetect *)
Nov 08 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 10 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 11 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 12 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 13 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 14 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 15 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 16 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 17 1999	5.000 ppb	1.609 (* Nondetect *)

Dec 18 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 19 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 20 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 21 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 22 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 23 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 24 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 25 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 26 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 27 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 28 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 29 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 30 1999	10.000 ppb	2.303 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

Minimum:	5.000 ppb	Ln Minimum:	1.609
Maximum:	10.000 ppb	Ln Maximum:	2.303
Mean:	6.757 ppb	Ln Mean:	1.853
Std. Dev.:	2.420 ppb	Ln Std. Dev.:	0.335

Well ID:13MW2

Sample Date	Observation	Ln
Mar 31 1996	5.000 ppb	1.609 (* Nondetect *)
Jun 30 1996	5.000 ppb	1.609 (* Nondetect *)
Sep 30 1996	5.000 ppb	1.609 (* Nondetect *)
Dec 31 1996	5.000 ppb	1.609 (* Nondetect *)
Mar 31 1997	5.000 ppb	1.609 (* Nondetect *)
Jun 30 1997	5.000 ppb	1.609 (* Nondetect *)
Sep 30 1997	5.000 ppb	1.609 (* Nondetect *)
Dec 31 1997	5.000 ppb	1.609 (* Nondetect *)
Mar 09 1998	5.000 ppb	1.609 (* Nondetect *)
May 14 1998	5.000 ppb	1.609 (* Nondetect *)
Aug 14 1998	5.000 ppb	1.609 (* Nondetect *)
Nov 23 1998	5.000 ppb	1.609 (* Nondetect *)
Mar 13 1999	5.000 ppb	1.609 (* Nondetect *)
May 27 1999	5.000 ppb	1.609 (* Nondetect *)
Jul 27 1999	5.000 ppb	1.609 (* Nondetect *)
Nov 08 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 10 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 11 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 12 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 13 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 14 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 15 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 16 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 17 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 18 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 19 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 20 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 21 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 22 1999	10.000 ppb	2.303 (* Nondetect *)

Dec 23 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 24 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 25 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 26 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 27 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 28 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 29 1999	10.000 ppb	2.303 (* Nondetect *)
Dec 30 1999	10.000 ppb	2.303 (* Nondetect *)

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 100

Minimum:	5.000 ppb	Ln Minimum:	1.609
Maximum:	10.000 ppb	Ln Maximum:	2.303
Mean:	6.757 ppb	Ln Mean:	1.853
Std. Dev.:	2.420 ppb	Ln Std. Dev.:	0.335

Data Set Summary

Report Printed: 05-10-2005 16:48

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:NGlycern Nitroglycerin or1,2,3-Propanetriol,trinitrate

CAS Number: 55-63-0
MCL: 0.000 mg/l
ACL: 0.000 mg/l
Detect Limit: 20.000 mg/l

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Mar 31 1996	0.005 mg/l	-5.298 (* Nondetect *)
Jun 30 1996	0.005 mg/l	-5.298 (* Nondetect *)
Sep 30 1996	0.005 mg/l	-5.298 (* Nondetect *)
Dec 31 1996	0.005 mg/l	-5.298 (* Nondetect *)
Mar 31 1997	0.005 mg/l	-5.298 (* Nondetect *)
Jun 30 1997	0.005 mg/l	-5.298 (* Nondetect *)
Sep 30 1997	0.005 mg/l	-5.298 (* Nondetect *)
Dec 31 1997	0.005 mg/l	-5.298 (* Nondetect *)
Mar 09 1998	0.005 mg/l	-5.298 (* Nondetect *)
May 14 1998	0.005 mg/l	-5.298 (* Nondetect *)
Aug 14 1998	0.005 mg/l	-5.298 (* Nondetect *)
Nov 23 1998	0.005 mg/l	-5.298 (* Nondetect *)
Mar 13 1999	0.005 mg/l	-5.298 (* Nondetect *)
May 27 1999	0.005 mg/l	-5.298 (* Nondetect *)
Jul 27 1999	0.005 mg/l	-5.298 (* Nondetect *)
Nov 08 1999	0.005 mg/l	-5.298 (* Nondetect *)
Dec 10 1999	0.005 mg/l	-5.298 (* Nondetect *)
Dec 11 1999	0.005 mg/l	-5.298 (* Nondetect *)
Dec 12 1999	0.005 mg/l	-5.298 (* Nondetect *)
Dec 13 1999	0.005 mg/l	-5.298 (* Nondetect *)
Dec 14 1999	0.005 mg/l	-5.298 (* Nondetect *)
Dec 15 1999	0.005 mg/l	-5.298 (* Nondetect *)
Dec 16 1999	0.005 mg/l	-5.298 (* Nondetect *)
Dec 17 1999	0.005 mg/l	-5.298 (* Nondetect *)

Dec 18 1999	10.000 mg/l	2.303 (* Nondetect *)
Dec 19 1999	10.000 mg/l	2.303 (* Nondetect *)
Dec 20 1999	10.000 mg/l	2.303 (* Nondetect *)
Dec 21 1999	10.000 mg/l	2.303 (* Nondetect *)
Dec 22 1999	10.000 mg/l	2.303 (* Nondetect *)
Dec 23 1999	10.000 mg/l	2.303 (* Nondetect *)
Dec 24 1999	10.000 mg/l	2.303 (* Nondetect *)
Dec 25 1999	10.000 mg/l	2.303 (* Nondetect *)
Dec 26 1999	10.000 mg/l	2.303 (* Nondetect *)
Dec 27 1999	10.000 mg/l	2.303 (* Nondetect *)
Dec 28 1999	10.000 mg/l	2.303 (* Nondetect *)
Dec 29 1999	10.000 mg/l	2.303 (* Nondetect *)
Dec 30 1999	10.000 mg/l	2.303 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND):100

Minimum:	0.005 mg/l	Ln Minimum:	-5.298
Maximum:	10.000 mg/l	Ln Maximum:	2.303
Mean:	3.517 mg/l	Ln Mean:	-2.628
Std. Dev.:	4.837 mg/l	Ln Std. Dev.:	3.679

Well ID:13MW2

Sample Date	Observation	Ln
Mar 31 1996	0.005 mg/l	-5.298 (* Nondetect *)
Jun 30 1996	0.005 mg/l	-5.298 (* Nondetect *)
Sep 30 1996	0.005 mg/l	-5.298 (* Nondetect *)
Dec 31 1996	0.005 mg/l	-5.298 (* Nondetect *)
Mar 31 1997	0.005 mg/l	-5.298 (* Nondetect *)
Jun 30 1997	0.005 mg/l	-5.298 (* Nondetect *)
Sep 30 1997	0.005 mg/l	-5.298 (* Nondetect *)
Dec 31 1997	0.005 mg/l	-5.298 (* Nondetect *)
Mar 09 1998	0.005 mg/l	-5.298 (* Nondetect *)
May 14 1998	0.005 mg/l	-5.298 (* Nondetect *)
Aug 14 1998	0.005 mg/l	-5.298 (* Nondetect *)
Nov 23 1998	0.005 mg/l	-5.298 (* Nondetect *)
Mar 13 1999	0.005 mg/l	-5.298 (* Nondetect *)
May 27 1999	0.005 mg/l	-5.298 (* Nondetect *)
Jul 27 1999	0.005 mg/l	-5.298 (* Nondetect *)
Nov 08 1999	0.005 mg/l	-5.298 (* Nondetect *)
Dec 10 1999	0.005 mg/l	-5.298 (* Nondetect *)
Dec 11 1999	0.005 mg/l	-5.298 (* Nondetect *)
Dec 12 1999	0.005 mg/l	-5.298 (* Nondetect *)
Dec 13 1999	0.005 mg/l	-5.298 (* Nondetect *)
Dec 14 1999	0.005 mg/l	-5.298 (* Nondetect *)
Dec 15 1999	0.005 mg/l	-5.298 (* Nondetect *)
Dec 16 1999	0.005 mg/l	-5.298 (* Nondetect *)
Dec 17 1999	0.005 mg/l	-5.298 (* Nondetect *)
Dec 18 1999	10.000 mg/l	2.303 (* Nondetect *)
Dec 19 1999	10.000 mg/l	2.303 (* Nondetect *)
Dec 20 1999	10.000 mg/l	2.303 (* Nondetect *)
Dec 21 1999	10.000 mg/l	2.303 (* Nondetect *)
Dec 22 1999	10.000 mg/l	2.303 (* Nondetect *)

Dec 23 1999	10.000 mg/l	2.303 (* Nondetect *)
Dec 24 1999	10.000 mg/l	2.303 (* Nondetect *)
Dec 25 1999	10.000 mg/l	2.303 (* Nondetect *)
Dec 26 1999	10.000 mg/l	2.303 (* Nondetect *)
Dec 27 1999	10.000 mg/l	2.303 (* Nondetect *)
Dec 28 1999	10.000 mg/l	2.303 (* Nondetect *)
Dec 29 1999	10.000 mg/l	2.303 (* Nondetect *)
Dec 30 1999	10.000 mg/l	2.303 (* Nondetect *)

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 100

Minimum:	0.005 mg/l	Ln Minimum:	-5.298
Maximum:	10.000 mg/l	Ln Maximum:	2.303
Mean:			

3.517 mg/l	Ln Mean:	-2.628	
Std. Dev.:	4.837 mg/l	Ln Std. Dev.:	3.679

Data Set Summary

Report Printed: 05-10-2005 16:59

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Phenols Phenols, total

CAS Number: 108-95-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Mar 31 1996	20.000 ppb	2.996
Jun 30 1996	5.000 ppb	1.609 (* Nondetect *)
Sep 30 1996	5.000 ppb	1.609 (* Nondetect *)
Dec 31 1996	5.000 ppb	1.609 (* Nondetect *)
Mar 31 1997	14.000 ppb	2.639
Jun 30 1997	5.000 ppb	1.609 (* Nondetect *)
Sep 30 1997	5.000 ppb	1.609 (* Nondetect *)
Dec 31 1997	5.000 ppb	1.609 (* Nondetect *)
Mar 09 1998	5.000 ppb	1.609 (* Nondetect *)
May 14 1998	5.000 ppb	1.609 (* Nondetect *)
Aug 14 1998	5.000 ppb	1.609 (* Nondetect *)
Nov 23 1998	5.000 ppb	1.609 (* Nondetect *)
Mar 13 1999	5.000 ppb	1.609 (* Nondetect *)
May 27 1999	5.000 ppb	1.609 (* Nondetect *)
Jul 27 1999	5.000 ppb	1.609 (* Nondetect *)
Nov 08 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 10 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 11 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 12 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 13 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 14 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 15 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 16 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 17 1999	5.000 ppb	1.609 (* Nondetect *)

Dec 18 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 19 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 20 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 21 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 22 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 23 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 24 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 25 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 26 1999	13.000 ppb	2.565
Dec 27 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 28 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 29 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 30 1999	5.000 ppb	1.609 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 92

Minimum:	5.000 ppb	Ln Minimum:	1.609
Maximum:	20.000 ppb	Ln Maximum:	2.996
Mean:	5.865 ppb	Ln Mean:	1.701
Std. Dev.:	3.084 ppb	Ln Std. Dev.:	0.316

Well ID:13MW2

Sample Date	Observation	Ln
Mar 31 1996	5.000 ppb	1.609 (* Nondetect *)
Jun 30 1996	5.000 ppb	1.609 (* Nondetect *)
Sep 30 1996	5.000 ppb	1.609 (* Nondetect *)
Dec 31 1996	5.000 ppb	1.609 (* Nondetect *)
Mar 31 1997	5.000 ppb	1.609 (* Nondetect *)
Jun 30 1997	5.000 ppb	1.609 (* Nondetect *)
Sep 30 1997	5.000 ppb	1.609 (* Nondetect *)
Dec 31 1997	5.000 ppb	1.609 (* Nondetect *)
Mar 09 1998	5.000 ppb	1.609 (* Nondetect *)
May 14 1998	5.000 ppb	1.609 (* Nondetect *)
Aug 14 1998	5.000 ppb	1.609 (* Nondetect *)
Nov 23 1998	5.000 ppb	1.609 (* Nondetect *)
Mar 13 1999	5.000 ppb	1.609 (* Nondetect *)
May 27 1999	5.000 ppb	1.609 (* Nondetect *)
Jul 27 1999	5.000 ppb	1.609 (* Nondetect *)
Nov 08 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 10 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 11 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 12 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 13 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 14 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 15 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 16 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 17 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 18 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 19 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 20 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 21 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 22 1999	5.000 ppb	1.609 (* Nondetect *)

Dec 23 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 24 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 25 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 26 1999	12.000 ppb	2.485
Dec 27 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 28 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 29 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 30 1999	5.000 ppb	1.609 (* Nondetect *)

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 97

Minimum:	5.000 ppb	Ln Minimum:	1.609
Maximum:	12.000 ppb	Ln Maximum:	2.485
Mean:	5.189 ppb	Ln Mean:	1.633
Std. Dev.:	1.151 ppb	Ln Std. Dev.:	0.144

Normality Tests

Report Printed: 05-10-2005 16:59

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Phenols Phenols, total

CAS Number: 108-95-2
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

Scale	Minimum	Maximum	Mean	Std Dev
Original:	5.000	20.000	5.865	3.084
Log:	1.609	2.996	1.701	0.316

Well:13MW2 Position:Upgradient Observations:37

Scale	Minimum	Maximum	Mean	Std Dev
Original:	5.000	12.000	5.189	1.151
Log:	1.609	2.485	1.633	0.144

Pooled Statistics
Observations: 74

Statistic	Original Scale	Log Scale
Mean:	5.527	1.667
Std Dev:	2.336	0.246
Skewness:	4.671*	4.192*
Kurtosis:	22.128	16.382
Minimum:	5.000	1.609
Maximum:	20.000	2.996

CV:	0.423	0.148

Shapiro-Francia Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.2166*	0.9690	0.9560
Log:	0.2249*	0.9690	0.9560

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

Nonparametric Prediction Interval
Report Printed May 10,2005

Facility:Haz. Waste Unit 13 - RAAP
Parameter:Phenols, total(CAS Number:108-95-2)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

Observations (n):	74
Conf. Level (1-α):	100.000%
UL:	~~5.000~~ 20.0 ppb
LL:	0.000

%ND: 97%

Report Produced by GRITS/STAT 5.01

Data Set Summary

Report Printed: 05-10-2005 17:05

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:TOC Total Organic Carbon

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 2000.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Mar 31 1996	500.000 ppb	6.215 (* Nondetect *)
Jun 30 1996	3000.000 ppb	8.006
Sep 30 1996	500.000 ppb	6.215 (* Nondetect *)
Dec 31 1996	500.000 ppb	6.215 (* Nondetect *)
Mar 31 1997	500.000 ppb	6.215 (* Nondetect *)
Jun 30 1997	2000.000 ppb	7.601
Sep 30 1997	500.000 ppb	6.215 (* Nondetect *)
Dec 31 1997	500.000 ppb	6.215 (* Nondetect *)
Mar 09 1998	500.000 ppb	6.215 (* Nondetect *)
May 14 1998	500.000 ppb	6.215 (* Nondetect *)
Aug 14 1998	500.000 ppb	6.215 (* Nondetect *)
Nov 23 1998	500.000 ppb	6.215 (* Nondetect *)
Mar 13 1999	1725.000 ppb	7.453
May 27 1999	500.000 ppb	6.215 (* Nondetect *)
Jul 27 1999	500.000 ppb	6.215 (* Nondetect *)
Nov 08 1999	500.000 ppb	6.215 (* Nondetect *)
Dec 10 1999	500.000 ppb	6.215 (* Nondetect *)
Dec 11 1999	500.000 ppb	6.215 (* Nondetect *)
Dec 12 1999	1550.000 ppb	7.346
Dec 13 1999	500.000 ppb	6.215 (* Nondetect *)
Dec 14 1999	500.000 ppb	6.215 (* Nondetect *)
Dec 15 1999	500.000 ppb	6.215 (* Nondetect *)
Dec 16 1999	500.000 ppb	6.215 (* Nondetect *)
Dec 17 1999	500.000 ppb	6.215 (* Nondetect *)

Dec 18 1999	1000.000 ppb	6.908 (* Nondetect *)
Dec 19 1999	1000.000 ppb	6.908 (* Nondetect *)
Dec 20 1999	1000.000 ppb	6.908 (* Nondetect *)
Dec 21 1999	1000.000 ppb	6.908 (* Nondetect *)
Dec 22 1999	1000.000 ppb	6.908 (* Nondetect *)
Dec 23 1999	2177.000 ppb	7.686
Dec 24 1999	10600.000 ppb	9.269
Dec 25 1999	10600.000 ppb	9.269
Dec 26 1999	5682.000 ppb	8.645
Dec 27 1999	8370.000 ppb	9.032
Dec 28 1999	1000.000 ppb	6.908 (* Nondetect *)
Dec 29 1999	1000.000 ppb	6.908 (* Nondetect *)
Dec 30 1999	1000.000 ppb	6.908 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 76

Minimum:	500.000 ppb	Ln Minimum:	6.215
Maximum:	10600.000 ppb	Ln Maximum:	9.269
Mean:	1721.730 ppb	Ln Mean:	6.861
Std. Dev.:	2653.605 ppb	Ln Std. Dev.:	0.928

Well ID:13MW2

Sample Date	Observation	Ln
Mar 31 1996	500.000 ppb	6.215 (* Nondetect *)
Jun 30 1996	3000.000 ppb	8.006
Sep 30 1996	500.000 ppb	6.215 (* Nondetect *)
Dec 31 1996	500.000 ppb	6.215 (* Nondetect *)
Mar 31 1997	500.000 ppb	6.215 (* Nondetect *)
Jun 30 1997	2000.000 ppb	7.601
Sep 30 1997	500.000 ppb	6.215 (* Nondetect *)
Dec 31 1997	500.000 ppb	6.215 (* Nondetect *)
Mar 09 1998	500.000 ppb	6.215 (* Nondetect *)
May 14 1998	1400.000 ppb	7.244
Aug 14 1998	500.000 ppb	6.215 (* Nondetect *)
Nov 23 1998	500.000 ppb	6.215 (* Nondetect *)
Mar 13 1999	8625.000 ppb	9.062
May 27 1999	500.000 ppb	6.215 (* Nondetect *)
Jul 27 1999	500.000 ppb	6.215 (* Nondetect *)
Nov 08 1999	500.000 ppb	6.215 (* Nondetect *)
Dec 10 1999	500.000 ppb	6.215 (* Nondetect *)
Dec 11 1999	500.000 ppb	6.215 (* Nondetect *)
Dec 12 1999	1625.000 ppb	7.393
Dec 13 1999	500.000 ppb	6.215 (* Nondetect *)
Dec 14 1999	500.000 ppb	6.215 (* Nondetect *)
Dec 15 1999	500.000 ppb	6.215 (* Nondetect *)
Dec 16 1999	500.000 ppb	6.215 (* Nondetect *)
Dec 17 1999	500.000 ppb	6.215 (* Nondetect *)
Dec 18 1999	1000.000 ppb	6.908 (* Nondetect *)
Dec 19 1999	1000.000 ppb	6.908 (* Nondetect *)
Dec 20 1999	1000.000 ppb	6.908 (* Nondetect *)
Dec 21 1999	1000.000 ppb	6.908 (* Nondetect *)
Dec 22 1999	1000.000 ppb	6.908 (* Nondetect *)

Dec 23 1999	3550.000 ppb	8.175
Dec 24 1999	1505.000 ppb	7.317
Dec 25 1999	8417.000 ppb	9.038
Dec 26 1999	5972.000 ppb	8.695
Dec 27 1999	8255.000 ppb	9.019
Dec 28 1999	1000.000 ppb	6.908 (* Nondetect *)
Dec 29 1999	1000.000 ppb	6.908 (* Nondetect *)
Dec 30 1999	1042.000 ppb	6.949

Well ID:13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 70

Minimum:	500.000 ppb	Ln Minimum:	6.215
Maximum:	8625.000 ppb	Ln Maximum:	9.062
Mean:	1672.730 ppb	Ln Mean:	6.890
Std. Dev.:	2302.313 ppb	Ln Std. Dev.:	0.909

Normality Tests

Report Printed: 05-10-2005 17:02

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:TOC Total Organic Carbon

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 2000.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

Scale	Minimum	Maximum	Mean	Std Dev
Original:	500.000	10600.000	1721.730	2653.605
Log:	6.215	9.269	6.861	0.928

Well:13MW2 Position:Upgradient Observations:37

Scale	Minimum	Maximum	Mean	Std Dev
Original:	500.000	8625.000	1672.730	2302.313
Log:	6.215	9.062	6.890	0.909

Pooled Statistics
Observations: 74

Statistic	Original Scale	Log Scale
Mean:	1697.230	6.876
Std Dev:	2467.227	0.912
Skewness:	2.485*	1.364*
Kurtosis:	5.030	0.781
Minimum:	500.000	6.215
Maximum:	10600.000	9.269

CV:	1.454	0.133

Shapiro-Francia Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.5304*	0.9690	0.9560
Log:	0.7452*	0.9690	0.9560

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

Nonparametric Prediction Interval
Report Printed May 10,2005

Facility:Haz. Waste Unit 13 - RAAP
Parameter:Total Organic Carbon(CAS Number:- -)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

Observations (n):	74
Conf. Level (1-α):	***.***%
UL:	~~16,000.0~~ ~~500.000 ppb~~ 10,600.00 ppb
LL:	0.000

%ND: 73%.

Report Produced by GRITS/STAT 5.01

Normality Tests

Report Printed: 05-10-2005 17:10

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:TOX Total Organic Halogens, Halides

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 40.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:37

Scale	Minimum	Maximum	Mean	Std Dev
Original:	2.500	38.000	10.932	10.539
Log:	0.916	3.638	1.874	1.056

Well:13MW2 Position:Upgradient Observations:37

Scale	Minimum	Maximum	Mean	Std Dev
Original:	2.500	54.500	10.405	11.289
Log:	0.916	3.998	1.789	1.059

Pooled Statistics
Observations: 74

Statistic	Original Scale	Log Scale
Mean:	10.669	1.831
Std Dev:	10.849	1.051
Skewness:	1.378*	0.399
Kurtosis:	2.259	-1.616
Minimum:	2.500	0.916
Maximum:	54.500	3.998

CV: 1.017 0.574

Shapiro-Francia Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.7158*	0.9690	0.9560
Log:	0.7407*	0.9690	0.9560

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

Data Set Summary

Report Printed: 05-10-2005 17:10

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:TOX Total Organic Halogens, Halides

CAS Number: - -
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 40.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Mar 31 1996	2.500 ppb	0.916 (* Nondetect *)
Jun 30 1996	2.500 ppb	0.916 (* Nondetect *)
Sep 30 1996	2.500 ppb	0.916 (* Nondetect *)
Dec 31 1996	2.500 ppb	0.916 (* Nondetect *)
Mar 31 1997	2.500 ppb	0.916 (* Nondetect *)
Jun 30 1997	2.500 ppb	0.916 (* Nondetect *)
Sep 30 1997	2.500 ppb	0.916 (* Nondetect *)
Dec 31 1997	9.000 ppb	2.197
Mar 09 1998	2.500 ppb	0.916 (* Nondetect *)
May 14 1998	5.500 ppb	1.705
Aug 14 1998	2.500 ppb	0.916 (* Nondetect *)
Nov 23 1998	25.500 ppb	3.239
Mar 13 1999	2.500 ppb	0.916 (* Nondetect *)
May 27 1999	2.500 ppb	0.916 (* Nondetect *)
Jul 27 1999	6.500 ppb	1.872
Nov 08 1999	14.500 ppb	2.674
Dec 10 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 11 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 12 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 13 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 14 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 15 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 16 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 17 1999	2.500 ppb	0.916 (* Nondetect *)

Dec 18 1999	20.000 ppb	2.996 (* Nondetect *)
Dec 19 1999	20.000 ppb	2.996 (* Nondetect *)
Dec 20 1999	20.000 ppb	2.996 (* Nondetect *)
Dec 21 1999	20.000 ppb	2.996 (* Nondetect *)
Dec 22 1999	20.000 ppb	2.996 (* Nondetect *)
Dec 23 1999	20.000 ppb	2.996 (* Nondetect *)
Dec 24 1999	20.000 ppb	2.996 (* Nondetect *)
Dec 25 1999	20.000 ppb	2.996 (* Nondetect *)
Dec 26 1999	20.000 ppb	2.996 (* Nondetect *)
Dec 27 1999	20.000 ppb	2.996 (* Nondetect *)
Dec 28 1999	38.000 ppb	3.638
Dec 29 1999	20.000 ppb	2.996 (* Nondetect *)
Dec 30 1999	38.000 ppb	3.638

Well ID:13MW1 Summary Statistics

Observations (N): 37
Nondetects (%ND): 81

Minimum:	2.500 ppb	Ln Minimum:	0.916
Maximum:	38.000 ppb	Ln Maximum:	3.638
Mean:	10.932 ppb	Ln Mean:	1.874
Std. Dev.:	10.539 ppb	Ln Std. Dev.:	1.056

Well ID:13MW2

Sample Date	Observation	Ln
Mar 31 1996	2.500 ppb	0.916 (* Nondetect *)
Jun 30 1996	2.500 ppb	0.916 (* Nondetect *)
Sep 30 1996	2.500 ppb	0.916 (* Nondetect *)
Dec 31 1996	2.500 ppb	0.916 (* Nondetect *)
Mar 31 1997	2.500 ppb	0.916 (* Nondetect *)
Jun 30 1997	2.500 ppb	0.916 (* Nondetect *)
Sep 30 1997	2.500 ppb	0.916 (* Nondetect *)
Dec 31 1997	2.500 ppb	0.916 (* Nondetect *)
Mar 09 1998	2.500 ppb	0.916 (* Nondetect *)
May 14 1998	6.000 ppb	1.792
Aug 14 1998	2.500 ppb	0.916 (* Nondetect *)
Nov 23 1998	7.500 ppb	2.015
Mar 13 1999	2.500 ppb	0.916 (* Nondetect *)
May 27 1999	2.500 ppb	0.916 (* Nondetect *)
Jul 27 1999	2.500 ppb	0.916 (* Nondetect *)
Nov 08 1999	24.500 ppb	3.199
Dec 10 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 11 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 12 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 13 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 14 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 15 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 16 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 17 1999	2.500 ppb	0.916 (* Nondetect *)
Dec 18 1999	20.000 ppb	2.996 (* Nondetect *)
Dec 19 1999	20.000 ppb	2.996 (* Nondetect *)
Dec 20 1999	20.000 ppb	2.996 (* Nondetect *)
Dec 21 1999	20.000 ppb	2.996 (* Nondetect *)
Dec 22 1999	20.000 ppb	2.996 (* Nondetect *)

Dec 23 1999	20.000 ppb	2.996 (* Nondetect *)
Dec 24 1999	20.000 ppb	2.996 (* Nondetect *)
Dec 25 1999	20.000 ppb	2.996 (* Nondetect *)
Dec 26 1999	20.000 ppb	2.996 (* Nondetect *)
Dec 27 1999	20.000 ppb	2.996 (* Nondetect *)
Dec 28 1999	20.000 ppb	2.996 (* Nondetect *)
Dec 29 1999	20.000 ppb	2.996 (* Nondetect *)
Dec 30 1999	54.500 ppb	3.998

Well ID: 13MW2 Summary Statistics

Observations (N): 37
Nondetects (%ND): 89

Minimum:	2.500 ppb	Ln Minimum:	0.916
Maximum:	54.500 ppb	Ln Maximum:	3.998
Mean:	10.405 ppb	Ln Mean:	1.789
Std. Dev.:	11.289 ppb	Ln Std. Dev.:	1.059

Nonparametric Prediction Interval
Report Printed May 10,2005

Facility:Haz. Waste Unit 13 - RAAP
Parameter:Total Organic Halogens, Halides(CAS Number:- -)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

Observations (n):	74
Conf. Level (1-α):	100.000%
UL:	54.5 ~~2500~~ ppb
LL:	0.000

%ND : 85%.

Report Produced by GRITS/STAT 5.01

Data Set Summary

Report Printed: 05-10-2005 17:13

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Cond F Specific Conductivity, Field

CAS Number: - -
MCL: 0.000 umhos/cm
ACL: 0.000 umhos/cm
Detect Limit: 2.000 umhos/cm

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Mar 31 1996	707.500 umhos/cm	6.562
Sep 30 1997	717.500 umhos/cm	6.576
Dec 31 1997	692.500 umhos/cm	6.540
Mar 09 1998	660.000 umhos/cm	6.492
May 14 1998	590.000 umhos/cm	6.380
Aug 14 1998	613.000 umhos/cm	6.418
Nov 23 1998	660.000 umhos/cm	6.492
Mar 13 1999	1940.000 umhos/cm	7.570
May 27 1999	6870.000 umhos/cm	8.835
Jul 27 1999	759.000 umhos/cm	6.632
Nov 08 1999	896.000 umhos/cm	6.798
Dec 10 1999	634.000 umhos/cm	6.452
Dec 11 1999	599.000 umhos/cm	6.395
Dec 12 1999	506.000 umhos/cm	6.227
Dec 13 1999	871.000 umhos/cm	6.770
Dec 14 1999	754.000 umhos/cm	6.625
Dec 15 1999	457.000 umhos/cm	6.125
Dec 16 1999	762.000 umhos/cm	6.636
Dec 17 1999	730.000 umhos/cm	6.593
Dec 18 1999	732.000 umhos/cm	6.596
Dec 19 1999	665.000 umhos/cm	6.500
Dec 20 1999	733.000 umhos/cm	6.597
Dec 21 1999	729.000 umhos/cm	6.592
Dec 23 1999	430.000 umhos/cm	6.064

Dec 24 1999	490.000 umhos/cm	6.194
Dec 25 1999	640.000 umhos/cm	6.461
Dec 26 1999	690.000 umhos/cm	6.537
Dec 27 1999	440.000 umhos/cm	6.087
Dec 28 1999	610.000 umhos/cm	6.413
Dec 29 1999	620.000 umhos/cm	6.430
Dec 30 1999	720.000 umhos/cm	6.579

Well ID:13MW1 Summary Statistics

Observations (N): 31
Nondetects (%ND): 0

Minimum:	430.000 umhos/cm	Ln Minimum:	6.064
Maximum:	6870.000 umhos/cm	Ln Maximum:	8.835
Mean:	900.564 umhos/cm	Ln Mean:	6.586
Std. Dev.:	1136.958 umhos/cm	Ln Std. Dev.:	0.495

Well ID:13MW2

Sample Date	Observation	Ln
Mar 31 1996	582.500 umhos/cm	6.367
Sep 30 1997	567.500 umhos/cm	6.341
Dec 31 1997	570.000 umhos/cm	6.346
Mar 09 1998	568.000 umhos/cm	6.342
May 14 1998	573.000 umhos/cm	6.351
Aug 14 1998	553.000 umhos/cm	6.315
Nov 23 1998	560.000 umhos/cm	6.328
Mar 13 1999	500.000 umhos/cm	6.215
May 27 1999	5810.000 umhos/cm	8.667
Jul 27 1999	589.000 umhos/cm	6.378
Nov 08 1999	687.000 umhos/cm	6.532
Dec 10 1999	495.000 umhos/cm	6.205
Dec 11 1999	568.000 umhos/cm	6.342
Dec 12 1999	601.000 umhos/cm	6.399
Dec 13 1999	689.000 umhos/cm	6.535
Dec 14 1999	618.000 umhos/cm	6.426
Dec 15 1999	574.000 umhos/cm	6.353
Dec 16 1999	613.000 umhos/cm	6.418
Dec 17 1999	617.000 umhos/cm	6.425
Dec 18 1999	612.000 umhos/cm	6.417
Dec 19 1999	648.000 umhos/cm	6.474
Dec 20 1999	610.000 umhos/cm	6.413
Dec 21 1999	621.000 umhos/cm	6.431
Dec 23 1999	630.000 umhos/cm	6.446
Dec 24 1999	670.000 umhos/cm	6.507
Dec 25 1999	600.000 umhos/cm	6.397
Dec 26 1999	750.000 umhos/cm	6.620
Dec 27 1999	450.000 umhos/cm	6.109
Dec 28 1999	550.000 umhos/cm	6.310
Dec 29 1999	670.000 umhos/cm	6.507
Dec 30 1999	710.000 umhos/cm	6.565

Well ID:13MW2 Summary Statistics

Observations (N): 31
Nondetects (%ND): 0

Minimum:	450.000 umhos/cm	Ln Minimum:	6.109
Maximum:	5810.000 umhos/cm	Ln Maximum:	8.667
Mean:	769.548 umhos/cm	Ln Mean:	6.467
Std. Dev.:	937.607 umhos/cm	Ln Std. Dev.:	0.422

Normality Tests

Report Printed: 05-10-2005 17:12

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Cond F Specific Conductivity, Field

CAS Number: - -
MCL: 0.000 umhos/cm
ACL: 0.000 umhos/cm
Detect Limit: 2.000 umhos/cm

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:31

Scale	Minimum	Maximum	Mean	Std Dev
Original:	430.000	6870.000	900.564	1136.958
Log:	6.064	8.835	6.586	0.495

Well:13MW2 Position:Upgradient Observations:31

Scale	Minimum	Maximum	Mean	Std Dev
Original:	450.000	5810.000	769.548	937.607
Log:	6.109	8.667	6.467	0.422

Pooled Statistics
Observations: 62

Statistic	Original Scale	Log Scale
Mean:	835.056	6.527
Std Dev:	1035.592	0.460
Skewness:	5.111*	3.858*
Kurtosis:	25.116	15.873
Minimum:	430.000	6.064
Maximum:	6870.000	8.835

CV:	1.240	0.071

Shapiro-Francia Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.2489*	0.9640	0.9470
Log:	0.5030*	0.9640	0.9470

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

Nonparametric Prediction Interval
Report Printed May 10,2005

Facility:Haz. Waste Unit 13 - RAAP
Parameter:Specific Conductivity, Field(CAS Number:- -)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

Observations (n):	62
Conf. Level (1-α):	100.000%
UL:	6870.0 umhos/cm
LL:	0.000

%ND: 0

Report Produced by GRITS/STAT 5.01

Data Set Summary

Report Printed: 05-10-2005 17:13

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:pH F pH, Field

CAS Number: - -
MCL: 0.000 SU
ACL: 0.000 SU
Detect Limit: 0.100 SU

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Mar 31 1996	7.100 SU	1.960
Sep 30 1997	7.200 SU	1.974
Dec 31 1997	7.200 SU	1.974
Mar 09 1998	6.700 SU	1.902
May 14 1998	6.300 SU	1.841
Aug 14 1998	6.500 SU	1.872
Nov 23 1998	7.000 SU	1.946
Mar 13 1999	6.700 SU	1.902
May 27 1999	6.990 SU	1.944
Jul 27 1999	7.030 SU	1.950
Nov 08 1999	6.950 SU	1.939
Dec 10 1999	6.820 SU	1.920
Dec 11 1999	6.600 SU	1.887
Dec 12 1999	6.390 SU	1.855
Dec 13 1999	5.720 SU	1.744
Dec 14 1999	7.010 SU	1.947
Dec 15 1999	6.480 SU	1.869
Dec 16 1999	6.520 SU	1.875
Dec 17 1999	6.690 SU	1.901
Dec 18 1999	6.940 SU	1.937
Dec 19 1999	6.570 SU	1.883
Dec 20 1999	6.550 SU	1.879
Dec 21 1999	6.650 SU	1.895
Dec 23 1999	6.670 SU	1.898

Dec 24 1999	6.400 SU	1.856
Dec 25 1999	6.930 SU	1.936
Dec 26 1999	6.640 SU	1.893
Dec 27 1999	6.720 SU	1.905
Dec 28 1999	6.470 SU	1.867
Dec 29 1999	7.020 SU	1.949
Dec 30 1999	7.250 SU	1.981

Well ID:13MW1 Summary Statistics

Observations (N): 31
Nondetects (%ND): 0

Minimum:	5.720 SU	Ln Minimum:	1.744
Maximum:	7.250 SU	Ln Maximum:	1.981
Mean:	6.733 SU	Ln Mean:	1.906
Std. Dev.:	0.323 SU	Ln Std. Dev.:	0.049

Well ID:13MW2

Sample Date	Observation	Ln
Mar 31 1996	7.400 SU	2.001
Sep 30 1997	7.800 SU	2.054
Dec 31 1997	7.200 SU	1.974
Mar 09 1998	6.800 SU	1.917
May 14 1998	6.700 SU	1.902
Aug 14 1998	6.700 SU	1.902
Nov 23 1998	7.100 SU	1.960
Mar 13 1999	7.700 SU	2.041
May 27 1999	7.180 SU	1.971
Jul 27 1999	7.170 SU	1.970
Nov 08 1999	7.090 SU	1.959
Dec 10 1999	6.910 SU	1.933
Dec 11 1999	6.960 SU	1.940
Dec 12 1999	6.710 SU	1.904
Dec 13 1999	6.200 SU	1.825
Dec 14 1999	7.090 SU	1.959
Dec 15 1999	6.830 SU	1.921
Dec 16 1999	6.670 SU	1.898
Dec 17 1999	6.790 SU	1.915
Dec 18 1999	7.060 SU	1.954
Dec 19 1999	6.840 SU	1.923
Dec 20 1999	6.670 SU	1.898
Dec 21 1999	6.710 SU	1.904
Dec 23 1999	7.130 SU	1.964
Dec 24 1999	7.030 SU	1.950
Dec 25 1999	7.070 SU	1.956
Dec 26 1999	7.020 SU	1.949
Dec 27 1999	7.090 SU	1.959
Dec 28 1999	7.220 SU	1.977
Dec 29 1999	6.970 SU	1.942
Dec 30 1999	7.500 SU	2.015

Well ID:13MW2 Summary Statistics

Observations (N): 31
Nondetects (%ND): 0

Minimum:	6.200 SU	Ln Minimum:	1.825
Maximum:	7.800 SU	Ln Maximum:	2.054
Mean:	7.010 SU	Ln Mean:	1.946
Std. Dev.:	0.322 SU	Ln Std. Dev.:	0.046

Normality Tests

Report Printed: 05-10-2005 17:14

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:pH F pH, Field

CAS Number: - -
MCL: 0.000 SU
ACL: 0.000 SU
Detect Limit: 0.100 SU

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:31

Scale	Minimum	Maximum	Mean	Std Dev
Original:	5.720	7.250	6.733	0.323
Log:	1.744	1.981	1.906	0.049

Well:13MW2 Position:Upgradient Observations:31

Scale	Minimum	Maximum	Mean	Std Dev
Original:	6.200	7.800	7.010	0.322
Log:	1.825	2.054	1.946	0.046

Pooled Statistics
Observations: 62

Statistic	Original Scale	Log Scale
Mean:	6.871	1.926
Std Dev:	0.349	0.051
Skewness:	-0.187	-0.447
Kurtosis:	1.327	1.708
Minimum:	5.720	1.744
Maximum:	7.800	2.054

CV:	0.051	0.027

Shapiro-Francia Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.9566*	0.9640	0.9470
Log:	0.9489*	0.9640	0.9470

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

Nonparametric Prediction Interval
Report Printed May 10,2005

Facility:Haz. Waste Unit 13 - RAAP
Parameter:pH, Field(CAS Number:- -)

TWO-TAILED PARAMETRIC PREDICTION INTERVAL

Observations (n):	62
Conf. Level (1-α):	100.000%

UL: ~~6.990 SU~~ 7.80 SU
LL: 6.910 SU 5.72 SU

Report Produced by GRITS/STAT 5.01

Data Set Summary

Report Printed: 05-10-2005 17:17

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Nitrate Nitrate

CAS Number:14797-55-8
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 100.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Mar 31 1996	700.000 ppb	6.551
Jun 30 1996	700.000 ppb	6.551
Sep 30 1996	500.000 ppb	6.215
Dec 31 1996	600.000 ppb	6.397
Mar 31 1997	700.000 ppb	6.551
Jun 30 1997	700.000 ppb	6.551
Sep 30 1997	900.000 ppb	6.802
Dec 31 1997	700.000 ppb	6.551
Mar 09 1998	480.000 ppb	6.174
May 14 1998	360.000 ppb	5.886
Aug 14 1998	440.000 ppb	6.087
Nov 23 1998	560.000 ppb	6.328
Mar 13 1999	410.000 ppb	6.016
May 27 1999	230.000 ppb	5.438
Jul 27 1999	380.000 ppb	5.940
Nov 08 1999	430.000 ppb	6.064
Dec 10 1999	430.000 ppb	6.064
Dec 11 1999	130.000 ppb	4.868
Dec 12 1999	900.000 ppb	6.802
Dec 13 1999	310.000 ppb	5.737
Dec 14 1999	320.000 ppb	5.768
Dec 15 1999	150.000 ppb	5.011
Dec 16 1999	380.000 ppb	5.940
Dec 17 1999	400.000 ppb	5.991

Dec 18 1999	340.000 ppb	5.829
Dec 19 1999	250.000 ppb	5.521
Dec 20 1999	260.000 ppb	5.561
Dec 21 1999	380.000 ppb	5.940
Dec 22 1999	300.000 ppb	5.704
Dec 23 1999	300.000 ppb	5.704
Dec 24 1999	50.000 ppb	3.912 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 31
Nondetects (%ND): 3

Minimum:	50.000 ppb	Ln Minimum:	3.912
Maximum:	900.000 ppb	Ln Maximum:	6.802
Mean:	441.613 ppb	Ln Mean:	5.950
Std. Dev.:	212.259 ppb	Ln Std. Dev.:	0.600

Well ID:13MW2

Sample Date	Observation	Ln
Mar 31 1996	600.000 ppb	6.397
Jun 30 1996	800.000 ppb	6.685
Sep 30 1996	700.000 ppb	6.551
Dec 31 1996	800.000 ppb	6.685
Mar 31 1997	700.000 ppb	6.551
Jun 30 1997	900.000 ppb	6.802
Sep 30 1997	700.000 ppb	6.551
Dec 31 1997	600.000 ppb	6.397
Mar 09 1998	790.000 ppb	6.672
May 14 1998	380.000 ppb	5.940
Aug 14 1998	640.000 ppb	6.461
Nov 23 1998	600.000 ppb	6.397
Mar 13 1999	710.000 ppb	6.565
May 27 1999	860.000 ppb	6.757
Jul 27 1999	890.000 ppb	6.791
Nov 08 1999	920.000 ppb	6.824
Dec 10 1999	50.000 ppb	3.912 (* Nondetect *)
Dec 11 1999	920.000 ppb	6.824
Dec 12 1999	1050.000 ppb	6.957
Dec 13 1999	1360.000 ppb	7.215
Dec 14 1999	1200.000 ppb	7.090
Dec 15 1999	1160.000 ppb	7.056
Dec 16 1999	1190.000 ppb	7.082
Dec 17 1999	710.000 ppb	6.565
Dec 18 1999	920.000 ppb	6.824
Dec 19 1999	750.000 ppb	6.620
Dec 20 1999	580.000 ppb	6.363
Dec 22 1999	800.000 ppb	6.685
Dec 23 1999	700.000 ppb	6.551
Dec 24 1999	441.000 ppb	6.089

Well ID:13MW2 Summary Statistics

Observations (N): 30

Nondetects (%ND): 3

Minimum:	50.000 ppb	Ln Minimum:	3.912
Maximum:	1360.000 ppb	Ln Maximum:	7.215
Mean:	780.700 ppb	Ln Mean:	6.562
Std. Dev.:	262.094 ppb	Ln Std. Dev.:	0.574

Normality Tests

Report Printed: 05-10-2005 17:17

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Nitrate Nitrate

CAS Number:14797-55-8
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 100.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:31

Scale	Minimum	Maximum	Mean	Std Dev
Original:	50.000	900.000	441.613	212.259
Log:	3.912	6.802	5.950	0.600

Well:13MW2 Position:Upgradient Observations:30

Scale	Minimum	Maximum	Mean	Std Dev
Original:	50.000	1360.000	780.700	262.094
Log:	3.912	7.215	6.562	0.574

Pooled Statistics
Observations: 61

Statistic	Original Scale	Log Scale
Mean:	608.377	6.251
Std Dev:	291.453	0.659
Skewness:	0.269	-1.602*
Kurtosis:	-0.285	3.355
Minimum:	50.000	3.912
Maximum:	1360.000	7.215

CV:	0.479	0.105

Shapiro-Francia Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.9813	0.9630	0.9470
Log:	0.8553*	0.9630	0.9470

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

Parametric Prediction Interval
Report Printed May 10,2005

Facility:Haz. Waste Unit 13 - RAAP
Parameter:Nitrate(CAS Number:14797-55-8)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

Observations (n):	61
Shapiro-Francia (W):	0.9813
Critical W,α=0.01:	0.9470
Mean:	608.377 ppb
Std Dev:	291.453 ppb
DF:	60
Conf. Level (1-α):	0.9500
Future Samples (k):	5
$t_{\left[1-\frac{\alpha}{k}\right]}$:	2.3901
Kappa:	2.4096
UL:	1310.672 ppb
LL:	-∞

X.ND: 3y.

Report Produced by GRITS/STAT 5.01

Data Set Summary

Report Printed: 05-10-2005 17:19

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Nitrite Nitrite

CAS Number:14797-65-0
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 10.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Mar 31 1996	5.000 ppb	1.609 (* Nondetect *)
Jun 30 1996	5.000 ppb	1.609 (* Nondetect *)
Sep 30 1996	5.000 ppb	1.609 (* Nondetect *)
Dec 31 1996	5.000 ppb	1.609 (* Nondetect *)
Mar 31 1997	5.000 ppb	1.609 (* Nondetect *)
Jun 30 1997	5.000 ppb	1.609 (* Nondetect *)
Sep 30 1997	5.000 ppb	1.609 (* Nondetect *)
Dec 31 1997	5.000 ppb	1.609 (* Nondetect *)
Mar 09 1998	5.000 ppb	1.609 (* Nondetect *)
May 14 1998	5.000 ppb	1.609 (* Nondetect *)
Aug 14 1998	5.000 ppb	1.609 (* Nondetect *)
Nov 23 1998	5.000 ppb	1.609 (* Nondetect *)
Mar 13 1999	5.000 ppb	1.609 (* Nondetect *)
May 27 1999	5.000 ppb	1.609 (* Nondetect *)
Jul 27 1999	5.000 ppb	1.609 (* Nondetect *)
Nov 08 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 10 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 11 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 12 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 13 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 14 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 15 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 16 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 17 1999	5.000 ppb	1.609 (* Nondetect *)

Dec 18 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 19 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 20 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 21 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 22 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 23 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 24 1999	5.000 ppb	1.609 (* Nondetect *)

Well ID:13MW1 Summary Statistics

Observations (N): 31
Nondetects (%ND):100

Minimum:	5.000 ppb	Ln Minimum:	1.609
Maximum:	5.000 ppb	Ln Maximum:	1.609
Mean:	5.000 ppb	Ln Mean:	1.609
Std. Dev.:	0.000 ppb	Ln Std. Dev.:	0.000

Well ID:13MW2

Sample Date	Observation	Ln
Mar 31 1996	5.000 ppb	1.609 (* Nondetect *)
Jun 30 1996	5.000 ppb	1.609 (* Nondetect *)
Sep 30 1996	5.000 ppb	1.609 (* Nondetect *)
Dec 31 1996	5.000 ppb	1.609 (* Nondetect *)
Mar 31 1997	5.000 ppb	1.609 (* Nondetect *)
Jun 30 1997	5.000 ppb	1.609 (* Nondetect *)
Sep 30 1997	5.000 ppb	1.609 (* Nondetect *)
Dec 31 1997	5.000 ppb	1.609 (* Nondetect *)
Mar 09 1998	5.000 ppb	1.609 (* Nondetect *)
May 14 1998	5.000 ppb	1.609 (* Nondetect *)
Aug 14 1998	5.000 ppb	1.609 (* Nondetect *)
Nov 23 1998	5.000 ppb	1.609 (* Nondetect *)
Mar 13 1999	5.000 ppb	1.609 (* Nondetect *)
May 27 1999	5.000 ppb	1.609 (* Nondetect *)
Jul 27 1999	5.000 ppb	1.609 (* Nondetect *)
Nov 08 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 10 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 11 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 12 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 13 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 14 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 15 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 16 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 17 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 18 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 19 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 20 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 22 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 23 1999	5.000 ppb	1.609 (* Nondetect *)
Dec 24 1999	5.000 ppb	1.609 (* Nondetect *)

Well ID:13MW2 Summary Statistics

Observations (N): 30

Nondetects (%ND):100

Minimum:	5.000 ppb	Ln Minimum:	1.609
Maximum:	5.000 ppb	Ln Maximum:	1.609
Mean:	5.000 ppb	Ln Mean:	1.609
Std. Dev.:	0.000 ppb	Ln Std. Dev.:	0.000

Data Set Summary

Report Printed: 05-10-2005 17:19

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Sulfate Sulfate, total

CAS Number:14808-79-8
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 1000.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Well ID:13MW1

Sample Date	Observation	Ln
Mar 31 1996	88000.000 ppb	11.385
Jun 30 1996	84000.000 ppb	11.339
Sep 30 1996	80000.000 ppb	11.290
Dec 31 1996	82000.000 ppb	11.314
Mar 31 1997	70000.000 ppb	11.156
Jun 30 1997	64000.000 ppb	11.067
Sep 30 1997	73000.000 ppb	11.198
Dec 31 1997	79000.000 ppb	11.277
Mar 09 1998	73900.000 ppb	11.210
May 14 1998	61500.000 ppb	11.027
Aug 14 1998	64100.000 ppb	11.068
Nov 23 1998	73300.000 ppb	11.202
Mar 13 1999	65000.000 ppb	11.082
May 27 1999	53900.000 ppb	10.895
Jul 27 1999	68500.000 ppb	11.135
Nov 08 1999	61700.000 ppb	11.030
Dec 10 1999	65000.000 ppb	11.082
Dec 11 1999	47500.000 ppb	10.768
Dec 12 1999	39800.000 ppb	10.592
Dec 13 1999	59600.000 ppb	10.995
Dec 14 1999	59100.000 ppb	10.987
Dec 15 1999	34700.000 ppb	10.454
Dec 16 1999	58300.000 ppb	10.973
Dec 17 1999	64900.000 ppb	11.081

Dec 18 1999	65000.000 ppb	11.082
Dec 19 1999	49200.000 ppb	10.804
Dec 20 1999	62900.000 ppb	11.049
Dec 21 1999	65000.000 ppb	11.082
Dec 22 1999	50100.000 ppb	10.822
Dec 23 1999	40900.000 ppb	10.619
Dec 24 1999	38900.000 ppb	10.569

Well ID:13MW1 Summary Statistics

Observations (N): 31
Nondetects (%ND): 0

Minimum:	34700.000 ppb	Ln Minimum:	10.454
Maximum:	88000.000 ppb	Ln Maximum:	11.385
Mean:	62670.957 ppb	Ln Mean:	11.020
Std. Dev.:	13583.912 ppb	Ln Std. Dev.:	0.235

Well ID:13MW2

Sample Date	Observation	Ln
Mar 31 1996	32000.000 ppb	10.373
Jun 30 1996	31000.000 ppb	10.342
Sep 30 1996	28000.000 ppb	10.240
Dec 31 1996	27000.000 ppb	10.204
Mar 31 1997	24000.000 ppb	10.086
Jun 30 1997	24000.000 ppb	10.086
Sep 30 1997	26000.000 ppb	10.166
Dec 31 1997	29000.000 ppb	10.275
Mar 09 1998	30300.000 ppb	10.319
May 14 1998	30700.000 ppb	10.332
Aug 14 1998	26900.000 ppb	10.200
Nov 23 1998	27500.000 ppb	10.222
Mar 13 1999	26200.000 ppb	10.174
May 27 1999	22400.000 ppb	10.017
Jul 27 1999	23100.000 ppb	10.048
Nov 08 1999	24400.000 ppb	10.102
Dec 10 1999	25700.000 ppb	10.154
Dec 11 1999	22200.000 ppb	10.008
Dec 12 1999	27300.000 ppb	10.215
Dec 13 1999	23400.000 ppb	10.060
Dec 14 1999	26300.000 ppb	10.177
Dec 15 1999	31800.000 ppb	10.367
Dec 16 1999	22700.000 ppb	10.030
Dec 17 1999	24100.000 ppb	10.090
Dec 18 1999	29900.000 ppb	10.306
Dec 19 1999	28300.000 ppb	10.251
Dec 20 1999	28500.000 ppb	10.258
Dec 22 1999	34100.000 ppb	10.437
Dec 23 1999	48800.000 ppb	10.795
Dec 24 1999	32800.000 ppb	10.398

Well ID:13MW2 Summary Statistics

Observations (N): 30

Nondetects (%ND): 0

Minimum:	22200.000 ppb	Ln Minimum:	10.008
Maximum:	48800.000 ppb	Ln Maximum:	10.795
Mean:	27946.664 ppb	Ln Mean:	10.224
Std. Dev.:	5141.363 ppb	Ln Std. Dev.:	0.162

Normality Tests

Report Printed: 05-10-2005 17:19

Facility:RAAPHWMU13 Haz. Waste Unit 13 - RAAP

Address:

City:Radford ST:VA Zip:
County:PULASKI

Contact:
Phone:( ) -

Permit Type:Detection

Constituent:Sulfate Sulfate, total

CAS Number:14808-79-8
MCL: 0.000 ppb
ACL: 0.000 ppb
Detect Limit: 1000.000 ppb

Start Date:Mar 31 1996
End Date:Dec 30 1999

Normality Test on Observations for wells listed below:

Well:13MW1 Position:Upgradient Observations:31

Scale	Minimum	Maximum	Mean	Std Dev
Original:	34700.000	88000.000	62670.957	13583.912
Log:	10.454	11.385	11.020	0.235

Well:13MW2 Position:Upgradient Observations:30

Scale	Minimum	Maximum	Mean	Std Dev
Original:	22200.000	48800.000	27946.664	5141.363
Log:	10.008	10.795	10.224	0.162

Pooled Statistics
Observations: 61

Statistic	Original Scale	Log Scale
Mean:	45593.438	10.629
Std Dev:	20283.574	0.449
Skewness:	0.447	0.144
Kurtosis:	-1.253	-1.551
Minimum:	22200.000	10.008
Maximum:	88000.000	11.385

CV:	0.445	0.042

Shapiro-Francia Statistics

Scale	Test Statistic	5% Critical Value	1% Critical Value
Original:	0.8955*	0.9630	0.9470
Log:	0.9128*	0.9630	0.9470

* Indicates statistically significant evidence of non-normality.
GRIT/STAT Version 5.0

Nonparametric Prediction Interval
Report Printed May 10,2005

Facility:Haz. Waste Unit 13 - RAAP
Parameter:Sulfate, total(CAS Number:14808-79-8)

ONE-TAILED UPPER PARAMETRIC PREDICTION INTERVAL

Observations (n):	61
Conf. Level (1-α):	100.000%
UL:	88,000.0 ~~22200.000~~ ppb
LL:	0.000

% ND: 0

Report Produced by GRITS/STAT 5.01

APPENDIX G.2
2007-2008 ANNUAL SOIL MONITORING REPORT
FOR THE OPEN BURNING GROUND
MARCH 2009

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2007-2008
ANNUAL SOIL MONITORING REPORT
FOR THE
OPEN BURNING GROUND

RADFORD ARMY AMMUNITION PLANT
RADFORD, VIRGINIA

Submitted to:

Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219
(800) 592-5482

Prepared for:

Alliant Techsystems Inc.
Radford Army Ammunition Plant
Route 114
Radford, Virginia 24141-0100

MARCH 2009

DAA PROJECT NO. B03204-203

Draper Aden Associates
Engineering • Surveying • Environmental Services

Blacksburg • Charlottesville • Hampton Roads • Richmond, Virginia

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1.0 INTRODUCTION

This document is the 2007-2008 Annual Soil Monitoring Report for the Open Burning Ground (OBG) located at the Radford Army Ammunition Plant (RFAAP) in Radford, Virginia. This Annual Soil Monitoring Report summarizes activities conducted at the OBG from October 2007 through December 2008. The Annual Soil Monitoring Report was compiled in accordance with the requirements specified in *Soil Monitoring Program for the Open Burning Ground* (April 2005), which is included in the Final *Permit for the Treatment of Hazardous Waste by Open Burning* (effective date October 28, 2005).

This report presents background information for the OBG, a description of the permit requirements for soil sampling and reporting, sample collection and analytical methods, data validation results, and analytical results.

2.0 SITE BACKGROUND

RFAAP is located in the Valley and Ridge Physiographic Province in southwestern Virginia along the New River in Pulaski and Montgomery Counties and is divided into two sections by the river. The southern section, which comprises two-thirds of the facility, is known as the Main Plant. The northern one-third of the property, which includes the OBG, is known as the Horseshoe Area.

The OBG serves as the waste propellant burning ground for the RFAAP facility. Material that cannot be burned in the Explosive Waste Incinerators is burned at the OBG. The OBG is located within the 100-year floodplain of the New River at the southeastern end of the Horseshoe Area. The OBG is relatively flat and is located at an approximate elevation of 1,695 feet above Mean Sea Level (MSL). The site slopes steeply upward 75 to 100 feet north of the unit.

The geology at RFAAP consists of the Cambrian-aged Elbrook formation comprising limestone and dolomite with some shale and siltstone, covered by weathered residual deposits and/or alluvial deposits. The alluvial deposits have an average thickness of approximately 13 to 20 feet and consist of typical fluvial deposits of interbedded clay, silt, and sand/gravel deposits with lenses of cobbles. In portions of the site, the alluvial deposits and bedrock are separated by residual deposits, which consist of clay, silt, and clasts resulting from weathering of the parent bedrock. The residuum thickness on the site ranges from a few feet to up to 40 feet depending on the location.

The OBG is underlain by the Wheeling Silty Loam, which is characterized by low slopes. The unit includes a surface layer of approximately 10 inches of dark brown sandy loam underlain by 50 inches of dark brown gravelly sandy loam subsoil. At depths greater than 60 inches, the soil is predominantly a mixture of silt and sand with minor amounts of clay.

The general hydrogeologic setting for RFAAP is characterized by alluvial sediments overlying weathered and unweathered dolomite and limestone bedrock. In areas where alluvial sediments form the uppermost water-bearing zone, groundwater flow is generally from topographically high areas to topographically low areas. In some areas of the facility, the uppermost water-bearing zone is located within bedrock. Karst features within the bedrock aquifer can provide conduits for transport of groundwater to the New River, which is the discharge area for regional groundwater flow.

3.0 SOIL MONITORING PROGRAM REQUIREMENTS

The Soil Monitoring Program (SMP) was developed to monitor the OBG for potential effects to surface soils resulting from the facility operations. Implementation of the SMP will continue throughout the lifetime of the Resource Conservation & Recovery Act (RCRA) Operating Permit for the OBG facility. Currently, the SMP requires semiannual soil sampling at prescribed locations as shown on **Figure 1** in **Appendix A**.

As the SMP is designed to evaluate potential effects to the site by airborne deposition, soil sample collection targets the uppermost soil horizon. Sample locations were selected to represent the areas of greatest potential to be affected and are located between the burn pans of each burn pad. Each pad is defined as the area of raised topography that contains two individual burn pans. Burn pans are the ceramic or clay-lined vessels that hold waste propellant before and during the open burning process. The sample locations represent an area that will be subject to overlapping zones of ejecta from each pan. The ejecta zone is conservatively defined as 20 feet in all directions based on previous studies. The actual sample locations correspond to areas of low topography between each pan that function as the runoff conduit for the pad. These areas are erosion channels that flow toward the river-side berm and to the pond that precedes Outfall 017. The channels are not vegetated and are comprised of uncovered soils.

In addition to the eight samples collected adjacent to the burn pans (PAD 1-8), two discreet grab samples (SB-1 and SB-2) were collected along the southern boundary of the OBG along the New River. Two samples (NB-1 and NB-2) were also collected in the grassed median north of the burn pads. In addition, one grab sample (BERM-1) was collected at the southeast corner of the OBG inside the berm, and one sample (POND-1) was collected at the bottom of the sediment basin. According to the facility permit, if no constituents are detected at the additional monitoring locations (SB-1, SB-2, NB-1, NB-2, BERM-1, and POND-1) above their respective Action Limits (ALs), RFAAP may petition VDEQ to cease sampling at these additional locations.

In accordance with the SMP, the analytical results for the annual sampling event were compiled, evaluated, and interpreted upon receipt from the laboratory to determine whether concentrations of COPCs in soil are greater than the designated ALs. Analytical results from the January 2008 monitoring event were compared to the then current ALs. As stated in Section 3.2 of the SMP, the ALs may be updated on a bi-annual basis. As a result, RFAAP submitted a Class 1 Permit Modification to request a revision to the ALs in the SMP. The revised ALs were approved by VDEQ in a letter dated December 18, 2008. Analytical results from the November 2008 monitoring event were compared to the then current ALs as well as to the then proposed updated ALs as approved in the December 18, 2008 VDEQ correspondence.

The results of the data evaluation from the January 2008 and November 2008 semiannual events are summarized in this Annual Soil Monitoring Report.

4.0 SAMPLE COLLECTION

The semiannual soil sampling events for 2007-2008 were performed on January 7-8, 2008, and November 19 and 24, 2008, in accordance with the requirements of the OBG SMP. Approximate sample locations are shown on **Figure 1** in **Appendix A**.

Soil samples were collected from the uppermost six inches of soil using dedicated stainless steel tulip bulb samplers as described in the ASTM International (ASTM) *Standard Guide for Soil Sampling in the Vadose Zone, Designation D 4700-91* (reapproved 1998). Each sampler is labeled with the corresponding sample location.

Samples were collected from the lowest point in the swale between the pans at each burn pad. In order to determine the appropriate sample location, the center of each pan was located using a measuring tape. The lowest point in the swale was marked along a line connecting the centers of the burn pans. Samples were collected from the designated low point in accordance with the sample collection procedure outlined in the SMP. Also, grab samples were collected along the southern boundary of the OBG along the New River, in the grassed median north of the burn pads, at the southeast corner of the OBG inside the berm, and at the bottom of the sediment basin. For analytical quality assurance/quality control (QA/QC) purposes, a duplicate sample (PAD-X) was collected from PAD-7, and trip and equipment blanks were submitted. Copies of chains-of-custody (COCs) and field notes are included in **Appendix B**.

The dedicated samplers were cleaned prior to and following sample collection in accordance with equipment decontamination procedures outlined in the SMP. Equipment rinsate water generated during the sampling events was containerized and taken to the RFAAP Biological Wastewater Treatment Plant for disposal.

All samples were shipped in coolers under appropriate chain-of-custody. Sample coolers were shipped via overnight courier service to the analytical laboratory.

5.0 SOIL ANALYTICAL DATA EVALUATION

Soil samples collected during the semiannual sampling events were analyzed for the Constituents of Potential Concern (COPCs) as listed in the SMP and as shown on **Tables 1** and **2A/2B** in **Appendix C**. A copy of the COPC list from the SMP is included in **Appendix D**. Samples were analyzed using analytical methods set forth in U.S. Environmental Protection Agency (USEPA) *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (SW-846). All analyses were performed by TestAmerica North Canton (formerly Severn Trent Laboratory) of North Canton, Ohio, TestAmerica Austin of Austin, Texas, TestAmerica Knoxville of Knoxville, Tennessee, and TestAmerica West Sacramento of Sacramento, California. Laboratory analytical data were validated in accordance with the SMP.

The constituents detected at concentrations greater than their respective Permit-required reporting limits during the January 2008 semiannual event are summarized in **Tables 2A** and **2B** in **Appendix C**. Historical soil results are also included in **Tables 2A** and **2B**. The constituents detected at concentrations greater than their respective Permit-required reporting limits during the November 2008 semiannual event are summarized in **Tables 3A** and **3B**. Dioxin results are summarized in **Tables 4A** and **4B** in **Appendix C**. The complete laboratory certificates of analysis and data validation reports are included in **Appendix E**. As required by the permit, **Appendix E** also includes a list of analytes that were detected at concentrations between the Reporting Limit (RL) and the Limit of Detection (LOD).

During the January 2008 event, dioxin and lead were detected above the then current ALs at PAD-1, and mercury was detected above the then current AL at PAD-7. No other analytes were detected at concentrations above ALs. A verification event to confirm the initial results was performed on March 25, 2008. Dioxin and lead were present at concentrations below the ALs in the verification sample from PAD-1. The verification sample result for mercury at PAD-7 was greater than the AL.

An assessment of the horizontal extent of mercury in soil at PAD-7 was conducted on August 18, 2008, in general accordance with Section 7.4 of the SMP for the OBG (Permit Attachment II.C). This assessment was performed to evaluate the need to conduct Interim Measures as specified in Section 8.0 of the SMP.

On August 18, 2008, additional samples were collected in duplicate at the original PAD-7 sampling location and at approximately 20 feet to the north, south, east, and west of the original location. PAD-7 sampling locations are shown on **Figure 2** in **Appendix A**. The samples were sent to TestAmerica of North Canton, Ohio, and to CompuChem of Cary, North Carolina, for analysis for mercury. As shown in **Table 5** in **Appendix C**, both laboratories reported concentrations of mercury above the then current AL in samples collected at the PAD-7 original sampling location and at the north, south, and west sampling locations. In accordance with Section 7.4 of the SMP for the OBG, RFAAP was to submit a proposed Interim Measure Corrective Action Work Plan prepared in accordance with Section 8.0 of the SMP. However, the AL for mercury was updated from 0.13 mg/kg to 28 mg/kg as part of a Class I Permit Modification approved by VDEQ in a letter dated December 18, 2008. As concentrations of mercury at PAD-7 ranged from 0.30 to 2.20 mg/kg, RFAAP is not required to conduct further investigation of mercury detections at the OBG.

Analytical results from the November 2008 monitoring event were compared to the then current ALs as well as to the then proposed updated ALs as approved in the December 18, 2008 VDEQ correspondence. During the November 2008 event, no compounds were detected above either set of ALs at the OBG monitoring points.

Within the revised ALs presented in the December 18, 2008 correspondence, the VDEQ requested notification if 3,3-dimethylbenzidine is detected at concentrations less than the RL, since the RL for this analyte is above the updated AL due to instrument limitations. For the November 2008 monitoring event, the RL for 3,3-dimethylbenzidine at sample locations PAD-5 and PAD-6 was adjusted due to sample dilution required to accurately quantitate a result for another target analyte. 3,3-Dimethylbenzidine was not detected at concentrations less than the RL or the adjusted RL during the November 2008 monitoring event. 3,3-Dimethylbenzidine will continue to be monitored during future events. A summary of the adjusted RLs for 3,3-dimethylbenzidine is provided below.

Summary of 3,3-Dimethylbenzidine Adjusted Reporting Limits Above the Action Level Due to Sample Dilution

Location	Result	Adjusted RL	Adjusted Detection Limit	Action Level	Action Level Basis
3,3-Dimethylbenzidine					
PAD-5	ND	7 mg/kg	0.28 mg/kg	0.16 mg/kg	Region III RBC Industrial
PAD-6	ND	12 mg/kg	0.46 mg/kg	0.16 mg/kg	Region III RBC Industrial

Note: ND Denotes not detected at or above the adjusted detection limit or RL.

In addition, ten non-carcinogenic COPCs were detected during the January 2008 sampling event, and 11 non-carcinogenic COPCs were detected during the November 2008 event. These COPCs are analyzed for in accordance with the permit. Non-carcinogenic COPCs detected during the January 2008 event include: 1,3,5-trinitrotoluene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, barium, bromomethane, cadmium, diethyl phthalate, di-n-butyl phthalate, nitrobenzene, and nitroglycerine. Non-carcinogenic COPCs detected during the November 2008 event include: 1,3,5-trinitrobenzene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2-amino-4,6-dinitrotoluene, 4-amino-4,6-dinitrotoluene, barium, cadmium, diethyl phthalate, di-n-butyl phthalate, mercury, and nitroglycerine. Summaries of the non-carcinogenic COPCs detected during the January and November 2008 events are included in **Appendix F**.

Copies of correspondence notifying VDEQ of the results of soil sampling conducted at the OBG during the timeframe for this report are included as **Appendix G**.

6.0 CONCLUSIONS

Based on an evaluation of the soil analytical data for the OBG, no compounds were detected at concentrations above permit-specified updated ALs, approved on December 18, 2008, during the 2007-2008 soil monitoring events.

On August 9, 2007, RFAAP submitted a Class 3 permit modification that included modification to the soil monitoring program. In a letter dated October 31, 2007, the VDEQ indicated intent to approve the following modifications to the Permit:

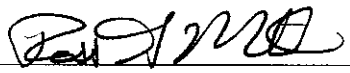
- Decrease the sampling frequency from semiannual to annual.
- Remove the constituents antimony, benzoic acid, dibenzofuran, di-n-octyl phthalate, nickel, pyrene, and zinc from the list of COPCs.

The first monitoring event for 2008-2009 was performed in January 2009.

7.0 SIGNATURE/CERTIFICATION

Prepared by:

Name: Ross G. Miller, Senior Project Geologist

Signature: 

Company: Draper Aden Associates

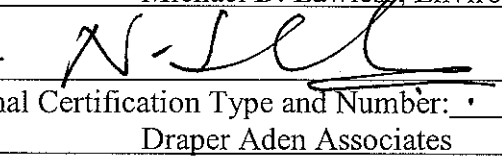
Address: 2206 South Main Street

City/State/Zip: Blacksburg, Virginia 24060-6600

Reviewed by:

I certify that I have supervised preparation of the attached report, that it has been prepared in accordance with industry standards and practices, and that the information contained herein is truthful and accurate to the best of my knowledge.

Name: Michael D. Lawless, Environmental Program Manager

Signature: 

Virginia Professional Certification Type and Number: PG 832

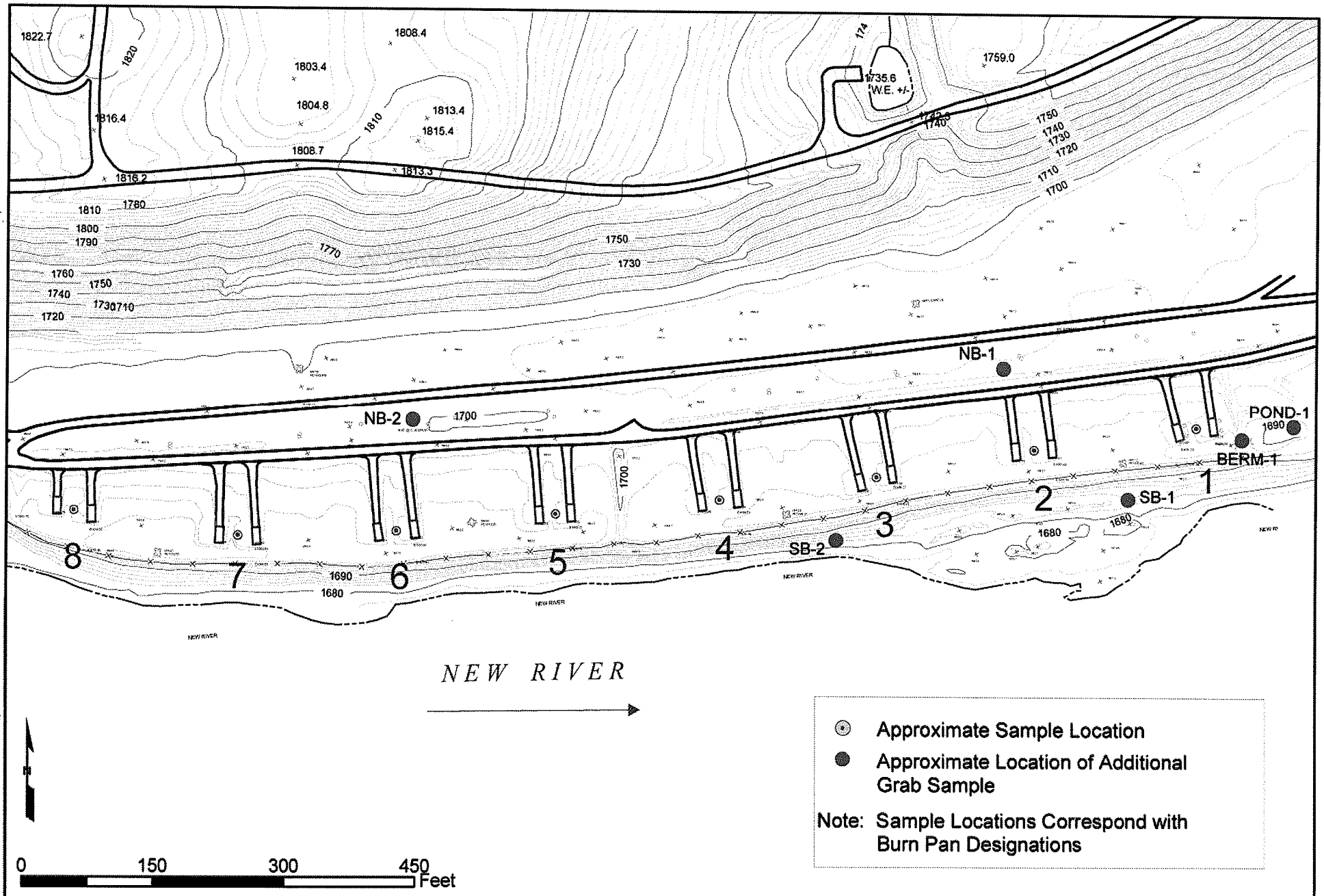
Company: Draper Aden Associates

Address: 2206 South Main Street

City/State/Zip: Blacksburg, Virginia 24060-6600

APPENDIX A

FIGURES



Draper Aden Associates
Engineering • Surveying • Environmental Services

DAA JN: B03204-201
Date: August 28, 2006

FIGURE 1
Sample Location Map
Open Burning Ground; Radford Army Ammunition Plant; Radford, Virginia

PAD-6 →

PAD-7

← PAD-8

PAD-7 NORTH

PAD-7 WEST

PAD-7 CENTER/ ORIGINAL

PAD-7 EAST

PAD-7 SOUTH

13MW3

LEGEND

PAD-7 CENTER/ ORIGINAL ★ — PERMIT-DESIGNATED SEMIANNUAL AND DETECTION SOIL MONITORING LOCATION

PAD-7 NORTH ● — ADDITIONAL DETECTION SOIL SAMPLE LOCATIONS

13MW1 ◎ — GROUNDWATER MONITORING WELL

NOTE: TOPOGRAPHIC CONTOUR INTERVAL 2'

GRAPHIC SCALE

20 0 10 20 40

(IN FEET)
1 inch = 20 ft.

Draper Aden Associates
Engineering • Surveying • Environmental Services
2206 South Main Street
Blacksburg, VA 24060
540-552-0444 Fax: 540-552-0291
Richmond, VA
Charlottesville, VA
Hampton Roads, VA

DESIGNED	LCL
DRAWN	KKD
CHECKED	MDL
DATE	09/10/2008

OPEN BURNING GROUND: PAD-7 DETECTION SAMPLING (AUG. 18, 2008)

RADFORD ARMY AMMUNITION PLANT

RADFORD, VIRGINIA

SCALE: 1"=200'

PLAN NO. B03204-203

FIGURE 2

P:\B03\200\B03204\B03204-203\CAD\B03204-203_ENV.dwg\B03204-203_HWMU-13.dwg Oct 07, 2008 4:48pm

APPENDIX B

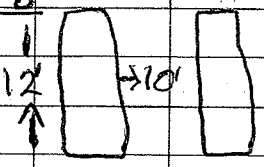
CHAINS-OF-CUSTODY AND FIELD NOTES

1/7/08 RAAP FB#7

B03204,203
DAS/TAE

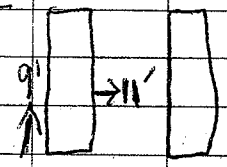
Weather - Sunny, 50's
PPE - Cotton Suits, Eye Protection, Nitrile gloves
Dedicated equipment used at each location
All equipment deconed before and after sampling

PAD-8



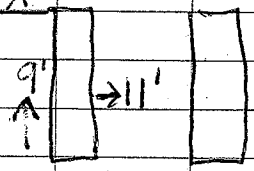
Sample Time (830)
Samples Collected: (3)8260
(1)8270, (1)6010B, (1)8290, (1)8330, (1)8332

PAD-7



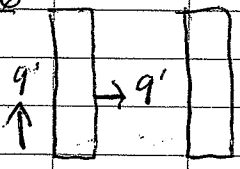
Sample Time (900)
Samples Collected: (3)8260, (1)8270
(1)8015B, (1)6010B, (1)8290, (1)8330, (1)8332

PAD-X



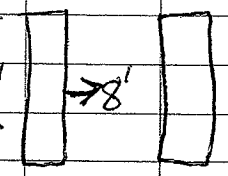
Sample Time (0900)
Samples Collected: (3)8260, (1)8270
(1)8015, (1)6010B, (1)8290, (1)8330, (1)8332

PAD-6



Sample Time (0945)
Samples Collected: (3)8260, (1)8270
(1)6010B, (1)8290, (1)8330, (1)8332

PAD-5



Sample Time (1010)
Samples Collected: (3)8260, (1)8270
(1)6010B, (1)8290, (1)8330, (1)8332

1/7/08

PAD-

7'

PAD-

7'

Berm

Rem

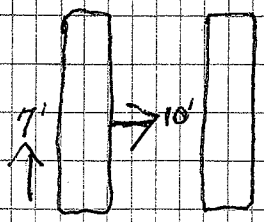
FB#7

1/7/08

RAAP
B03204203
DAS/TQE

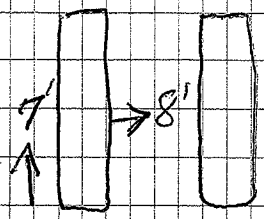
FB#7

PAD-3



Sample Time (1035)
Samples Collected: (3)8260, (1)8270
(1)6010B, (1)8290, (1)8330, (1)8332

PAD-1



Sample Time (1100)
Samples Collected: (3)8260, (1)8270
(1)8015, (1)6010, (1)8290, (1)8330, (1)8332

Berm-1

Sample Time (1130)
Samples Collected: (3)8260, (1)8270, (1)6010, (1)8290
(1)8330, (1)8332

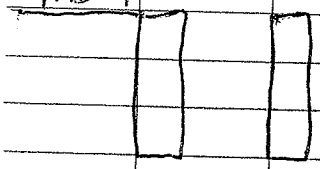
Removed lock from 4WC42 (Unit 4) and placed on 16-3 (Unit 16)

1/8/08 RAAP FB#7
B03204-203
DAS/TQE

General Notes
Weather - Sunny, 40-50's
PPE - Cotton Suits, Eye Protection, Nitrile gloves
Dedicated equipment used at each location
All equipment deconed before and after sampling

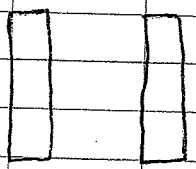
Equipment Blank: Sample Time (1145) Samples Collected: (1) TPH,

PAD-4



Sample Time (0930)
Samples Collected: (3) 8260, (1) 8270
(1) 6010, (1) 8290, (1) 8330, (1) 8332

PAD-2



Sample Time (0900)
Samples Collected: (3) 8260, (1) 8270, (1) 8015
(1) 6010, (1) 8290, (1) 8330, (1) 8332

SB-1 Sample Time (1000)
Samples Collected: (3) 8260, (1) 8270, (1) 6010, (1) 8290, (1) 8330, (1) 8332

SB-2 Sample Time (1030)
Samples Collected: (3) 8260, (1) 8270, (1) 6010, (1) 8290, (1) 8330, (1) 8332

NB-1 Sample Time (1105)
Samples Collected: (3) 8260, (1) 8270, (1) 6010, (1) 8290, (1) 8330, (1) 8332

NB-2 Sample Time (1045)
Samples Collected: (3) 8260, (1) 8270, (1) 6010, (1) 8290, (1) 8330, (1) 8332

Pond-1 Sample Time (1130)
Samples Collected: (3) 8260, (1) 8270, (1) 6010, (1) 8290, (1) 8330, (1) 8332

(25)

TestAmerica, formerly JLK 12/27/07

CHAIN OF CUSTODY RECORD

SHEET #1

Laboratory: Severn Trent Laboratories, 4101 Shuffel Drive NW, North Canton, OH, 44720 / Mark Loeb, Manager/1-800-897-0297.

Client: Draper Aden Associates **Attn:** **Address:** **Phone:** **Fax:** **Fax:**	**Consultant:** Draper Aden Associates **Attn:** Janet C. Frazier **Address:** 2206 South Main Street, Blacksburg, Virginia 24060 **Phone:** (540) 552-0444 **Fax:** (540) 552-0291	**Sample Site:** RAAP, Radford, Virginia **Location:** HWMU-13 (Open Burning Ground) **Event:** Semiannual Soil Monitoring **DAA JN:** B03204-203 **Lab JN:**	**Project Specific (PS) QC:** ☑ YES ☐ NO **Sample Collection for Project Complete?** ☑ YES ☐ NO **Carrier:** UPS 12-237-301-01: -5300 4555 **Tracking Number:** -5334 8730 (TOTAL OF SEVEN) -5515 7324 A/B #s -5313 1140 -5302 4373 **Invoice** -5526 8964 -5437 0783 **Copy to Consultant:** ☑ YES ☐ NO **Bill:** ☐ Client ☑ Consultant **Preserved and shipped on ice:** ☑ YES Ba ☐ NO		

Box 1: Matrix
SW Surface Water; GW Groundwater; L Leachate; S Soil; T Trip Blank; E Equipment Blank; P Product; O Other

Box 2: Preservative
A HCL; B HNO_3; C H_2SO_4; D $Na_2S_2O_3$; E NaOH; F ZnAc; G Other (Specify); H None

Box 3: Filtered/Unfiltered
F Filtered; U Unfiltered

Box 4: Sample Type
G Grab; C Composite

Box 5: Sample Container Type
P Plastic; V VOA; AG Amber Glass; CG Clear Glass

Box 4 - Sample Type					G	G	G	G	G	G	G	G
Box 3 - Filtered/Unfiltered												U
Required pH of Sample												<2
Box 2 - Preservative					G	G	H	H	H	H	H	A
Box 5 - Sample Container Type					2-40ml V	1-40ml V	16 oz CG	16 oz CG	4 oz CG	4 oz GC	4 oz GC	40 ml V
Sample ID	**Date: 2008**	**Time**	**Box 1: Matrix**	**Number of Bottles**	**VOAs 5035/8260B**	**VOAs 5035/8260B**	**SVOCs 8270C**	**RCRA Metals 6010B/7471A**	**Dioxins/Furans 8290**	**Explosives 8330**	**Nitroglycerine 8332**	**VOAs 5030B/8260B**
NB-1	1/8	1105	S	8	X	X	X	X	X	X	X	
NB-2	1/8	1045	S	8	X	X	X	X	X	X	X	
SB-1	1/8	1000	S	8	X	X	X	X	X	X	X	
SB-2	1/8	1030	S	8	X	X	X	X	X	X	X	
BERM-1	1/7	1130	S	8	X	X	X	X	X	X	X	
POND-1	1/8	1130	S	8	X	X	X	X	X	X	X	
Trip Blank	12/26/07	JLK	3	T								X
Equip Blank	1/8	1145	1	E				X				

ENERAL NOTES: Estimated results required. Report results on a DRY WEIGHT BASIS. 8260B/5035-2 VOA with sodium bisulfate and 1- VOA with methanol and plastic container for dry weight.

* Note new target analytes
benzyl chloride 8260B
33'- dimethylbenzidine 8270C.
all other analytes + locations same as previous event.

JLK 12.27.7

Clients Special Instructions: level 4 with edd.

Received by lab in Good Condition _____ Yes _____ No Custody Seal Intact _____ Yes _____ No Temperature upon arrival _____ Received on Ice _____ Yes _____ No
Describe problems, if any:

Sampler Name (Print): Dale Slaughter	Date: 1/7/08	#1 Relinquished by (Signature): Dale Slaughter	Date 1/9/08	#2 Relinquished by (Signature): Ken Eddington	Date: 1/10/08	Sample Storage Time Requested:
Sampler Signature: Dale Slaughter	Time: 0630	Company Name: DAA	Time: 0800	Company Name: DAA	Time: 1700	
Sampler Name (Print):	Date:	#1 Received by (Signature): Ken Eddington	Date 1/9/08	#2 Received by (Signature):	Date: 1/11/08	30 DYS ORG/6 MTHS INORG
Sampler Signature:	Time:	Company Name: DAA	Time 0800	Company Name: TAL	Time: 1000	

ORIGINAL COPY

OK JLK 1-10-08

1/4 JLK 12.27.07

TestAmerica North Canton

36

SHEET #2

CHAIN OF CUSTODY RECORD

Laboratory: Test America, 4101 Shuffel Drive NW, North Canton, OH, 44720 / Mark Loeb, Manager/1-800-897-0297 10.15.15.800

Client: Draper Aden Associates **Attn:** **Address:** **Phone:** **Fax:** **Fax:**	**Consultant:** Draper Aden Associates **Attn:** Janet C. Frazier **Address:** 2206 South Main Street, Blacksburg, Virginia 24060 **Phone:** (540) 552-0444 **Fax:** (540) 552-0291	**Sample Site:** RAAP, Radford, Virginia **Location:** HWMU-13 (Open Burning Ground) **Event:** Semiannual Soil Monitoring **DAA JN:** B03204-203 **Lab JN:**	**Project Specific (PS) QC:** ☑ YES ☐ NO **Sample Collection for Project Complete?** ☑ YES ☐ NO **Carrier:** UPS SEE SHEET #1 **Tracking Number:**		

Box 1: Matrix SW Surface Water GW Groundwater L Leachate S Soil T Trip Blank E Equipment Blank P Product O Other	**Box 2: Preservative** A HCL B HNO_3 C H_2SO_4 D $Na_2S_2O_3$ E NaOH F ZnAc G Other (Specify) H None	**Box 3: Filtered/Unfiltered** F Filtered U Unfiltered **Box 5: Sample Container Type** P Plastic V VOA AG Amber Glass CG Clear Glass	**Box 4: Sample Type** G Grab C Composite	**Invoice** **Copy to Consultant:** ☑ YES ☐ NO **Bill:** ☐ Client ☑ Consultant **Preserved and shipped on ice:** ☑ YES Bo ☐ NO

Sample ID	Date: 2008	Time	Box 1: Matrix	Number of Bottles	VOAs 5035/8260B	VOAs 5035/8260B	SVOCs 8270C	TPH-DRO 8015B	RCRA Metals 6010B/7471A	Dioxins/Furans 8290	Explosives 8330	Nitroglycerine 8332	VOAs 5030B/8260B
Box 4 - Sample Type					G	G	G	G	G	G	G	G	G
Box 3 - Filtered/Unfiltered													U
Required pH of Sample													<2
Box 2 - Preservative					G	G	H	H	H	H	H	H	A
Box 5 - Sample Container Type					2-40ml V	1-40ml V	16 oz CG	16 oz CG	16 oz CG	4 oz CG	4 oz GC	4 oz GC	3-40 ml V
PAD-1	1/7	1100	S	9	X	X	X	X	X	X	X	X	
PAD-2	1/8	0900	S	8	X	X	X		X	X	X	X	
PAD-3	1/7	1035	S	8	X	X	X		X	X	X	X	
PAD-4	1/8	0930	S	9	X	X	X	X	X	X	X	X	
PAD-5	1/7	1010	S	8	X	X	X		X	X	X	X	
PAD-6	1/7	0945	S	8	X	X	X		X	X	X	X	
PAD-7	1/7	0900	S	9	X	X	X	X	X	X	X	X	
PAD-8	1/7	0830	S	8	X	X	X		X	X	X	X	
PAD-X	1/7	0900	S	9	X	X	X	X	X	X	X	X	
Trip Blank			T	1									X

GENERAL NOTES: Estimated results required. Report results on a DRY WEIGHT BASIS. 8260B/5035-2 VOA with sodium bisulfate and 1- VOA with methanol and plastic container for dry weight.

*Note - new target analytes:
- benzyl chloride 826013
- 3,3-dimethylbenzidene 8270C

all other analytes + locations same as previous event. JLE 12-27-07

USE FOR QC

Clients Special instructions: level 4 with edd.

Received by lab in Good Condition _____ Yes _____ No Custody Seal Intact _____ Yes _____ No Temperature upon arrival _____ Received on Ice _____ Yes _____ No
Describe problems, if any:

Sampler Name (Print): Dale Slaughter	Date: 1/7/08 0630 08	#1 Relinquished by (Signature): Dale Slaughter	Date: 1/9/08	#2 Relinquished by (Signature): Ken Eddington	Date: 1/10/07	Sample Storage
Sampler Signature: Dale Slaughter	Time: 0630	Company Name: DAA	Time: 0800	Company Name: DAA	Time: 1700	Time Requested:
Sampler Name (Print):	Date:	#1 Received by (Signature): Ken Eddington	Date: 1/9/08	#2 Received by (Signature):	Date: 1/11/08	30 DYS ORG/6 MTHS INORG
Sampler Signature:	Time:	Company Name: DAA	Time: 0800	Company Name: TAL	Time: 1000	

JLE 1-10-08

2/4

TestAmerica North Canton

3/25/08 RAAP FB#7

B03204-203
DAS/TQE

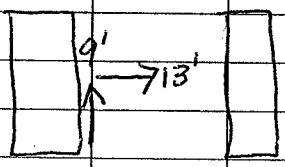
General Notes

Weather - Sunny, 40's

PPE - Nitrile gloves(2), Heavy duty Chem. resistant boots, Heavy duty Nitrile exterior gloves, Flame retardant cotton suits, Dust mask/Face shields, safety glasses

- All equipment deconed before and after sampling
- Dedicated equipment and plastic skirts used at each location
- Decon water contained and disposed at treatment plant onsite
- Samples collected, stored and transported in coolers on ice.

PAD-7

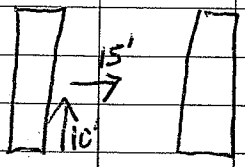


Sample location measured from left pad facing woods. (Back to river)

Sample Time (0955)

Samples Collected: (a) 7471A / Mercury

PAD-1



Sample location measured from left pad facing woods (Back to river)

Sample Time (1030)

Samples Collected: (1) 8290 Dioxins/furans, (2) 6010B Lead Only

DUP-1

Sample Time (1030) (0900 on COC for masking purpose)

Samples Collected: (1) 8290 Dioxins/furans, (collected from Pad-1)

4/14/08

General

We

PPE

Col

ph

Co

• Ded

di

• All

• Pur

• Sam

FALL 2

DTW -

Post Purge

Time	Tem
(1100)	12.6
(1105)	12.1
(1110)	12.2
(1115)	12.2
(1120)	12.1
(1125)	12.1
(1130)	12.1
(1130)	Ro

CHAIN OF CUSTODY RECORD

Laboratory: Test America, 4101 Shuffel Road NW, North Canton, OH, 44720 / Mark Loeb, Manager/1-800-456-9396.

Client: Draper Aden Associates **Attn:** **Address:** **Phone:** **Fax:** **Fax:**	**Consultant:** Draper Aden Associates **Attn:** Janet C. Frazier **Address:** 2206 South Main Street, Blacksburg, Virginia 24060 **Phone:** (540) 552-0444 **Fax:** (540) 552-0291	**Sample Site:** RAAP, Radford, Virginia **Location:** HWMU-13 (Open Burning Ground) March 08 **Event:** Verification Soil Monitoring **DAA JN:** B03204-203 **Lab JN:**	**Project Specific (PS) QC:** ☑ YES ☐ NO **Sample Collection for Project Complete?** ☑ YES ☐ NO **Carrier:** UPS **Tracking Number:** 1Z237301015341016		

Box 1: Matrix	**Box 2: Preservative**	**Box 3: Filtered/Unfiltered**	**Box 4: Sample Type**	**Invoice**
SW Surface Water GW Groundwater L Leachate S Soil T Trip Blank E Equipment Blank P Product O Other	A HCL B HNO_3 C H_2SO_4 D $Na_2S_2O_3$ E NaOH F ZnAc G Other (Specify) H None	F Filtered U Unfiltered **Box 5: Sample Container Type** P Plastic AG Amber Glass V VOA CG Clear Glass	G Grab C Composite	**Copy to Consultant:** ☑ YES ☐ NO **Bill:** ☐ Client ☑ Consultant **Preserved and shipped on ice:** ☑ YES ☐ NO

Box 4 - Sample Type				G	G	G							
Box 3 - Filtered/Unfiltered													
Required pH of Sample													
Box 2 - Preservative				H	H	H							
Box 5 - Sample Container Type				1-4 oz CG	2-4 oz CG	2-4 oz CG							
Sample ID	**Date: 2008**	**Time**	**Box 1: Matrix**	**Number of Bottles**	**Lead ONLY - 6010B**	**Dioxins/Furans 8290**	**Mercury ONLY - 7471A**						
PAD-1	3/25	1030	S	2	X	X							
PAD-7	3/25	0955	S	1			X						
DUP-1	3/25	0900	S	1		X							← HOLD UNTIL AUTHORIZED BY DAA. JCF 3/24-08
~~DUP-2~~	JCF 3/28/08						~~X~~ deleted	3/28/08					

JCF 3-24-08B

JCF 3-28-08

GENERAL NOTES: Estimated results required. Report results on a DRY WEIGHT BASIS. ~~plastic container for dry weight~~

Clients Special Instructions: level 4 with edd.

Received by lab in Good Condition _____ Yes _____ No Custody Seal Intact _____ Yes _____ No Temperature upon arrival _____ Received on Ice _____ Yes _____ No

Describe problems, if any:

Sampler Name (Print): Dale Slaughter	Date: 3/25/08 0800 DS	#1 Relinquished by (Signature): Dale Slaughter	Date: 3/25/08	#2 Relinquished by (Signature):	Date:
Sampler Signature: Dale Slaughter	Time: 0800	Company Name: DAA	Time: 1700	Company Name:	Time:
Sampler Name (Print): Tyler Emery	Date: 3/25/08	#1 Received by (Signature):	Date: 3/26/08	#2 Received by (Signature):	Date:
Sampler Signature: Tyler Emery	Time: 0800	Company Name: TAL NC	Time: 1000	Company Name:	Time:

Sample Storage

Time Requested:

30 DYS ORG/6 MTHS INORG

Y1

JCF 3/28/08

North Canton

CHAIN OF CUSTODY RECORD

H18399

Laboratory: ProChem Analytical, 6040 North Fork Road, Roanoke, VA 24012/Kim Altizer, Manager/1-800-897-0297

Client: Draper Aden Associates **Attn:** **Address:** **Phone:** **Fax:** **Fax:**	**Consultant:** Draper Aden Associates **Attn:** Janet C. Frazier **Address:** 2206 South Main Street Blacksburg, Virginia 24060 **Phone:** (540) 552-0444 **Fax:** (540) 552-0291	**Sample Site:** RAAP, Radford, Virginia **Location:** HWMU-13 (Open Burning Ground) **Event:** MARCH 08 Verification Soil Monitoring **DAA JN:** B03204-203 **Lab JN:** JLF 3/24/08	**Project Specific (PS) QC:** ☑ YES ☐ NO **Sample Collection for Project Complete?** ☑ YES ☐ NO **Carrier:** **Tracking Number:**		

Box 1: Matrix
SW Surface Water; GW Groundwater; L Leachate; S Soil; T Trip Blank; E Equipment Blank; P Product; O Other

Box 2: Preservative
A HCL; B HNO_3; C H_2SO_4; D $Na_2S_2O_3$; E NaOH; F ZnAc; G Other (Specify); H None

Box 3: Filtered/Unfiltered
F Filtered; U Unfiltered

Box 4: Sample Type
G Grab; C Composite

Box 5: Sample Container Type
P Plastic; V VOA; AG Amber Glass; CG Clear Glass

Invoice
Copy to Consultant: ☑ YES ☐ NO
Bill: ☐ Client ☑ Consultant
Preserved and shipped on ice: ☑ YES B ☐ NO

Box 4 - Sample Type					G	G	G						
Box 3 - Filtered/Unfiltered													
Required pH of Sample													
Box 2 - Preservative					H	H	H						
Box 5 - Sample Container Type					4 oz CG	2-4 oz CG	4 oz CG						
Sample ID	Date: 2008	Time	Box 1: Matrix	Number of Bottles	Lead ONLY - 6010B	~~Dioxins/Furans 8290~~ Delete JLF 3/24/08	Mercury ONLY - 7471A						
PAD-1	3/25	1030	S	2	X								01 A
PAD-7	3/25	0755	S	1			X						02 A

GENERAL NOTES: Estimated results required. Report results on a DRY WEIGHT BASIS. Hold Sample until further instruction.

14 day turnaround. JLF 3/24/08
Level 1 deliverable
JLF 3-20-08

Clients Special Instructions: ~~Hold Sample until further instruction.~~ JLF

Received by lab in Good Condition X Yes ____ No Custody Seal Intact X Yes ____ No Temperature upon arrival 1.0 Received on Ice X Yes ____ No
Describe problems, if any:

Sampler Name (Print): Dale Slaughter	Date: 3/25/08	#1 Relinquished by (Signature): Dale Slaughter	Date: 3/26/08	#2 Relinquished by (Signature):	Date:	Sample Storage Time Requested:
Sampler Signature: Dale Slaughter	Time: 0800	Company Name: DAA	Time: 1010	Company Name:	Time:	
Sampler Name (Print): Tyler Embry	Date: 3/25/08	#1 Received by (Signature):	Date: 3/26/08	#2 Received by (Signature):	Date:	30 DYS ORG/6 MTHS INORG
Sampler Signature: Tyler Embry	Time: 0800	Company Name: PCI	Time: 1010	Company Name:	Time:	

1/1 / 3/26/08 JLF 3/24/08

JK JLF 3/24/08

8/18/08 RAAP FB#8
B03304-203
TAE/KFC

8/18
PAD

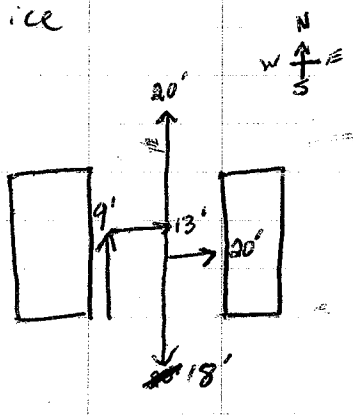
General Notes

Weather:

PPE: Nitrile Gloves (x2), Heavy duty Chem. resistant Boots. Heavy duty nitrile exterior gloves, Flame retardant cotton suits, Dust masks / Face Shields, Safety glasses

- All equipment decon'ed before and after sampling
- Dedicated equipment and plastic skirts used at each location
- Decon water containered and disposed of at treatment plant onsite
- Samples collected, stored and transported in coolers on ice

PAD 7



Sample location measured from left pad facing woods (Back to River)

PAD-7 Center Point
Sample time: (0830)
Samples Collected: (2) 7471A Mercury

PAD7 North Point
Sample time: (0840)
Samples Collected: (2) 7471A Mercury

PAD7 South Point
Sample time (0850)
Samples collected: (2) 7471A Mercury

PAD7 East Point (soil under gravel and cinders @ approx 3" depth)
Sample time (0900)
Samples collected: (2) 7471A Mercury

FB#8 8/13/08 RAAP FB#8
B03204-203
TQE/RFC

PAD7 cont

PAD7 West Point

Sample Time (0910)

Samples Collected: (2) 7471A Mercury

+ Boots

-dont

glasses

ing

+ each

Cat ment

coolers

from

PAD7 East Point #II (gravel & cinders above soil)

Sample Time (0920)

Sample collected: (2) 7471A Mercury

ot 8" depth)

CHAIN OF CUSTODY RECORD

Laboratory: Test America, 4101 Shuffel Drive NW, North Canton, OH, 44720 / Mark Loeb, Manager/1-800-966-9387

Client: Draper Aden Associates **Attn:** **Address:** **Phone:** **Fax:** **Fax:**	**Consultant:** Draper Aden Associates **Attn:** Janet C. Frazier **Address:** 2206 South Main Street Blacksburg, Virginia 24060 **Phone:** (540) 552-0444 **Fax:** (540) 552-0291	**Sample Site:** RAAP, Radford, Virginia **Location:** HWMU-13 (Open Burning Ground) **Event:** August 2008 Verification Soil Monitoring **DAA JN:** B03204-203 A JCF 8/12/08 **Lab JN:**	**Project Specific (PS) QC:** ☐ YES ☑ NO **Sample Collection for Project Complete?** ☑ YES ☐ NO **Carrier:** UPS **Tracking Number:** 1Z 257 301 01 5402 9116

Box 1: Matrix		Box 2: Preservative		Box 3: Filtered/Unfiltered	Box 4: Sample Type	Invoice
SW Surface Water	T Trip Blank	A HCL	E NaOH	F Filtered	G Grab	Copy to Consultant: ☑ YES ☐ NO
GW Groundwater	E Equipment Blank	B HNO_3	F ZnAc	U Unfiltered	C Composite	Bill: ☐ Client ☑ Consultant
L Leachate	P Product	C H_2SO_4	G Other (Specify)	**Box 5: Sample Container Type**		Preserved and shipped on ice: ☑ YES B ☐ NO
S Soil	O Other	D $Na_2S_2O_3$	H None	P Plastic V VOA AG Amber Glass CG Clear Glass		

Box 4 - Sample Type					G								
Box 3 - Filtered/Unfiltered					U								
Required pH of Sample													
Box 2 - Preservative					H								
Box 5 - Sample Container Type					4 oz CG								
Sample ID	Date: 2008	Time	Box 1: Matrix	Number of Bottles	Mercury ONLY -7470A 747IA JCF								
PAD-7 (Center/Original Point)	8/18	0830	S	1	X								
PAD-7 (North Point)	"	0840	S	1	X								
PAD-7 (South Point)	"	0850	S	1	X								
PAD-7 (East Point ~~inside Pad~~)	"	0900	S	1	X								
PAD-7 (East Point ~~outside Pad~~) II	"	0920	S	1	X								
PAD-7 (West Point ~~inside Pad~~)	"	0910	S	1	X								
~~PAD-7 (West Point outside Pad)~~	—	—	—	—	—	JCF 8/18/08							DID NOT COLLECT

GENERAL NOTES: Estimated results required. Report results on a DRY WEIGHT BASIS. 14 Day Turnaround. Level 1 Deliverable.

Clients Special Instructions:

Received by lab in Good Condition Yes No Custody Seal Intact Yes No Temperature upon arrival Received on Ice Yes No
Describe problems, if any:

Sampler Name (Print): ICEN CODDINGTON	Date: 8/18/08	#1 Relinquished by (Signature): Icen Coddington	Date: 8/18/18	#2 Relinquished by (Signature):	Date:	Sample Storage	
Sampler Signature: Icen Coddington	Time: 0700	Company Name: DAA	Time: 1700	Company Name:	Time:	Time Requested:	
Sampler Name (Print): Tyler Emery	Date: 8/18/08	#1 Received by (Signature): Deana Mangum	Date: 8/19/08 1000	#2 Received by (Signature):	Date:	30 DYS ORG/6 MTHS INORG	
Sampler Signature: Tyler Emery	Time: 0700	Company Name:	Time:	Company Name:	Time:		

1/1 OK JCF 8/12/08

14

North Canton

CHAIN OF CUSTODY RECORD

Laboratory: Compuchem Environmental, 501 Madison Avenue, Cary, NC 27513/Cathy Dover, Manager/1-800-833-5097

Client: Draper Aden Associates **Attn:** **Address:** **Phone:** **Fax:** **Fax:**	**Consultant:** Draper Aden Associates **Attn:** Janet C. Frazier **Address:** 2206 South Main Street, Blacksburg, Virginia 24060 **Phone:** (540) 552-0444 **Fax:** (540) 552-0291	**Sample Site:** RAAP, Radford, Virginia **Location:** HWMU-13 (Open Burning Ground) **Event:** August 2008 Verification Soil Monitoring **DAA JN:** B03204-203A **Lab JN:**	**Project Specific (PS) QC:** ☐ YES ☑ NO **Sample Collection for Project Complete?** ☑ YES ☐ NO **Carrier:** UPS **Tracking Number:** 1Z2373010101 5382 5516		

Box 1: Matrix
SW Surface Water; GW Groundwater; L Leachate; S Soil; T Trip Blank; E Equipment Blank; P Product; O Other

Box 2: Preservative
A HCL; B HNO_3; C H_2SO_4; D $Na_2S_2O_3$; E NaOH; F ZnAc; G Other (Specify); H None

Box 3: Filtered/Unfiltered
F Filtered; U Unfiltered

Box 5: Sample Container Type
P Plastic; V VOA; AG Amber Glass; CG Clear Glass

Box 4: Sample Type
G Grab; C Composite

Invoice
Copy to Consultant: ☑ YES ☐ NO
Bill: ☐ Client ☑ Consultant
Preserved and shipped on Ice: ☑ YES ☐ NO

Box 4 - Sample Type					G								
Box 3 - Filtered/Unfiltered					U								
Required pH of Sample													
Box 2 - Preservative					H								
Box 5 - Sample Container Type					4 oz CG								
Sample ID	**Date: 2008**	**Time**	**Box 1: Matrix**	**Number of Bottles**	**Mercury ONLY - Method 7471A**								
PAD-7 (Center/Original Point)	8/18	0830	S	1	X	0809010-01							
PAD-7 (North Point)	"	0840	S	1	X	"	-02						
PAD-7 (South Point)	"	0850	S	1	X	"	-03						
PAD-7 (East Point ~~inside Bull~~)			S	1	X								
PAD-7 (East Point ~~outside Bull~~) II			S	1	X								
PAD-7 (West Point ~~inside Bull~~)		0910	S	1	X	0809010-04							
~~PAD-7 (West Point outside PSD)~~			S	1	X								

HOLD until authorized by DAA 8/18/08

Temp 5.7C

GENERAL NOTES: Estimated results required. Report results on a DRY WEIGHT BASIS. 14 Day Turnaround. Level 1 Deliverable.

DID NOT COLLECT due 8/18/08

Clients Special Instructions:

Received by lab in Good Condition ✓ Yes No Custody Seal Intact ✓ Yes No Temperature upon arrival 5.7°C Received on Ice ✓ Yes No
Describe problems, if any:

Sampler Name (Print): KEN CODDINGTON	Date: 8/18/08	#1 Relinquished by (Signature):	Date: 8/21/08	#2 Relinquished by (Signature):	Date:	Sample Storage Time Requested: 30 DYS ORG/6 MTHS INORG
Sampler Signature:	Time: 0710	Company Name: DAA	Time: 1700	Company Name:	Time:	
Sampler Name (Print):	Date:	#1 Received by (Signature):	Date: 8/22/08	#2 Received by (Signature):	Date:	
Sampler Signature:	Time:	Company Name: Compuchem	Time: 0945	Company Name:	Time:	

11/19/08

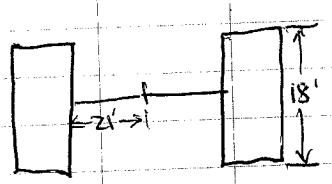
RAAP
B03204-203B
ICFC/TD

FB#8

General Notes:

- Weather- Mostly Cloudy, 20's - cold!
- PPE- Nitrile Gloves, Eye Protection, Flame retardant cotton suits, Chem. Resistant Boots
- All equipment decanned after sampling
- Dedicated equipment used at each location
- Decanned water containerized and disposed of at treatment site plant.
- Samples collected, stored and transported in coolers on ice.

PAD-1



UNABLE TO COLLECT DUE TO FROZEN GROUND WILL REATTEMPT NEXT WK

Sample Collection Time ( )
Samples Collected: (3) 8260, (1) 8270/TM/8015, (2) 8290/8330/8332 (1) dry wt.

NB-1

Sample Collection Time (0900)
Samples Collected: (3) 8260, (1) 8270/TM/8015, (2) 8290/8330/8332, (1) Dry Wt.

NB-2

Sample Collection Time (0920)
Samples Collected: (3) 8260, (1) 8270/TM/8015 (2) 8290/8330/8332, (1) Dry Wt.

11/19/08

RAAP
B03204-203B
TD/KFC

BERM-1

Sample Collection Time (0945)
Samples Collected: (3) 8260, (1) 8270/T (2) 8290/8330/8332, (1) DRY WT.

BOMD-1

Sample Collection Time (1000)
Samples Collected: (3) 8260, (1) 8270 (2) 8290/8330/8332, (1) DRY WT.

SB-1

Sample Collection Time (1050)
Samples Collected: (3) 8260, (1) 8270/T (2) 8290/8330/8332, (1) DRY WT

SB-2

Sample Collection Time (1100)
Samples Collected: (3) 8260, (1) 8270/ (2) 8290/8330/8332, (1) DRY W

Left Site ~ 1200
KFC

11/24/08

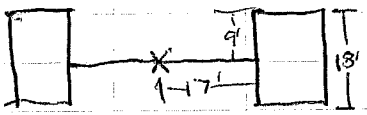
RAAP SOIL
B03204-203B
KFC/TD

FB#8

General Notes:

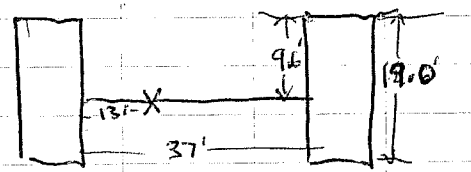
- Weather- Overcast & 30's, Light Rain!
- PPE- Eye Protection, Nitrile Gloves, Flame retardant cotton suits, Chemical Resistant Boots
- All equipment decon'ed after sampling.
- Dedicated equipment used at each sampling location.
- Decon'ed water containerized and disposed of at Plant treatment site.
- Samples collected, stored and transported in coolers on ice.

PAD-1



Sample Collection Time (1000)
Samples Collected: (3) 8260, (1) 8270/TM/8015, TPH-DRO
(2) 8290/8330/8332, (1) DRY WT.

PAD-2

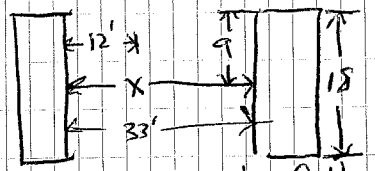


Sample Collection Time (1020)
Samples Collected: (3) 8260, (1) 8270/TM/8015,
(2) 8290/8330/8332, (1) DRY WT.

11/24/08

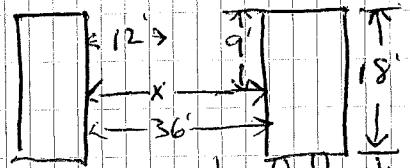
RAAP SOIL
B03204-203B
KFC/TD

PAD-3



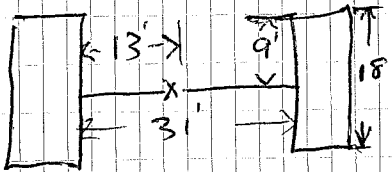
Sample Collection Time (103
Samples Collected: (3) 8260, (1) 8270/T
(2) 8290/8330/8332, (1) DRY WT.

PAD-4



Sample Collection Time (105
Samples Collected: (3) 8260, (3) 8270/TM
(2) 8290/8330/8332, (1) DRY WT.

PAD-5

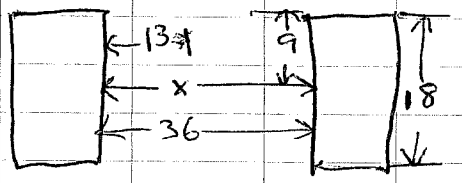


Sample Collection Time (1110
Samples Collected: (3) 8260, (1) 8270/TM
(2) 8270/8330/8332, (1) DRY WT.

11/24/08

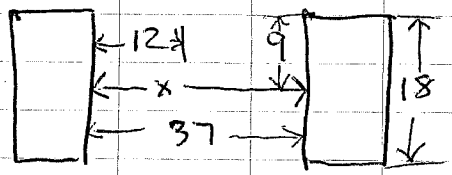
RAAP SOIL
B03204-203B
ICFC/TD

PAD-6



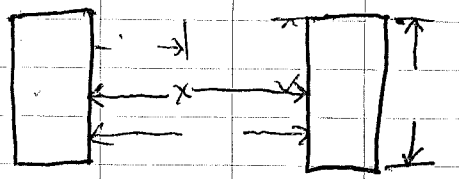
Sample Collection Time (1125)
Samples Collected: (3) 8260, (1) 8270/TM/8015, (2) 8290/8330/8332, (1) DRY WT.

PAD-7



Sample Collection Time (1140)
Samples Collected: (3) 8260, (1) 8270/TM/8015, TPH-DRO (2) 8290/8330/8332, (1) DRY WT.

PAD-X

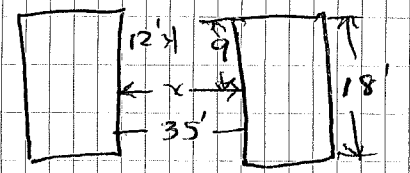


Sample Collection Time (1155)
Samples Collected: (3) 8260, (1) 8270/TM/8015, TPH-DRO (2) 8290/8330/8332 (1) DRY WT.

11/24/08

RAAP SOIL
B03204-203B
ICFC/TD

PAD-8



Sample Collection Time (1210
Samples Collected: (3) 8260, (1) 8270/
(2) 8290/8330/8332, (1) DRY WT.

EQUIPMENT BLANK: (PAD-8 Equipm

Sample Collection Time (1230
Samples Collected: (2) 6010/

Left Site ~ 1330

CHAIN OF CUSTODY RECORD **REVISED COC** (1 of 1) 11/20/08

Laboratory: Test America, 4101 Shuffel Drive NW, North Canton, OH, 44720 / Mark Loeb, Manager/1-800-966-9387

Client: Draper Aden Associates **Attn:** **Address:** **Phone:** **Fax:** **Fax:**	**Consultant:** Draper Aden Associates **Attn:** Janet C. Frazier **Address:** 2206 South Main Street Blacksburg, Virginia 24060 **Phone:** (540) 552-0444 **Fax:** (540) 552-0291	**Sample Site:** RAAP, Radford, Virginia **Location:** HWMU-13 (Open Burning Ground) **Event:** Semiannual Soil Monitoring **DAA JN:** B03204-203 **Lab JN:**	**Project Specific (PS) QC:** ☑ YES ☐ NO **Sample Collection for Project Complete?** ☑ YES ☐ NO **Carrier:** UPS: 1Z-237-301-01 JCF 11/19/08 **Tracking Number:** ~~5468-6522~~ 5350-0349		

Box 1: Matrix
SW Surface Water; GW Groundwater; L Leachate; S Soil; T Trip Blank; E Equipment Blank; P Product; O Other

Box 2: Preservative
A HCL; B HNO_3; C H_2SO_4; D $Na_2S_2O_3$; E NaOH; F ZnAc; G Other (Specify); H None

Box 3: Filtered/Unfiltered
F Filtered; U Unfiltered

Box 4: Sample Type
G Grab; C Composite

Box 5: Sample Container Type
P Plastic; V VOA; AG Amber Glass; CG Clear Glass

Invoice
Copy to Consultant: ☑ YES ☐ NO
Bill: ☐ Client ☑ Consultant
Preserved and shipped on ice: ☑ YES B ☐ NO

Sample ID	Date: 2008	Time	Box 1: Matrix	Number of Bottles	VOAs 5035/8260B (2-40ml V)	VOAs 5035/8260B (1-40ml V)	SVOCs 8270C	RCRA Metals 6010B/7471A	Dioxins/Furans 8290	Explosives 8330	Nitroglycerine 8332	VOAs 5030B/8260B
Box 4 - Sample Type					G	G	G	G	G	G	G	G
Box 3 - Filtered/Unfiltered												U
Required pH of Sample												<2
Box 2 - Preservative					G	G	H	H	H	H	H	A
Box 5 - Sample Container Type					2-40ml V	1-40ml V	~~16 oz CG~~ 16 oz CG		4 oz CG	~~4 oz GG~~ 4 oz GC		40 ml V
NB-1	11/19	0900	S	~~8~~ 6	X	X	X	X	X	X	X	
NB-2		0920	S	~~8~~ 6	X	X	X	X	X	X	X	
SB-1		1050	S	~~8~~ 6	X	X	X	X	X	X	X	
SB-2		1100	S	~~8~~ 6	X	X	X	X	X	X	X	
BERM-1		0945	S	~~8~~ 6	X	X	X	X	X	X	X	
POND-1	↓	1000	S	~~8~~ 6	X	X	X	X	X	X	X	
Trip Blank	11/19	—	T	3								X
~~Equip Blank~~			~~E~~	~~1~~				~~X~~				

GENERAL NOTES: Estimated results required. Report results on a DRY WEIGHT BASIS. 8260B/5035-2 VOA with sodium bisulfate and 1- VOA with methanol and plastic container for dry weight.

* Note New Target analytes
Benzyl Chloride 8260B
3-3'-dimethybenzidine 8270C
JCF 11-18-08

NO TIME GIVEN FROM LAB.
to be submitted w/ final COC. JCF 11-19-08

Clients Special Instructions: level 4 with edd.

Received by lab in Good Condition _____ Yes _____ No Custody Seal Intact _____ Yes _____ No Temperature upon arrival _____ Received on Ice _____ Yes _____ No
Describe problems, if any:

Sampler Name (Print): ICEY CODDINGTON	Date: 11/19/08	#1 Relinquished by (Signature):	Date: 11/19/08	#2 Relinquished by (Signature):	Date:	Sample Storage Time Requested:
Sampler Signature:	Time: 0700	Company Name: DAA	Time: 700	Company Name:	Time:	
Sampler Name (Print):	Date:	#1 Received by (Signature):	Date:	#2 Received by (Signature):	Date:	30 DYS ORG/6 MTHS INORG
Sampler Signature:	Time:	Company Name:	Time:	Company Name:	Time:	

Sample date originally omitted from COC JCF 11/20/08

(we will attempt to collect/weather pending JCF 11-19-08)

* Remainder of project samples to be collected week of 24th. JCF 11-19-08.

2/2 JCF 11-19-08

CHAIN OF CUSTODY RECORD

Laboratory: Test America, 4101 Shuffel Drive NW, North Canton, OH, 44720 / Mark Loeb, Manager/1-800-966-9387

Client: Draper Aden Associates **Attn:** **Address:** **Phone:** **Fax:** **Fax:**	**Consultant:** Draper Aden Associates **Attn:** Janet C. Frazier **Address:** 2206 South Main Street, Blacksburg, Virginia 24060 **Phone:** (540) 552-0444 **Fax:** (540) 552-0291	**Sample Site:** RAAP, Radford, Virginia **Location:** HWMU-13 (Open Burning Ground) **Event:** Semiannual Soil Monitoring **DAA JN:** B03204-203 **Lab JN:**	**Project Specific (PS) QC:** ☑ YES ☐ NO **Sample Collection for Project Complete?** ☑ YES ☐ NO **Carrier:** UPS# 1Z-237-301-01 JCF 11/19/08 **Tracking Number:** ~~-5468-6522~~ -5250-0349

Box 1: Matrix
SW Surface Water; GW Groundwater; L Leachate; S Soil; T Trip Blank; E Equipment Blank; P Product; O Other

Box 2: Preservative
A HCL; B HNO_3; C H_2SO_4; D $Na_2S_2O_3$; E NaOH; F ZnAc; G Other (Specify); H None

Box 3: Filtered/Unfiltered
F Filtered; U Unfiltered

Box 4: Sample Type
G Grab; C Composite

Box 5: Sample Container Type
P Plastic; V VOA; AG Amber Glass; CG Clear Glass

Invoice
Copy to Consultant: ☑ YES ☐ NO
Bill: ☐ Client ☑ Consultant
Preserved and shipped on ice: ☑ YES ☐ NO

Box 4 - Sample Type	G	G	G	G	G	G	G	G
Box 3 - Filtered/Unfiltered								U
Required pH of Sample								<2
Box 2 - Preservative	G	G	H	H	H	H	H	A
Box 5 - Sample Container Type	2-40ml V	1-40ml V	~~16 oz CG~~	16 oz CG	4 oz CG	~~4 oz GC~~	4 oz GC	40 ml V

Sample ID	Date: 2008	Time	Box 1: Matrix	Number of Bottles	VOAs 5035/8260B w/sodium bisulfate	VOAs 5035/8260B +1-w/methanol	SVOCs 8270C	RCRA Metals 6010B/7471A	Dioxins/Furans 8290	Explosives 8330	Nitroglycerine 8332	VOAs 5030B/8260B
NB-1		0900	S	~~8~~ 6	X	X	X	X	X	X	X	
NB-2		0920	S	~~8~~ 6	X	X	X	X	X	X	X	
SB-1		1050	S	~~8~~ 6	X	X	X	X	X	X	X	
SB-2		1100	S	~~8~~ 6	X	X	X	X	X	X	X	
BERM-1		0945	S	~~8~~ 6	X	X	X	X	X	X	X	
POND-1		1000	S	~~8~~ 6	X	X	X	X	X	X	X	
Trip Blank			T	~~2~~ 2								X
~~Equip Blank~~			~~E~~	~~1~~				X				

ENERAL NOTES: Estimated results required. Report results on a DRY WEIGHT BASIS. 8260B/5035-2 VOA with sodium bisulfate and 1- VOA with methanol and plastic container for dry weight.

* Note New Target analytes
Benzyl Chloride 8260B
3-3'-dimethybenzidine 8270C
JCF 11-18-08

A bubble present in the Trip Blank Vial 11-19-08 to be submitted w/ final COC. JCF 11-19-08

Clients Special Instructions: level 4 with edd.

Received by lab in Good Condition _____ Yes _____ No Custody Seal Intact _____ Yes _____ No Temperature upon arrival _____ Received on Ice _____ Yes _____ No
Describe problems, if any:

Sampler Name (Print): ICETH CODDINGTON	Date: 11/19/08	#1 Relinquished by (Signature):	Date: 11/19/08	#2 Relinquished by (Signature):	Date:	Sample Storage Time Requested:
Sampler Signature:	Time: 0700	Company Name: DAA	Time: 700	Company Name:	Time:	
Sampler Name (Print):	Date:	#1 Received by (Signature):	Date: 11/20/08	#2 Received by (Signature):	Date:	30 DYS ORG/6 MTHS INORG
Sampler Signature:	Time:	Company Name: TAL	Time: 9:50	Company Name:	Time:	

* Remainder of project samples to be collected week of 24th. JCF 11-19-08

We will attempt to collect/weather pending JCF

2/2 JCF

North Canton

CHAIN OF CUSTODY RECORD

Laboratory: Test America, 4101 Shuffel Drive NW, North Canton, OH, 44720 / Mark Loeb, Manager/1-330-966-9387

ORDER 11-15-08

Client: Draper Aden Associates **Attn:** **Address:** **Phone:** **Fax:** **Fax:**	**Consultant:** Draper Aden Associates **Attn:** Janet C. Frazier **Address:** 2206 South Main Street, Blacksburg, Virginia 24060 **Phone:** (540) 552-0444 **Fax:** (540) 552-0291	**Sample Site:** RAAP, Radford, Virginia **Location:** HWMU-13 (Open Burning Ground) **Event:** Semiannual Soil Monitoring **DAA JN:** B03204-203 **Lab JN:**	**Project Specific (PS) QC:** ☑ YES ☐ NO ~~Sample Collection for Project Complete?~~ ☑ YES ☐ NO **Carrier:** UPS: 1Z 237 301 01: 5482-5461 5541-1058 **Tracking Number:**

Box 1: Matrix
SW Surface Water; GW Groundwater; L Leachate; S Soil; T Trip Blank; E Equipment Blank; P Product; O Other

Box 2: Preservative
A HCL; B HNO_3; C H_2SO_4; D $Na_2S_2O_3$; E NaOH; F ZnAc; G Other (Specify); H None

Box 3: Filtered/Unfiltered
F Filtered; U Unfiltered

Box 4: Sample Type
G Grab; C Composite

Box 5: Sample Container Type
P Plastic; V VOA; AG Amber Glass; CG Clear Glass

Invoice
Copy to Consultant: ☑ YES ☐ NO
Bill: ☐ Client ☑ Consultant
Preserved and shipped on ice: ☑ YES ☐ NO

Box 4 - Sample Type	G	G	G	G	G	G	G	G	G	G
Box 3 - Filtered/Unfiltered									U	U
Required pH of Sample									<2	<2
Box 2 - Preservative	G	G	H	H	H	H	H	H	A	A
Box 5 - Sample Container Type	2-40ml V	1-40ml V	~~16 oz CG~~	16 oz CG	~~16 oz CG~~	4 oz CG	4 oz GC	~~4 oz GC~~	40 ml V	40 ml V

Sample ID	Date: 2008	Time	Box 1: Matrix	Number of Bottles	VOAs 5035/8260B w/ methanol/sodium bisulfate	VOAs 5035/8260B w/ methanol	SVOCs 8270C	TPH-DRO 8015B	RCRA Metals 6010B/7471A	Dioxins/Furans 8290	Explosives 8330	Nitroglycerine 8332	VOAs 5030B/8260B	RCRA Metals 6010B/7470
PAD-1	11/24	1000	S	6	X	X	X	X	X	X	X	X		
PAD-2		1020	S	6	X	X	X		X	X	X	X		
PAD-3		1035	S	6	X	X	X		X	X	X	X		
PAD-4		1050	S	12	X	X	X	X	X	X	X	X		
PAD-5		1110	S	6	X	X	X		X	X	X	X		
PAD-6		1125	S	6	X	X	X		X	X	X	X		
PAD-7		1140	S	6	X	X	X	X	X	X	X	X		
PAD-8		1218	S	6	X	X	X		X	X	X	X		
PAD-X	↓	1155	S	6	X	X	X	X	X	X	X	X		
Trip Blank	11/19	—	T	2									X	
~~Equip. Blank~~	11/24	1230	E	~~2~~					~~X~~					X

GENERAL NOTES: Estimated results required. Report results on a DRY WEIGHT BASIS. 8260B/5035-2 VOA with sodium bisulfate and 1- VOA with methanol and plastic container for dry weight.

New analytes since 01/08 event:
* include benzyl chloride 8260B
* 3-3'-d. methybenzine 8270C.

JYS 11-15-08

USE FOR MS/MSD. JCF 11-15-08

Clients Special Instructions: level 4 with edd.

Received by lab in Good Condition _____ Yes _____ No Custody Seal Intact _____ Yes _____ No Temperature upon arrival _____ Received on Ice _____ Yes _____ No

Describe problems, if any:

Sampler Name (Print): Trey Dickerson	Date: 11/19/08	#1 Relinquished by (Signature):	Date: 11/24/08	#2 Relinquished by (Signature):	Date:	Sample Storage Time Requested:
Sampler Signature:	Time: 0800	Company Name: DAA	Time: 1700	Company Name:	Time:	
Sampler Name (Print): KEN CODDINGTON	Date:	#1 Received by (Signature):	Date: 11/25/08	#2 Received by (Signature):	Date:	30 DYS ORG/6 MTHS INORG
Sampler Signature:	Time:	Company Name: TA NC	Time: 1010	Company Name:	Time:	

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North Canton

Table 1: Page 1 of 2
Identification of Constituents of Potential Concern
Open Burning Ground Soil Monitoring Program
Radford Army Ammunition Plant

Constituent	CASRN	Type of Constituent	In Waste?	Reported in Bang Box Database?	On GW List	To be Sampled?	SW-846 Method	Proposed RL mg/kg	Action Level mg/kg	Updated Action Level mg/kg	Source of A.L.
1,2-Dichloroethane	107-06-2	PIC		Yes		Yes	8260B	5.00E-03	3.10E+01	3.10E+01	R3 RBC Ind
1,3,5-Trinitrobenzene	99-35-4	PIC		Yes		Yes	8330	2.50E-01	3.10E+04	3.10E+04	R3 RBC Ind
2,4,6-Trinitrotoluene	118-96-7	ENER				Yes	8330	2.50E-01	9.50E+01	9.50E+01	R3 RBC Ind
2-amino-4,6-dinitrotoluene	35572-78-2	ENER				Yes	8330	2.50E-01	2.00E+03	2.00E+03	R3 RBC Ind
4-amino-2,6-dinitrotoluene	19406-51-0	ENER				Yes	8330	2.50E-01	2.00E+03	2.00E+03	R3 RBC Ind
2,4-Dichlorophenol	120-83-2	PIC		Yes		Yes	8270C	3.30E-01	3.10E+03	3.10E+03	R3 RBC Ind
1,3-Dinitrobenzene	99-65-0	ENER				Yes	8330	2.50E-01	1.00E+02	1.00E+02	R3 RBC Ind
2,4-Dinitrotoluene	121-14-2	Both	Yes		Yes	Yes	8330	2.50E-01	2.00E+03	2.00E+03	R3 RBC Ind
2,6-Dinitrotoluene	606-20-2	PIC		Yes	Yes	Yes	8330	2.50E-01	1.00E+03	1.00E+03	R3 RBC Ind
2-Chlorophenol	95-57-8	PIC		Yes		Yes	8270C	3.30E-01	5.10E+03	5.10E+03	R3 RBC Ind
3-Methylphenol	108-39-4	PIC		Yes		Yes	8270C	3.30E-01	5.10E+04	5.10E+04	R3 RBC Ind
4-Methylphenol	106-44-5	PIC		Yes		Yes	8270C	3.30E-01	5.10E+03	5.10E+03	R3 RBC Ind
2-Nitrotoluene (ortho)	88-72-2	ENER				Yes	8330	2.50E-01	1.20E+01	1.00E+04	R3 RBC Ind
3-Nitrotoluene (meta)	99-08-1	ENER				Yes	8330	2.50E-01	2.00E+04	1.00E+03	R9 PRG Ind
4-Nitrotoluene (para)	99-99-0	ENER				Yes	8330	2.50E-01	1.70E+02	1.80E+02	R3 RBC Ind
3,3-Dimethylbenzidine	119-93-7	PIC		Yes		Yes	8270C	1.60E+00	--	7.50E-01	R9 PRG Ind
4-Nitrophenol	100-02-7	PIC		Yes		Yes	8270C	1.60E+00	7.00E+00	7.00E+00	ECO Risk
Acetophenone	98-86-2	PIC		Yes		Yes	8270C	3.30E-01	1.00E+05	1.00E+05	R3 RBC Ind
Arsenic	7440-38-2	Propellant ingredient	Yes		Yes	Yes	6010B	1.00E+00	1.58E+01	1.58E+01	FWB
Barium	7440-39-3	Propellant ingredient	Yes	Yes	Yes	Yes	6010B	2.00E+01	7.20E+04	2.00E+05	R3 RBC Ind
Benz(a)anthracene	56-55-3	PIC		Yes		Yes	8270C	3.30E-01	3.90E+00	3.90E+00	R3 RBC Ind
Benzene	71-43-2	Propellant ingredient	Yes		Yes	Yes	8260B	5.00E-03	5.20E+01	5.20E+01	R3 RBC Ind
Benzo(a)pyrene	50-32-8	PIC		Yes		Yes	8270C	3.30E-01	3.90E-01	3.90E-01	R3 RBC Ind
Benzo(b)fluoranthene	205-99-2	PIC		Yes		Yes	8270C	3.30E-01	3.90E+00	3.90E+00	R3 RBC Ind
Benzo(k)fluoranthene	207-08-9	PIC		Yes		Yes	8270C	3.30E-01	3.90E+01	3.90E+01	R3 RBC Ind
Benzyl chloride	100-44-7	PIC		Yes		Yes	8260B	5.00E-03	--	1.70E+01	R3 RBC Ind
bis(2-Ethylhexyl)phthalate	117-81-7	PIC		Yes		Yes	8270C	3.30E-01	2.00E+02	2.00E+02	R3 RBC Ind
Butylbenzylphthalate	85-68-7	PIC		Yes		Yes	8270C	3.30E-01	2.00E+05	2.00E+05	R3 RBC Ind
Cadmium	7440-43-9	PIC		Yes		Yes	6010B	5.00E-01	5.10E+02	5.10E+02	R3 RBC Ind
Carbon Tetrachloride	56-23-5	PIC		Yes	Yes	Yes	8260B	5.00E-03	2.20E+01	2.20E+01	R3 RBC Ind
Chlorobenzene	108-90-7	Both	Yes	Yes	Yes	Yes	8260B	5.00E-03	2.00E+04	2.00E+04	R3 RBC Ind
Chloroform	67-66-3	PIC		Yes		Yes	8260B	5.00E-03	1.00E+04	1.00E+04	R3 RBC Ind
Chromium	7740-47-3	PIC		Yes	Yes	Yes	6010B	1.00E+00	3.10E+03	3.10E+03	R3 RBC Ind
Dibenz(a,h)anthracene	53-70-3	PIC		Yes		Yes	8270C	3.30E-01	3.90E-01	3.90E-01	R3 RBC Ind
Dibutylphthalate	84-74-2	Propellant ingredient	Yes		Yes	Yes	8270C	3.30E-01	1.00E+05	1.00E+05	R3 RBC Ind
Diethylphthalate	84-66-2	Propellant ingredient	Yes			Yes	8270C	3.30E-01	8.20E+05	8.20E+05	R3 RBC Ind
Dimethyl phthalate	131-11-3	PIC		Yes		Yes	8270C	3.30E-01	1.00E+07	1.00E+05	R9 PRG Ind
Di-n-butyl phthalate	84-74-2	PIC		Yes	Yes	Yes	8270C	3.30E-01	1.00E+05	1.00E+05	R3 RBC Ind
Diphenylamine	122-39-4	Both	Yes	Yes	Yes	Yes	8270C	1.60E+00	2.60E+04	2.60E+04	R3 RBC Ind
Ethanol	64-17-5	Propellant ingredient	Yes				NCA				
Fluoranthene	206-44-0	PIC		Yes		Yes	8270C	3.30E-01	4.10E+04	4.10E+04	R3 RBC Ind
Hexachloroethane	67-72-1	Propellant ingredient	Yes		Yes	Yes	8260B	5.00E-03	2.00E+02	2.00E+02	R3 RBC Ind
HMX	2691-41-0	ENER				Yes	8330	2.20E+00	5.10E+04	5.10E+04	R3 RBC Ind
Indeno(1,2,3-cd)pyrene	193-39-5	PIC		Yes		Yes	8270C	3.30E-01	3.90E+00	3.90E+00	R3 RBC Ind
Lead	7439-92-1	PIC		Yes	Yes	Yes	6010B	3.00E-01	8.00E+02	8.00E+02	ALM
Mercury	7439-97-6	Propellant ingredient	Yes		Yes	Yes	6010B	1.00E-01	1.30E-01	1.30E-01	FWB
Methyl bromide (Bromomethane)	74-83-9	PIC		Yes		Yes	8260B	5.00E-03	1.50E+01	1.40E+03	R3 RBC Ind
Methyl chloride (Chloromethane)	74-87-3	Both	Yes	Yes	Yes	Yes	8260B	5.00E-03	6.00E+00	1.60E+02	R9 PRG Ind
Methylene chloride	75-09-2	Both	Yes	Yes	Yes	Yes	8260B	5.00E-03	3.80E+02	3.80E+02	R3 RBC Ind
Naphthalene	91-20-3	PIC		Yes		Yes	8270C	3.30E-01	2.00E+04	2.00E+04	R3 RBC Ind
Nitrobenzene	98-95-3	ENER				Yes	8330	2.50E-01	5.10E+02	5.10E+02	R3 RBC Ind
Nitrogen dioxide (peroxide)	10102-44-0	PIC		Yes			NCA				

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* New 1/08

Mark L. STL

8270C

8270C RL = 330 ug/kg
AL = 270 ug/kg
.04.9 mg/kg

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North Canton

Table 1 (Continued): Page 2 of 2

Constituent	CASRN	Type of Constituent	In Waste?	Reported in Bang Box Database?	On GW List	To be Sampled?	Method SW-846	Proposed RL mg/kg	Action Level mg/kg	Updated Action Level mg/kg	Source of A.L.
Phenol	108-95-2	PIC		Yes		Yes	8270C	3.30E-01	3.10E+05	3.10E+05	R3 RBC Ind
RDX	121-82-4	ENER				Yes	8330	1.00E+00	2.60E+01	2.60E+01	R3 RBC Ind
Silver	7440-22-4	Propellant ingredient	Yes		Yes	Yes	6010B	1.00E+00	5.10E+03	5.10E+03	R3 RBC Ind
Selenium	7782-49-2	Background				Yes	6010B	5.00E-01	5.10E+03	5.10E+03	R3 RBC Ind
Total Petroleum Hydrocarbons - DRO		Site Accelerant				Yes	8015B	1.00E+01	1.10E+04	1.10E+04	DEQ gd
Tetrachloroethylene	127-18-4	PIC		Yes		Yes	8260B	5.00E-03	5.30E+00	5.30E+00	R3 RBC Ind
Tetryl	479-45-8	ENER				Yes	8330	6.50E-01	1.00E+04	4.10E+03	R3 RBC Ind
Toluene	108-88-3	Both	Yes	Yes	Yes	Yes	8260B	5.00E-03	2.00E+05	8.20E+04	R3 RBC Ind
Trichloroethylene	79-01-6	PIC		Yes		Yes	8260B	5.00E-03	7.20E+00	7.20E+00	R3 RBC Ind
Vinyl chloride	75-01-4	PIC		Yes		Yes	8260B	5.00E-03	4.00E+00	4.00E+00	R3 RBC Ind
Vinylidene chloride (1,1-Dichloroethene)	75-35-4	PIC		Yes		Yes	8260B	5.00E-03	5.10E+04	5.10E+04	R3 RBC Ind
Polychlorinated Dibenzo(p)dioxins and furans											
1,2,3,4,5,7,8,9-Octachlorodibenzo(p)dioxin (OCDD)	3268-87-9	PIC		Yes		Yes	8920	See Note 4			
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	39001-02-0	PIC		Yes		Yes	8920	See Note 4			
1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin (HpCDD)	35822-46-9	PIC		Yes		Yes	8920	See Note 4			
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	67562-39-4	PIC		Yes		Yes	8920	See Note 4			
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	55673-89-7	PIC		Yes		Yes	8920	See Note 4			
1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin (HxCDD)	39227-28-6	PIC		Yes		Yes	8920	See Note 4			
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	70648-26-9	PIC		Yes		Yes	8920	See Note 4			
1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin (HxCDD)	57653-85-7	PIC		Yes		Yes	8920	See Note 4			
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	57117-44-9	PIC		Yes		Yes	8920	See Note 4			
1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin (HxCDD)	19408-74-3	PIC		Yes		Yes	8920	See Note 4			
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	72918-21-9	PIC		Yes		Yes	8920	See Note 4			
1,2,3,7,8-Pentachlorodibenzo(p)dioxin (PeCDD)	40321-76-4	PIC		Yes		Yes	8920	See Note 4			
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	57117-31-4	PIC		Yes		Yes	8920	See Note 4			
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	60851-34-5	PIC		Yes		Yes	8920	See Note 4			
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	57117-31-4	PIC		Yes		Yes	8920	See Note 4			
2,3,7,8-Tetrachlorodibenzo(p)dioxin (TCDD)	1746-01-6	PIC		Yes		Yes	8920	See Note 4			
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	51207-31-9	PIC		Yes		Yes	8920	See Note 4			
* Constituents to be sampled first 2 semi-annual events (see Section 3.3 of this plan)											
Antimony	7440-36-0	PIC			Yes	* Yes	6010B	1.00E+01	4.10E+02	4.10E+02	R3 RBC Ind
Benzoic acid	65-85-0	Propellant ingredient	Yes			* Yes	8270C	3.30E+00	4.10E+06	4.10E+06	R3 RBC Ind
Dibenzofuran	132-64-9	PIC		Yes		* Yes	8270C	3.30E-01	2.00E+03	1.00E+03	R3 RBC Ind
Di-n-octyl phthalate	117-84-0	PIC				* Yes	8270C	3.30E-01	4.10E+04	2.50E+04	R9 PRG Ind
Nickel	7440-02-0	PIC		Yes		* Yes	6010B	3.30E+02	2.00E+04	2.00E+04	R3 RBC Ind
Nitroglycerin	55-63-0	ENER	Yes		Yes	* Yes	8330	2.50E+00	2.00E+02	1.00E+02	R3 RBC Ind
Pyrene	129-00-0	PIC		Yes		* Yes	8270C	3.30E-01	3.10E+04	3.10E+04	R3 RBC Ind
Zinc	7440-06-66	PIC		Yes		* Yes	6010B	2.50E+03	3.10E+05	3.10E+05	R3 RBC Ind

NOTES:

1. Type of Constituent - "Propellant Ingredient" = Ingredient in propellant compound.
   "PIC" Product of Incomplete Combustion": means that it was reported in the Bangbox Database (see Appendix A-2).
   "Both" Both PIC and Propellant Ingredient.
   "ENER" - Energetic on SW-846 Method 8330 parameter List.
2. In Waste- "Yes" - means it was reported in Radford AAP's waste characterization.
3. BOLD Constituent Constituent not in 40 CFR 261 Appendix VIII List of Hazardous Substances.
4. Dioxins Reporting Limit and Action Level will be calculated for each sample and detection, respectively. See Table 2 for example reporting format.
5. NCA Constituent is not analyzed by commercial laboratories.
6. Source of Action Levels - **"R3 RBC Ind"** - Region III RBC for Industrial Sites - Dated October 11, 2007.
   "R9 PRG Ind" - Region IX Preliminary Remediation Goals for Industrial Soils - Dated October 2004.
   "DEQ gd" - Table 5-5 Soil Saturation Values, Page 5-27 of VDEQ Storage Tank Program Technical Manual, Rev 3, October 4, 2001.
   "FWB" - Facility Wide Background Study.
   "ALM" is the Adult Lead Methodology (ALM). NHANES III (National Health and Nutrition Evaluation Survey) is a lead study. ALM identifies 800 mg/kg as a screening value and states that it is based on an analysis of the NHANES III study and that it is "a cleanup goal protective of all subpopulations."
   "ECO RISK" - June 23, 2000 EPA memorandum Entitled *Amended Guidance on Ecological Risk Assessment at Military Bases: Process Considerations, Timing of Activities and Inclusion of Stakeholders.*
7. RL and AL "RL" is the laboratory reporting limit and is analogous to the Limit of Quantitation (LOQ). "AL" is the Action Level based on published risk based values.

APPENDIX C

TABLES

Table 1 - Sample Analytical Requirements
Open Burning Ground - Soil Monitoring Program

Sample Location ID	Sample Analytical Method						
	VOCs (8260B)	SVOCs (8270C)	RCRA Metals (6010B/7471A)	Dioxins/Furans (8290)	Explosives (8330)	Nitroglycerine (8332)	TPH-DRO (8015B)
PAD-1	X	X	X	X	X	X	X
PAD-2	X	X	X	X	X	X	
PAD-3	X	X	X	X	X	X	
PAD-4	X	X	X	X	X	X	X
PAD-5	X	X	X	X	X	X	
PAD-6	X	X	X	X	X	X	
PAD-7	X	X	X	X	X	X	X
PAD-8	X	X	X	X	X	X	
NB-1	X	X	X	X	X	X	
NB-2	X	X	X	X	X	X	
SB-1	X	X	X	X	X	X	
SB-2	X	X	X	X	X	X	
BERM-1	X	X	X	X	X	X	
POND-1	X	X	X	X	X	X	

Notes:
X indicates sample was analyzed for corresponding analytical method.
Each method was performed for certain Constituents of Potential Concern (COPCs), which are listed on the COPC list included in Appendix D of this Annual Soil Monitoring Report.
A duplicate sample (PAD-X) of PAD-7 is collected for QA/QC purposes.

Table 2A - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit .
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	PAD-1	Q	PAD-2	Q	PAD-3	Q	PAD-4	Q	PAD-5	Q	PAD-6	Q	PAD-7	Q	PAD-8	Q	POND-1	Q	SB-1	Q	SB-2	Q	QL/RL	Action Limit	Method	Unit
1,1-Dichloroethene					CAS #: 75-35-4																					
11/17/2005	U		U		U		U		U		U		U		U		U		U	A	U	A	0.005	51000	SW846 8260B	mg/kg
6/9/2006	U		U		U		U		U	A	U		U		U		U		U	A	U		0.005	51000	SW846 8260B	mg/kg
1/11/2007	U		U		U		U		U		U		U		U	J	U		U	J	U		0.005	51000	SW846 8260B	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		U		U		U		0.005	51000	SW846 8260B	mg/kg
1/8/2008	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	0.005	51000	SW846 8260B	mg/kg
1,2-Dichloroethane					CAS #: 107-06-2																					
11/17/2005	U		U		U		U		U		U		U		U		U		U	A	U	A	0.005	31	SW846 8260B	mg/kg
6/9/2006	U		U		U		U		U	A	U		U		U		U		U	A	U		0.005	31	SW846 8260B	mg/kg
1/11/2007	U		U		U		U		U		U		U		U	J	U		U	J	U		0.005	31	SW846 8260B	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		U		U		U		0.005	31	SW846 8260B	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.005	31	SW846 8260B	mg/kg
1,3,5-Trinitrobenzene					CAS #: 99-35-4																					
11/17/2005	U		1.6		0.51		0.95		U		U		U		U		U		U		U		0.25	31000	SW846 8330	mg/kg
6/9/2006	U		U		2		0.75		U		U		U		U		U		U		U		0.25	31000	SW846 8330	mg/kg
1/11/2007	U		U		3.1		0.71		U		U		U		U		U		U		U		0.25	31000	SW846 8330	mg/kg
6/18/2007	U		U		16		U		U		U		U		U		U		U		U		0.25	31000	SW846 8330	mg/kg
1/8/2008	U		U		0.45		U		U		U		U		0.54		U		U		U		0.25	31000	SW846 8330	mg/kg
1,3-Dinitrobenzene					CAS #: 99-65-0																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.25	100	SW846 8330	mg/kg
6/9/2006	U		U		U		U		U		U		U		U		U		U		U		0.25	100	SW846 8330	mg/kg
1/11/2007	U		U		U		U		U		U		U		U		U		U		U		0.25	100	SW846 8330	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		U		U		U		0.25	100	SW846 8330	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.25	100	SW846 8330	mg/kg
2,4,6-Trinitrotoluene					CAS #: 118-96-7																					
11/17/2005	U		9.6		U		3.1		U		2		0.35		U		0.47		U		U		0.25	95	SW846 8330	mg/kg
6/9/2006	U		0.84		44		1.6		U		0.83		0.33		U		U		U		U		0.25	95	SW846 8330	mg/kg
1/11/2007	0.49		2.8		69		U		U		1.7		0.34		0.5		2.1		U		U		0.25	95	SW846 8330	mg/kg
6/18/2007	U		0.74		23		3.6		U		2.2		0.3		U		1.3		1.4		U		0.25	95	SW846 8330	mg/kg
1/8/2008	0.55		0.29		0.75		0.3		U		U		5.3	J	59		U		U		U		0.25	95	SW846 8330	mg/kg
2,4-Dichlorophenol					CAS #: 120-83-2																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	3100	SW846 8270C	mg/kg
6/9/2006	U		U		U	A	U		U		U	A	U		U		U		U		U		0.4	3100	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		U		U		U		0.4	3100	SW846 8270C	mg/kg
6/18/2007	U	J	U	J	U	J	U		U		U	J	U	J	U		U		U	J	U		0.4	3100	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.4	3100	SW846 8270C	mg/kg

See last page of this report for definitions.

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Table 2A - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit .
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	PAD-1	Q	PAD-2	Q	PAD-3	Q	PAD-4	Q	PAD-5	Q	PAD-6	Q	PAD-7	Q	PAD-8	Q	POND-1	Q	SB-1	Q	SB-2	Q	QL/RL	Action Limit	Method	Unit
2,4-Dinitrotoluene					*CAS #: 121-14-2*																					
11/17/2005	U		0.79		U		1.1		U		0.82		U		U		U		U		U		0.25	2000	SW846 8330	mg/kg
6/9/2006	U		1.5		0.26		0.61		U		0.71		U		U		U		U		U		0.25	2000	SW846 8330	mg/kg
1/11/2007	U		1.1		0.46		U		U		1		U		U		U		U		U		0.25	2000	SW846 8330	mg/kg
6/18/2007	U		0.31		1.9		0.74		U		0.99		U		U		U		U		U		0.25	2000	SW846 8330	mg/kg
1/8/2008	0.34		U		U		U		U		U		U		0.73		U		U		U		0.25	2000	SW846 8330	mg/kg
2,6-Dinitrotoluene					*CAS #: 606-20-2*																					
11/17/2005	U		0.55		U		1.5		U		U		U		U		U		U		U		0.25	1000	SW846 8330	mg/kg
6/9/2006	U		U		U		1.5		U		U		U		U		U		U		U		0.25	1000	SW846 8330	mg/kg
1/11/2007	U		0.76		0.35		0.32		U		0.3		U		U		U		U		U		0.25	1000	SW846 8330	mg/kg
6/18/2007	U		U		0.7		0.33		U		U		U		U		U		U		U		0.25	1000	SW846 8330	mg/kg
1/8/2008	U		U		U		U		U		U		U		0.31		U		U		U		0.25	1000	SW846 8330	mg/kg
2-Amino-4,6-dinitrotoluene					*CAS #: 35572-78-2*																					
11/17/2005	U		1.7		U		0.53		U		U		U		U		U		U		U		0.25	2000	SW846 8330	mg/kg
6/9/2006	U		0.29		0.36		U		U		U		0.25		U		U		U		U		0.25	2000	SW846 8330	mg/kg
1/11/2007	U		0.28		0.5		U		U		0.32		U		U		U		U		U		0.25	2000	SW846 8330	mg/kg
6/18/2007	U		0.66		0.66		U		U		0.42		0.47		U		0.3		0.48		U		0.25	2000	SW846 8330	mg/kg
1/8/2008	U		U		0.27		U		U		U		0.36		1.7		U		U		U		0.25	2000	SW846 8330	mg/kg
2-Chlorophenol					*CAS #: 95-57-8*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	5100	SW846 8270C	mg/kg
6/9/2006	U		U		U	A	U		U		U	A	U		U		U		U		U		0.4	5100	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		U		U		U		0.4	5100	SW846 8270C	mg/kg
6/18/2007	U	J	U	J	U	J	U		U		U	J	U	J	U		U		U	J	U		0.4	5100	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.4	5100	SW846 8270C	mg/kg
2-Nitrotoluene					*CAS #: 88-72-2*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.25	12	SW846 8330	mg/kg
6/9/2006	U		U		U		U		U		U		U		U		U		U		U		0.25	12	SW846 8330	mg/kg
1/11/2007	U		U		U		U		U		U		U		U		U		U		U		0.25	12	SW846 8330	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		U		U		U		0.25	12	SW846 8330	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.25	12	SW846 8330	mg/kg
3,3'-Dimethylbenzidine					*CAS #: 119-93-7*																					
1/8/2008	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	2		SW846 8270C	mg/kg

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Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	PAD-1	Q	PAD-2	Q	PAD-3	Q	PAD-4	Q	PAD-5	Q	PAD-6	Q	PAD-7	Q	PAD-8	Q	POND-1	Q	SB-1	Q	SB-2	Q	QL/RL	Action Limit	Method	Unit
3-Methylphenol					CAS #: 108-39-4																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	51000	SW846 8270C	mg/kg
6/9/2006	U		U		U	A	U		U		U	A	U		U		U		U		U		0.4	51000	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		U		U		U		0.4	51000	SW846 8270C	mg/kg
6/18/2007	U	J	U	J	U	J	U		U		U	J	U	J	U		U		U	J	U		0.4	51000	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.4	51000	SW846 8270C	mg/kg
3-Nitrotoluene					CAS #: 99-08-1																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.25	20000	SW846 8330	mg/kg
6/9/2006	U		U		U		U		U		U		U		U		U		U		U		0.25	20000	SW846 8330	mg/kg
1/11/2007	U		U		U		U		U		U		U		U		U		U		U		0.25	20000	SW846 8330	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		U		U		U		0.25	20000	SW846 8330	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.25	20000	SW846 8330	mg/kg
4-Amino-2,6-dinitrotoluene					CAS #: 19406-51-0																					
11/17/2005	U		1.8		U		0.26		U		U		U		U		U		U		U		0.25	2000	SW846 8330	mg/kg
6/9/2006	U		0.39		0.34		U		U		0.34		0.28		U		U		U		U		0.25	2000	SW846 8330	mg/kg
1/11/2007	U		0.25		0.28		U		U		0.39		U		U		U		U		U		0.25	2000	SW846 8330	mg/kg
6/18/2007	U		0.67		0.82		0.3		U		0.64		0.47	J	U		0.28	J	0.41		U		0.25	2000	SW846 8330	mg/kg
1/8/2008	U		U		0.25		U		U		U		0.59		2.2		U		U		U		0.25	2000	SW846 8330	mg/kg
4-Methylphenol					CAS #: 106-44-5																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	5100	SW846 8270C	mg/kg
6/9/2006	U		U		U	A	U		U		U	A	U		U		U		U		U		0.4	5100	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		U		U		U		0.4	5100	SW846 8270C	mg/kg
6/18/2007	U	J	U	J	U	J	U		U		U	J	U	J	U		U		U	J	U		0.4	5100	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.4	5100	SW846 8270C	mg/kg
4-Nitrophenol					CAS #: 100-02-7																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		2	7	SW846 8270C	mg/kg
6/9/2006	U		U		U	A	U		U		U	A	U		U		U		U		U		2	7	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		U		U		U		2	7	SW846 8270C	mg/kg
6/18/2007	U	J	U	J	U	J	U		U		U	J	U	J	U		U		U	J	U		2	7	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		2	7	SW846 8270C	mg/kg
4-Nitrotoluene					CAS #: 99-99-0																					
11/17/2005	U		0.45		U		0.34		U		U		U		U		U		U		U		0.25	170	SW846 8330	mg/kg
6/9/2006	U		U		U		U		U		U		U		U		U		U		U		0.25	170	SW846 8330	mg/kg
1/11/2007	U		U		U		U		U		U		U		U		U		U		U		0.25	170	SW846 8330	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		U		U		U		0.25	170	SW846 8330	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.25	170	SW846 8330	mg/kg

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Table 2A - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit .
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	PAD-1	Q	PAD-2	Q	PAD-3	Q	PAD-4	Q	PAD-5	Q	PAD-6	Q	PAD-7	Q	PAD-8	Q	POND-1	Q	SB-1	Q	SB-2	Q	QL/RL	Action Limit	Method	Unit
Acetophenone					*CAS #: 98-86-2*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	100000	SW846 8270C	mg/kg
6/9/2006	U		U		U	A	U		U		U	A	U		U		U		U		U		0.4	100000	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		U		U		U		0.4	100000	SW846 8270C	mg/kg
6/18/2007	U	J	U	J	U	J	U		U		U	J	U	J	U		U		U	J	U		0.4	100000	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.4	100000	SW846 8270C	mg/kg
Antimony					*CAS #: 7440-36-0*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.5	410	SW846 6010B	mg/kg
6/9/2006	U		U		U		U		U		U		U		U		U		U		U		0.5	410	SW846 6010B	mg/kg
1/11/2007	U		U		U		U		U		U		U		U		U		U		U		6	410	SW846 6010B	mg/kg
6/18/2007	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	6	410	SW846 6010B	mg/kg
1/8/2008	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	6	410	SW846 6010B	mg/kg
Arsenic					*CAS #: 7440-38-2*																					
11/17/2005	2		3		1.4		1.8		1.2		1.7		1.2		2		1.7		3		4.6		1	16	SW846 6010B	mg/kg
6/9/2006	2		1.4		1.9		2.2		1.1		1.2		1.7		1.5		1.5		2.6		2.9		1	16	SW846 6010B	mg/kg
1/11/2007	1.8		2		1.9		1.9		U		2		1.8		2.7		4.5		3.6		4.3		1	16	SW846 6010B	mg/kg
6/18/2007	1.1		1.5		1.6		2.1		U		1.7		1.3		1.2		2.2		3.2		4		1	16	SW846 6010B	mg/kg
1/8/2008	2.1		1.2		1.5		1.4		U		U		1.6		2.3		2.6		2.4		2.8		1	16	SW846 6010B	mg/kg
Barium					*CAS #: 7440-39-3*																					
11/17/2005	85.9		127		51.9		88.8		28.4		81.1		78.4		123		105		125		153		20	72000	SW846 6010B	mg/kg
6/9/2006	131		54.4		64.2		79.1		48.8		54.8		135		156		109		110		79.6		20	72000	SW846 6010B	mg/kg
1/11/2007	156		72.9		66.5		78.1		39.3		70.6		99.1		213		134		147		149		20	72000	SW846 6010B	mg/kg
6/18/2007	249		65.9		61.4		71.7		50.7		80.7		156		111		93.5		97.2		83.7		20	72000	SW846 6010B	mg/kg
1/8/2008	172		73.4		81.9		70.8		38		30.3		85.4		133		121		117		141		20	72000	SW846 6010B	mg/kg
Benzene					*CAS #: 71-43-2*																					
11/17/2005	0.0063		U		U		0.0072		U		U		0.008		U		U		U		U	A	0.005	52	SW846 8260B	mg/kg
6/9/2006	U		U		U		U		U	A	U		U		U		U		U	A	U		0.005	52	SW846 8260B	mg/kg
1/11/2007	U		U		U		U		U		U		U		U	J	U		U	J	U		0.005	52	SW846 8260B	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		U		U		U		0.005	52	SW846 8260B	mg/kg
1/8/2008	U		U		U		0.0071		U		U		U		U		U		U		U		0.005	52	SW846 8260B	mg/kg
Benzo(a)anthracene					*CAS #: 56-55-3*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.38	3.9	SW846 8270C	mg/kg
6/9/2006	U		U		U	A	U		U		U	A	U		U		U		U		U		0.38	3.9	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		U		U		U		0.4	3.9	SW846 8270C	mg/kg
6/18/2007	U	J	U	J	U	J	U		U		U	J	U	J	U		U		U	J	U		0.4	3.9	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.4	3.9	SW846 8270C	mg/kg

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Open Burning Ground - Soil Monitoring Program

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Event Date	PAD-1	Q	PAD-2	Q	PAD-3	Q	PAD-4	Q	PAD-5	Q	PAD-6	Q	PAD-7	Q	PAD-8	Q	POND-1	Q	SB-1	Q	SB-2	Q	QL/RL	Action Limit	Method	Unit
Benzo(a)pyrene					CAS #: 50-32-8																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.38	0.39	SW846 8270C	mg/kg
6/9/2006	U		U		U	A	U		U		U	A	U		U		U		U		U		0.38	0.39	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		U		U		U		0.4	0.39	SW846 8270C	mg/kg
6/18/2007	U	J	U	J	U	J	U		U		U	J	U	J	U		U		U	J	U		0.4	0.39	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		U	J	U		U		U		0.4	0.39	SW846 8270C	mg/kg
Benzo(b)fluoranthene					CAS #: 205-99-2																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.38	3.9	SW846 8270C	mg/kg
6/9/2006	U		U		U	A	U		U		U	A	U		U		U		U		U		0.38	3.9	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		U		U		U		0.4	3.9	SW846 8270C	mg/kg
6/18/2007	U	J	U	J	U	J	U		U		U	J	U	J	U		U		U	J	U		0.4	3.9	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		U	J	U		U		U		0.4	3.9	SW846 8270C	mg/kg
Benzo(k)fluoranthene					CAS #: 207-08-9																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.38	39	SW846 8270C	mg/kg
6/9/2006	U		U		U	A	U		U		U	A	U		U		U		U		U		0.38	39	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		U		U		U		0.4	39	SW846 8270C	mg/kg
6/18/2007	U	J	U	J	U	J	U		U		U	J	U	J	U		U		U	J	U		0.4	39	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		U	J	U		U		U		0.4	39	SW846 8270C	mg/kg
Benzoic acid					CAS #: 65-85-0																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		2	4100000	SW846 8270C	mg/kg
6/9/2006	U		U		U	A	U		U		U	A	U		U		U		U		U		2	4100000	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		U		U		U		2	4100000	SW846 8270C	mg/kg
6/18/2007	U	J	U	J	U	J	U		U		U	J	U	J	U		U		U	J	U		2	4100000	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		2	4100000	SW846 8270C	mg/kg
Benzyl chloride					CAS #: 100-44-7																					
1/8/2008	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	0.005		SW846 8260B	mg/kg
bis(2-Ethylhexyl) phthalate					CAS #: 117-81-7																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	200	SW846 8270C	mg/kg
6/9/2006	U		U		U	A	U		U		U	A	U		U		U		U		U		0.4	200	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		0.82		U		U		0.4	200	SW846 8270C	mg/kg
6/18/2007	U	J	0.51	J	U	J	U		U		U	J	U	J	U		0.48		U	J	U		0.4	200	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.4	200	SW846 8270C	mg/kg

See last page of this report for definitions.

Table 2A - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit .
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	PAD-1	Q	PAD-2	Q	PAD-3	Q	PAD-4	Q	PAD-5	Q	PAD-6	Q	PAD-7	Q	PAD-8	Q	POND-1	Q	SB-1	Q	SB-2	Q	QL/RL	Action Limit	Method	Unit
Bromomethane					CAS #: 74-83-9																					
11/17/2005	U		U		U		U		U		U		U		U		U		U	A	U	A	0.005	15	SW846 8260B	mg/kg
6/9/2006	U		U		U		U		U	A	0.0092		U		U		U		U	A	U		0.005	15	SW846 8260B	mg/kg
1/11/2007	U		U		U		U		U		U		U		U	J	U		U	J	U		0.005	15	SW846 8260B	mg/kg
6/18/2007	U		0.0066		U		0.005		U		0.0059		0.079		U		0.0067		0.008		U		0.005	15	SW846 8260B	mg/kg
1/8/2008	U		0.02		U		U		U		U		U		U		U		U		U		0.01	15	SW846 8260B	mg/kg
Butyl benzyl phthalate					CAS #: 85-68-7																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	200000	SW846 8270C	mg/kg
6/9/2006	U		U		U	A	U		U		U	A	U		U		U		U		U		0.4	200000	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		U		U		U		0.4	200000	SW846 8270C	mg/kg
6/18/2007	U	J	U	J	U	J	U		U		U	J	U	J	U		U		U	J	U		0.4	200000	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.4	200000	SW846 8270C	mg/kg
Cadmium					CAS #: 7440-43-9																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.5	510	SW846 6010B	mg/kg
6/9/2006	0.58		U		U		U		U		U		U		U		U		U		U		0.5	510	SW846 6010B	mg/kg
1/11/2007	U		U		U		U		U		U		U		U		0.75		U		U		0.5	510	SW846 6010B	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		U		U		U		0.5	510	SW846 6010B	mg/kg
1/8/2008	1.5		U		U		U		U		U		U		U		0.93		U		0.76		0.5	510	SW846 6010B	mg/kg
Carbon tetrachloride					CAS #: 56-23-5																					
11/17/2005	U		U		U		U		U		U		U		U		U		U	A	U	A	0.005	22	SW846 8260B	mg/kg
6/9/2006	U		U		U		U		U	A	U		U		U		U		U	A	U		0.005	22	SW846 8260B	mg/kg
1/11/2007	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	0.005	22	SW846 8260B	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		U		U		U		0.005	22	SW846 8260B	mg/kg
1/8/2008	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	0.005	22	SW846 8260B	mg/kg
Chlorobenzene					CAS #: 108-90-7																					
11/17/2005	U		U		U		U		U		U		U		U		U		U	A	U	A	0.005	20000	SW846 8260B	mg/kg
6/9/2006	U		U		U		U		U	A	U		U		U		U		U	A	U		0.005	20000	SW846 8260B	mg/kg
1/11/2007	U		U		U		U		U		U		U		U	J	U		U	J	U		0.005	20000	SW846 8260B	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		U		U		U		0.005	20000	SW846 8260B	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.005	20000	SW846 8260B	mg/kg
Chloroform					CAS #: 67-66-3																					
11/17/2005	U		U		U		U		U		U		0.0071		U		U		U	A	U	A	0.005	10000	SW846 8260B	mg/kg
6/9/2006	U		U		U		U		U	A	U		U		U		U		U	A	U		0.005	10000	SW846 8260B	mg/kg
1/11/2007	U		U		U		U		U		U		U		U	J	U		U	J	U		0.005	10000	SW846 8260B	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		U		U		U		0.005	10000	SW846 8260B	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.005	10000	SW846 8260B	mg/kg

See last page of this report for definitions.

Table 2A - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit .
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	PAD-1	Q	PAD-2	Q	PAD-3	Q	PAD-4	Q	PAD-5	Q	PAD-6	Q	PAD-7	Q	PAD-8	Q	POND-1	Q	SB-1	Q	SB-2	Q	QL/RL	Action Limit	Method	Unit
Chloromethane					CAS #: 74-87-3																					
11/17/2005	U		U		U		U		U		U		U		U		U		U	A	U	A	0.005	6	SW846 8260B	mg/kg
6/9/2006	U		U		U		U		U	A	U		U		U		U		U	A	U		0.005	6	SW846 8260B	mg/kg
1/11/2007	U		U		U		U		U		U		U		U	J	U		U	J	U		0.005	6	SW846 8260B	mg/kg
6/18/2007	U		0.0064		U		U		U		U		0.03		U		U		U		U		0.005	6	SW846 8260B	mg/kg
1/8/2008	U		0.016		U		U		U		U		U		U		U		U		U		0.01	6	SW846 8260B	mg/kg
Chromium					CAS #: 7440-47-3																					
11/17/2005	24.2		16.7		9.1		12.1		3.8		14.6		13.6		19.1		17.3		21.2		28		1	3100	SW846 6010B	mg/kg
6/9/2006	17.1		9.3		13.8		13.4		7.7		11		11.8		13		18.1		19.8		14.3		1	3100	SW846 6010B	mg/kg
1/11/2007	16		11		10.6		14.7		5.9		14		14.5		16.5		16		27.1		25		1	3100	SW846 6010B	mg/kg
6/18/2007	15.3		7.5		14		13.9		8.4		16.4		13.8		11.7		15.1		19.3		16.2		1	3100	SW846 6010B	mg/kg
1/8/2008	20.1		13.5		13		12.1		7.3		6.7		14		18		13.9		21.1		24.4		1	3100	SW846 6010B	mg/kg
Dibenz(a,h)anthracene					CAS #: 53-70-3																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	0.39	SW846 8270C	mg/kg
6/9/2006	U		U		U	A	U		U		U	A	U		U		U		U		U		0.4	0.39	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		U		U		U		0.4	0.39	SW846 8270C	mg/kg
6/18/2007	U	J	U	J	U	J	U		U		U	J	U	J	U		U		U	J	U		0.4	0.39	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		U	J	U		U		U		0.4	0.39	SW846 8270C	mg/kg
Dibenzofuran					CAS #: 132-64-9																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	2000	SW846 8270C	mg/kg
6/9/2006	U		U		U	A	U		U		U	A	U		U		U		U		U		0.4	2000	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		U		U		U		0.4	2000	SW846 8270C	mg/kg
6/18/2007	U	J	U	J	U	J	U		U		U	J	U	J	U		U		U	J	U		0.4	2000	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.4	2000	SW846 8270C	mg/kg
Diethyl phthalate					CAS #: 84-66-2																					
11/17/2005	U		U		0.96		0.45		U		6.4		0.5		U		U		U		U		0.4	820000	SW846 8270C	mg/kg
6/9/2006	U		U		U		1.2		U		1.8		U		U		U		U		U		0.4	820000	SW846 8270C	mg/kg
1/11/2007	U		U		0.46		U	J	0.41		6.9		U		4.1		U		U		U		0.4	820000	SW846 8270C	mg/kg
6/18/2007	U	J	0.44	J	U	J	0.67		U		4.9	J	1.6	J	U		1.5		U	J	0.58		0.4	820000	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		0.95		U		U		U		0.4	820000	SW846 8270C	mg/kg
Dimethyl phthalate					CAS #: 131-11-3																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	10000000	SW846 8270C	mg/kg
6/9/2006	U		U		U	A	U		U		U	A	U		U		U		U		U		0.4	10000000	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		U		U		U		0.4	10000000	SW846 8270C	mg/kg
6/18/2007	U	J	U	J	U	J	U		U		U	J	U	J	U		U		U	J	U		0.4	10000000	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		1.2		U		U		U		0.4	10000000	SW846 8270C	mg/kg

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Draper Aden Associates
Engineering ◆ Surveying ◆ Environmental Services

Table 2A - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit .
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	PAD-1	Q	PAD-2	Q	PAD-3	Q	PAD-4	Q	PAD-5	Q	PAD-6	Q	PAD-7	Q	PAD-8	Q	POND-1	Q	SB-1	Q	SB-2	Q	QL/RL	Action Limit	Method	Unit
Di-n-butyl phthalate					*CAS #: 84-74-2*																					
11/17/2005	2		U		1.3		U		U		2.3		U		U		U		U		U		0.4	100000	SW846 8270C	mg/kg
6/9/2006	U		0.8		1.7		0.38		U		4.1		U		U		U		U		U		0.4	100000	SW846 8270C	mg/kg
1/11/2007	U		U		0.47		U	J	U		12		U		11		U		U		U		0.4	100000	SW846 8270C	mg/kg
6/18/2007	U	J	0.83	J	U	J	0.7		U		6.3	J	0.76	J	U		0.48		U	J	U		0.4	100000	SW846 8270C	mg/kg
1/8/2008	1.2		U		U		U		U		U		2		1.4		U		U		U		0.4	100000	SW846 8270C	mg/kg
Di-n-octyl phthalate					*CAS #: 117-84-0*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	41000	SW846 8270C	mg/kg
6/9/2006	U		U		U	A	U		U		U	A	U		U		U		U		U		0.4	41000	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		U		U		U		0.4	41000	SW846 8270C	mg/kg
6/18/2007	U	J	U	J	U	J	U		U		U	J	U	J	U		U		U	J	U		0.4	41000	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		U	J	U		U		U		0.4	41000	SW846 8270C	mg/kg
Fluoranthene					*CAS #: 206-44-0*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	41000	SW846 8270C	mg/kg
6/9/2006	U		U		U	A	U		U		U	A	U		U		U		U		U		0.4	41000	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		U		U		U		0.4	41000	SW846 8270C	mg/kg
6/18/2007	U	J	U	J	U	J	U		U		U	J	U	J	U		U		U	J	U		0.4	41000	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		U	J	U		U		U		0.4	41000	SW846 8270C	mg/kg
Hexachloroethane					*CAS #: 67-72-1*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	200	SW846 8270C	mg/kg
6/9/2006	U		U		U	A	U		U		U	A	U		U		U		U		U		0.4	200	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		U		U		U		0.4	200	SW846 8270C	mg/kg
6/18/2007	U	J	U	J	U	J	U		U		U	J	U	J	U		U		U	J	U		0.4	200	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.4	200	SW846 8270C	mg/kg
HMX					*CAS #: 2691-41-0*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		2.2	51000	SW846 8330	mg/kg
6/9/2006	U		U		U		U		U		U		U		U		U		U		U		2.2	51000	SW846 8330	mg/kg
1/11/2007	U		U		U		U		U		U		U		U		U		U		U		0.5	51000	SW846 8330	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		0.83		U		U		0.5	51000	SW846 8330	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.5	51000	SW846 8330	mg/kg
Indeno(1,2,3-cd)pyrene					*CAS #: 193-39-5*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	3.9	SW846 8270C	mg/kg
6/9/2006	U		U		U	A	U		U		U	A	U		U		U		U		U		0.4	3.9	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		U		U		U		0.4	3.9	SW846 8270C	mg/kg
6/18/2007	U	J	U	J	U	J	U		U		U	J	U	J	U		U		U	J	U		0.4	3.9	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		U	J	U		U		U		0.4	3.9	SW846 8270C	mg/kg

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Table 2A - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit .
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	PAD-1	Q	PAD-2	Q	PAD-3	Q	PAD-4	Q	PAD-5	Q	PAD-6	Q	PAD-7	Q	PAD-8	Q	POND-1	Q	SB-1	Q	SB-2	Q	QL/RL	Action Limit	Method	Unit
Lead					*CAS #: 7439-92-1*																					
11/17/2005	414		471		188		208		11.8		660		199		259		140		81.3		104		3	800	SW846 6010B	mg/kg
6/9/2006	234		181		216		242		245		676		317		51.4		63.2		66		128		3	800	SW846 6010B	mg/kg
1/11/2007	201		193		202		164		165		781		339		290		219		68.9		122		0.3	800	SW846 6010B	mg/kg
6/18/2007	271	J	195	J	217	J	191	J	190	J	336		512	J	73.9	J	135	J	149	J	164	J	0.3	800	SW846 6010B	mg/kg
1/8/2008	417		183		579		219		436		251		251	J	684		203		78.2		92.2		0.3	800	SW846 6010B	mg/kg
Mercury					*CAS #: 7439-97-6*																					
11/17/2005	U		U		U		U		U		U		0.127		U		U		U		U		0.11	0.13	SW846 7471A	mg/kg
6/9/2006	U		U		U		U		U		U		0.12		U		U		U		0.11		0.11	0.13	SW846 7471A	mg/kg
1/11/2007	U		U		U		U		U		U		U		U		U		U		U		0.11	0.13	SW846 7471A	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		U		U		U		0.11	0.13	SW846 7471A	mg/kg
1/8/2008	U		U		U		U		U		U		0.34		U		U		U		U		0.11	0.13	SW846 7471A	mg/kg
Methylene chloride					*CAS #: 75-09-2*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U	A	0.005	380	SW846 8260B	mg/kg
6/9/2006	U		U		U		U		U	A	U		U		U		U		U		U		0.005	380	SW846 8260B	mg/kg
1/11/2007	U		U		U		U		U		U		U		U	J	U		U	J	U		0.005	380	SW846 8260B	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		U		U		U		0.005	380	SW846 8260B	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.005	380	SW846 8260B	mg/kg
Naphthalene					*CAS #: 91-20-3*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	20000	SW846 8270C	mg/kg
6/9/2006	U		U		U		U		U		U		U		U		U		U		U		0.4	20000	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		U		U		U		0.4	20000	SW846 8270C	mg/kg
6/18/2007	U	J	U	J	U	J	U		U		U	J	U	J	U		U		U	J	U		0.4	20000	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.4	20000	SW846 8270C	mg/kg
Nickel					*CAS #: 7440-02-0*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		330	20000	SW846 6010B	mg/kg
6/9/2006	U		U		U		U		U		U		U		U		U		U		U		330	20000	SW846 6010B	mg/kg
1/11/2007	U		U		U		U		U		U		U		U		U		U		U		330	20000	SW846 6010B	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		U		U		U		330	20000	SW846 6010B	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		330	20000	SW846 6010B	mg/kg
Nitrobenzene					*CAS #: 98-95-3*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.25	510	SW846 8330	mg/kg
6/9/2006	U		U		U		U		U		U		U		U		U		U		U		0.25	510	SW846 8330	mg/kg
1/11/2007	U		U		U		U		U		U		U		U		U		U		U		0.25	510	SW846 8330	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		U		U		U		0.25	510	SW846 8330	mg/kg
1/8/2008	0.43		1.1		2		2.5		0.53		0.46		0.61	J	0.91		0.34		0.79		0.45		0.25	510	SW846 8330	mg/kg

See last page of this report for definitions.

Draper Aden Associates
Engineering ◆ Surveying ◆ Environmental Services

Table 2A - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit .
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	PAD-1	Q	PAD-2	Q	PAD-3	Q	PAD-4	Q	PAD-5	Q	PAD-6	Q	PAD-7	Q	PAD-8	Q	POND-1	Q	SB-1	Q	SB-2	Q	QL/RL	Action Limit	Method	Unit
Nitroglycerin					*CAS #: 55-63-0*																					
11/17/2005	U		2.8		U		20		U		26		U		U		U		U		U		2.5	200	SW846 8332	mg/kg
6/9/2006	U		3		U		49		U		7.7		U		U		U		U		U		2.5	200	SW846 8332	mg/kg
1/11/2007	17		U		U		U		34		100		U		U		U		U		U		2.5	200	SW846 8332	mg/kg
6/18/2007	U		U		U		5.5		U		8.1		5.7		U		U		U		U		2.5	200	SW846 8332	mg/kg
1/8/2008	U		U		U		6.5		U		U		3.2		5.2		U		U		U		2.5	200	SW846 8332	mg/kg
N-Nitrosodiphenylamine					*CAS #: 86-30-6*																					
11/17/2005	3.5		U		U		U		U		U		U		U		U		U		U		1.6	26000	SW846 8270C	mg/kg
6/9/2006	U		U		U		U		U		U		U		U		U		U		U		1.6	26000	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		U		U		U		1.6	26000	SW846 8270C	mg/kg
6/18/2007	U	J	U	J	U	J	U		U		U	J	U	J	U		U		U	J	U		1.6	26000	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.4	26000	SW846 8270C	mg/kg
Phenol					*CAS #: 108-95-2*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	310000	SW846 8270C	mg/kg
6/9/2006	U		U		U		U		U		U		U		U		U		U		U		0.4	310000	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		U		U		U		0.4	310000	SW846 8270C	mg/kg
6/18/2007	U	J	U	J	U	J	U		U		U	J	U	J	U		U		U	J	U		0.4	310000	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.4	310000	SW846 8270C	mg/kg
Pyrene					*CAS #: 129-00-0*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	31000	SW846 8270C	mg/kg
6/9/2006	U		U		U		U		U		U		U		U		U		U		U		0.4	31000	SW846 8270C	mg/kg
1/11/2007	U		U		U		U	J	U		U		U		U		U		U		U		0.4	31000	SW846 8270C	mg/kg
6/18/2007	U	J	U	J	U	J	U		U		U	J	U	J	U		U		U	J	U		0.4	31000	SW846 8270C	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.4	31000	SW846 8270C	mg/kg
RDX					*CAS #: 121-82-4*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.5	26	SW846 8330	mg/kg
6/9/2006	U		U		U		U		U		U		U		U		U		U		U		0.5	26	SW846 8330	mg/kg
1/11/2007	U		U		U		1.2		U		U		U		U		U		U		U		0.5	26	SW846 8330	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		U		U		U		0.5	26	SW846 8330	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.5	26	SW846 8330	mg/kg
Selenium					*CAS #: 7782-49-2*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.6	5100	SW846 6010B	mg/kg
6/9/2006	U		U		U		U		U		U		U		U		U		U		U		0.6	5100	SW846 6010B	mg/kg
1/11/2007	U		U		U		U		U		U		U		U		U		U		U		0.6	5100	SW846 6010B	mg/kg
6/18/2007	U		U		0.69		U		U		0.73		U		U		1.3		1.2		1.3		0.6	5100	SW846 6010B	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.6	5100	SW846 6010B	mg/kg

See last page of this report for definitions.

Table 2A - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit .
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	PAD-1	Q	PAD-2	Q	PAD-3	Q	PAD-4	Q	PAD-5	Q	PAD-6	Q	PAD-7	Q	PAD-8	Q	POND-1	Q	SB-1	Q	SB-2	Q	QL/RL	Action Limit	Method	Unit
Silver					CAS #: 7440-22-4																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		1	5100	SW846 6010B	mg/kg
6/9/2006	U		U		U		U		U		U		U		U		U		U		U		1	5100	SW846 6010B	mg/kg
1/11/2007	U		U		U		U		U		U		U		U		U		U		U		1	5100	SW846 6010B	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		U		U		U		1	5100	SW846 6010B	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		1	5100	SW846 6010B	mg/kg
Tetrachloroethene					CAS #: 127-18-4																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U	A	0.005	5.3	SW846 8260B	mg/kg
6/9/2006	U		U		U		U		U	A	U		U		U		U		U	A	U		0.005	5.3	SW846 8260B	mg/kg
1/11/2007	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	0.005	5.3	SW846 8260B	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		U		U		U		0.005	5.3	SW846 8260B	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.005	5.3	SW846 8260B	mg/kg
Tetryl					CAS #: 479-45-8																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.65	10000	SW846 8330	mg/kg
6/9/2006	U		U		U		U		U		U		U		U		U		U		U		0.65	10000	SW846 8330	mg/kg
1/11/2007	U		U		U		U		U		U		U		U		U		U		U		0.65	10000	SW846 8330	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		U		U		U		0.65	10000	SW846 8330	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.65	10000	SW846 8330	mg/kg
Toluene					CAS #: 108-88-3																					
11/17/2005	U		U		U		0.011		U		U		U		U		U		U		U		0.005	200000	SW846 8260B	mg/kg
6/9/2006	U		U		U		U		U	A	U		U		U		U		U		U		0.005	200000	SW846 8260B	mg/kg
1/11/2007	U		U		U		U		U		U		U		U	J	U		U	J	U		0.005	200000	SW846 8260B	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		U		U		U		0.005	200000	SW846 8260B	mg/kg
1/8/2008	0.007		U		U		U		U		U		U		U		U		U		U		0.005	200000	SW846 8260B	mg/kg
TPH (as Diesel)					CAS #: Q797																					
11/17/2005	59		-		-		49		-		-		27		-		-		-		-		50	11000	SW846 8015B	mg/kg
6/9/2006	U		-		-		U		-		-		U		-		-		-		-		50	11000	SW846 8015B	mg/kg
1/11/2007	12		-		-		23		-		-		24		-		-		-		-		10	11000	SW846 8015B	mg/kg
6/18/2007	14	J	-		-		20	J	-		-		20	J	-		-		-		-		10	11000	SW846 8015B	mg/kg
1/8/2008	42		-		-		20		-		-		U		-		-		-		-		10	11000	SW846 8015B	mg/kg
Trichloroethene					CAS #: 79-01-6																					
11/17/2005	0.0072		U		U		U		U		U		U		U		U		U		U	A	0.005	7.2	SW846 8260B	mg/kg
6/9/2006	U		U		U		U		U	A	U		U		U		U		U	A	U		0.005	7.2	SW846 8260B	mg/kg
1/11/2007	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	0.005	7.2	SW846 8260B	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		U		U		U		0.005	7.2	SW846 8260B	mg/kg
1/8/2008	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	0.005	7.2	SW846 8260B	mg/kg

See last page of this report for definitions.

Table 2A - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit .
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	PAD-1	Q	PAD-2	Q	PAD-3	Q	PAD-4	Q	PAD-5	Q	PAD-6	Q	PAD-7	Q	PAD-8	Q	POND-1	Q	SB-1	Q	SB-2	Q	QL/RL	Action Limit	Method	Unit
Vinyl chloride					CAS #: 75-01-4																					
11/17/2005	U		U		U		U		U		U		U		U		U		U	A	U	A	0.005	4	SW846 8260B	mg/kg
6/9/2006	U		U		U		U		U	A	U		U		U		U		U	A	U		0.005	4	SW846 8260B	mg/kg
1/11/2007	U		U		U		U		U		U		U		U	J	U		U	J	U		0.005	4	SW846 8260B	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		U		U		U		0.005	4	SW846 8260B	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		0.005	4	SW846 8260B	mg/kg
Zinc					CAS #: 7440-66-6																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		2500	310000	SW846 6010B	mg/kg
6/9/2006	U		U		U		U		U		U		U		U		U		U		U		2500	310000	SW846 6010B	mg/kg
1/11/2007	U		U		U		U		U		U		U		U		U		U		U		2500	310000	SW846 6010B	mg/kg
6/18/2007	U		U		U		U		U		U		U		U		U		U		U		2500	310000	SW846 6010B	mg/kg
1/8/2008	U		U		U		U		U		U		U		U		U		U		U		2500	310000	SW846 6010B	mg/kg

Definitions: QL Denotes limit of quantitation. **RL** Denotes reporting limit. **Q** Denotes data validation qualifier. **U** Denotes analyte not detected at or above QL/RL. **UA** Denotes analyte not detected at or above adjusted sample QL/RL. **J** Denotes analyte reported at or above QL/RL and associated result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not **detected** at or above QL/RL and QL/RL is estimated**.** When used with "UA" (i.e., "**UAJ**"), denotes analyte not detected at or above adjusted QL/RL and adjusted QL/RL is estimated. **R** Denotes result rejected. (-) Denotes not sampled. Action limit obtained from Permit (09/05) -Attachment 1II.C-23 and -24- OBG Soil Monitoring Program. Results for Method 8290 Dioxin/Furan submitted as a separate report.

See last page of this report for definitions.

Table 2B - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit.
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	BG-1A	Q	BG-1B	Q	BG-1C	Q	BG-1D	Q	BG-2A	Q	BG-2B	Q	BG-2C	Q	BG-2D	Q	NB-1	Q	NB-2	Q	BERM-1	Q	QL/RL	Action Limit	Method	Unit
1,1-Dichloroethene					*CAS #: 75-35-4*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.005	51000	SW846 8260B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U	A	U		U		0.005	51000	SW846 8260B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U	J	U		U	J	0.005	51000	SW846 8260B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U	J	U	J	U		0.005	51000	SW846 8260B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U	J	U	J	U	J	0.005	51000	SW846 8260B	mg/kg
1,2-Dichloroethane					*CAS #: 107-06-2*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.005	31	SW846 8260B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U	A	U		U		0.005	31	SW846 8260B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U	J	U		U	J	0.005	31	SW846 8260B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U	J	U	J	U		0.005	31	SW846 8260B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.005	31	SW846 8260B	mg/kg
1,3,5-Trinitrobenzene					*CAS #: 99-35-4*																					
11/17/2005	-		-		-		-		-		-		-		-		U		U		U		0.25	31000	SW846 8330	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U		0.25	31000	SW846 8330	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.25	31000	SW846 8330	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U		U		0.25	31000	SW846 8330	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.25	31000	SW846 8330	mg/kg
1,3-Dinitrobenzene					*CAS #: 99-65-0*																					
11/17/2005	-		-		-		-		-		-		-		-		U		U		U		0.25	100	SW846 8330	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U		0.25	100	SW846 8330	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.25	100	SW846 8330	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U		U		0.25	100	SW846 8330	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.25	100	SW846 8330	mg/kg
2,4,6-Trinitrotoluene					*CAS #: 118-96-7*																					
11/17/2005	-		-		-		-		-		-		-		-		U		U		0.51		0.25	95	SW846 8330	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		0.85		0.25	95	SW846 8330	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		1.2		0.25	95	SW846 8330	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U		1		0.25	95	SW846 8330	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		0.43		0.25	95	SW846 8330	mg/kg
2,4-Dichlorophenol					*CAS #: 120-83-2*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	3100	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U	A	0.4	3100	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.4	3100	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	U	J	0.4	3100	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.4	3100	SW846 8270C	mg/kg

Table 2B - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit.
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	BG-1A	Q	BG-1B	Q	BG-1C	Q	BG-1D	Q	BG-2A	Q	BG-2B	Q	BG-2C	Q	BG-2D	Q	NB-1	Q	NB-2	Q	BERM-1	Q	QL/RL	Action Limit	Method	Unit
2,4-Dinitrotoluene					*CAS #: 121-14-2*																					
11/17/2005	-		-		-		-		-		-		-		-		U		U		0.25		0.25	2000	SW846 8330	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		0.42		U		U		0.25	2000	SW846 8330	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		0.82		U		0.3		0.25	2000	SW846 8330	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U		U		0.25	2000	SW846 8330	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.25	2000	SW846 8330	mg/kg
2,6-Dinitrotoluene					*CAS #: 606-20-2*																					
11/17/2005	-		-		-		-		-		-		-		-		U		U		U		0.25	1000	SW846 8330	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U		0.25	1000	SW846 8330	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.25	1000	SW846 8330	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U		U		0.25	1000	SW846 8330	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.25	1000	SW846 8330	mg/kg
2-Amino-4,6-dinitrotoluene					*CAS #: 35572-78-2*																					
11/17/2005	-		-		-		-		-		-		-		-		U		U		U		0.25	2000	SW846 8330	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		0.46		0.25	2000	SW846 8330	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		1.2		0.25	2000	SW846 8330	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U		0.27		0.25	2000	SW846 8330	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.25	2000	SW846 8330	mg/kg
2-Chlorophenol					*CAS #: 95-57-8*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	5100	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U	A	0.4	5100	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.4	5100	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	U	J	0.4	5100	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.4	5100	SW846 8270C	mg/kg
2-Nitrotoluene					*CAS #: 88-72-2*																					
11/17/2005	-		-		-		-		-		-		-		-		U		U		U		0.25	12	SW846 8330	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U		0.25	12	SW846 8330	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.25	12	SW846 8330	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U		U		0.25	12	SW846 8330	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.25	12	SW846 8330	mg/kg
3,3'-Dimethylbenzidine					*CAS #: 119-93-7*																					
1/8/2008	-		-		-		-		-		-		-		-		U	J	U	J	U	J	2		SW846 8270C	mg/kg

See last page of this report for definitions.

Table 2B - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit.
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	BG-1A	Q	BG-1B	Q	BG-1C	Q	BG-1D	Q	BG-2A	Q	BG-2B	Q	BG-2C	Q	BG-2D	Q	NB-1	Q	NB-2	Q	BERM-1	Q	QL/RL	Action Limit	Method	Unit
3-Methylphenol					*CAS #: 108-39-4*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	51000	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U	A	0.4	51000	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.4	51000	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	U	J	0.4	51000	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.4	51000	SW846 8270C	mg/kg
3-Nitrotoluene					*CAS #: 99-08-1*																					
11/17/2005	-		-		-		-		-		-		-		-		U		U		U		0.25	20000	SW846 8330	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U		0.25	20000	SW846 8330	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.25	20000	SW846 8330	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U		U		0.25	20000	SW846 8330	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.25	20000	SW846 8330	mg/kg
4-Amino-2,6-dinitrotoluene					*CAS #: 19406-51-0*																					
11/17/2005	-		-		-		-		-		-		-		-		U		U		U		0.25	2000	SW846 8330	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		0.72		0.25	2000	SW846 8330	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		1.1		0.25	2000	SW846 8330	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U		0.29		0.25	2000	SW846 8330	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.25	2000	SW846 8330	mg/kg
4-Methylphenol					*CAS #: 106-44-5*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	5100	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U	A	0.4	5100	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.4	5100	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	U	J	0.4	5100	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.4	5100	SW846 8270C	mg/kg
4-Nitrophenol					*CAS #: 100-02-7*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		2	7	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U	A	2	7	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		2	7	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	U	J	2	7	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		2	7	SW846 8270C	mg/kg
4-Nitrotoluene					*CAS #: 99-99-0*																					
11/17/2005	-		-		-		-		-		-		-		-		U		U		U		0.25	170	SW846 8330	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U		0.25	170	SW846 8330	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.25	170	SW846 8330	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U		U		0.25	170	SW846 8330	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.25	170	SW846 8330	mg/kg

Table 2B - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit.
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	BG-1A	Q	BG-1B	Q	BG-1C	Q	BG-1D	Q	BG-2A	Q	BG-2B	Q	BG-2C	Q	BG-2D	Q	NB-1	Q	NB-2	Q	BERM-1	Q	QL/RL	Action Limit	Method	Unit
Acetophenone					*CAS #: 98-86-2*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	100000	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U	A	0.4	100000	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.4	100000	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	U	J	0.4	100000	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.4	100000	SW846 8270C	mg/kg
Antimony					*CAS #: 7440-36-0*																					
11/17/2005	-		-		-		-		-		-		-		-		U		U		U		0.5	410	SW846 6010B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U		0.5	410	SW846 6010B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		6	410	SW846 6010B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U	J	U	J	U	J	6	410	SW846 6010B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U	J	U	J	U	J	6	410	SW846 6010B	mg/kg
Arsenic					*CAS #: 7440-38-2*																					
11/17/2005	-		-		-		-		-		-		-		-		2.5		1.4		1.7		1	16	SW846 6010B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		2		1.5		1.7		1	16	SW846 6010B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		2.7		1.9		2.6		1	16	SW846 6010B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		2.1		1.8		1.2		1	16	SW846 6010B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		2.3		U		1.4		1	16	SW846 6010B	mg/kg
Barium					*CAS #: 7440-39-3*																					
11/17/2005	-		-		-		-		-		-		-		-		129		97.7		143		20	72000	SW846 6010B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		130		110		107		20	72000	SW846 6010B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		162		95.8		126		20	72000	SW846 6010B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		125		91.4		92.1		20	72000	SW846 6010B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		147		108		91.3		20	72000	SW846 6010B	mg/kg
Benzene					*CAS #: 71-43-2*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.005	52	SW846 8260B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U	A	U		U		0.005	52	SW846 8260B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U	J	U		U	J	0.005	52	SW846 8260B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U	J	U	J	U		0.005	52	SW846 8260B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.005	52	SW846 8260B	mg/kg
Benzo(a)anthracene					*CAS #: 56-55-3*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.38	3.9	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U	A	0.38	3.9	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.4	3.9	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	U	J	0.4	3.9	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.4	3.9	SW846 8270C	mg/kg

Table 2B - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit.
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	BG-1A	Q	BG-1B	Q	BG-1C	Q	BG-1D	Q	BG-2A	Q	BG-2B	Q	BG-2C	Q	BG-2D	Q	NB-1	Q	NB-2	Q	BERM-1	Q	QL/RL	Action Limit	Method	Unit
Benzo(a)pyrene					*CAS #: 50-32-8*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.38	0.39	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U	A	0.38	0.39	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.4	0.39	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	U	J	0.4	0.39	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U	J	U	J	U		0.4	0.39	SW846 8270C	mg/kg
Benzo(b)fluoranthene					*CAS #: 205-99-2*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.38	3.9	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U	A	0.38	3.9	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.4	3.9	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	U	J	0.4	3.9	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U	J	U	J	U		0.4	3.9	SW846 8270C	mg/kg
Benzo(k)fluoranthene					*CAS #: 207-08-9*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.38	39	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U	A	0.38	39	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.4	39	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	U	J	0.4	39	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U	J	U	J	U		0.4	39	SW846 8270C	mg/kg
Benzoic acid					*CAS #: 65-85-0*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		2	4100000	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U	A	2	4100000	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		2	4100000	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	U	J	2	4100000	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		2	4100000	SW846 8270C	mg/kg
Benzyl chloride					*CAS #: 100-44-7*																					
1/8/2008	-		-		-		-		-		-		-		-		U	J	U	J	U	J	0.005		SW846 8260B	mg/kg
bis(2-Ethylhexyl) phthalate					*CAS #: 117-81-7*																					
11/17/2005	U		U		U		U		U		U		U		U		0.69		1.5		0.63		0.4	200	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U		0.4	200	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		0.64		U		U		0.4	200	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		1.9		1.1	J	U	J	0.4	200	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		2.1		1.5		U		0.4	200	SW846 8270C	mg/kg

Draper Aden Associates
Engineering ◆ Surveying ◆ Environmental Services

Table 2B - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit.
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	BG-1A	Q	BG-1B	Q	BG-1C	Q	BG-1D	Q	BG-2A	Q	BG-2B	Q	BG-2C	Q	BG-2D	Q	NB-1	Q	NB-2	Q	BERM-1	Q	QL/RL	Action Limit	Method	Unit
Bromomethane					*CAS #: 74-83-9*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.005	15	SW846 8260B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		0.019		U		0.005	15	SW846 8260B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		0.0064	J	U		U	J	0.005	15	SW846 8260B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		0.0086	J	0.0063	J	0.0065		0.005	15	SW846 8260B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.01	15	SW846 8260B	mg/kg
Butyl benzyl phthalate					*CAS #: 85-68-7*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	200000	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U	A	0.4	200000	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.4	200000	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	U	J	0.4	200000	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.4	200000	SW846 8270C	mg/kg
Cadmium					*CAS #: 7440-43-9*																					
11/17/2005	-		-		-		-		-		-		-		-		U		U		U		0.5	510	SW846 6010B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U		0.5	510	SW846 6010B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.5	510	SW846 6010B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U		U		0.5	510	SW846 6010B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.5	510	SW846 6010B	mg/kg
Carbon tetrachloride					*CAS #: 56-23-5*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.005	22	SW846 8260B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U	A	U		U		0.005	22	SW846 8260B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U	J	U	J	U	J	0.005	22	SW846 8260B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U	J	U	J	U		0.005	22	SW846 8260B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U	J	U	J	U	J	0.005	22	SW846 8260B	mg/kg
Chlorobenzene					*CAS #: 108-90-7*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.005	20000	SW846 8260B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U	A	U		U		0.005	20000	SW846 8260B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U	J	U		U	J	0.005	20000	SW846 8260B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U	J	U	J	U		0.005	20000	SW846 8260B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.005	20000	SW846 8260B	mg/kg
Chloroform					*CAS #: 67-66-3*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.005	10000	SW846 8260B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U	A	U		U		0.005	10000	SW846 8260B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U	J	U		U	J	0.005	10000	SW846 8260B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U	J	U	J	U		0.005	10000	SW846 8260B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.005	10000	SW846 8260B	mg/kg

Table 2B - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit.
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	BG-1A	Q	BG-1B	Q	BG-1C	Q	BG-1D	Q	BG-2A	Q	BG-2B	Q	BG-2C	Q	BG-2D	Q	NB-1	Q	NB-2	Q	BERM-1	Q	QL/RL	Action Limit	Method	Unit
Chloromethane					*CAS #: 74-87-3*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.005	6	SW846 8260B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U	A	U		U		0.005	6	SW846 8260B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U	J	U		U	J	0.005	6	SW846 8260B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U	J	U	J	U		0.005	6	SW846 8260B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.01	6	SW846 8260B	mg/kg
Chromium					*CAS #: 7440-47-3*																					
11/17/2005	-		-		-		-		-		-		-		-		17.1		11.4		17.9		1	3100	SW846 6010B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		15.5		11.6		14.9		1	3100	SW846 6010B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		17.2		12.6		15.4		1	3100	SW846 6010B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		15.3		15		15.6		1	3100	SW846 6010B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		19.3		11.8		16.4		1	3100	SW846 6010B	mg/kg
Dibenz(a,h)anthracene					*CAS #: 53-70-3*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	0.39	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U	A	0.4	0.39	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.4	0.39	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	U	J	0.4	0.39	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U	J	U	J	U		0.4	0.39	SW846 8270C	mg/kg
Dibenzofuran					*CAS #: 132-64-9*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	2000	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U	A	0.4	2000	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.4	2000	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	U	J	0.4	2000	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.4	2000	SW846 8270C	mg/kg
Diethyl phthalate					*CAS #: 84-66-2*																					
11/17/2005	U		U		U		U		U		U		U		U		0.79		0.7		U		0.4	820000	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		0.43		0.37		0.89		0.4	820000	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		0.73		0.42		5.2		0.4	820000	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	0.63	J	0.4	820000	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		0.84		0.43		U		0.4	820000	SW846 8270C	mg/kg
Dimethyl phthalate					*CAS #: 131-11-3*																					
11/17/2005	U		U		U		U		U		U		U		U		1.1		U		U		0.4	10000000	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U	A	0.4	10000000	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.4	10000000	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	U	J	0.4	10000000	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		0.48		0.62		U		0.4	10000000	SW846 8270C	mg/kg

Table 2B - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit.
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	BG-1A	Q	BG-1B	Q	BG-1C	Q	BG-1D	Q	BG-2A	Q	BG-2B	Q	BG-2C	Q	BG-2D	Q	NB-1	Q	NB-2	Q	BERM-1	Q	QL/RL	Action Limit	Method	Unit
Di-n-butyl phthalate					*CAS #: 84-74-2*																					
11/17/2005	U		U		U		U		U		U		U		U		0.48		1.1		U		0.4	100000	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U		0.4	100000	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		0.75		U		1.6		0.4	100000	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	0.46	J	0.4	100000	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.4	100000	SW846 8270C	mg/kg
Di-n-octyl phthalate					*CAS #: 117-84-0*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	41000	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U	A	0.4	41000	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.4	41000	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	U	J	0.4	41000	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U	J	U	J	U		0.4	41000	SW846 8270C	mg/kg
Fluoranthene					*CAS #: 206-44-0*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	41000	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U	A	0.4	41000	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.4	41000	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	U	J	0.4	41000	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.4	41000	SW846 8270C	mg/kg
Hexachloroethane					*CAS #: 67-72-1*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	200	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U	A	0.4	200	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.4	200	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	U	J	0.4	200	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.4	200	SW846 8270C	mg/kg
HMX					*CAS #: 2691-41-0*																					
11/17/2005	-		-		-		-		-		-		-		-		U		U		U		2.2	51000	SW846 8330	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U		2.2	51000	SW846 8330	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.5	51000	SW846 8330	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U		U		0.5	51000	SW846 8330	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.5	51000	SW846 8330	mg/kg
Indeno(1,2,3-cd)pyrene					*CAS #: 193-39-5*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	3.9	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U	A	0.4	3.9	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.4	3.9	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	U	J	0.4	3.9	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U	J	U	J	U		0.4	3.9	SW846 8270C	mg/kg

Table 2B - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit.
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	BG-1A	Q	BG-1B	Q	BG-1C	Q	BG-1D	Q	BG-2A	Q	BG-2B	Q	BG-2C	Q	BG-2D	Q	NB-1	Q	NB-2	Q	BERM-1	Q	QL/RL	Action Limit	Method	Unit
Lead					CAS #: 7439-92-1																					
11/17/2005	-		-		-		-		-		-		-		-		219		208		98.1		3	800	SW846 6010B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		170		235		367		3	800	SW846 6010B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		190		118		164		0.3	800	SW846 6010B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		222	J	144	J	103	J	0.3	800	SW846 6010B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		181		179		105		0.3	800	SW846 6010B	mg/kg
Mercury					CAS #: 7439-97-6																					
11/17/2005	-		-		-		-		-		-		-		-		U		U		U		0.11	0.13	SW846 7471A	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U		0.11	0.13	SW846 7471A	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.11	0.13	SW846 7471A	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U		U		0.11	0.13	SW846 7471A	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.11	0.13	SW846 7471A	mg/kg
Methylene chloride					CAS #: 75-09-2																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.005	380	SW846 8260B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U		0.005	380	SW846 8260B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U	J	U		U	J	0.005	380	SW846 8260B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U	J	U	J	U		0.005	380	SW846 8260B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.005	380	SW846 8260B	mg/kg
Naphthalene					CAS #: 91-20-3																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	20000	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U		0.4	20000	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.4	20000	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	U	J	0.4	20000	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.4	20000	SW846 8270C	mg/kg
Nickel					CAS #: 7440-02-0																					
11/17/2005	-		-		-		-		-		-		-		-		U		U		U		330	20000	SW846 6010B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U		330	20000	SW846 6010B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		330	20000	SW846 6010B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U		U		330	20000	SW846 6010B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		330	20000	SW846 6010B	mg/kg
Nitrobenzene					CAS #: 98-95-3																					
11/17/2005	-		-		-		-		-		-		-		-		U		U		U		0.25	510	SW846 8330	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U		0.25	510	SW846 8330	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.25	510	SW846 8330	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U		U		0.25	510	SW846 8330	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		0.99		1.3		0.34		0.25	510	SW846 8330	mg/kg

Table 2B - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit.
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	BG-1A	Q	BG-1B	Q	BG-1C	Q	BG-1D	Q	BG-2A	Q	BG-2B	Q	BG-2C	Q	BG-2D	Q	NB-1	Q	NB-2	Q	BERM-1	Q	QL/RL	Action Limit	Method	Unit
Nitroglycerin					*CAS #: 55-63-0*																					
11/17/2005	-		-		-		-		-		-		-		-		U		U		U		2.5	200	SW846 8332	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		3.2		2.5	200	SW846 8332	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		3.9		2.5	200	SW846 8332	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U		U		2.5	200	SW846 8332	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		2.5	200	SW846 8332	mg/kg
N-Nitrosodiphenylamine					*CAS #: 86-30-6*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		1.6	26000	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		1.8		1.6	26000	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		1.9		1.6	26000	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	U	J	1.6	26000	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.4	26000	SW846 8270C	mg/kg
Phenol					*CAS #: 108-95-2*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	310000	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U		0.4	310000	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.4	310000	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	U	J	0.4	310000	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.4	310000	SW846 8270C	mg/kg
Pyrene					*CAS #: 129-00-0*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.4	31000	SW846 8270C	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U		0.4	31000	SW846 8270C	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.4	31000	SW846 8270C	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U	J	U	J	0.4	31000	SW846 8270C	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.4	31000	SW846 8270C	mg/kg
RDX					*CAS #: 121-82-4*																					
11/17/2005	-		-		-		-		-		-		-		-		U		U		U		0.5	26	SW846 8330	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U		0.5	26	SW846 8330	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.5	26	SW846 8330	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U		U		0.5	26	SW846 8330	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.5	26	SW846 8330	mg/kg
Selenium					*CAS #: 7782-49-2*																					
11/17/2005	-		-		-		-		-		-		-		-		U		U		U		0.6	5100	SW846 6010B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U		0.6	5100	SW846 6010B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.6	5100	SW846 6010B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		1.1		0.84		0.75		0.6	5100	SW846 6010B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.6	5100	SW846 6010B	mg/kg

See last page of this report for definitions.

Table 2B - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit.
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	BG-1A	Q	BG-1B	Q	BG-1C	Q	BG-1D	Q	BG-2A	Q	BG-2B	Q	BG-2C	Q	BG-2D	Q	NB-1	Q	NB-2	Q	BERM-1	Q	QL/RL	Action Limit	Method	Unit
Silver					*CAS #: 7440-22-4*																					
11/17/2005	-		-		-		-		-		-		-		-		U		U		U		1	5100	SW846 6010B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U		1	5100	SW846 6010B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		1	5100	SW846 6010B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U		U		1	5100	SW846 6010B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		1	5100	SW846 6010B	mg/kg
Tetrachloroethene					*CAS #: 127-18-4*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.005	5.3	SW846 8260B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U	A	U		U		0.005	5.3	SW846 8260B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U	J	U	J	U	J	0.005	5.3	SW846 8260B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U	J	U	J	U		0.005	5.3	SW846 8260B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.005	5.3	SW846 8260B	mg/kg
Tetryl					*CAS #: 479-45-8*																					
11/17/2005	-		-		-		-		-		-		-		-		U		U		U		0.65	10000	SW846 8330	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U		0.65	10000	SW846 8330	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		0.65	10000	SW846 8330	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U		U		0.65	10000	SW846 8330	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.65	10000	SW846 8330	mg/kg
Toluene					*CAS #: 108-88-3*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.005	200000	SW846 8260B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U	A	U		U		0.005	200000	SW846 8260B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U	J	U		U	J	0.005	200000	SW846 8260B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U	J	U	J	U		0.005	200000	SW846 8260B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.005	200000	SW846 8260B	mg/kg
TPH (as Diesel)					*CAS #: Q797*																					
11/17/2005	-		-		-		-		-		-		-		-		-		-		-		50	11000	SW846 8015B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		-		-		-		50	11000	SW846 8015B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		-		-		-		10	11000	SW846 8015B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		-		-		-		10	11000	SW846 8015B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		-		-		-		10	11000	SW846 8015B	mg/kg
Trichloroethene					*CAS #: 79-01-6*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.005	7.2	SW846 8260B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U	A	U		U		0.005	7.2	SW846 8260B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U	J	U	J	0.012	J	0.005	7.2	SW846 8260B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U	J	U	J	U		0.005	7.2	SW846 8260B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U	J	U	J	U	J	0.005	7.2	SW846 8260B	mg/kg

Table 2B - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit.
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	BG-1A	Q	BG-1B	Q	BG-1C	Q	BG-1D	Q	BG-2A	Q	BG-2B	Q	BG-2C	Q	BG-2D	Q	NB-1	Q	NB-2	Q	BERM-1	Q	QL/RL	Action Limit	Method	Unit
Vinyl chloride					*CAS #: 75-01-4*																					
11/17/2005	U		U		U		U		U		U		U		U		U		U		U		0.005	4	SW846 8260B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U	A	U		U		0.005	4	SW846 8260B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U	J	U		U	J	0.005	4	SW846 8260B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U	J	U	J	U		0.005	4	SW846 8260B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		0.005	4	SW846 8260B	mg/kg
Zinc					*CAS #: 7440-66-6*																					
11/17/2005	-		-		-		-		-		-		-		-		U		U		U		2500	310000	SW846 6010B	mg/kg
6/9/2006	-		-		-		-		-		-		-		-		U		U		U		2500	310000	SW846 6010B	mg/kg
1/11/2007	-		-		-		-		-		-		-		-		U		U		U		2500	310000	SW846 6010B	mg/kg
6/18/2007	-		-		-		-		-		-		-		-		U		U		U		2500	310000	SW846 6010B	mg/kg
1/8/2008	-		-		-		-		-		-		-		-		U		U		U		2500	310000	SW846 6010B	mg/kg

Definitions: QL Denotes limit of quantitation. **RL** Detones reporting limit. **Q** Denotes data validation qualifier. **U** Denotes analyte not detected at or above QL/RL. **UA** Denotes analyte not detected at or above adjusted sample QL/RL. **J** Denotes analyte reported at or above QL/RL and associated result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not **detected** at or above QL/RL and QL/RL is estimated**.** When used with "UA" (i.e., "**UAJ**"), denotes analyte not detected at or above adjusted QL/RL and adjusted QL/RL is estimated. **R** Denotes result rejected. (-) Denotes not sampled. Action limit obtained from Permit (09/05) -Attachment 1II.C-23 and -24- OBG Soil Monitoring Program.

Table 3A - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit .
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	PAD-1	Q	PAD-2	Q	PAD-3	Q	PAD-4	Q	PAD-5	Q	PAD-6	Q	PAD-7	Q	PAD-8	Q	POND-1	Q	SB-1	Q	SB-2	Q	QL/RL	Action Limit	Method	Unit
Acetophenone					CAS #: 98-86-2																					
11/24/2008	U		U		U		U		U	A	U	A	U		U		U		U		U		0.4	100000	SW846 8270C	mg/kg
Antimony					CAS #: 7440-36-0																					
11/24/2008	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	1	J	U	J	6	410	SW846 6010B	mg/kg
Arsenic					CAS #: 7440-38-2																					
11/24/2008	U		2.4		1.1		7.3		U		1.4		1.1		2.2		2.6		3.9		8.3		1	15.8	SW846 6010B	mg/kg
Barium					CAS #: 7440-39-3																					
11/24/2008	75.4		113		37.1		101		26.8		70.7		74.6		125		120		147		247		20	190000	SW846 6010B	mg/kg
Benzene					CAS #: 71-43-2																					
11/24/2008	U		U		U		U		U		U	J	U		U		U		U		U		0.005	5.6	SW846 8260B	mg/kg
Benzo(a)anthracene					CAS #: 56-55-3																					
11/24/2008	U		U		U		U		U	A	U	A	U		U		U		U		U		0.4	2.1	SW846 8270C	mg/kg
Benzo(a)pyrene					CAS #: 50-32-8																					
11/24/2008	U		U	J	U		U		U	A	U	JA	U		U		U		U		U		0.02	0.21	SW846 8270C	mg/kg
Benzo(b)fluoranthene					CAS #: 205-99-2																					
11/24/2008	U		U	J	U		U		U	A	U	JA	U		U		U		U		U		0.4	2.1	SW846 8270C	mg/kg
Benzo(k)fluoranthene					CAS #: 207-08-9																					
11/24/2008	U		U	J	U		U		U	A	U	JA	U		U		U		U		U		0.4	21	SW846 8270C	mg/kg
Benzoic acid					CAS #: 65-85-0																					
11/24/2008	U	J	U	J	U	J	U		U	AJ	U	AJ	U	J	U	J	U		U		U		2	2500000	SW846 8270C	mg/kg
Benzyl Chloride					CAS #: 100-44-7																					
11/24/2008	U	J	U		U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	10	17	SW846 8260B	mg/kg
bis(2-Ethylhexyl) phthalate					CAS #: 117-81-7																					
11/24/2008	U		U		U		U		U	A	U	A	U		U		U		U		U		0.4	120	SW846 8270C	mg/kg
Bromomethane					CAS #: 74-83-9																					
11/24/2008	U		U		U		U		U		U	J	U		U		U		U		U		0.005	35	SW846 8260B	mg/kg
Butyl benzyl phthalate					CAS #: 85-68-7																					
11/24/2008	U		U		U		U		U	A	U	A	U		U		U		U		U		0.4	910	SW846 8270C	mg/kg
Cadmium					CAS #: 7440-43-9																					
11/24/2008	2.1		0.61		U		U		U		U		U		U		U		U		0.77		0.5	810	SW846 6010B	mg/kg
Carbon tetrachloride					CAS #: 56-23-5																					
11/24/2008	U		U		U		U		U		U	J	U		U		U		U		U		0.005	1.3	SW846 8260B	mg/kg
Chlorobenzene					CAS #: 108-90-7																					
11/24/2008	U		U		U		U		U		U	J	U		U		U		U		U		0.005	1500	SW846 8260B	mg/kg
Chloroform					CAS #: 67-66-3																					
11/24/2008	U		U		U		U		U		U	J	U		U		U		U		U		0.005	1.5	SW846 8260B	mg/kg

See last page of this report for definitions.

Table 3A - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit .
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	PAD-1	Q	PAD-2	Q	PAD-3	Q	PAD-4	Q	PAD-5	Q	PAD-6	Q	PAD-7	Q	PAD-8	Q	POND-1	Q	SB-1	Q	SB-2	Q	QL/RL	Action Limit	Method	Unit
Chloromethane					CAS #: 74-87-3																					
11/24/2008	U		U		U		U		U		U	J	U		U		U		U		U		0.005	8.4	SW846 8260B	mg/kg
Chromium					CAS #: 7440-47-3																					
11/24/2008	18.9		15.6		8.3		15.2		6.6		18.7		11.1		11.8		18.6		25.7		19.5		1	1400	SW846 6010B	mg/kg
Dibenz(a,h)anthracene					CAS #: 53-70-3																					
11/24/2008	U		U	J	U		U		U	A	U	JA	U		U		U		U		U		0.02	0.21	SW846 8270C	mg/kg
Dibenzofuran					CAS #: 132-64-9																					
11/24/2008	U		U		U		U		U	A	U	A	U		U		U		U		U		0.4	2000	SW846 8270C	mg/kg
Diethyl phthalate					CAS #: 84-66-2																					
11/24/2008	U		U		U		0.44		U	A	6		U		U		U		U		U		0.4	490000	SW846 8270C	mg/kg
Dimethyl phthalate					CAS #: 131-11-3																					
11/24/2008	U		U		U		0.81		U	A	U	A	U		U		U		U		U		0.4	10000000	SW846 8270C	mg/kg
Di-n-butyl phthalate					CAS #: 84-74-2																					
11/24/2008	U		0.54		U		0.88		U	A	7.6		U		U		0.82		U		U		0.4	62000	SW846 8270C	mg/kg
Di-n-octyl phthalate					CAS #: 117-84-0																					
11/24/2008	U		U	J	U		U		U	A	U	JA	U		U		U		U		U		0.4	41000	SW846 8270C	mg/kg
Fluoranthene					CAS #: 206-44-0																					
11/24/2008	U		U		U		U		U	A	U	A	U		U		U		U		U		0.4	22000	SW846 8270C	mg/kg
Hexachloroethane					CAS #: 67-72-1																					
11/24/2008	U		U		U		U		U	A	U	A	U		U		U		U		U		0.05	120	SW846 8270C	mg/kg
HMX					CAS #: 2691-41-0																					
11/24/2008	U		U		U		U		U		U		U		U		U		U		U		0.5	49000	SW846 8330	mg/kg
Indeno(1,2,3-cd)pyrene					CAS #: 193-39-5																					
11/24/2008	U		U	J	U		U		U	A	U	JA	U		U		U		U		U		0.4	2.1	SW846 8270C	mg/kg
Lead					CAS #: 7439-92-1																					
11/24/2008	359		382		363		346		163		792		221		239		256		93.9		188		0.3	800	SW846 6010B	mg/kg
Mercury					CAS #: 7439-97-6																					
11/24/2008	U	J	U	J	U	J	U	J	U	J	0.12	J	U	J	U	J	U		U		U		0.11	28	SW846 7471A	mg/kg
Methylene chloride					CAS #: 75-09-2																					
11/24/2008	U		U		U		U		U		U		U		U		U		U		U		0.005	54	SW846 8260B	mg/kg
Naphthalene					CAS #: 91-20-3																					
11/24/2008	U		U		U		U		U	A	U	A	U		U		U		U		U		0.4	20	SW846 8270C	mg/kg
Nickel					CAS #: 7440-02-0																					
11/24/2008	U		U		U		U		U		U		U		U		U		U		U		330	20000	SW846 6010B	mg/kg
Nitrobenzene					CAS #: 98-95-3																					
11/24/2008	U		U		U		U		U		U		U		U		U		U		U		0.25	280	SW846 8330	mg/kg

See last page of this report for definitions.

Draper Aden Associates
Engineering ◆ Surveying ◆ Environmental Services

Table 3A - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit . Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	PAD-1	Q	PAD-2	Q	PAD-3	Q	PAD-4	Q	PAD-5	Q	PAD-6	Q	PAD-7	Q	PAD-8	Q	POND-1	Q	SB-1	Q	SB-2	Q	QL/RL	Action Limit	Method	Unit
Nitroglycerin					*CAS #: 55-63-0*																					
11/24/2008	U		U		U		5.1		U		30		U	J	U		3.9		U		U		2.5	62	SW846 8332	mg/kg
N-Nitrosodiphenylamine					*CAS #: 86-30-6*																					
11/24/2008	U		U		U		0.61		U	A	U	A	U		U		U		U		U		0.4	15000	SW846 8270C	mg/kg
Phenol					*CAS #: 108-95-2*																					
11/24/2008	U		U		U		U		U	A	U	A	U		U		U		U		U		0.4	180000	SW846 8270C	mg/kg
Pyrene					*CAS #: 129-00-0*																					
11/24/2008	U		U		U		U		U	A	U	A	U		U		U		U		U		0.4	17000	SW846 8270C	mg/kg
RDX					*CAS #: 121-82-4*																					
11/24/2008	U		U		U		0.53		U		U		U		U		U		U		U		0.5	24	SW846 8330	mg/kg
Selenium					*CAS #: 7782-49-2*																					
11/24/2008	U		U		U		U		U		U		U		U		U		U		0.69		0.6	5100	SW846 6010B	mg/kg
Silver					*CAS #: 7440-22-4*																					
11/24/2008	U		U		U		U		U		U		U		U		U		U		U		1	5100	SW846 6010B	mg/kg
Tetrachloroethene					*CAS #: 127-18-4*																					
11/24/2008	U		U		U		U		U		U	J	U		U		U		U		U		0.005	2.7	SW846 8260B	mg/kg
Tetryl					*CAS #: 479-45-8*																					
11/24/2008	U		U		U		U		U		U		U		U		U		U		U		0.65	2500	SW846 8330	mg/kg
Toluene					*CAS #: 108-88-3*																					
11/24/2008	U		0.011		U		U		U		U	J	U		U		U		U		U		0.005	46000	SW846 8260B	mg/kg
TPH (as Diesel)					*CAS #: Q797*																					
11/24/2008	17		-		-		46		-		-		28		-		-		-		-		11	11000	SW846 8015B	mg/kg
Trichloroethene					*CAS #: 79-01-6*																					
11/24/2008	U		U		U		U		U		U	J	U		U		U		U		U		0.005	14	SW846 8260B	mg/kg
Vinyl chloride					*CAS #: 75-01-4*																					
11/24/2008	U		U		U		U		U		U	J	U		U		U		U		U		0.005	1.7	SW846 8260B	mg/kg
Zinc					*CAS #: 7440-66-6*																					
11/24/2008	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U	J	U		U		U		2500	310000	SW846 6010B	mg/kg

Definitions: **QL** Denotes limit of quantitation. **RL** Denotes reporting limit. **Q** Denotes data validation qualifier. **U** Denotes analyte not detected at or above QL/RL. **UA** Denotes analyte not detected at or above adjusted sample QL/RL. **J** Denotes analyte reported at or above QL/RL and associated result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not **detected** at or above QL/RL and QL/RL is estimated. When used with "UA" (i.e., "**UAJ**"), denotes analyte not detected at or above adjusted QL/RL and adjusted QL/RL is estimated. **R** Denotes result rejected. (-) Denotes not sampled. Action limit obtained from permit modification approved December 18, 2008. Results for Method 8290 Dioxin/Furan submitted as a separate report.

See last page of this report for definitions.

Table 3B - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit.
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	BG-1A	Q	BG-1B	Q	BG-1C	Q	BG-1D	Q	BG-2A	Q	BG-2B	Q	BG-2C	Q	BG-2D	Q	NB-1	Q	NB-2	Q	BERM-1	Q	QL/RL	Action Limit	Method	Unit
1,1-Dichloroethene					CAS #: 75-35-4																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U	A	0.005	1100	SW846 8260B	mg/kg
1,2-Dichloroethane					CAS #: 107-06-2																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U	A	0.005	2.2	SW846 8260B	mg/kg
1,3,5-Trinitrobenzene					CAS #: 99-35-4																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U		0.25	27000	SW846 8330	mg/kg
1,3-Dinitrobenzene					CAS #: 99-65-0																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U		0.25	62	SW846 8330	mg/kg
2,4,6-Trinitrotoluene					CAS #: 118-96-7																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		1.2		0.25	79	SW846 8330	mg/kg
2,4-Dichlorophenol					CAS #: 120-83-2																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U		U		0.4	1800	SW846 8270C	mg/kg
2,4-Dinitrotoluene					CAS #: 121-14-2																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		0.33		0.25	1200	SW846 8330	mg/kg
2,6-Dinitrotoluene					CAS #: 606-20-2																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U		0.25	620	SW846 8330	mg/kg
2-Amino-4,6-dinitrotoluene					CAS #: 35572-78-2																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U		0.25	2000	SW846 8330	mg/kg
2-Chlorophenol					CAS #: 95-57-8																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U		U		0.4	5100	SW846 8270C	mg/kg
2-Nitrotoluene					CAS #: 88-72-2																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U		0.25	13	SW846 8330	mg/kg
3,3'-Dimethylbenzidine					CAS #: 119-93-7																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U		U		2	0.16	SW846 8270C	mg/kg
3-Methylphenol					CAS #: 108-39-4																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U		U		0.4	31000	SW846 8270C	mg/kg
3-Nitrotoluene					CAS #: 99-08-1																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U		0.25	12000	SW846 8330	mg/kg
4-Amino-2,6-dinitrotoluene					CAS #: 19406-51-0																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U		0.25	1900	SW846 8330	mg/kg
4-Methylphenol					CAS #: 106-44-5																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U		U		0.4	3100	SW846 8270C	mg/kg
4-Nitrophenol					CAS #: 100-02-7																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U		U		2	7	SW846 8270C	mg/kg
4-Nitrotoluene					CAS #: 99-99-0																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U		0.25	110	SW846 8330	mg/kg

See last page of this report for definitions.

Draper Aden Associates
Engineering ◆ Surveying ◆ Environmental Services

Table 3B - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit.
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	BG-1A	Q	BG-1B	Q	BG-1C	Q	BG-1D	Q	BG-2A	Q	BG-2B	Q	BG-2C	Q	BG-2D	Q	NB-1	Q	NB-2	Q	BERM-1	Q	QL/RL	Action Limit	Method	Unit
Acetophenone					*CAS #: 98-86-2*																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U		U		0.4	100000	SW846 8270C	mg/kg
Antimony					*CAS #: 7440-36-0*																					
11/24/2008	-		-		-		-		-		-		-		-		U	J	U	J	U	J	6	410	SW846 6010B	mg/kg
Arsenic					*CAS #: 7440-38-2*																					
11/24/2008	-		-		-		-		-		-		-		-		2.3		1.5		1.9		1	15.8	SW846 6010B	mg/kg
Barium					*CAS #: 7440-39-3*																					
11/24/2008	-		-		-		-		-		-		-		-		135		99.6		98.2		20	190000	SW846 6010B	mg/kg
Benzene					*CAS #: 71-43-2*																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U	A	0.005	5.6	SW846 8260B	mg/kg
Benzo(a)anthracene					*CAS #: 56-55-3*																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U		U		0.4	2.1	SW846 8270C	mg/kg
Benzo(a)pyrene					*CAS #: 50-32-8*																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U	J	U		0.02	0.21	SW846 8270C	mg/kg
Benzo(b)fluoranthene					*CAS #: 205-99-2*																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U	J	U		0.4	2.1	SW846 8270C	mg/kg
Benzo(k)fluoranthene					*CAS #: 207-08-9*																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U	J	U		0.4	21	SW846 8270C	mg/kg
Benzoic acid					*CAS #: 65-85-0*																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U		U		2	2500000	SW846 8270C	mg/kg
Benzyl Chloride					*CAS #: 100-44-7*																					
11/24/2008	-		-		-		-		-		-		-		-		U	J	U	J	U	A J	10	17	SW846 8260B	mg/kg
bis(2-Ethylhexyl) phthalate					*CAS #: 117-81-7*																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U		U		0.4	120	SW846 8270C	mg/kg
Bromomethane					*CAS #: 74-83-9*																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U	A	0.005	35	SW846 8260B	mg/kg
Butyl benzyl phthalate					*CAS #: 85-68-7*																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U		U		0.4	910	SW846 8270C	mg/kg
Cadmium					*CAS #: 7440-43-9*																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U		0.5	810	SW846 6010B	mg/kg
Carbon tetrachloride					*CAS #: 56-23-5*																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U	A	0.005	1.3	SW846 8260B	mg/kg
Chlorobenzene					*CAS #: 108-90-7*																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U	A	0.005	1500	SW846 8260B	mg/kg
Chloroform					*CAS #: 67-66-3*																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U	A	0.005	1.5	SW846 8260B	mg/kg

See last page of this report for definitions.

Table 3B - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit.
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	BG-1A	Q	BG-1B	Q	BG-1C	Q	BG-1D	Q	BG-2A	Q	BG-2B	Q	BG-2C	Q	BG-2D	Q	NB-1	Q	NB-2	Q	BERM-1	Q	QL/RL	Action Limit	Method	Unit
Chloromethane					CAS #: 74-87-3																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U	A	0.005	8.4	SW846 8260B	mg/kg
Chromium					CAS #: 7440-47-3																					
11/24/2008	-		-		-		-		-		-		-		-		18.2		12.7		15.9		1	1400	SW846 6010B	mg/kg
Dibenz(a,h)anthracene					CAS #: 53-70-3																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U	J	U		0.02	0.21	SW846 8270C	mg/kg
Dibenzofuran					CAS #: 132-64-9																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U		U		0.4	2000	SW846 8270C	mg/kg
Diethyl phthalate					CAS #: 84-66-2																					
11/24/2008	-		-		-		-		-		-		-		-		2		0.69		0.73		0.4	490000	SW846 8270C	mg/kg
Dimethyl phthalate					CAS #: 131-11-3																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	0.39		U		0.4	10000000	SW846 8270C	mg/kg
Di-n-butyl phthalate					CAS #: 84-74-2																					
11/24/2008	-		-		-		-		-		-		-		-		0.91		U		0.83		0.4	62000	SW846 8270C	mg/kg
Di-n-octyl phthalate					CAS #: 117-84-0																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U	J	U		0.4	41000	SW846 8270C	mg/kg
Fluoranthene					CAS #: 206-44-0																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U		U		0.4	22000	SW846 8270C	mg/kg
Hexachloroethane					CAS #: 67-72-1																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U		U		0.05	120	SW846 8270C	mg/kg
HMX					CAS #: 2691-41-0																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U		0.5	49000	SW846 8330	mg/kg
Indeno(1,2,3-cd)pyrene					CAS #: 193-39-5																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U	J	U		0.4	2.1	SW846 8270C	mg/kg
Lead					CAS #: 7439-92-1																					
11/24/2008	-		-		-		-		-		-		-		-		251		203		131		0.3	800	SW846 6010B	mg/kg
Mercury					CAS #: 7439-97-6																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U		0.11	28	SW846 7471A	mg/kg
Methylene chloride					CAS #: 75-09-2																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U	A	0.005	54	SW846 8260B	mg/kg
Naphthalene					CAS #: 91-20-3																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U		U		0.4	20	SW846 8270C	mg/kg
Nickel					CAS #: 7440-02-0																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U		330	20000	SW846 6010B	mg/kg
Nitrobenzene					CAS #: 98-95-3																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U		0.25	280	SW846 8330	mg/kg

See last page of this report for definitions.

Table 3B - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit.
Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	BG-1A	Q	BG-1B	Q	BG-1C	Q	BG-1D	Q	BG-2A	Q	BG-2B	Q	BG-2C	Q	BG-2D	Q	NB-1	Q	NB-2	Q	BERM-1	Q	QL/RL	Action Limit	Method	Unit
Nitroglycerin					CAS #: 55-63-0																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U		2.5	62	SW846 8332	mg/kg
N-Nitrosodiphenylamine					CAS #: 86-30-6																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U		U		0.4	15000	SW846 8270C	mg/kg
Phenol					CAS #: 108-95-2																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U		U		0.4	180000	SW846 8270C	mg/kg
Pyrene					CAS #: 129-00-0																					
11/24/2008	-		-		-		-		-		-		-		-		U	A	U		U		0.4	17000	SW846 8270C	mg/kg
RDX					CAS #: 121-82-4																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U		0.5	24	SW846 8330	mg/kg
Selenium					CAS #: 7782-49-2																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U		0.6	5100	SW846 6010B	mg/kg
Silver					CAS #: 7440-22-4																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U		1	5100	SW846 6010B	mg/kg
Tetrachloroethene					CAS #: 127-18-4																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U	A	0.005	2.7	SW846 8260B	mg/kg
Tetryl					CAS #: 479-45-8																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U		0.65	2500	SW846 8330	mg/kg
Toluene					CAS #: 108-88-3																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U	A	0.005	46000	SW846 8260B	mg/kg
TPH (as Diesel)					CAS #: Q797																					
11/24/2008	-		-		-		-		-		-		-		-		-		-		-		11	11000	SW846 8015B	mg/kg
Trichloroethene					CAS #: 79-01-6																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U	A	0.005	14	SW846 8260B	mg/kg
Vinyl chloride					CAS #: 75-01-4																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U	A	0.005	1.7	SW846 8260B	mg/kg
Zinc					CAS #: 7440-66-6																					
11/24/2008	-		-		-		-		-		-		-		-		U		U		U		2500	310000	SW846 6010B	mg/kg

Definitions: **QL** Denotes limit of quantitation. **RL** Detones reporting limit. **Q** Denotes data validation qualifier. **U** Denotes analyte not detected at or above QL/RL. **UA** Denotes analyte not detected at or above adjusted sample QL/RL. **J** Denotes analyte reported at or above QL/RL and associated result is estimated. When used with "U" (i.e., "UJ"), denotes analyte not **detected** at or above QL/RL and QL/RL is estimated. When used with "UA" (i.e., "**UAJ**"), denotes analyte not detected at or above adjusted QL/RL and adjusted QL/RL is estimated. **R** Denotes result rejected. (-) Denotes not sampled. Action limit obtained from permit modification approved December 18, 2008.

See last page of this report for definitions.

Table 3A - Summary of Analytical Results for Soil Samples Above the Permit Reporting Limit . Open Burning Ground - Soil Monitoring Program

All Results Reported on a Dry Weight Basis

Event Date	PAD-1	Q	PAD-2	Q	PAD-3	Q	PAD-4	Q	PAD-5	Q	PAD-6	Q	PAD-7	Q	PAD-8	Q	POND-1	Q	SB-1	Q	SB-2	Q	QL/RL	Action Limit	Method	Unit
1,1-Dichloroethene					*CAS #: 75-35-4*																					
11/24/2008	U		U		U		U		U		U	J	U		U		U		U		U		0.005	1100	SW846 8260B	mg/kg
1,2-Dichloroethane					*CAS #: 107-06-2*																					
11/24/2008	U		U		U		U		U		U	J	U		U		U		U		U		0.005	2.2	SW846 8260B	mg/kg
1,3,5-Trinitrobenzene					*CAS #: 99-35-4*																					
11/24/2008	U		0.51		2.1		U		U		U		U		U		U		U		U		0.25	27000	SW846 8330	mg/kg
1,3-Dinitrobenzene					*CAS #: 99-65-0*																					
11/24/2008	U		U		U		U		U		U		U		U		U		U		U		0.25	62	SW846 8330	mg/kg
2,4,6-Trinitrotoluene					*CAS #: 118-96-7*																					
11/24/2008	U		1.5		2.1		0.4		U		1.7		U		0.42		2		U		U		0.25	79	SW846 8330	mg/kg
2,4-Dichlorophenol					*CAS #: 120-83-2*																					
11/24/2008	U		U		U		U		U	A	U	A	U		U		U		U		U		0.4	1800	SW846 8270C	mg/kg
2,4-Dinitrotoluene					*CAS #: 121-14-2*																					
11/24/2008	U		0.57		U		U		0.62		1.3		U		U		0.42		U		U		0.25	1200	SW846 8330	mg/kg
2,6-Dinitrotoluene					*CAS #: 606-20-2*																					
11/24/2008	U		0.49		U		U		U		U		U		U		U		U		U		0.25	620	SW846 8330	mg/kg
2-Amino-4,6-dinitrotoluene					*CAS #: 35572-78-2*																					
11/24/2008	U		0.48		U		U		U		U		U		U		U		U		U		0.25	2000	SW846 8330	mg/kg
2-Chlorophenol					*CAS #: 95-57-8*																					
11/24/2008	U		U		U		U		U	A	U	A	U		U		U		U		U		0.4	5100	SW846 8270C	mg/kg
2-Nitrotoluene					*CAS #: 88-72-2*																					
11/24/2008	U		U		U		U		U		U		U		U		U		U		U		0.25	13	SW846 8330	mg/kg
3,3'-Dimethylbenzidine					*CAS #: 119-93-7*																					
11/24/2008	U		U		U		U		U	A	U	A	U		U		U		U		U		2	0.16	SW846 8270C	mg/kg
3-Methylphenol					*CAS #: 108-39-4*																					
11/24/2008	U		U		U		U		U	A	U	A	U		U		U		U		U		0.4	31000	SW846 8270C	mg/kg
3-Nitrotoluene					*CAS #: 99-08-1*																					
11/24/2008	U		U		U		U		U		U		U		U		U		U		U		0.25	12000	SW846 8330	mg/kg
4-Amino-2,6-dinitrotoluene					*CAS #: 19406-51-0*																					
11/24/2008	U		0.58		U		U		U		U		U		U		0.28		U		U		0.25	1900	SW846 8330	mg/kg
4-Methylphenol					*CAS #: 106-44-5*																					
11/24/2008	U		U		U		U		U	A	U	A	U		U		U		U		U		0.4	3100	SW846 8270C	mg/kg
4-Nitrophenol					*CAS #: 100-02-7*																					
11/24/2008	U		U		U		U		U	A	U	A	U		U		U		U		U		2	7	SW846 8270C	mg/kg
4-Nitrotoluene					*CAS #: 99-99-0*																					
11/24/2008	U		U		U		U		U		U		U		U		U		U		U		0.25	110	SW846 8330	mg/kg

See last page of this report for definitions.

Table 4A
Method 8290 Dioxin/Furan Results - January 2008 Event
2,3,7,8 - TCDD Toxicity Equivalent Quotient (TEQ)
Radford Facility AAP, Open Burning Ground Soil Monitoring Program
All results presented in ng/kg =pg/g

Action Level: TEQ >16 ng/kg, pg/g (Region IX)
Action Level: TEQ >19 ng/kg, pg/g (Region III)

Sample Location ID		PAD-1				PAD-2				PAD-3				PAD-4			
Depth		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches	
Constituent	TEF	Flag	Flag	Result		Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ
1,2,3,4,6,7,8-HpCDD	0.01			23	0.23			22	0.22			20	0.2			20	0.2
1,2,3,4,6,7,8-HpCDF	0.01			6.3	0.063		U	ND			U	ND		J	U	4	
1,2,3,4,7,8,9-HpCDF	0.01	J	U	1.0			U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDD	0.1	JQ	U	1.4			U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDF	0.1	J	U	4.5			U	ND			U	ND		J	U	4.2	
1,2,3,6,7,8-HxCDD	0.1	JQ	U	4.2			U	ND			U	ND			U	ND	
1,2,3,6,7,8-HxCDF	0.1	J	U	3.9			U	ND			U	ND			U	ND	
1,2,3,7,8,9-HxCDD	0.1	JQ	U	3.3			U	ND			U	ND			U	ND	
1,2,3,7,8,9-HxCDF	0.1		U	ND			U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDD	1	JQ	U	1.3			U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDF	0.03	J	U	3.9			U	ND			U	ND		J	U	4.3	
2,3,4,6,7,8-HxCDF	0.1	J	U	2.1			U	ND			U	ND			U	ND	
2,3,4,7,8-PeCDF	0.3	J	U	4.9			U	ND			U	ND		J	U	4.8	
2,3,7,8-TCDD	1		U	ND			U	ND			U	ND			U	ND	
2,3,7,8-TCDF	0.1			7	0.7		U	ND			U	ND				6.5	0.65
OCDD	0.0003			120	0.036			650	0.195			490	0.147			210	0.063
OCDF	0.0003	J	U	5.1			U	ND			U	ND		J	U	6.6	
2,3,7,8 Toxicity Equivalence (TEQ) ng/kg					***1.029***				***0.415***				***0.347***				***0.913***

Sample Location ID		PAD-5				PAD-6				PAD-7				PAD-8			
Depth		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches	
Constituent	TEF	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ
1,2,3,4,6,7,8-HpCDD	0.01			18	0.18		J	33	0.33			80	0.8			89	0.89
1,2,3,4,6,7,8-HpCDF	0.01		U	ND		J	J	4.7				16	0.16			19	0.19
1,2,3,4,7,8,9-HpCDF	0.01		U	ND			J	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDD	0.1		U	ND			J	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDF	0.1		U	ND			J	ND		J	J	4.7			U	ND	
1,2,3,6,7,8-HxCDD	0.1		U	ND			J	ND		J	J	4.1		JA	JA	5.4	
1,2,3,6,7,8-HxCDF	0.1		U	ND			J	ND			U	ND			U	ND	
1,2,3,7,8,9-HxCDD	0.1		U	ND			J	ND		J	J	3.6		J	J	4.5	
1,2,3,7,8,9-HxCDF	0.1		U	ND			J	ND			U	ND			U	ND	
1,2,3,7,8-PeCDD	1		U	ND			J	ND			U	ND			U	ND	
1,2,3,7,8-PeCDF	0.03		U	ND			J	ND			U	ND			U	ND	
2,3,4,6,7,8-HxCDF	0.1		U	ND			J	ND			U	ND			U	ND	
2,3,4,7,8-PeCDF	0.3		U	ND			J	ND		J	J	3.4			U	ND	
2,3,7,8-TCDD	1		U	ND			J	ND			U	ND		JA	JA	1.3	
2,3,7,8-TCDF	0.1	J	U	0.64		J	J	1.3				2.8	0.28			2.6	0.26
OCDD	0.0003			140	0.042		J	320	0.096			710	0.213			1100	0.33
OCDF	0.0003		U	ND		J	J	11				26	0.0078			75	0.0225
2,3,7,8 Toxicity Equivalence (TEQ) ng/kg					***0.222***		J		***0.6063***				***1.4608***				***1.6925***

Sample Location ID		POND-1				SB-1				SB-2				PAD-X			
Depth		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches	
Constituent	TEF	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ
1,2,3,4,6,7,8-HpCDD	0.01			11	0.11			43	0.43			50	0.5			71	0.71
1,2,3,4,6,7,8-HpCDF	0.01	ND	U	ND				7.8	0.078	JA	JA	6				17	0.17
1,2,3,4,7,8,9-HpCDF	0.01		U	ND			U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDD	0.1		U	ND			U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDF	0.1		U	ND			U	ND			U	ND				5.9	0.59
1,2,3,6,7,8-HxCDD	0.1		U	ND			U	ND			U	ND		J	J	3.9	
1,2,3,6,7,8-HxCDF	0.1		U	ND			U	ND			U	ND		J	J	4.3	
1,2,3,7,8,9-HxCDD	0.1		U	ND			U	ND			U	ND		J	J	4.6	
1,2,3,7,8,9-HxCDF	0.1		U	ND			U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDD	1		U	ND			U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDF	0.03		U	ND			U	ND			U	ND		J	J	4.2	
2,3,4,6,7,8-HxCDF	0.1		U	ND			U	ND			U	ND		J	J	3	
2,3,4,7,8-PeCDF	0.3		U	ND			U	ND			U	ND				6.4	1.92
2,3,7,8-TCDD	1		U	ND			U	ND			U	ND			U	ND	
2,3,7,8-TCDF	0.1		U	ND				0.73	0.073		U	ND				4.4	0.44
OCDD	0.0003			630	0.189			1900	0.57			2200	0.66			680	0.204
OCDF	0.0003		U	ND		J	J	9.7				26	0.0078			31	0.0093
2,3,7,8 Toxicity Equivalence (TEQ) ng/kg					***0.299***				***1.151***				***1.1678***				***4.0433***

Sample Location ID		BERM-1				NB-1				NB-2			
Depth		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches	
Constituent	TEF	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ
1,2,3,4,6,7,8-HpCDD	0.01			31	0.31			33	0.33			9.1	0.091
1,2,3,4,6,7,8-HpCDF	0.01	JA	JA	4.2				7.5	0.075		U	ND	
1,2,3,4,7,8,9-HpCDF	0.01		U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDD	0.1		U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDF	0.1		U	ND			U	ND			U	ND	
1,2,3,6,7,8-HxCDD	0.1		U	ND			U	ND			U	ND	
1,2,3,6,7,8-HxCDF	0.1		U	ND			U	ND			U	ND	
1,2,3,7,8,9-HxCDD	0.1		U	ND			U	ND			U	ND	
1,2,3,7,8,9-HxCDF	0.1		U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDD	1		U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDF	0.03		U	ND			U	ND			U	ND	
2,3,4,6,7,8-HxCDF	0.1		U	ND			U	ND			U	ND	
2,3,4,7,8-PeCDF	0.3		U	ND			U	ND			U	ND	
2,3,7,8-TCDD	1		U	ND			U	ND			U	ND	
2,3,7,8-TCDF	0.1	JA	JA	0.9				2.1	0.21	JA	JA	0.65	
OCDD	0.0003			440	0.132			500	0.15			180	0.054
OCDF	0.0003	J	J	11				16	0.0048		U	ND	
2,3,7,8 Toxicity Equivalence (TEQ) ng/kg					***0.442***				***0.7698***				***0.145***

Notes: Analytical Method: SW-846 8290 -Test America West Sacramento, unless noted.

TEF Denotes USEPA Region 3 Toxicity Equivalence Factor based on WHO June 2005 values. (See www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/usersguide.htm). TEF factors based on noted reference reflect current research.

2,3,7,8 - TCDD Toxicity Equivalence Quotient (TEQ) ng/kg. Calculated by summing the multiplication of detections by the respective TEF

LOQ/QL-Limit of Quantitation/sample specific reporting limit. See analytical results for sample specific reporting limit.

Data Qualifiers:

U denotes not detected. See certificate of analysis for sample specific estimated detection limit.

J Denotes result reported below LOQ/Quantitation Limit.

JA Denotes result positively identified, but quantitation is estimated.

JQ (laboratory data qualifier) Denotes result estimated maximum possible concentration reported

ND (Laboraory data qualifier) denotes analyte not detected above estimated detection limit and constituent specific TEQ was not calculated.

Verification event performed on 3/25/2008 for PAD-1 (DUP-1). Verification results reported (Test America Knoxville).

PAD-X is a blind duplicate for PAD-7. " Val Flag" denotes data validation data qualifier. "Lab Flag" denotes Laboratory data qualifier.

Table 4B
Method 8290 Dioxin/Furan Results - November 2008 Event
2,3,7,8 - TCDD Toxicity Equivalent Quotient (TEQ)
Radford Facility AAP, Open Burning Ground Soil Monitoring Program
All results presented in ng/kg =pg/g

Action Level: TEQ >16 ng/kg, pg/g (Region IX)
Action Level: TEQ >19 ng/kg, pg/g (Region III)

Sample Location ID		PAD-1				PAD-2				PAD-3				PAD-4			
Depth		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches	
Constituent	TEF	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ
1,2,3,4,6,7,8-HpCDD	0.01		J	38	0.38		J	93	0.93		J	17	0.17		J	62	0.62
1,2,3,4,6,7,8-HpCDF	0.01			6.9	0.069			14	0.14		U	ND				13	0.13
1,2,3,4,7,8,9-HpCDF	0.01		U	ND			U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDD	0.1		U	ND			U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDF	0.1	J	U	5.6		J	U	3.4			U	ND			U	ND	
1,2,3,6,7,8-HxCDD	0.1	J	U	5.1				6.2	0.62		U	ND			U	ND	
1,2,3,6,7,8-HxCDF	0.1	J	U	3.3			U	ND			U	ND			U	ND	
1,2,3,7,8,9-HxCDD	0.1	J	U	5.3				6	0.6		U	ND		J	U	2.9	
1,2,3,7,8,9-HxCDF	0.1		U	ND			U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDD	1		U	ND			U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDF	0.03	J	U	3.8			U	ND			U	ND			U	ND	
2,3,4,6,7,8-HxCDF	0.1		U	ND			U	ND			U	ND			U	ND	
2,3,4,7,8-PeCDF	0.3	J	U	4.9			U	ND			U	ND			U	ND	
2,3,7,8-TCDD	1		U	ND			U	ND			U	ND			U	ND	
2,3,7,8-TCDF	0.1	CON		7.1	0.71	CON		2.2	0.22	CON		1.1	0.11	CON		1.6	0.16
OCDD	0.0003	H	J	300	0.09	H	J	1000	0.3	H	J	260	0.078	H	J	980	0.294
OCDF	0.0003	HJ		8.3		H		30	0.009	H		ND		H		24	0.007
2,3,7,8 Toxicity Equivalence (TEQ) ng/kg			**J**		***1.249***		**J**		***2.819***		**J**		***0.358***		**J**		***1.2112***

Sample Location ID		PAD-5				PAD-6				PAD-7				PAD-8			
Depth		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches	
Constituent	TEF	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ
1,2,3,4,6,7,8-HpCDD	0.01		J	18	0.18		J	100	1		J	26	0.26		J	46	0.46
1,2,3,4,6,7,8-HpCDF	0.01	J	U	5.1				14	0.14	J	U	5.3				8.6	0.086
1,2,3,4,7,8,9-HpCDF	0.01		U	ND			U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDD	0.1		U	ND			U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDF	0.1		U	ND		J	U	3			U	ND			U	ND	
1,2,3,6,7,8-HxCDD	0.1		U	ND		J	U	4.9			U	ND			U	ND	
1,2,3,6,7,8-HxCDF	0.1		U	ND			U	ND			U	ND			U	ND	
1,2,3,7,8,9-HxCDD	0.1		U	ND				5.9	0.59		U	ND			U	ND	
1,2,3,7,8,9-HxCDF	0.1		U	ND			U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDD	1		U	ND			U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDF	0.03		U	ND			U	ND			U	ND			U	ND	
2,3,4,6,7,8-HxCDF	0.1		U	ND			U	ND			U	ND			U	ND	
2,3,4,7,8-PeCDF	0.3		U	ND			U	ND			U	ND			U	ND	
2,3,7,8-TCDD	1		U	ND			U	ND			U	ND				1.5	1.5
2,3,7,8-TCDF	0.1	J CON	U	0.75		CON		2.4	0.24	CON		1.4	0.14	CON		2.5	0.25
OCDD	0.0003	H	J	150	0.045		J	960	0.288		J	260	0.078		J	560	0.168
OCDF	0.0003	HJ	U	7.8				31	0.0093	J	U	8.2				24	0.0072
2,3,7,8 Toxicity Equivalence (TEQ) ng/kg			**J**		***0.225***		**J**		***2.2673***		**J**		***0.478***		**J**		***2.4712***

Sample Location ID		POND-1				SB-1				SB-2				PAD-X			
Depth		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches	
Constituent	TEF	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ
1,2,3,4,6,7,8-HpCDD	0.01		J	230	2.3		J	33	0.33		J	11	0.11		J	27	0.27
1,2,3,4,6,7,8-HpCDF	0.01			38	0.38		U	ND			U	ND			U	4.9	
1,2,3,4,7,8,9-HpCDF	0.01		U	ND			U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDD	0.1	J	U	4.5			U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDF	0.1	JA	U	3			U	ND			U	ND			U	ND	
1,2,3,6,7,8-HxCDD	0.1			14	1.4		U	ND			U	ND			U	ND	
1,2,3,6,7,8-HxCDF	0.1	J	U	3.3			U	ND			U	ND			U	ND	
1,2,3,7,8,9-HxCDD	0.1			10	1		U	ND			U	ND			U	ND	
1,2,3,7,8,9-HxCDF	0.1		U	ND			U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDD	1	J	U	3.1			U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDF	0.03		U	ND			U	ND			U	ND			U	ND	
2,3,4,6,7,8-HxCDF	0.1		U	ND			U	ND			U	ND			U	ND	
2,3,4,7,8-PeCDF	0.3	J	U	3.8			U	ND			U	ND			U	ND	
2,3,7,8-TCDD	1	J	U	0.98			U	ND			U	ND			U	ND	
2,3,7,8-TCDF	0.1	CON		5.7	0.57		U	ND			U	ND		CON		1.2	0.12
OCDD	0.0003		J	2600	0.78		J	1700	0.51		J	770	0.231		J	290	0.087
OCDF	0.0003		J	94	0.0282	J	J	7.7			UJ	ND			U	7.5	
2,3,7,8 Toxicity Equivalence (TEQ) ng/kg			**J**		***6.4582***		**J**		***0.84***		**J**		***0.341***		**J**		***0.477***

Sample Location ID		BERM-1				NB-1				NB-2			
Depth		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches	
Constituent	TEF	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ
1,2,3,4,6,7,8-HpCDD	0.01		J	72	0.72		J	58	0.58		J	34	0.34
1,2,3,4,6,7,8-HpCDF	0.01			11	0.11			14	0.14			6.7	0.067
1,2,3,4,7,8,9-HpCDF	0.01		U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDD	0.1	J	U	5.2			U	ND			U	ND	
1,2,3,4,7,8-HxCDF	0.1		U	ND			U	ND			U	ND	
1,2,3,6,7,8-HxCDD	0.1		U	ND		J	U	3			U	ND	
1,2,3,6,7,8-HxCDF	0.1		U	ND			U	ND			U	ND	
1,2,3,7,8,9-HxCDD	0.1	J	U	3.1			U	ND			U	ND	
1,2,3,7,8,9-HxCDF	0.1		U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDD	1		U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDF	0.03		U	ND			U	ND			U	ND	
2,3,4,6,7,8-HxCDF	0.1		U	ND			U	ND			U	ND	
2,3,4,7,8-PeCDF	0.3		U	ND			U	ND			U	ND	
2,3,7,8-TCDD	1		U	ND			U	ND			U	ND	
2,3,7,8-TCDF	0.1	CON		2.1	0.21	CON		3.8	0.38	CON		2.2	0.22
OCDD	0.0003		J	820	0.246		J	640	0.192		J	350	0.105
OCDF	0.0003		J	28	0.0084		J	30	0.009		J	16	0.0048
2,3,7,8 Toxicity Equivalence (TEQ) ng/kg			**J**		***1.2944***		**J**		***1.301***		**J**		***0.7368***

Notes: Analytical Method: SW-846 8290 -TestAmerica West Sacramento, unless noted.

TEF Denotes USEPA Region 3 Toxicity Equivalence Factor based on WHO June 2005 values. (See www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/usersguide.htm). TEF factors based on noted reference reflect current research.

2,3,7,8 - TCDD Toxicity Equivalence Quotient (TEQ) ng/kg. Calculated by summing the multiplication of detections by the respective TEF

LOQ/QL-Limit of Quantitation/sample specific reporting limit. See analytical results for sample specific reporting limit.

Data Qualifiers:

U denotes not detected. See certificate of analysis for sample specific estimated detection limit.

J Denotes result reported below LOQ/Quantitation Limit.

JA Denotes result positively identified, but quantitation is estimated.

JQ (laboratory data qualifier) Denotes result estimated maximum possible concentration reported.

ND (Laboratory data qualifier) denotes analyte not detected above estimated detection limit and constituent specific TEQ was not calculated.

CON denotes confirmation analysis. H denotes OCDD/F reported from separate analytical analysis.

PAD-X is a blind duplicate for PAD-7.

"Val Flag" denotes data validation data qualifier. "Lab Flag" denotes Laboratory data qualifier.

Table 5 - Analytical Results for Soil Samples – PAD-7 Mercury
Open Burning Ground - Soil Monitoring Program

Sample ID	Result mg/kg	RL mg/kg	Action Limit mg/kg	Updated Action Limit mg/kg
January 7, 2007 Result				
PAD-7	0.3	0.1	0.13	28
March 25, 2008 Result				
PAD-7	0.34	0.1	0.13	28
August 18, 2008 Result (TestAmerica)				
PAD-7 (Center/Original Pt.)	2.2*	0.22	0.13	28
PAD-7 (North)	1.9	0.13	0.13	28
PAD-7 (South)	0.2	0.14	0.13	28
PAD-7 (West)	0.21	0.12	0.13	28
PAD-7 (East II)	U	0.12	0.13	28
August 18, 2008 Result (CompuChem)				
PAD-7 (Center/Original Pt.)	0.34	0.1	0.13	28
PAD-7 (North)	1.1	0.1	0.13	28
PAD-7 (South)	0.12	0.1	0.13	28
PAD-7 (West)	0.18	0.1	0.13	28
PAD-7 (East II)	NA	0.1	0.13	28

Notes:
Original Action Limit based on Facility Wide Background Study. Action Limit was updated by a Class I Permit Modification approved by VDEQ in a letter dated December 18, 2008. Updated Action Limit based on Region 3 Risk-Based Concentrations (RBCs) dated September 12, 2008.
Sample results reported on a dry weight basis.
RL – Reporting Limit. Also may be referenced as Quantitation Limit (QL) or Limit of Quantitation (LOQ).
* – Sample diluted 1:2. The result for the sample duplicate (CompuChem Lab) was 0.3 mg/kg.
U – Mercury was not detected above the RL.
NA – Sample was not analyzed.

APPENDIX D

CONSTITUENTS OF POTENTIAL CONCERN (COPCs) LIST

Table 1: 1 of 2
Identification of Constituents of Potential Concern
Open Burning Ground Soil Monitoring Program
Radford Army Ammunition Plant

Constituent	CASRN	Type of Constituent	In Waste?	Reported in Bang	On GW List	To be Sampled?	Method SW-846	Proposed RL mg/kg	Action Level mg/kg	Source of A.L.
1,2-Dichloroethane	107-06-2	PIC		Yes		Yes	8260B	5.00E-03	3.10E+01	R3 RBC Ind
1,3,5-Trinitrobenzene	99-35-4	PIC		Yes		Yes	8330	2.50E-01	3.10E+04	R3 RBC Ind
2,4,6 - Trinotrotoluene	118-96-7	ENER				Yes	8330	2.50E-01	9.50E+01	R3 RBC Ind
2-amino-4,6-dinitrotoluene	35572-78-2	ENER				Yes	8330	2.50E-01	2.00E+03	R3 RBC Ind
4-amino-2,6-dinitrotoluene	19406-51-0	ENER				Yes	8330	2.50E-01	2.00E+03	R3 RBC Ind
2,4-Dichlorophenol	120-83-2	PIC		Yes	*	Yes	8270C	3.30E-01	3.10E+03	R3 RBC Ind
1,3 Dinitrobenzene	99-65-0	ENER				Yes	8330	2.50E-01	1.00E+02	R3 RBC Ind
2,4 Dinitrotoluene	121-14-2	Both	Yes		Yes	Yes	8330	2.50E-01	2.00E+03	R3 RBC Ind
2,6-Dinitrotoluene	606-20-2	PIC		Yes	Yes	Yes	8330	2.50E-01	1.00E+03	R3 RBC Ind
2-Chlorophenol	95-57-8	PIC		Yes	*	Yes	8270C	3.30E-01	5.10E+03	R3 RBC Ind
3 -Methylphenol	108-39-4	PIC		Yes		Yes	8270C	3.30E-01	5.10E+04	R3 RBC Ind
4-Methylphenol	106-44-5	PIC		Yes		Yes	8270C	3.30E-01	5.10E+03	R3 RBC Ind
2- Nitrotoluene (ortho)	88-72-2	ENER				Yes	8330	2.50E-01	1.20E+01	R3 RBC Ind
3- Nitrotoluene (meta)	99-08-1	ENER				Yes	8330	2.50E-01	2.00E+04	R3 RBC Ind
4- Nitrotoluene (para)	99-99-0	ENER				Yes	8330	2.50E-01	1.70E+02	R3 RBC Ind
3,3-Dimethylbenzidine	119-93-7	PIC		Yes			NCA			
4-Nitrophenol	100-02-7	PIC		Yes		Yes	8270C	1.60E+00	7.00E+00	ECO Risk
Acetophenone	98-86-2	PIC		Yes		Yes	8270C	3.30E-01	1.00E+05	R3 RBC Ind
Arsenic	7440-38-2	Propellant ingredient	Yes		Yes	Yes	6010B	1.00E+00	1.58E+01	FWB
Barium	7440-39-3	Propellant ingredient	Yes	Yes	Yes	Yes	6010B	2.00E+01	7.20E+04	R3 RBC Ind
Benz(a)anthracene	56-55-3	PIC		Yes		Yes	8270C	3.30E-01	3.90E+00	R3 RBC Ind
Benzene	71-43-2	Propellant ingredient	Yes		Yes	Yes	8260B	5.00E-03	5.20E+01	R3 RBC Ind
Benzo(a)pyrene	50-32-8	PIC		Yes		Yes	8270C	3.30E-01	3.90E-01	R3 RBC Ind
Benzo(b)fluoranthene	205-99-2	PIC		Yes		Yes	8270C	3.30E-01	3.90E+00	R3 RBC Ind
Benzo(k)fluoranthene	207-08-9	PIC		Yes		Yes	8270C	3.30E-01	3.90E+01	R3 RBC Ind
Benzyl chloride	100-44-7	PIC		Yes			NCA			
bis (2-Ethylhexyl)phthalate	117-81-7	PIC		Yes		Yes	8270C	3.30E-01	2.00E+02	R3 RBC Ind
Butylbenzyl phthalate	85-68-7	PIC		Yes		Yes	8270C	3.30E-01	2.00E+05	R3 RBC Ind
Cadmium	7440-43-9	PIC		Yes		Yes	6010B	5.00E-01	5.10E+02	R3 RBC Ind
Carbon Tetrachloride	56-23-5	PIC		Yes	Yes	Yes	6010B	5.00E-03	2.20E+01	R3 RBC Ind
Chlorobenzene	108-90-7	Both	Yes	Yes	Yes	Yes	8260B	5.00E-03	2.00E+04	R3 RBC Ind
Chloroform	67-66-3	PIC		Yes		Yes	8260B	5.00E-03	1.00E+04	R3 RBC Ind
Chromium	7740-47-3	PIC		Yes	Yes	Yes	6010B	1.00E+00	3.10E+03	R3 RBC Ind
Dibenz(a,h)anthracene	53-70-3	PIC		Yes		Yes	8270C	3.30E-01	3.90E-01	R3 RBC Ind
Dibutyl phthalate	84-74-2	Propellant ingredient	Yes		Yes	Yes	8270C	3.30E-01	1.00E+05	R3 RBC Ind
Diethylphthalate	84-66-2	Propellant ingredient	Yes			Yes	8270C	3.30E-01	8.20E+05	R3 RBC Ind
Dimethyl phthalate	131-11-3	PIC		Yes		Yes	8270C	3.30E-01	1.00E+07	R3 RBC Ind
Di-n-butyl phthalate	131-11-3	PIC		Yes	Yes	Yes	8270C	3.30E-01	1.00E+05	R3 RBC Ind
Diphenylamine	122-39-4	Both	Yes	Yes	Yes	Yes	8270C	1.60E+00	2.60E+04	R3 RBC Ind
Ethanol	67-56-1	Propellant ingredient	Yes				NCA			
Fluoranthene	206-44-0	PIC		Yes		Yes	8270C	3.30E-01	4.10E+04	R3 RBC Ind
Hexachloroethane	67-72-1	Propellant ingredient	Yes		Yes	Yes	8260B	5.00E-03	2.00E+02	R3 RBC Ind
HMX	2691-41-0	ENER				Yes	8330	2.20E+00	5.10E+04	R3 RBC Ind
Indeno(1,2,3-cd)pyrene	193-39-5	PIC		Yes		Yes	8270C	3.30E-01	3.90E+00	R3 RBC Ind
Lead	7439-92-1	PIC		Yes	Yes	Yes	6010B	3.00E-01	8.00E+02	ALM
Mercury	7439-97-6	Propellant ingredient	Yes		Yes	Yes	6010B	1.00E-01	1.30E-01	FWB
Methyl Bromide (bromomethane)	74-83-9	PIC		Yes		Yes	8260B	5.00E-03	1.50E+01	R3 RBC Ind
Methyl Chloride (Chloromethane)	74-87-3	Both	Yes	Yes	Yes	Yes	8260B	5.00E-03	6.00E+00	R9 PRG Ind
Methylene chloride	75-09-2	Both	Yes	Yes	Yes	Yes	8260B	5.00E-03	3.80E+02	R3 RBC Ind
Naphthalene	91-20-3	PIC		Yes		Yes	8270C	3.30E-01	2.00E+04	R3 RBC Ind
Nitrobenzene	98-95-3	ENER				Yes	8330	2.50E-01	5.10E+02	R3 RBC Ind
Nitrogen Dioxide (peroxide)	10102-44-0	PIC		Yes			NCA			

Constituent	CASRN	Type of Constituent	In Waste?	Reported in Bang	On GW List	To be Sampled?	Method SW-846	Proposed RL mg/kg	Action Level mg/kg	Source of A.L.
Phenol	108-95-2	PIC		Yes	*	Yes	8270C	3.30E-01	3.10E+05	R3 RBC ind
RDX	121-82-4	ENER				Yes	8330	1.00E+00	2.60E+01	R3 RBC ind
Silver	7440-22-4	Propellant ingredient	Yes		Yes	Yes	6010B	1.00E+00	5.10E+03	R3 RBC ind
Selenium	7782-49-2	Background				Yes	6010B	5.00E-01	5.10E+03	R3 RBC ind
Total Petroleum Hydrocarbons - DRO		Site Accelerant				Yes	8015B	1.00E+01	1.10E+04	DEQ gd
Tetrachloroethylene	127-18-4	PIC		Yes		Yes	8260B	5.00E-03	5.30E+00	R3 RBC ind
Tetryl	479-45-8	ENER				Yes	8330	6.50E-01	1.00E+04	R3 RBC ind
Toluene	108-88-3	Both	Yes	Yes	Yes	Yes	8260B	5.00E-03	2.00E+05	R3 RBC ind
Trichloroethylene	79-01-6	PIC		Yes		Yes	8260B	5.00E-03	7.20E+00	R3 RBC ind
Vinyl Chloride	75-01-4	PIC		Yes		Yes	8260B	5.00E-03	4.00E+00	R3 RBC ind
Vinylidene Chloride (1,1, Dichloroethene)	75-35-4	PIC		Yes		Yes	8260B	5.00E-03	5.10E+04	R3 RBC ind
Polychlorinated Dibenzo(p)dioxins and furans										
1,2,3,4,5,7,8,9-Octachlorodibenzo(p)dioxin (OCDD)	3268-87-9	PIC		Yes		Yes	8920	See Note 4		
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	39001-02-0	PIC		Yes		Yes	8920	See Note 4		
1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin (HpCDD)	35822-46-9	PIC		Yes		Yes	8920	See Note 4		
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	67562-39-4	PIC		Yes		Yes	8920	See Note 4		
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	55673-89-7	PIC		Yes		Yes	8920	See Note 4		
1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin (HxCDD)	39227-28-6	PIC		Yes		Yes	8920	See Note 4		
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	70648-26-9	PIC		Yes		Yes	8920	See Note 4		
1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin (HxCDD)	57653-85-7	PIC		Yes		Yes	8920	See Note 4		
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	57117-44-9	PIC		Yes		Yes	8920	See Note 4		
1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin (HxCDD)	19408-74-3	PIC		Yes		Yes	8920	See Note 4		
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	72918-21-9	PIC		Yes		Yes	8920	See Note 4		
1,2,3,7,8-Pentachlorodibenzo(p)dioxin (PeCDD)	40321-76-4	PIC		Yes		Yes	8920	See Note 4		
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	57117-31-4	PIC		Yes		Yes	8920	See Note 4		
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	60851-34-5	PIC		Yes		Yes	8920	See Note 4		
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	57117-31-4	PIC		Yes		Yes	8920	See Note 4		
2,3,7,8-Tetrachlorodibenzo(p)dioxin (TCDD)	1746-01-6	PIC		Yes		Yes	8920	See Note 4		
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	51207-31-9	PIC		Yes		Yes	8920	See Note 4		
*** Constituents to be sampled first 2 semi-annual events (see Section 3.3 of this plan)**										
antimony	7440-36-0	PIC			Yes	* Yes	6010B	1.00E+01	4.10E+02	R3 RBC ind
benzoic acid	65-85-0	Propellant ingredient	Yes			* Yes	8270C	3.30E+00	4.10E+06	R3 RBC ind
dibenzofuran	132-64-9	PIC		Yes		* Yes	8270C	3.30E-01	2.00E+03	R3 RBC ind
di-n-octyl pthalate	117-84-0	PIC				* Yes	8270C	3.30E-01	4.10E+04	R3 RBC ind
nickel	7440-02-0	PIC		Yes		* Yes	6010B	3.30E+02	2.00E+04	R3 RBC ind
nitroglycerin ✓	55-63-0	ENER	Yes		Yes	* Yes	8330	2.50E+00	2.00E+02	R3 RBC ind
pyrene	129-00-0	PIC		Yes		* Yes	8270C	3.30E-01	3.10E+04	R3 RBC ind
zinc	7440-06-66	PIC		Yes		* Yes	6010B	2.50E+03	3.10E+05	R3 RBC ind

NOTES:

1. Type of Constituent -
   - "Propellant Ingredient" = Ingredient in propellant compound
   - "PIC" Product of Incomplete Combustion": means that it was reported in the Bangbox Database (see Appendix A-2)
   - "Both" Both PIC and Propellant Ingredient
   - "ENER" - Energetic on SW-846 Method 8330 parameter List
2. In Waste-
   - "Yes" - means it was reported in Radfords' waste characterization
3. **BOLD** Constituent
   - Constituent not in 40 CFR 261 Appendix VIII List of Hazardous Substances
4. Dioxins
   - Reporting Limit and Action Level will be calculated for each sample and detection, respectively. See Table 2 for example reporting format.
5. NCA
   - Constituent is not analyzed by commercial laboratories
6. Source of Action Levels -
   - **"R3 RBC ind"** - Region III RBC for Industrial Sites - Dated 10/8/2004
   - **"R9 PRG ind"** - Region IX Preliminary Remediation Goals for Industrial Soils - Dated October 2004
   - **"DEQ gd"** - Table 5-5 Soil Saturation Values, Page 5-27 of VDEQ Storage Tank Program Technical Manual, Rev 2, May 3, 1999
   - **"FWB"** - Facility Wide Background Study
   - **"ALM"** is the Adult Lead Methodology (ALM). NHANES III (National Health and Nutrition Evaluation Survey) is a lead study. ALM identifies 800 mg/kg as a screening value and states that it is based on an analysis of the NHANES III study and that it is "a cleanup goal protective of all subpopulations."
   - **"ECO RISK"** - June 23, 2000 EPA memorandum Entitled *Amended Guidance on Ecological Risk Assessment at Military Bases: Process Considerations, Timing of Activities and Inclusion of Stakeholders.*
7. RL and AL
   - "RL" is the laboratory reporting limit and is analogous to the Limit of Quantitation (LOQ). "AL" is the Action Level based on published risk based values.

APPENDIX E

LABORATORY CERTIFICATES OF ANALYSIS AND DATA VALIDATION REPORTS (CD-ROM)

Draper Aden Associates
Engineering • Surveying • Environmental Services
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Data Validation Summary
First Quarter 2008 Soil Monitoring Event

Soil Monitoring Program for the Open Burning Ground (OBG)
Radford Facility Army Ammunition Plant, Radford, Virginia
Permit for the Treatment of Hazardous Waste by Open Burning
EPA ID# VA1210020730

Draper Aden Associates performed comprehensive data validation of the analytical results for the January 2008 soil monitoring event at the Open Burning Ground (OBG) located at the Radford Facility Army Ammunition Plant (RFAAP) in Radford, Virginia.

Results from the January 2008 soil monitoring event were compared to the then current Action Level for each target analyte (constituents) listed Table 1, in Attachment II.C-24 of the operating permit. For the January 2008 monitoring event, mercury was reported above the then current Action Level and subsequent additional monitoring was conducted to further assess the reported mercury detection.

However, a permit modification was submitted to VDEQ in December 2008 to update the Action Levels, where applicable, to the new Action Levels established in the September 2008 Environmental Protection Agency Regional Screening Table developed by Oak Ridge Laboratory. VDEQ approved the requested permit modification on December 18, 2008. Since the Action Level for mercury was revised from 0.13 mg/kg to 28 mg/kg, no further action regarding the reported mercury concentrations in the January 2008 soil monitoring event was required.

The information below summarizes the January 2008 soil monitoring event data validation.

Sample Collection/Analytical Services

Draper Aden Associates of Blacksburg, Virginia collected soil samples during January 7-8, 2008 from sample locations PAD-1 through PAD-8, NB-1, NB-2, SB-1, SB-2, BERM-1 and POND-1.

Samples were submitted for laboratory analysis via overnight courier to TestAmerica North Canton, of North Canton, Ohio. Samples were analyzed for target analytes listed in Table 1 in Attachment II.C-24 of the operating permit. Samples were analyzed for volatiles, semivolatiles, explosives, nitroglycerin, inorganics, mercury and dioxin/furans by SW-846 Methods 8260B/5035, 8270C, 8330, 8332, 6010B, 7471A and 8290, respectively. Samples PAD-1, PAD-4 and PAD-7 were also analyzed for Total Petroleum Hydrocarbons-Diesel Range Organics (TPH-DRO) by Method 8015B. As well, all samples were analyzed for total residue as percent solids by MCAWW 160.3 MOD.

Sample PAD-7 was selected as the blind field sample duplicate and project specific matrix spike and matrix spike duplicate sample for all methods of analysis. The blind sample duplicate

sample identification was PAD-X. A trip blank was submitted for volatile organic analysis (Method 8260B). An equipment blank (water sample) was submitted for inorganic analysis only (Methods 6010B and 7470A).

TestAmerica North Canton submitted select sample aliquots for analysis to TestAmerica Austin, Austin, Texas (Method 8260B), TestAmerica Knoxville of Knoxville, Tennessee (Method 8330 and 8332) and TestAmerica West Sacramento of Sacramento, California (Method 8290). On behalf of Alliant Techsystems Inc., the laboratory submitted the certificate of analysis to Draper Aden Associates for data validation as a single sample delivery group, (SDG) A8A110170.

Monitoring Program Notes

Benzyl chloride was analyzed by SW-846 8260B and 3,3-dimethylbenzidine was analyzed by Method 8270C. Although listed as a target analyte (constituent of concern) on Table 1, Attachment II.C-24, of the operating permit, previously, these target analytes could not be analyzed by the laboratory. The laboratory submitted the method detection limit study for these two target analytes prior to analysis.

The analyst initial demonstration of capability data was not received from the laboratory. According to the laboratory, the information is on file at the laboratory. The omission of this information did not result in data qualification. The information will be requested with future sampling events.

Receipt of Monitoring Event Data

The original certificate of analysis for the event was received on February 22, 2008. Subsequent revisions were received from the laboratory. The revisions were associated with missing supporting documentation.

Verification Events

Verification sampling was conducted on March 25, 2008 to confirm or refute detections of concern reported for the January 2008 monitoring event (lead, mercury and dioxin/furan). The samples were collected in duplicate and submitted as split samples to Test America (Knoxville, North Canton and West Sacramento) and ProChem Analytical, Inc., of Elliston, Virginia. Verification results were less than the respective Action Level, except for mercury reported at PAD-7 above the then current Action Level in place prior to December 2008.

An assessment of horizontal extent of mercury in soil at PAD-7 was conducted on August 18, 2008. The samples were collected in duplicate and submitted as split samples to CompuChem, a Division of Liberty Analytical, Cary, North Carolina and Test America North Canton, North Canton, Ohio.

See the *2008 Annual Soil Monitoring Report* for additional information regarding the verification event and assessment of horizontal extent at PAD-7. As previously noted, in December 2008, VDEQ approved a permit modification revising the Action Level for mercury and no further action regarding reported mercury concentrations was required.

Summary of OBG Soil Sample Locations and Required Analytical Methods

Summary of OBG Soil Sample Locations and Required Analytical Methods

SW-846 Analytical Method	*Sample Location*													
	PAD-1	*PAD-2*	*PAD-3*	*PAD-4*	*PAD-5*	*PAD-6*	*PAD-7/PAD-X*	*PAD-8*	*NB-1*	*NB-2*	*SB-1*	*SB-2*	*BERM-1*	*POND-1*
8260B/5035 Volatiles	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8270C Semivolatiles	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8330 Explosives	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8332 Nitroglycerin	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6010B Inorganics	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7471A Mercury	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8015B –TPH-DRO	X			X			X							
8290 Dioxins/Furans	X	X	X	X	X	X	X	X	X	X	X	X	X	X

The chain of custody and permit required target analytes are provided as an attachment.

Laboratory Analysis

Samples were analyzed by *SW-846 Method requirements (Test Methods for Evaluating Solid Wastes - Physical and Chemical Methods, USEPA SW-846, 3rd edition - Final Update I, II/IIA and III).*

Data Validation

Data were evaluated in general accordance with:

- *Test Methods for Evaluating Solid Wastes - Physical and Chemical Methods*, USEPA SW-846, 3rd edition - Final Update I, II/IIA and III)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*, October 1999
- *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004
- *USEPA Contract Laboratory Program National Functional Guidelines for Chlorinated Dioxin/Furan Data Review*, September 2005

Draper Aden Associates, of Blacksburg, Virginia, performed comprehensive data validation, including recalculation of 10% of the data, except where noted. A summary table of data validation results is provided as an attachment. The comprehensive data validation report for each analytical method is provided on CD ROM in Appendix E. No results were rejected.

Reporting of Results

As required by the permit, the laboratory reported results at or above the method detection limit (MDL) for the target analytes (constituents) listed Table 1, in Attachment II.C-24 of the operating permit. Detections between the MDL and reporting limit (RL) are considered estimated concentrations and the validated result was qualified with a "J" flag. Target analytes not detected at or above the MDL or RL are validated and qualified with a "U" flag, unless further data qualification was required based on data validation. Results are reported on a dry weight basis.

Method 8290 Dioxin/Furan reporting: The laboratory reports results on a dry weight basis to the estimated detection limit (EDL) for each isomer. The laboratory reports results between the EDL and sample specific reporting limit as estimated and the result was flagged "J." As per the operating permit, only concentrations above the sample specific reporting limit were used in the 2,3,7,8-TCDD Toxicity Equivalent Quotient (TEQ) calculation. TEQ calculations are submitted as an attachment.

Summary of Results

No results were rejected.
Mercury was reported above the then current Action Level at PAD-7 in January 2008. The Action Level for mercury was subsequently revised in December 2008 and no further action regarding reported mercury concentrations was required. The January 2008 soil monitoring data was compared to the Action Levels in place prior to December 2008.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the laboratory control sample (LCS), matrix spike and matrix spike duplicate (MS/MSD) samples, and the surrogate spike. LCS and MS/MSD recoveries were within the acceptance criteria, except where noted on the attached data validation report.

Precision

Precision was evaluated using the relative percent difference (RPD) data obtained from the MS/MSD and sample/blind field duplicate results. For metals, a control limit of 60 RPD was used due to expected and observed soil variability. For all other sample/blind field duplicate results, a control limit of <35% RPD and 2x the RL/QL was used, where applicable.

MS/MSD RPD criteria were within acceptance criteria, except where noted on the attached data validation report. Sample/blind field duplicate RPD criteria was met except where noted on the attached data validation report.

Completeness

Completeness was evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data. Valid analytical data are results not qualified as rejected.

All results were accepted. The completeness for the data set is 100%.

Representativeness

Representativeness. Data collected at the site met accuracy and precision requirements, except where noted. Samples were collected using standardized procedures. Samples were analyzed using standardized, accepted analytical methods using traceable standard to ensure that accurate and reproducible data were generated. None of the data required qualification for exceeding holding time requirements. Data from the January 2008 monitoring event were considered representative.

Draper Aden Associates
Engineering ◆ Surveying ◆ Environmental Services

This Report has been prepared by:

3.27.09

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3-27-09

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Table 4A
Method 8290 Dioxin/Furan Results - January 2008 Event
2,3,7,8 - TCDD Toxicity Equivalent Quotient (TEQ)
Radford Facility AAP, Open Burning Ground Soil Monitoring Program
All results presented in ng/kg =pg/g

Action Level: TEQ >16 ng/kg, pg/g (Region IX)
Action Level: TEQ >19 ng/kg, pg/g (Region III)

Sample Location ID		PAD-1				PAD-2				PAD-3				PAD-4			
Depth		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches	
Constituent	TEF	Flag	Flag	Result		Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ
1,2,3,4,6,7,8-HpCDD	0.01			23	0.23			22	0.22			20	0.2			20	0.2
1,2,3,4,6,7,8-HpCDF	0.01			6.3	0.063		U	ND			U	ND		J	U	4	
1,2,3,4,7,8,9-HpCDF	0.01	J	U	1.0			U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDD	0.1	JQ	U	1.4			U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDF	0.1	J	U	4.5			U	ND			U	ND		J	U	4.2	
1,2,3,6,7,8-HxCDD	0.1	JQ	U	4.2			U	ND			U	ND			U	ND	
1,2,3,6,7,8-HxCDF	0.1	J	U	3.9			U	ND			U	ND			U	ND	
1,2,3,7,8,9-HxCDD	0.1	JQ	U	3.3			U	ND			U	ND			U	ND	
1,2,3,7,8,9-HxCDF	0.1		U	ND			U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDD	1	JQ	U	1.3			U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDF	0.03	J	U	3.9			U	ND			U	ND		J	U	4.3	
2,3,4,6,7,8-HxCDF	0.1	J	U	2.1			U	ND			U	ND			U	ND	
2,3,4,7,8-PeCDF	0.3	J	U	4.9			U	ND			U	ND		J	U	4.8	
2,3,7,8-TCDD	1		U	ND			U	ND			U	ND			U	ND	
2,3,7,8-TCDF	0.1			7	0.7		U	ND			U	ND				6.5	0.65
OCDD	0.0003			120	0.036			650	0.195			490	0.147			210	0.063
OCDF	0.0003	J	U	5.1			U	ND			U	ND		J	U	6.6	
2,3,7,8 Toxicity Equivalence (TEQ) ng/kg					***1.029***				***0.415***				***0.347***				***0.913***

Sample Location ID		PAD-5				PAD-6				PAD-7				PAD-8			
Depth		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches	
Constituent	TEF	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ
1,2,3,4,6,7,8-HpCDD	0.01			18	0.18		J	33	0.33			80	0.8			89	0.89
1,2,3,4,6,7,8-HpCDF	0.01		U	ND		J	J	4.7				16	0.16			19	0.19
1,2,3,4,7,8,9-HpCDF	0.01		U	ND			J	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDD	0.1		U	ND			J	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDF	0.1		U	ND			J	ND		J	J	4.7			U	ND	
1,2,3,6,7,8-HxCDD	0.1		U	ND			J	ND		J	J	4.1		JA	JA	5.4	
1,2,3,6,7,8-HxCDF	0.1		U	ND			J	ND			U	ND			U	ND	
1,2,3,7,8,9-HxCDD	0.1		U	ND			J	ND		J	J	3.6		J	J	4.5	
1,2,3,7,8,9-HxCDF	0.1		U	ND			J	ND			U	ND			U	ND	
1,2,3,7,8-PeCDD	1		U	ND			J	ND			U	ND			U	ND	
1,2,3,7,8-PeCDF	0.03		U	ND			J	ND			U	ND			U	ND	
2,3,4,6,7,8-HxCDF	0.1		U	ND			J	ND			U	ND			U	ND	
2,3,4,7,8-PeCDF	0.3		U	ND			J	ND		J	J	3.4			U	ND	
2,3,7,8-TCDD	1		U	ND			J	ND			U	ND		JA	JA	1.3	
2,3,7,8-TCDF	0.1	J	U	0.64		J	J	1.3				2.8	0.28			2.6	0.26
OCDD	0.0003			140	0.042		J	320	0.096			710	0.213			1100	0.33
OCDF	0.0003		U	ND		J	J	11				26	0.0078			75	0.0225
2,3,7,8 Toxicity Equivalence (TEQ) ng/kg					***0.222***		J		***0.6063***				***1.4608***				***1.6925***

Sample Location ID		POND-1				SB-1				SB-2				PAD-X			
Depth		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches	
Constituent	TEF	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ
1,2,3,4,6,7,8-HpCDD	0.01			11	0.11			43	0.43			50	0.5			71	0.71
1,2,3,4,6,7,8-HpCDF	0.01	ND	U	ND				7.8	0.078	JA	JA	6				17	0.17
1,2,3,4,7,8,9-HpCDF	0.01		U	ND			U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDD	0.1		U	ND			U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDF	0.1		U	ND			U	ND			U	ND				5.9	0.59
1,2,3,6,7,8-HxCDD	0.1		U	ND			U	ND			U	ND		J	J	3.9	
1,2,3,6,7,8-HxCDF	0.1		U	ND			U	ND			U	ND		J	J	4.3	
1,2,3,7,8,9-HxCDD	0.1		U	ND			U	ND			U	ND		J	J	4.6	
1,2,3,7,8,9-HxCDF	0.1		U	ND			U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDD	1		U	ND			U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDF	0.03		U	ND			U	ND			U	ND		J	J	4.2	
2,3,4,6,7,8-HxCDF	0.1		U	ND			U	ND			U	ND		J	J	3	
2,3,4,7,8-PeCDF	0.3		U	ND			U	ND			U	ND				6.4	1.92
2,3,7,8-TCDD	1		U	ND			U	ND			U	ND			U	ND	
2,3,7,8-TCDF	0.1		U	ND				0.73	0.073		U	ND				4.4	0.44
OCDD	0.0003			630	0.189			1900	0.57			2200	0.66			680	0.204
OCDF	0.0003		U	ND		J	J	9.7				26	0.0078			31	0.0093
2,3,7,8 Toxicity Equivalence (TEQ) ng/kg					***0.299***				***1.151***				***1.1678***				***4.0433***

Sample Location ID		BERM-1				NB-1				NB-2			
Depth		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches	
Constituent	TEF	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ
1,2,3,4,6,7,8-HpCDD	0.01			31	0.31			33	0.33			9.1	0.091
1,2,3,4,6,7,8-HpCDF	0.01	JA	JA	4.2				7.5	0.075		U	ND	
1,2,3,4,7,8,9-HpCDF	0.01		U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDD	0.1		U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDF	0.1		U	ND			U	ND			U	ND	
1,2,3,6,7,8-HxCDD	0.1		U	ND			U	ND			U	ND	
1,2,3,6,7,8-HxCDF	0.1		U	ND			U	ND			U	ND	
1,2,3,7,8,9-HxCDD	0.1		U	ND			U	ND			U	ND	
1,2,3,7,8,9-HxCDF	0.1		U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDD	1		U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDF	0.03		U	ND			U	ND			U	ND	
2,3,4,6,7,8-HxCDF	0.1		U	ND			U	ND			U	ND	
2,3,4,7,8-PeCDF	0.3		U	ND			U	ND			U	ND	
2,3,7,8-TCDD	1		U	ND			U	ND			U	ND	
2,3,7,8-TCDF	0.1	JA	JA	0.9				2.1	0.21	JA	JA	0.65	
OCDD	0.0003			440	0.132			500	0.15			180	0.054
OCDF	0.0003	J	J	11				16	0.0048		U	ND	
2,3,7,8 Toxicity Equivalence (TEQ) ng/kg					***0.442***				***0.7698***				***0.145***

Notes: Analytical Method: SW-846 8290 -Test America West Sacramento, unless noted.

TEF Denotes USEPA Region 3 Toxicity Equivalence Factor based on WHO June 2005 values. (See www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/usersguide.htm). TEF factors based on noted reference reflect current research.

2,3,7,8 - TCDD Toxicity Equivalence Quotient (TEQ) ng/kg. Calculated by summing the multiplication of detections by the respective TEF

LOQ/QL-Limit of Quantitation/sample specific reporting limit. See analytical results for sample specific reporting limit.

Data Qualifiers:

U denotes not detected. See certificate of analysis for sample specific estimated detection limit.

J Denotes result reported below LOQ/Quantitation Limit.

JA Denotes result positively identified, but quantitation is estimated.

JQ (laboratory data qualifier) Denotes result estimated maximum possible concentration reported

ND (Laboraory data qualifier) denotes analyte not detected above estimated detection limit and constituent specific TEQ was not calculated.

Verification event performed on 3/25/2008 for PAD-1 (DUP-1). Verification results reported (Test America Knoxville).

PAD-X is a blind duplicate for PAD-7. " Val Flag" denotes data validation data qualifier. "Lab Flag" denotes Laboratory data qualifier.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
BERM-1										
Nitroglycerin	1.4	J	U		2.5	0.26	mg/kg	200	SW846 8332	Result < QL.
1,3,5-Trinitrobenzene	0.25	U	U		0.25	0.024	mg/kg	31000	SW846 8330	Analyte not detected at or above detection limit.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	100	SW846 8330	Analyte not detected at or above detection limit.
2,4,6-Trinitrotoluene	0.43		0.43		0.25	0.033	mg/kg	95	SW846 8330	No action taken. Result < action limit (AL)
2,4-Dinitrotoluene	0.11	J	U		0.25	0.029	mg/kg	2000	SW846 8330	Result < QL.
2,6-Dinitrotoluene	0.037	J	U		0.25	0.028	mg/kg	1000	SW846 8330	Result < QL.
2-Amino-4,6-dinitrotoluene	0.11	J	U		0.25	0.031	mg/kg	2000	SW846 8330	Result < QL.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	12	SW846 8330	Analyte not detected at or above detection limit.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	20000	SW846 8330	Analyte not detected at or above detection limit.
4-Amino-2,6-dinitrotoluene	0.14	J	U		0.25	0.03	mg/kg	2000	SW846 8330	Result < QL.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	170	SW846 8330	Analyte not detected at or above detection limit.
HMX	0.14	J	U		0.5	0.048	mg/kg	51000	SW846 8330	Result < QL.
Nitrobenzene	0.34		0.34		0.25	0.028	mg/kg	510	SW846 8330	No action taken. Result < action limit (AL)
RDX	0.5	U	U		0.5	0.031	mg/kg	26	SW846 8330	Analyte not detected at or above detection limit.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	10000	SW846 8330	Analyte not detected at or above detection limit.
2,4-Dichlorophenol	0.39	U	U		0.4	0.024	mg/kg	3100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
2-Chlorophenol	0.39	U	U		0.4	0.031	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
3,3'-Dimethylbenzidine	1.9	U	U	J	2	0.075	mg/kg		SW846 8270C	Target analyte not detected at or above detection limit or QL/RL. Estimated due to MDL study conducted in 01/05.
3-Methylphenol	0.39	U	U		0.4	0.0051	mg/kg	51000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Methylphenol	0.39	U	U		0.4	0.026	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Nitrophenol	1.9	U	U		2	0.13	mg/kg	7	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Acetophenone	0.39	U	U		0.4	0.011	mg/kg	100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)anthracene	0.39	U	U		0.4	0.0011	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)pyrene	0.39	U	U		0.4	0.0015	mg/kg	0.39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(b)fluoranthene	0.39	U	U		0.4	0.0014	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(k)fluoranthene	0.39	U	U		0.4	0.002	mg/kg	39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzoic acid	1.9	U	U		2	0.29	mg/kg	4100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
bis(2-Ethylhexyl) phthalate	0.081	J	U		0.4	0.021	mg/kg	200	SW846 8270C	Result < QL. Blank contamination suspected. Analyte detected less than MDL.
Butyl benzyl phthalate	0.39	U	U		0.4	0.023	mg/kg	200000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenz(a,h)anthracene	0.39	U	U		0.4	0.0015	mg/kg	0.39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenzofuran	0.39	U	U		0.4	0.024	mg/kg	2000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Diethyl phthalate	0.34	J	U		0.4	0.023	mg/kg	820000	SW846 8270C	Result < QL.
Dimethyl phthalate	0.39	U	U		0.4	0.025	mg/kg	10000000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Di-n-butyl phthalate	0.094	J	U		0.4	0.023	mg/kg	100000	SW846 8270C	Result < QL.
Di-n-octyl phthalate	0.39	U	U		0.4	0.021	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.

SEE LAST PAGE FOR DATA QUALIFIER DEFINITIONS.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
BERM-1										
Fluoranthene	0.39	U	U		0.4	0.0014	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Hexachloroethane	0.059	U	U		0.4	0.033	mg/kg	200	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Indeno(1,2,3-cd)pyrene	0.39	U	U		0.4	0.0018	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Naphthalene	0.39	U	U		0.4	0.0019	mg/kg	20000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
N-Nitrosodiphenylamine	0.099	J	U		0.4	0.025	mg/kg	26000	SW846 8270C	Result < QL.
Phenol	0.39	U	U		0.4	0.03	mg/kg	310000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Pyrene	0.39	U	U		0.4	0.0013	mg/kg	31000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
1,1-Dichloroethene	0.005	U	U	J	0.005	0.00087	mg/kg	51000	SW846 8260B	Analyte not detected. MS recovered low.
1,2-Dichloroethane	0.005	U	U		0.005	0.00078	mg/kg	31	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Benzene	0.005	U	U		0.005	0.00068	mg/kg	52	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Benzyl chloride	0.005	U	U	J	0.005	0.0016	mg/kg		SW846 8260B	Analyte not detected. LCS/LCSD/MS recovered low.
Bromomethane	0.01	U	U		0.01	0.00066	mg/kg	15	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Carbon tetrachloride	0.005	U	U	J	0.005	0.0012	mg/kg	22	SW846 8260B	Analyte not detected. MS recovered low.
Chlorobenzene	0.005	U	U		0.005	0.00059	mg/kg	20000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloroform	0.005	U	U		0.005	0.00074	mg/kg	10000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloromethane	0.01	U	U		0.01	0.00063	mg/kg	6	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Methylene chloride	0.005	U	U		0.005	0.00091	mg/kg	380	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Tetrachloroethene	0.005	U	U		0.005	0.0016	mg/kg	5.3	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Toluene	0.005	U	U		0.005	0.00081	mg/kg	200000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Trichloroethene	0.005	U	U	J	0.005	0.00096	mg/kg	7.2	SW846 8260B	Analyte not detected. MS recovered low.
Vinyl chloride	0.005	U	U		0.005	0.00078	mg/kg	4	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Mercury	0.021	B	U		0.11	0.018	mg/kg	0.13	SW846 7471A	Result < QL.
Antimony	1	B	U	J	6	0.46	mg/kg	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank. MS/MSD recovered low.
Arsenic	1.4		1.4		1	0.36	mg/kg	16	SW846 6010B	No action taken. Result < action limit (AL)
Barium	91.3		91.3		20	0.084	mg/kg	72000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.41	B	U		0.5	0.043	mg/kg	510	SW846 6010B	Result < QL.
Chromium	16.4		16.4		1	0.24	mg/kg	3100	SW846 6010B	No action taken. Result < action limit (AL)
Lead	105		105		0.3	0.23	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	9.2	J	U		330	0.32	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.59	U	U		0.6	0.53	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.2	U	U		1	0.12	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	122	J	U		2500	1.2	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg.

SEE LAST PAGE FOR DATA QUALIFIER DEFINITIONS.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
EQUIP BLANK									
Mercury	0.2	U	U	0.2	0.12	ug/L	0.13	SW846 7470A	Analyte not detected above dectection limit or QL.
Antimony	1.8	B	U	60	1.8	ug/L	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank. MS/MSD recovered low.
Arsenic	10	U	U	10	3.2	ug/L	16	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Barium	200	U	U	200	0.67	ug/L	72000	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Cadmium	5	U	U	5	0.66	ug/L	510	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Chromium	10	U	U	10	2.2	ug/L	3100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Lead	3	U	U	3	1.9	ug/L	800	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Nickel	40	U	U	40	3.2	ug/L	20000	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Selenium	5	U	U	5	4.1	ug/L	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	10	U	U	10	2.2	ug/L	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	20	U	U	20	5	ug/L	310000	SW846 6010B	Target analyte not detected above detection limit or RL/QL.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
NB-1										
Nitroglycerin	2.2	J	U		2.5	0.26	mg/kg	200	SW846 8332	Result < QL.
1,3,5-Trinitrobenzene	0.25	U	U		0.25	0.024	mg/kg	31000	SW846 8330	Analyte not detected at or above detection limit.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	100	SW846 8330	Analyte not detected at or above detection limit.
2,4,6-Trinitrotoluene	0.068	J	U		0.25	0.033	mg/kg	95	SW846 8330	Result < QL.
2,4-Dinitrotoluene	0.1	J	U		0.25	0.029	mg/kg	2000	SW846 8330	Result < QL.
2,6-Dinitrotoluene	0.25	U	U		0.25	0.028	mg/kg	1000	SW846 8330	Analyte not detected at or above detection limit.
2-Amino-4,6-dinitrotoluene	0.25	U	U		0.25	0.031	mg/kg	2000	SW846 8330	Analyte not detected at or above detection limit.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	12	SW846 8330	Analyte not detected at or above detection limit.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	20000	SW846 8330	Analyte not detected at or above detection limit.
4-Amino-2,6-dinitrotoluene	0.25	U	U		0.25	0.03	mg/kg	2000	SW846 8330	Analyte not detected at or above detection limit.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	170	SW846 8330	Analyte not detected at or above detection limit.
HMX	0.061	J	U		0.5	0.048	mg/kg	51000	SW846 8330	Result < QL.
Nitrobenzene	0.99		0.99		0.25	0.028	mg/kg	510	SW846 8330	No action taken. Result < action limit (AL)
RDX	0.5	U	U		0.5	0.031	mg/kg	26	SW846 8330	Analyte not detected at or above detection limit.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	10000	SW846 8330	Analyte not detected at or above detection limit.
2,4-Dichlorophenol	0.41	U	U		0.4	0.025	mg/kg	3100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
2-Chlorophenol	0.41	U	U		0.4	0.032	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
3,3'-Dimethylbenzidine	2	U	U	J	2	0.079	mg/kg		SW846 8270C	Target analyte not detected at or above detection limit or QL/RL. Estimated due to MDL study conducted in 01/05.
3-Methylphenol	0.41	U	U		0.4	0.0054	mg/kg	51000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Methylphenol	0.41	U	U		0.4	0.027	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Nitrophenol	2	U	U		2	0.14	mg/kg	7	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Acetophenone	0.41	U	U		0.4	0.011	mg/kg	100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)anthracene	0.41	U	U		0.4	0.0012	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)pyrene	0.41	U	U	J	0.4	0.0016	mg/kg	0.39	SW846 8270C	Internal standard area outside limits.
Benzo(b)fluoranthene	0.021	J	U	J	0.4	0.0015	mg/kg	3.9	SW846 8270C	Result < QL. Internal standard area outside limits.
Benzo(k)fluoranthene	0.41	U	U	J	0.4	0.0021	mg/kg	39	SW846 8270C	Internal standard area outside limits.
Benzoic acid	2	U	U		2	0.3	mg/kg	4100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
bis(2-Ethylhexyl) phthalate	2.1		2.1		0.4	0.022	mg/kg	200	SW846 8270C	No action taken. Result < action limit (AL). Blank contamination suspected. Analyte detected less than MDL.
Butyl benzyl phthalate	0.41	U	U		0.4	0.024	mg/kg	200000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenz(a,h)anthracene	0.41	U	U	J	0.4	0.0016	mg/kg	0.39	SW846 8270C	Internal standard area outside limits.
Dibenzofuran	0.41	U	U		0.4	0.025	mg/kg	2000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Diethyl phthalate	0.84		0.84		0.4	0.024	mg/kg	820000	SW846 8270C	No action taken. Result < action limit (AL)
Dimethyl phthalate	0.48		0.48		0.4	0.026	mg/kg	10000000	SW846 8270C	No action taken. Result < action limit (AL)
Di-n-butyl phthalate	0.31	J	U		0.4	0.024	mg/kg	100000	SW846 8270C	Result < QL.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
NB-1										
Di-n-octyl phthalate	0.41	U	U	J	0.4	0.022	mg/kg	41000	SW846 8270C	Internal standard area outside limits.
Fluoranthene	0.41	U	U		0.4	0.0015	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Hexachloroethane	0.062	U	U		0.4	0.035	mg/kg	200	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Indeno(1,2,3-cd)pyrene	0.41	U	U	J	0.4	0.0019	mg/kg	3.9	SW846 8270C	Internal standard area outside limits.
Naphthalene	0.41	U	U		0.4	0.002	mg/kg	20000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
N-Nitrosodiphenylamine	0.12	J	U		0.4	0.026	mg/kg	26000	SW846 8270C	Result < QL.
Phenol	0.41	U	U		0.4	0.031	mg/kg	310000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Pyrene	0.41	U	U		0.4	0.0014	mg/kg	31000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
1,1-Dichloroethene	0.0061	U	U	J	0.005	0.0011	mg/kg	51000	SW846 8260B	Analyte not detected. MS recovered low.
1,2-Dichloroethane	0.0061	U	U		0.005	0.00094	mg/kg	31	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Benzene	0.0061	U	U		0.005	0.00082	mg/kg	52	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Benzyl chloride	0.0061	U	U	J	0.005	0.0019	mg/kg		SW846 8260B	Analyte not detected. LCS/LCSD/MS recovered low.
Bromomethane	0.012	U	U		0.01	0.0008	mg/kg	15	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Carbon tetrachloride	0.0061	U	U	J	0.005	0.0014	mg/kg	22	SW846 8260B	Analyte not detected. MS recovered low.
Chlorobenzene	0.0061	U	U		0.005	0.00071	mg/kg	20000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloroform	0.0061	U	U		0.005	0.00089	mg/kg	10000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloromethane	0.012	U	U		0.01	0.00076	mg/kg	6	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Methylene chloride	0.0061	U	U		0.005	0.0011	mg/kg	380	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Tetrachloroethene	0.0061	U	U		0.005	0.0019	mg/kg	5.3	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Toluene	0.0061	U	U		0.005	0.00099	mg/kg	200000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Trichloroethene	0.0061	U	U	J	0.005	0.0012	mg/kg	7.2	SW846 8260B	Analyte not detected. MS recovered low.
Vinyl chloride	0.0061	U	U		0.005	0.00094	mg/kg	4	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Mercury	0.049	B	U		0.11	0.019	mg/kg	0.13	SW846 7471A	Result < QL.
Antimony	0.94	B	U	J	6	0.49	mg/kg	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank. MS/MSD recovered low.
Arsenic	2.3		2.3		1	0.37	mg/kg	16	SW846 6010B	No action taken. Result < action limit (AL)
Barium	147		147		20	0.089	mg/kg	72000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.61	B	U		0.5	0.045	mg/kg	510	SW846 6010B	Result < QL.
Chromium	19.3		19.3		1	0.25	mg/kg	3100	SW846 6010B	No action taken. Result < action limit (AL)
Lead	181		181		0.3	0.24	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	9.9	J	U		330	0.34	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.62	U	U		0.6	0.56	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.2	U	U		1	0.12	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	242	J	U		2500	1.2	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
NB-2										
Nitroglycerin	2	J	U		2.5	0.26	mg/kg	200	SW846 8332	Result < QL.
1,3,5-Trinitrobenzene	0.25	U	U		0.25	0.024	mg/kg	31000	SW846 8330	Analyte not detected at or above detection limit.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	100	SW846 8330	Analyte not detected at or above detection limit.
2,4,6-Trinitrotoluene	0.25	U	U		0.25	0.033	mg/kg	95	SW846 8330	Analyte not detected at or above detection limit.
2,4-Dinitrotoluene	0.15	J	U		0.25	0.029	mg/kg	2000	SW846 8330	Result < QL.
2,6-Dinitrotoluene	0.25	U	U		0.25	0.028	mg/kg	1000	SW846 8330	Analyte not detected at or above detection limit.
2-Amino-4,6-dinitrotoluene	0.25	U	U		0.25	0.031	mg/kg	2000	SW846 8330	Analyte not detected at or above detection limit.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	12	SW846 8330	Analyte not detected at or above detection limit.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	20000	SW846 8330	Analyte not detected at or above detection limit.
4-Amino-2,6-dinitrotoluene	0.25	U	U		0.25	0.03	mg/kg	2000	SW846 8330	Analyte not detected at or above detection limit.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	170	SW846 8330	Analyte not detected at or above detection limit.
HMX	0.064	J	U		0.5	0.048	mg/kg	51000	SW846 8330	Result < QL.
Nitrobenzene	1.3		1.3		0.25	0.028	mg/kg	510	SW846 8330	No action taken. Result < action limit (AL)
RDX	0.5	U	U		0.5	0.031	mg/kg	26	SW846 8330	Analyte not detected at or above detection limit.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	10000	SW846 8330	Analyte not detected at or above detection limit.
2,4-Dichlorophenol	0.4	U	U		0.4	0.024	mg/kg	3100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
2-Chlorophenol	0.4	U	U		0.4	0.031	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
3,3'-Dimethylbenzidine	1.9	U	U	J	2	0.076	mg/kg		SW846 8270C	Target analyte not detected at or above detection limit or QL/RL. Estimated due to MDL study conducted in 01/05.
3-Methylphenol	0.4	U	U		0.4	0.0052	mg/kg	51000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Methylphenol	0.4	U	U		0.4	0.026	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Nitrophenol	1.9	U	U		2	0.13	mg/kg	7	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Acetophenone	0.4	U	U		0.4	0.011	mg/kg	100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)anthracene	0.4	U	U		0.4	0.0011	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)pyrene	0.4	U	U	J	0.4	0.0016	mg/kg	0.39	SW846 8270C	Internal standard area outside limits.
Benzo(b)fluoranthene	0.014	J	U	J	0.4	0.0014	mg/kg	3.9	SW846 8270C	Result < QL. Internal standard area outside limits.
Benzo(k)fluoranthene	0.4	U	U	J	0.4	0.002	mg/kg	39	SW846 8270C	Internal standard area outside limits.
Benzoic acid	1.9	U	U		2	0.29	mg/kg	4100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
bis(2-Ethylhexyl) phthalate	1.5		1.5		0.4	0.022	mg/kg	200	SW846 8270C	No action taken. Result < action limit (AL). Blank contamination suspected. Analyte detected less than MDL.
Butyl benzyl phthalate	0.4	U	U		0.4	0.023	mg/kg	200000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenz(a,h)anthracene	0.4	U	U	J	0.4	0.0016	mg/kg	0.39	SW846 8270C	Internal standard area outside limits.
Dibenzofuran	0.4	U	U		0.4	0.024	mg/kg	2000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Diethyl phthalate	0.43		0.43		0.4	0.023	mg/kg	820000	SW846 8270C	No action taken. Result < action limit (AL)
Dimethyl phthalate	0.62		0.62		0.4	0.025	mg/kg	10000000	SW846 8270C	No action taken. Result < action limit (AL)
Di-n-butyl phthalate	0.39	J	U		0.4	0.023	mg/kg	100000	SW846 8270C	Result < QL.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
NB-2										
Di-n-octyl phthalate	0.4	U	U	J	0.4	0.022	mg/kg	41000	SW846 8270C	Internal standard area outside limits.
Fluoranthene	0.4	U	U		0.4	0.0014	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Hexachloroethane	0.06	U	U		0.4	0.034	mg/kg	200	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Indeno(1,2,3-cd)pyrene	0.4	U	U	J	0.4	0.0018	mg/kg	3.9	SW846 8270C	Internal standard area outside limits.
Naphthalene	0.4	U	U		0.4	0.0019	mg/kg	20000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
N-Nitrosodiphenylamine	0.041	J	U		0.4	0.025	mg/kg	26000	SW846 8270C	Result < QL.
Phenol	0.4	U	U		0.4	0.03	mg/kg	310000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Pyrene	0.4	U	U		0.4	0.0013	mg/kg	31000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
1,1-Dichloroethene	0.0058	U	U	J	0.005	0.001	mg/kg	51000	SW846 8260B	Analyte not detected. MS recovered low.
1,2-Dichloroethane	0.0058	U	U		0.005	0.00089	mg/kg	31	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Benzene	0.0058	U	U		0.005	0.00078	mg/kg	52	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Benzyl chloride	0.0058	U	U	J	0.005	0.0018	mg/kg		SW846 8260B	Analyte not detected. LCS/LCSD/MS recovered low.
Bromomethane	0.012	U	U		0.01	0.00076	mg/kg	15	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Carbon tetrachloride	0.0058	U	U	J	0.005	0.0013	mg/kg	22	SW846 8260B	Analyte not detected. MS recovered low.
Chlorobenzene	0.0058	U	U		0.005	0.00068	mg/kg	20000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloroform	0.0058	U	U		0.005	0.00085	mg/kg	10000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloromethane	0.012	U	U		0.01	0.00072	mg/kg	6	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Methylene chloride	0.0058	U	U		0.005	0.0011	mg/kg	380	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Tetrachloroethene	0.0058	U	U		0.005	0.0018	mg/kg	5.3	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Toluene	0.0058	U	U		0.005	0.00094	mg/kg	200000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Trichloroethene	0.0058	U	U	J	0.005	0.0011	mg/kg	7.2	SW846 8260B	Analyte not detected. MS recovered low.
Vinyl chloride	0.0058	U	U		0.005	0.00089	mg/kg	4	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Mercury	0.12	U	U		0.11	0.018	mg/kg	0.13	SW846 7471A	Analyte not detected above dectection limit or QL.
Antimony	0.76	B	U	J	6	0.47	mg/kg	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank. MS/MSD recovered low.
Arsenic	0.97	B	U		1	0.36	mg/kg	16	SW846 6010B	Result < QL.
Barium	108		108		20	0.085	mg/kg	72000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.29	B	U		0.5	0.043	mg/kg	510	SW846 6010B	Result < QL.
Chromium	11.8		11.8		1	0.24	mg/kg	3100	SW846 6010B	No action taken. Result < action limit (AL)
Lead	179		179		0.3	0.23	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	6.2	J	U		330	0.32	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.6	U	U		0.6	0.54	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.2	U	U		1	0.12	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	98.5	J	U		2500	1.2	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-1										
Nitroglycerin	2.5	U	U		2.5	0.26	mg/kg	200	SW846 8332	Analyte not detected at or above detection limit.
1,3,5-Trinitrobenzene	0.25	U	U		0.25	0.024	mg/kg	31000	SW846 8330	Analyte not detected at or above detection limit.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	100	SW846 8330	Analyte not detected at or above detection limit.
2,4,6-Trinitrotoluene	0.55		0.55		0.25	0.033	mg/kg	95	SW846 8330	No action taken. Result < action limit (AL)
2,4-Dinitrotoluene	0.34		0.34		0.25	0.029	mg/kg	2000	SW846 8330	No action taken. Result < action limit (AL)
2,6-Dinitrotoluene	0.083	J	U		0.25	0.028	mg/kg	1000	SW846 8330	Result < QL.
2-Amino-4,6-dinitrotoluene	0.069	J	U		0.25	0.031	mg/kg	2000	SW846 8330	Result < QL.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	12	SW846 8330	Analyte not detected at or above detection limit.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	20000	SW846 8330	Analyte not detected at or above detection limit.
4-Amino-2,6-dinitrotoluene	0.15	J	U		0.25	0.03	mg/kg	2000	SW846 8330	Result < QL.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	170	SW846 8330	Analyte not detected at or above detection limit.
HMX	0.5	U	U		0.5	0.048	mg/kg	51000	SW846 8330	Analyte not detected at or above detection limit.
Nitrobenzene	0.43		0.43		0.25	0.028	mg/kg	510	SW846 8330	No action taken. Result < action limit (AL)
RDX	0.5	U	U		0.5	0.031	mg/kg	26	SW846 8330	Analyte not detected at or above detection limit.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	10000	SW846 8330	Analyte not detected at or above detection limit.
2,4-Dichlorophenol	0.39	U	U		0.4	0.024	mg/kg	3100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
2-Chlorophenol	0.39	U	U		0.4	0.031	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
3,3'-Dimethylbenzidine	1.9	U	U	J	2	0.075	mg/kg		SW846 8270C	Target analyte not detected at or above detection limit or QL/RL. Estimated due to MDL study conducted in 01/05.
3-Methylphenol	0.39	U	U		0.4	0.0051	mg/kg	51000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Methylphenol	0.39	U	U		0.4	0.026	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Nitrophenol	1.9	U	U		2	0.13	mg/kg	7	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Acetophenone	0.39	U	U		0.4	0.011	mg/kg	100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)anthracene	0.39	U	U		0.4	0.0011	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)pyrene	0.39	U	U		0.4	0.0016	mg/kg	0.39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(b)fluoranthene	0.39	U	U		0.4	0.0014	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(k)fluoranthene	0.39	U	U		0.4	0.002	mg/kg	39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzoic acid	1.9	U	U		2	0.29	mg/kg	4100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
bis(2-Ethylhexyl) phthalate	0.071	J	U		0.4	0.022	mg/kg	200	SW846 8270C	Result < QL. Blank contamination suspected. Analyte detected less than MDL.
Butyl benzyl phthalate	0.39	U	U		0.4	0.023	mg/kg	200000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenz(a,h)anthracene	0.39	U	U		0.4	0.0016	mg/kg	0.39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenzofuran	0.39	U	U		0.4	0.024	mg/kg	2000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Diethyl phthalate	0.12	J	U		0.4	0.023	mg/kg	820000	SW846 8270C	Result < QL.
Dimethyl phthalate	0.39	U	U		0.4	0.025	mg/kg	10000000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Di-n-butyl phthalate	1.2		1.2		0.4	0.023	mg/kg	100000	SW846 8270C	No action taken. Result < action limit (AL)
Di-n-octyl phthalate	0.39	U	U		0.4	0.022	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-1										
Fluoranthene	0.39	U	U		0.4	0.0014	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Hexachloroethane	0.06	U	U		0.4	0.033	mg/kg	200	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Indeno(1,2,3-cd)pyrene	0.39	U	U		0.4	0.0018	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Naphthalene	0.39	U	U		0.4	0.0019	mg/kg	20000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
N-Nitrosodiphenylamine	0.36	J	U		0.4	0.025	mg/kg	26000	SW846 8270C	Result < QL.
Phenol	0.39	U	U		0.4	0.03	mg/kg	310000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Pyrene	0.39	U	U		0.4	0.0013	mg/kg	31000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
1,1-Dichloroethene	0.0057	U	U	J	0.005	0.00098	mg/kg	51000	SW846 8260B	Analyte not detected. MS recovered low.
1,2-Dichloroethane	0.0057	U	U		0.005	0.00087	mg/kg	31	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Benzene	0.003	J	U		0.005	0.00076	mg/kg	52	SW846 8260B	Result < QL.
Benzyl chloride	0.0057	U	U	J	0.005	0.0018	mg/kg		SW846 8260B	Analyte not detected. LCS/LCSD/MS recovered low.
Bromomethane	0.0024	J	U		0.01	0.00075	mg/kg	15	SW846 8260B	Result < QL.
Carbon tetrachloride	0.0057	U	U	J	0.005	0.0013	mg/kg	22	SW846 8260B	Analyte not detected. MS recovered low.
Chlorobenzene	0.0057	U	U		0.005	0.00066	mg/kg	20000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloroform	0.0057	U	U		0.005	0.00083	mg/kg	10000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloromethane	0.0038	J	U		0.01	0.00071	mg/kg	6	SW846 8260B	Result < QL.
Methylene chloride	0.0012	J	U		0.005	0.001	mg/kg	380	SW846 8260B	Result < QL. Blank contamination in the trip blank (0.8 ug/l).
Tetrachloroethene	0.0057	U	U		0.005	0.0018	mg/kg	5.3	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Toluene	0.007		0.007		0.005	0.00091	mg/kg	200000	SW846 8260B	No action taken. Result < action limit (AL)
Trichloroethene	0.0015	J	U	J	0.005	0.0011	mg/kg	7.2	SW846 8260B	Result < QL. MS recovered low.
Vinyl chloride	0.0057	U	U		0.005	0.00087	mg/kg	4	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
TPH (as Diesel)	42		42		10	0.29	mg/kg	11000	SW846 8015B	No action taken. Result < action limit (AL)
Mercury	0.044	B	U		0.11	0.018	mg/kg	0.13	SW846 7471A	Result < QL.
Antimony	2.5	B	U	J	6	0.47	mg/kg	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank. MS/MSD recovered low.
Arsenic	2.1		2.1		1	0.36	mg/kg	16	SW846 6010B	No action taken. Result < action limit (AL)
Barium	172		172		20	0.085	mg/kg	72000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	1.5		1.5		0.5	0.043	mg/kg	510	SW846 6010B	No action taken. Result < action limit (AL)
Chromium	20.1		20.1		1	0.24	mg/kg	3100	SW846 6010B	No action taken. Result < action limit (AL)
Lead	417		417		0.3	0.23	mg/kg	800	SW846 6010B	Result < action limit (AL). Verification performed 03/25/2008. Original result 869 mg/kg. Verification result reported.
Nickel	7.4	J	U		330	0.32	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.6	U	U		0.6	0.54	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	0.27	B	U		1	0.12	mg/kg	5100	SW846 6010B	Result < QL.
Zinc	552	J	U		2500	1.2	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-2										
Nitroglycerin	1.3	J	U		2.5	0.26	mg/kg	200	SW846 8332	Result < QL.
1,3,5-Trinitrobenzene	0.057	J	U		0.25	0.024	mg/kg	31000	SW846 8330	Result < QL.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	100	SW846 8330	Analyte not detected at or above detection limit.
2,4,6-Trinitrotoluene	0.29		0.29		0.25	0.033	mg/kg	95	SW846 8330	No action taken. Result < action limit (AL)
2,4-Dinitrotoluene	0.17	J	U		0.25	0.029	mg/kg	2000	SW846 8330	Result < QL.
2,6-Dinitrotoluene	0.036	J	U		0.25	0.028	mg/kg	1000	SW846 8330	Result < QL.
2-Amino-4,6-dinitrotoluene	0.057	J	U		0.25	0.031	mg/kg	2000	SW846 8330	Result < QL.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	12	SW846 8330	Analyte not detected at or above detection limit.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	20000	SW846 8330	Analyte not detected at or above detection limit.
4-Amino-2,6-dinitrotoluene	0.071	J	U		0.25	0.03	mg/kg	2000	SW846 8330	Result < QL.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	170	SW846 8330	Analyte not detected at or above detection limit.
HMX	0.5	U	U		0.5	0.048	mg/kg	51000	SW846 8330	Analyte not detected at or above detection limit.
Nitrobenzene	1.1		1.1		0.25	0.028	mg/kg	510	SW846 8330	No action taken. Result < action limit (AL)
RDX	0.5	U	U		0.5	0.031	mg/kg	26	SW846 8330	Analyte not detected at or above detection limit.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	10000	SW846 8330	Analyte not detected at or above detection limit.
2,4-Dichlorophenol	0.39	U	U		0.4	0.024	mg/kg	3100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
2-Chlorophenol	0.39	U	U		0.4	0.031	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
3,3'-Dimethylbenzidine	1.9	U	U	J	2	0.075	mg/kg		SW846 8270C	Target analyte not detected at or above detection limit or QL/RL. Estimated due to MDL study conducted in 01/05.
3-Methylphenol	0.39	U	U		0.4	0.0051	mg/kg	51000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Methylphenol	0.39	U	U		0.4	0.026	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Nitrophenol	1.9	U	U		2	0.13	mg/kg	7	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Acetophenone	0.39	U	U		0.4	0.011	mg/kg	100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)anthracene	0.39	U	U		0.4	0.0011	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)pyrene	0.39	U	U		0.4	0.0015	mg/kg	0.39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(b)fluoranthene	0.39	U	U		0.4	0.0014	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(k)fluoranthene	0.39	U	U		0.4	0.002	mg/kg	39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzoic acid	1.9	U	U		2	0.29	mg/kg	4100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
bis(2-Ethylhexyl) phthalate	0.095	J	U		0.4	0.021	mg/kg	200	SW846 8270C	Result < QL. Blank contamination suspected. Analyte detected less than MDL.
Butyl benzyl phthalate	0.39	U	U		0.4	0.023	mg/kg	200000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenz(a,h)anthracene	0.39	U	U		0.4	0.0015	mg/kg	0.39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenzofuran	0.39	U	U		0.4	0.024	mg/kg	2000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Diethyl phthalate	0.23	J	U		0.4	0.023	mg/kg	820000	SW846 8270C	Result < QL.
Dimethyl phthalate	0.39	U	U		0.4	0.025	mg/kg	10000000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Di-n-butyl phthalate	0.21	J	U		0.4	0.023	mg/kg	100000	SW846 8270C	Result < QL.
Di-n-octyl phthalate	0.39	U	U		0.4	0.021	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-2										
Fluoranthene	0.39	U	U		0.4	0.0014	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Hexachloroethane	0.06	U	U		0.4	0.033	mg/kg	200	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Indeno(1,2,3-cd)pyrene	0.39	U	U		0.4	0.0018	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Naphthalene	0.39	U	U		0.4	0.0019	mg/kg	20000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
N-Nitrosodiphenylamine	0.069	J	U		0.4	0.025	mg/kg	26000	SW846 8270C	Result < QL.
Phenol	0.39	U	U		0.4	0.03	mg/kg	310000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Pyrene	0.39	U	U		0.4	0.0013	mg/kg	31000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
1,1-Dichloroethene	0.0056	U	U	J	0.005	0.00097	mg/kg	51000	SW846 8260B	Analyte not detected. MS recovered low.
1,2-Dichloroethane	0.0056	U	U		0.005	0.00086	mg/kg	31	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Benzene	0.0014	J	U		0.005	0.00075	mg/kg	52	SW846 8260B	Result < QL.
Benzyl chloride	0.0056	U	U	J	0.005	0.0017	mg/kg		SW846 8260B	Analyte not detected. LCS/LCSD/MS recovered low.
Bromomethane	0.02		0.02		0.01	0.00074	mg/kg	15	SW846 8260B	No action taken. Result < action limit (AL)
Carbon tetrachloride	0.0056	U	U	J	0.005	0.0013	mg/kg	22	SW846 8260B	Analyte not detected. MS recovered low.
Chlorobenzene	0.0056	U	U		0.005	0.00065	mg/kg	20000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloroform	0.0056	U	U		0.005	0.00082	mg/kg	10000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloromethane	0.016		0.016		0.01	0.0007	mg/kg	6	SW846 8260B	No action taken. Result < action limit (AL)
Methylene chloride	0.0056	U	U		0.005	0.001	mg/kg	380	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Tetrachloroethene	0.0056	U	U		0.005	0.0018	mg/kg	5.3	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Toluene	0.0056	U	U		0.005	0.0009	mg/kg	200000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Trichloroethene	0.0056	U	U	J	0.005	0.0011	mg/kg	7.2	SW846 8260B	Analyte not detected. MS recovered low.
Vinyl chloride	0.0056	U	U		0.005	0.00086	mg/kg	4	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Mercury	0.12	U	U		0.11	0.018	mg/kg	0.13	SW846 7471A	Analyte not detected above dectection limit or QL.
Antimony	0.96	B	U	J	6	0.46	mg/kg	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank. MS/MSD recovered low.
Arsenic	1.2		1.2		1	0.36	mg/kg	16	SW846 6010B	No action taken. Result < action limit (AL)
Barium	73.4		73.4		20	0.085	mg/kg	72000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.37	B	U		0.5	0.043	mg/kg	510	SW846 6010B	Result < QL.
Chromium	13.5		13.5		1	0.24	mg/kg	3100	SW846 6010B	No action taken. Result < action limit (AL)
Lead	183		183		0.3	0.23	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	6.6	J	U		330	0.32	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.6	U	U		0.6	0.54	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.2	U	U		1	0.12	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	127	J	U		2500	1.2	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-3										
Nitroglycerin	0.51	J	U		2.5	0.26	mg/kg	200	SW846 8332	Result < QL. RPD between columns > 40% (166%).
1,3,5-Trinitrobenzene	0.45		0.45		0.25	0.024	mg/kg	31000	SW846 8330	No action taken. Result < action limit (AL)
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	100	SW846 8330	Analyte not detected at or above detection limit.
2,4,6-Trinitrotoluene	0.75		0.75		0.25	0.033	mg/kg	95	SW846 8330	No action taken. Result < action limit (AL)
2,4-Dinitrotoluene	0.097	J	U		0.25	0.029	mg/kg	2000	SW846 8330	Result < QL.
2,6-Dinitrotoluene	0.17	J	U		0.25	0.028	mg/kg	1000	SW846 8330	Result < QL.
2-Amino-4,6-dinitrotoluene	0.27		0.27		0.25	0.031	mg/kg	2000	SW846 8330	No action taken. Result < action limit (AL)
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	12	SW846 8330	Analyte not detected at or above detection limit.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	20000	SW846 8330	Analyte not detected at or above detection limit.
4-Amino-2,6-dinitrotoluene	0.25		0.25		0.25	0.03	mg/kg	2000	SW846 8330	No action taken. Result < action limit (AL). RPD between columns 59%.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	170	SW846 8330	Analyte not detected at or above detection limit.
HMX	0.5	U	U		0.5	0.048	mg/kg	51000	SW846 8330	Analyte not detected at or above detection limit.
Nitrobenzene	2		2		0.25	0.028	mg/kg	510	SW846 8330	No action taken. Result < action limit (AL)
RDX	0.5	U	U		0.5	0.031	mg/kg	26	SW846 8330	Analyte not detected at or above detection limit.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	10000	SW846 8330	Analyte not detected at or above detection limit.
2,4-Dichlorophenol	0.39	U	U		0.4	0.024	mg/kg	3100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
2-Chlorophenol	0.39	U	U		0.4	0.031	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
3,3'-Dimethylbenzidine	1.9	U	U	J	2	0.074	mg/kg		SW846 8270C	Target analyte not detected at or above detection limit or QL/RL. Estimated due to MDL study conducted in 01/05.
3-Methylphenol	0.39	U	U		0.4	0.0051	mg/kg	51000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Methylphenol	0.39	U	U		0.4	0.026	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Nitrophenol	1.9	U	U		2	0.13	mg/kg	7	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Acetophenone	0.39	U	U		0.4	0.011	mg/kg	100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)anthracene	0.39	U	U		0.4	0.0011	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)pyrene	0.39	U	U		0.4	0.0015	mg/kg	0.39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(b)fluoranthene	0.39	U	U		0.4	0.0014	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(k)fluoranthene	0.39	U	U		0.4	0.002	mg/kg	39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzoic acid	1.9	U	U		2	0.28	mg/kg	4100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
bis(2-Ethylhexyl) phthalate	0.041	J	U		0.4	0.021	mg/kg	200	SW846 8270C	Result < QL. Blank contamination suspected. Analyte detected less than MDL.
Butyl benzyl phthalate	0.39	U	U		0.4	0.022	mg/kg	200000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenz(a,h)anthracene	0.39	U	U		0.4	0.0015	mg/kg	0.39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenzofuran	0.39	U	U		0.4	0.024	mg/kg	2000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Diethyl phthalate	0.17	J	U		0.4	0.022	mg/kg	820000	SW846 8270C	Result < QL.
Dimethyl phthalate	0.39	U	U		0.4	0.025	mg/kg	10000000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Di-n-butyl phthalate	0.083	J	U		0.4	0.022	mg/kg	100000	SW846 8270C	Result < QL.
Di-n-octyl phthalate	0.39	U	U		0.4	0.021	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-3										
Fluoranthene	0.39	U	U		0.4	0.0014	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Hexachloroethane	0.059	U	U		0.4	0.033	mg/kg	200	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Indeno(1,2,3-cd)pyrene	0.39	U	U		0.4	0.0018	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Naphthalene	0.39	U	U		0.4	0.0019	mg/kg	20000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
N-Nitrosodiphenylamine	0.39	U	U		0.4	0.025	mg/kg	26000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Phenol	0.39	U	U		0.4	0.03	mg/kg	310000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Pyrene	0.39	U	U		0.4	0.0013	mg/kg	31000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
1,1-Dichloroethene	0.005	U	U	J	0.005	0.00085	mg/kg	51000	SW846 8260B	Analyte not detected. MS recovered low.
1,2-Dichloroethane	0.005	U	U		0.005	0.00076	mg/kg	31	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Benzene	0.0025	J	U		0.005	0.00066	mg/kg	52	SW846 8260B	Result < QL.
Benzyl chloride	0.005	U	U	J	0.005	0.0015	mg/kg		SW846 8260B	Analyte not detected. LCS/LCSD/MS recovered low.
Bromomethane	0.0021	J	U		0.01	0.00065	mg/kg	15	SW846 8260B	Result < QL.
Carbon tetrachloride	0.005	U	U	J	0.005	0.0011	mg/kg	22	SW846 8260B	Analyte not detected. MS recovered low.
Chlorobenzene	0.005	U	U		0.005	0.00058	mg/kg	20000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloroform	0.005	U	U		0.005	0.00072	mg/kg	10000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloromethane	0.0013	J	U		0.01	0.00062	mg/kg	6	SW846 8260B	Result < QL.
Methylene chloride	0.005	U	U		0.005	0.0009	mg/kg	380	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Tetrachloroethene	0.005	U	U		0.005	0.0016	mg/kg	5.3	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Toluene	0.0013	J	U		0.005	0.0008	mg/kg	200000	SW846 8260B	Result < QL.
Trichloroethene	0.005	U	U	J	0.005	0.00094	mg/kg	7.2	SW846 8260B	Analyte not detected. MS recovered low.
Vinyl chloride	0.005	U	U		0.005	0.00076	mg/kg	4	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Mercury	0.029	B	U		0.11	0.018	mg/kg	0.13	SW846 7471A	Result < QL.
Antimony	0.84	B	U	J	6	0.46	mg/kg	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank. MS/MSD recovered low.
Arsenic	1.5		1.5		1	0.35	mg/kg	16	SW846 6010B	No action taken. Result < action limit (AL)
Barium	81.9		81.9		20	0.084	mg/kg	72000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.47	B	U		0.5	0.042	mg/kg	510	SW846 6010B	Result < QL.
Chromium	13		13		1	0.24	mg/kg	3100	SW846 6010B	No action taken. Result < action limit (AL)
Lead	579		579		0.3	0.22	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	6.9	J	U		330	0.32	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.59	U	U		0.6	0.53	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.2	U	U		1	0.12	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	148	J	U		2500	1.2	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-4										
Nitroglycerin	6.5		6.5		2.5	0.26	mg/kg	200	SW846 8332	No action taken. Result < action limit (AL).
1,3,5-Trinitrobenzene	0.078	J	U		0.25	0.024	mg/kg	31000	SW846 8330	Result < QL.
1,3-Dinitrobenzene	0.088	J	U		0.25	0.029	mg/kg	100	SW846 8330	Result < QL.
2,4,6-Trinitrotoluene	0.3		0.3		0.25	0.033	mg/kg	95	SW846 8330	No action taken. Result < action limit (AL)
2,4-Dinitrotoluene	0.18	J	U		0.25	0.029	mg/kg	2000	SW846 8330	Result < QL.
2,6-Dinitrotoluene	0.11	J	U		0.25	0.028	mg/kg	1000	SW846 8330	Result < QL. RPD between columns > 40% (90%).
2-Amino-4,6-dinitrotoluene	0.046	J	U		0.25	0.031	mg/kg	2000	SW846 8330	Result < QL.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	12	SW846 8330	Analyte not detected at or above detection limit.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	20000	SW846 8330	Analyte not detected at or above detection limit.
4-Amino-2,6-dinitrotoluene	0.25	U	U		0.25	0.03	mg/kg	2000	SW846 8330	Analyte not detected at or above detection limit.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	170	SW846 8330	Analyte not detected at or above detection limit.
HMX	0.5	U	U		0.5	0.048	mg/kg	51000	SW846 8330	Analyte not detected at or above detection limit.
Nitrobenzene	2.5		2.5		0.25	0.028	mg/kg	510	SW846 8330	No action taken. Result < action limit (AL)
RDX	0.11	J	U		0.5	0.031	mg/kg	26	SW846 8330	Result < QL.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	10000	SW846 8330	Analyte not detected at or above detection limit.
2,4-Dichlorophenol	0.38	U	U		0.4	0.023	mg/kg	3100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
2-Chlorophenol	0.38	U	U		0.4	0.03	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
3,3'-Dimethylbenzidine	1.8	U	U	J	2	0.072	mg/kg		SW846 8270C	Target analyte not detected at or above detection limit or QL/RL. Estimated due to MDL study conducted in 01/05.
3-Methylphenol	0.38	U	U		0.4	0.0049	mg/kg	51000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Methylphenol	0.38	U	U		0.4	0.025	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Nitrophenol	1.8	U	U		2	0.13	mg/kg	7	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Acetophenone	0.38	U	U		0.4	0.01	mg/kg	100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)anthracene	0.38	U	U		0.4	0.0011	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)pyrene	0.38	U	U		0.4	0.0015	mg/kg	0.39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(b)fluoranthene	0.38	U	U		0.4	0.0014	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(k)fluoranthene	0.38	U	U		0.4	0.002	mg/kg	39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzoic acid	1.8	U	U		2	0.28	mg/kg	4100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
bis(2-Ethylhexyl) phthalate	0.045	J	U		0.4	0.021	mg/kg	200	SW846 8270C	Result < QL. Blank contamination suspected. Analyte detected less than MDL.
Butyl benzyl phthalate	0.38	U	U		0.4	0.022	mg/kg	200000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenz(a,h)anthracene	0.38	U	U		0.4	0.0015	mg/kg	0.39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenzofuran	0.38	U	U		0.4	0.023	mg/kg	2000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Diethyl phthalate	0.07	J	U		0.4	0.022	mg/kg	820000	SW846 8270C	Result < QL.
Dimethyl phthalate	0.38	U	U		0.4	0.024	mg/kg	10000000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Di-n-butyl phthalate	0.17	J	U		0.4	0.022	mg/kg	100000	SW846 8270C	Result < QL.
Di-n-octyl phthalate	0.38	U	U		0.4	0.021	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-4										
Fluoranthene	0.38	U	U		0.4	0.0014	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Hexachloroethane	0.058	U	U		0.4	0.032	mg/kg	200	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Indeno(1,2,3-cd)pyrene	0.38	U	U		0.4	0.0017	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Naphthalene	0.38	U	U		0.4	0.0018	mg/kg	20000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
N-Nitrosodiphenylamine	0.38	U	U		0.4	0.024	mg/kg	26000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Phenol	0.38	U	U		0.4	0.029	mg/kg	310000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Pyrene	0.38	U	U		0.4	0.0013	mg/kg	31000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
1,1-Dichloroethene	0.005	U	U	J	0.005	0.00086	mg/kg	51000	SW846 8260B	Analyte not detected. MS recovered low.
1,2-Dichloroethane	0.005	U	U		0.005	0.00077	mg/kg	31	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Benzene	0.0071		0.0071		0.005	0.00067	mg/kg	52	SW846 8260B	No action taken. Result < action limit (AL)
Benzyl chloride	0.005	U	U	J	0.005	0.0016	mg/kg		SW846 8260B	Analyte not detected. LCS/LCSD/MS recovered low.
Bromomethane	0.01	U	U		0.01	0.00066	mg/kg	15	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Carbon tetrachloride	0.005	U	U	J	0.005	0.0011	mg/kg	22	SW846 8260B	Analyte not detected. MS recovered low.
Chlorobenzene	0.005	U	U		0.005	0.00058	mg/kg	20000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloroform	0.005	U	U		0.005	0.00073	mg/kg	10000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloromethane	0.01	U	U		0.01	0.00062	mg/kg	6	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Methylene chloride	0.005	U	U		0.005	0.0009	mg/kg	380	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Tetrachloroethene	0.005	U	U		0.005	0.0016	mg/kg	5.3	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Toluene	0.001	J	U		0.005	0.00081	mg/kg	200000	SW846 8260B	Result < QL.
Trichloroethene	0.005	U	U	J	0.005	0.00095	mg/kg	7.2	SW846 8260B	Analyte not detected. MS recovered low.
Vinyl chloride	0.005	U	U		0.005	0.00077	mg/kg	4	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
TPH (as Diesel)	20		20		10	0.28	mg/kg	11000	SW846 8015B	No action taken. Result < action limit (AL)
Mercury	0.035	B	U		0.11	0.017	mg/kg	0.13	SW846 7471A	Result < QL.
Antimony	0.97	B	U	J	6	0.45	mg/kg	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank. MS/MSD recovered low.
Arsenic	1.4		1.4		1	0.35	mg/kg	16	SW846 6010B	No action taken. Result < action limit (AL)
Barium	70.8		70.8		20	0.082	mg/kg	72000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.4	B	U		0.5	0.041	mg/kg	510	SW846 6010B	Result < QL.
Chromium	12.1		12.1		1	0.23	mg/kg	3100	SW846 6010B	No action taken. Result < action limit (AL)
Lead	219		219		0.3	0.22	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	6.5	J	U		330	0.31	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.58	U	U		0.6	0.52	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.2	U	U		1	0.12	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	255	J	U		2500	1.2	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-5										
Nitroglycerin	1	J	U		2.5	0.26	mg/kg	200	SW846 8332	Result < QL.
1,3,5-Trinitrobenzene	0.25	U	U		0.25	0.024	mg/kg	31000	SW846 8330	Analyte not detected at or above detection limit.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	100	SW846 8330	Analyte not detected at or above detection limit.
2,4,6-Trinitrotoluene	0.25	U	U		0.25	0.033	mg/kg	95	SW846 8330	Analyte not detected at or above detection limit.
2,4-Dinitrotoluene	0.054	J	U		0.25	0.029	mg/kg	2000	SW846 8330	Result < QL.
2,6-Dinitrotoluene	0.25	U	U		0.25	0.028	mg/kg	1000	SW846 8330	Analyte not detected at or above detection limit.
2-Amino-4,6-dinitrotoluene	0.25	U	U		0.25	0.031	mg/kg	2000	SW846 8330	Analyte not detected at or above detection limit.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	12	SW846 8330	Analyte not detected at or above detection limit.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	20000	SW846 8330	Analyte not detected at or above detection limit.
4-Amino-2,6-dinitrotoluene	0.045	J	U		0.25	0.03	mg/kg	2000	SW846 8330	Result < QL. RPD between columns > 40% (123%).
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	170	SW846 8330	Analyte not detected at or above detection limit.
HMX	0.5	U	U		0.5	0.048	mg/kg	51000	SW846 8330	Analyte not detected at or above detection limit.
Nitrobenzene	0.53		0.53		0.25	0.028	mg/kg	510	SW846 8330	No action taken. Result < action limit (AL)
RDX	0.5	U	U		0.5	0.031	mg/kg	26	SW846 8330	Analyte not detected at or above detection limit.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	10000	SW846 8330	Analyte not detected at or above detection limit.
2,4-Dichlorophenol	0.39	U	U		0.4	0.024	mg/kg	3100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
2-Chlorophenol	0.39	U	U		0.4	0.031	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
3,3'-Dimethylbenzidine	1.9	U	U	J	2	0.075	mg/kg		SW846 8270C	Target analyte not detected at or above detection limit or QL/RL. Estimated due to MDL study conducted in 01/05.
3-Methylphenol	0.39	U	U		0.4	0.0051	mg/kg	51000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Methylphenol	0.39	U	U		0.4	0.026	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Nitrophenol	1.9	U	U		2	0.13	mg/kg	7	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Acetophenone	0.39	U	U		0.4	0.011	mg/kg	100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)anthracene	0.39	U	U		0.4	0.0011	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)pyrene	0.39	U	U		0.4	0.0015	mg/kg	0.39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(b)fluoranthene	0.39	U	U		0.4	0.0014	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(k)fluoranthene	0.39	U	U		0.4	0.002	mg/kg	39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzoic acid	1.9	U	U		2	0.29	mg/kg	4100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
bis(2-Ethylhexyl) phthalate	0.024	J	U		0.4	0.021	mg/kg	200	SW846 8270C	Result < QL. Blank contamination suspected. Analyte detected less than MDL.
Butyl benzyl phthalate	0.39	U	U		0.4	0.023	mg/kg	200000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenz(a,h)anthracene	0.39	U	U		0.4	0.0015	mg/kg	0.39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenzofuran	0.39	U	U		0.4	0.024	mg/kg	2000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Diethyl phthalate	0.23	J	U		0.4	0.023	mg/kg	820000	SW846 8270C	Result < QL.
Dimethyl phthalate	0.39	U	U		0.4	0.025	mg/kg	10000000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Di-n-butyl phthalate	0.12	J	U		0.4	0.023	mg/kg	100000	SW846 8270C	Result < QL.
Di-n-octyl phthalate	0.39	U	U		0.4	0.021	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-5										
Fluoranthene	0.39	U	U		0.4	0.0014	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Hexachloroethane	0.06	U	U		0.4	0.033	mg/kg	200	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Indeno(1,2,3-cd)pyrene	0.39	U	U		0.4	0.0018	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Naphthalene	0.39	U	U		0.4	0.0019	mg/kg	20000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
N-Nitrosodiphenylamine	0.39	U	U		0.4	0.025	mg/kg	26000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Phenol	0.39	U	U		0.4	0.03	mg/kg	310000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Pyrene	0.39	U	U		0.4	0.0013	mg/kg	31000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
1,1-Dichloroethene	0.006	U	U	J	0.006	0.001	mg/kg	51000	SW846 8260B	Analyte not detected. MS recovered low.
1,2-Dichloroethane	0.006	U	U		0.005	0.00093	mg/kg	31	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Benzene	0.006	U	U		0.005	0.00081	mg/kg	52	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Benzyl chloride	0.006	U	U	J	0.005	0.0019	mg/kg		SW846 8260B	Analyte not detected. LCS/LCSD/MS recovered low.
Bromomethane	0.0012	J	U		0.01	0.00079	mg/kg	15	SW846 8260B	Result < QL.
Carbon tetrachloride	0.006	U	U	J	0.005	0.0014	mg/kg	22	SW846 8260B	Analyte not detected. MS recovered low.
Chlorobenzene	0.006	U	U		0.005	0.0007	mg/kg	20000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloroform	0.006	U	U		0.005	0.00088	mg/kg	10000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloromethane	0.012	U	U		0.01	0.00075	mg/kg	6	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Methylene chloride	0.0012	J	U		0.005	0.0011	mg/kg	380	SW846 8260B	Result < QL. Blank contamination in the trip blank (0.8 ug/l).
Tetrachloroethene	0.006	U	U		0.005	0.0019	mg/kg	5.3	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Toluene	0.006	U	U		0.005	0.00097	mg/kg	200000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Trichloroethene	0.006	U	U	J	0.005	0.0011	mg/kg	7.2	SW846 8260B	Analyte not detected. MS recovered low.
Vinyl chloride	0.006	U	U		0.005	0.00092	mg/kg	4	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Mercury	0.12	U	U		0.11	0.018	mg/kg	0.13	SW846 7471A	Analyte not detected above dectection limit or QL.
Antimony	7.1	U	U	J	6	0.46	mg/kg	410	SW846 6010B	Analyte not detected. MS/MSD recovered low.
Arsenic	0.4	B	U		1	0.36	mg/kg	16	SW846 6010B	Result < QL.
Barium	38		38		20	0.085	mg/kg	72000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.17	B	U		0.5	0.043	mg/kg	510	SW846 6010B	Result < QL.
Chromium	7.3		7.3		1	0.24	mg/kg	3100	SW846 6010B	No action taken. Result < action limit (AL)
Lead	436		436		0.3	0.23	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	3.8	J	U		330	0.32	mg/kg	20000	SW846 6010B	Result < QL.
Selenium	0.6	U	U		0.6	0.54	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.2	U	U		1	0.12	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	44.1	J	U		2500	1.2	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-6										
Nitroglycerin	1.5	J	U		2.5	0.26	mg/kg	200	SW846 8332	Result < QL.
1,3,5-Trinitrobenzene	0.25	U	U		0.25	0.024	mg/kg	31000	SW846 8330	Analyte not detected at or above detection limit.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	100	SW846 8330	Analyte not detected at or above detection limit.
2,4,6-Trinitrotoluene	0.05	J	U		0.25	0.033	mg/kg	95	SW846 8330	Result < QL.
2,4-Dinitrotoluene	0.095	J	U		0.25	0.029	mg/kg	2000	SW846 8330	Result < QL.
2,6-Dinitrotoluene	0.034	J	U		0.25	0.028	mg/kg	1000	SW846 8330	Result < QL.
2-Amino-4,6-dinitrotoluene	0.031	J	U		0.25	0.031	mg/kg	2000	SW846 8330	Result < QL.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	12	SW846 8330	Analyte not detected at or above detection limit.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	20000	SW846 8330	Analyte not detected at or above detection limit.
4-Amino-2,6-dinitrotoluene	0.079	J	U		0.25	0.03	mg/kg	2000	SW846 8330	Result < QL. RPD between columns > 40% (62%).
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	170	SW846 8330	Analyte not detected at or above detection limit.
HMX	0.5	U	U		0.5	0.048	mg/kg	51000	SW846 8330	Analyte not detected at or above detection limit.
Nitrobenzene	0.46		0.46		0.25	0.028	mg/kg	510	SW846 8330	No action taken. Result < action limit (AL)
RDX	0.5	U	U		0.5	0.031	mg/kg	26	SW846 8330	Analyte not detected at or above detection limit.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	10000	SW846 8330	Analyte not detected at or above detection limit.
2,4-Dichlorophenol	0.38	U	U		0.4	0.023	mg/kg	3100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
2-Chlorophenol	0.38	U	U		0.4	0.03	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
3,3'-Dimethylbenzidine	1.8	U	U	J	2	0.073	mg/kg		SW846 8270C	Target analyte not detected at or above detection limit or QL/RL. Estimated due to MDL study conducted in 01/05.
3-Methylphenol	0.38	U	U		0.4	0.005	mg/kg	51000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Methylphenol	0.38	U	U		0.4	0.025	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Nitrophenol	1.8	U	U		2	0.13	mg/kg	7	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Acetophenone	0.38	U	U		0.4	0.01	mg/kg	100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)anthracene	0.38	U	U		0.4	0.0011	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)pyrene	0.38	U	U		0.4	0.0015	mg/kg	0.39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(b)fluoranthene	0.38	U	U		0.4	0.0014	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(k)fluoranthene	0.38	U	U		0.4	0.002	mg/kg	39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzoic acid	1.8	U	U		1.8	0.28	mg/kg	4100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
bis(2-Ethylhexyl) phthalate	0.38	U	U		0.4	0.021	mg/kg	200	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Butyl benzyl phthalate	0.38	U	U		0.4	0.022	mg/kg	200000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenz(a,h)anthracene	0.38	U	U		0.4	0.0015	mg/kg	0.39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenzofuran	0.38	U	U		0.4	0.023	mg/kg	2000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Diethyl phthalate	0.3	J	U		0.4	0.022	mg/kg	820000	SW846 8270C	Result < QL.
Dimethyl phthalate	0.38	U	U		0.4	0.024	mg/kg	10000000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Di-n-butyl phthalate	0.041	J	U		0.4	0.022	mg/kg	100000	SW846 8270C	Result < QL.
Di-n-octyl phthalate	0.38	U	U		0.4	0.021	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-6										
Fluoranthene	0.38	U	U		0.4	0.0014	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Hexachloroethane	0.058	U	U		0.4	0.032	mg/kg	200	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Indeno(1,2,3-cd)pyrene	0.38	U	U		0.4	0.0017	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Naphthalene	0.38	U	U		0.4	0.0018	mg/kg	20000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
N-Nitrosodiphenylamine	0.38	U	U		0.4	0.024	mg/kg	26000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Phenol	0.38	U	U		0.4	0.029	mg/kg	310000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Pyrene	0.38	U	U		0.4	0.0013	mg/kg	31000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
1,1-Dichloroethene	0.0054	U	U	J	0.005	0.00092	mg/kg	51000	SW846 8260B	Analyte not detected. MS recovered low.
1,2-Dichloroethane	0.0054	U	U		0.005	0.00082	mg/kg	31	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Benzene	0.001	J	U		0.005	0.00072	mg/kg	52	SW846 8260B	Result < QL.
Benzyl chloride	0.0054	U	U	J	0.005	0.0017	mg/kg		SW846 8260B	Analyte not detected. LCS/LCSD/MS recovered low.
Bromomethane	0.011	U	U		0.01	0.0007	mg/kg	15	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Carbon tetrachloride	0.0054	U	U	J	0.005	0.0012	mg/kg	22	SW846 8260B	Analyte not detected. MS recovered low.
Chlorobenzene	0.0054	U	U		0.005	0.00062	mg/kg	20000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloroform	0.0054	U	U		0.005	0.00078	mg/kg	10000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloromethane	0.011	U	U		0.01	0.00067	mg/kg	6	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Methylene chloride	0.0054	U	U		0.005	0.00097	mg/kg	380	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Tetrachloroethene	0.0054	U	U		0.005	0.0017	mg/kg	5.3	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Toluene	0.0054	U	U		0.005	0.00086	mg/kg	200000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Trichloroethene	0.0054	U	U	J	0.005	0.001	mg/kg	7.2	SW846 8260B	Analyte not detected. MS recovered low.
Vinyl chloride	0.0054	U	U		0.005	0.00082	mg/kg	4	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Mercury	0.12	U	U		0.11	0.017	mg/kg	0.13	SW846 7471A	Analyte not detected above dectection limit or QL.
Antimony	0.58	B	U	J	6	0.45	mg/kg	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank. MS/MSD recovered low.
Arsenic	0.69	B	U		1	0.35	mg/kg	16	SW846 6010B	Result < QL.
Barium	30.3		30.3		20	0.082	mg/kg	72000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.15	B	U		0.5	0.041	mg/kg	510	SW846 6010B	Result < QL.
Chromium	6.7		6.7		1	0.23	mg/kg	3100	SW846 6010B	No action taken. Result < action limit (AL)
Lead	251		251		0.3	0.22	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	3	J	U		330	0.31	mg/kg	20000	SW846 6010B	Result < QL.
Selenium	0.58	U	U		0.6	0.52	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.2	U	U		1	0.12	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	55	J	U		2500	1.2	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-7										
Nitroglycerin	3.2		3.2		2.5	0.26	mg/kg	200	SW846 8332	No action taken. Result < action limit (AL).
1,3,5-Trinitrobenzene	0.054	J	U		0.25	0.024	mg/kg	31000	SW846 8330	Result < QL.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	100	SW846 8330	Analyte not detected at or above detection limit.
2,4,6-Trinitrotoluene	5.3		5.3	J	0.25	0.033	mg/kg	95	SW846 8330	Result < action limit (AL). Sample/duplicate RPD> 35 and +/- 2X RL.
2,4-Dinitrotoluene	0.17	J	U		0.25	0.029	mg/kg	2000	SW846 8330	Result < QL.
2,6-Dinitrotoluene	0.074	J	U		0.25	0.028	mg/kg	1000	SW846 8330	Result < QL.
2-Amino-4,6-dinitrotoluene	0.36		0.36		0.25	0.031	mg/kg	2000	SW846 8330	No action taken. Result < action limit (AL)
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	12	SW846 8330	Analyte not detected at or above detection limit.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	20000	SW846 8330	Analyte not detected at or above detection limit.
4-Amino-2,6-dinitrotoluene	0.59		0.59		0.25	0.03	mg/kg	2000	SW846 8330	No action taken. Result < action limit (AL)
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	170	SW846 8330	Analyte not detected at or above detection limit.
HMX	0.5	U	U		0.5	0.048	mg/kg	51000	SW846 8330	Analyte not detected at or above detection limit.
Nitrobenzene	0.61		0.61	J	0.25	0.028	mg/kg	510	SW846 8330	Result < action limit (AL). Sample/duplicate RPD> 35 and +/- 2X RL.
RDX	0.5	U	U		0.5	0.031	mg/kg	26	SW846 8330	Analyte not detected at or above detection limit.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	10000	SW846 8330	Analyte not detected at or above detection limit.
2,4-Dichlorophenol	0.75	U	U		0.4	0.045	mg/kg	3100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
2-Chlorophenol	0.75	U	U		0.4	0.059	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
3,3'-Dimethylbenzidine	3.6	U	U	J	2	0.14	mg/kg		SW846 8270C	Target analyte not detected at or above detection limit or QL/RL. Estimated due to MDL study conducted in 01/05.
3-Methylphenol	0.75	U	U		0.4	0.0097	mg/kg	51000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Methylphenol	0.75	U	U		0.4	0.05	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Nitrophenol	3.6	U	U		2	0.25	mg/kg	7	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Acetophenone	0.75	U	U		0.4	0.02	mg/kg	100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)anthracene	0.75	U	U		0.4	0.0022	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)pyrene	0.75	U	U		0.4	0.0029	mg/kg	0.39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(b)fluoranthene	0.75	U	U		0.4	0.0027	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(k)fluoranthene	0.75	U	U		0.4	0.0039	mg/kg	39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzoic acid	3.6	U	U		2	0.54	mg/kg	4100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
bis(2-Ethylhexyl) phthalate	0.14	J	U		0.4	0.041	mg/kg	200	SW846 8270C	Result < QL. Blank contamination suspected. Analyte detected less than MDL.
Butyl benzyl phthalate	0.75	U	U		0.4	0.043	mg/kg	200000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenz(a,h)anthracene	0.75	U	U		0.4	0.0029	mg/kg	0.39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenzofuran	0.75	U	U		0.4	0.045	mg/kg	2000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Diethyl phthalate	0.7	J	U		0.4	0.043	mg/kg	820000	SW846 8270C	Result < QL.
Dimethyl phthalate	0.75	U	U		0.4	0.048	mg/kg	10000000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Di-n-butyl phthalate	2		2		0.4	0.043	mg/kg	100000	SW846 8270C	No action taken. Result < action limit (AL).
Di-n-octyl phthalate	0.75	U	U		0.4	0.041	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-7										
Fluoranthene	0.75	U	U		0.4	0.0027	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Hexachloroethane	0.11	U	U		0.4	0.063	mg/kg	200	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Indeno(1,2,3-cd)pyrene	0.75	U	U		0.4	0.0034	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Naphthalene	0.75	U	U		0.4	0.0036	mg/kg	20000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
N-Nitrosodiphenylamine	0.15	J	U		0.4	0.048	mg/kg	26000	SW846 8270C	Result < QL.
Phenol	0.75	U	U		0.4	0.057	mg/kg	310000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Pyrene	0.75	U	U		0.4	0.0025	mg/kg	31000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
1,1-Dichloroethene	0.0054	U	U	J	0.005	0.00093	mg/kg	51000	SW846 8260B	Analyte not detected. MS recovered low.
1,2-Dichloroethane	0.0054	U	U		0.005	0.00083	mg/kg	31	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Benzene	0.0028	J	U		0.005	0.00072	mg/kg	52	SW846 8260B	Result < QL.
Benzyl chloride	0.0054	U	U	J	0.005	0.0017	mg/kg		SW846 8260B	Analyte not detected. LCS/LCSD/MS recovered low.
Bromomethane	0.011	U	U		0.01	0.00071	mg/kg	15	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Carbon tetrachloride	0.0054	U	U	J	0.005	0.0012	mg/kg	22	SW846 8260B	Analyte not detected. MS recovered low.
Chlorobenzene	0.0054	U	U		0.005	0.00063	mg/kg	20000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloroform	0.0017	J	U		0.005	0.00079	mg/kg	10000	SW846 8260B	Result < QL.
Chloromethane	0.011	U	U		0.01	0.00067	mg/kg	6	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Methylene chloride	0.0054	U	U		0.005	0.00097	mg/kg	380	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Tetrachloroethene	0.0054	U	U		0.005	0.0017	mg/kg	5.3	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Toluene	0.0017	J	U		0.005	0.00087	mg/kg	200000	SW846 8260B	Result < QL.
Trichloroethene	0.0054	U	U	J	0.005	0.001	mg/kg	7.2	SW846 8260B	Analyte not detected. MS recovered low.
Vinyl chloride	0.0054	U	U		0.005	0.00083	mg/kg	4	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
TPH (as Diesel)	23	J	U		50	1.4	mg/kg	11000	SW846 8015B	Result < adjusted QL. Analyzed in dilution, adjusted QL 50 mg/kg. Result < action limit (AL)
Mercury	0.34		0.34		0.11	0.017	mg/kg	0.13	SW846 7471A	Result < action limit (AL). Verification performed 03/25/2008. Original result 0.30 mg/kg. Verification result reported.
Antimony	0.48	B	U	J	6	0.44	mg/kg	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank. MS/MSD recovered low.
Arsenic	1.6		1.6		1	0.34	mg/kg	16	SW846 6010B	No action taken. Result < action limit (AL)
Barium	85.4		85.4		20	0.08	mg/kg	72000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.44	B	U		0.5	0.041	mg/kg	510	SW846 6010B	Result < QL.
Chromium	14		14		1	0.23	mg/kg	3100	SW846 6010B	No action taken. Result < action limit (AL)
Lead	251		251	J	0.3	0.22	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL). RPD >35 and +/- 2X RL.
Nickel	9.5	J	U		330	0.31	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.57	U	U		0.6	0.51	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.1	U	U		1	0.11	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	97.1	J	U		2500	1.1	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-8										
Nitroglycerin	5.2		5.2		2.5	0.26	mg/kg	200	SW846 8332	No action taken. Result < action limit (AL). RPD between columns 51%.
1,3,5-Trinitrobenzene	0.54		0.54		0.25	0.024	mg/kg	31000	SW846 8330	No action taken. Result < action limit (AL)
1,3-Dinitrobenzene	0.03	J	U		0.25	0.029	mg/kg	100	SW846 8330	Result < QL.
2,4,6-Trinitrotoluene	59		59		0.25	0.33	mg/kg	95	SW846 8330	No action taken. Result < action limit (AL). Sample analyzed in dilution.
2,4-Dinitrotoluene	0.73		0.73		0.25	0.029	mg/kg	2000	SW846 8330	No action taken. Result < action limit (AL)
2,6-Dinitrotoluene	0.31		0.31		0.25	0.028	mg/kg	1000	SW846 8330	No action taken. Result < action limit (AL)
2-Amino-4,6-dinitrotoluene	1.7		1.7		0.25	0.031	mg/kg	2000	SW846 8330	No action taken. Result < action limit (AL)
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	12	SW846 8330	Analyte not detected at or above detection limit.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	20000	SW846 8330	Analyte not detected at or above detection limit.
4-Amino-2,6-dinitrotoluene	2.2		2.2		0.25	0.03	mg/kg	2000	SW846 8330	No action taken. Result < action limit (AL)
4-Nitrotoluene	0.076	J	U		0.25	0.045	mg/kg	170	SW846 8330	Result < QL. RPD between columns > 40% (179%).
HMX	0.13	J	U		0.5	0.048	mg/kg	51000	SW846 8330	Result < QL.
Nitrobenzene	0.91		0.91		0.25	0.028	mg/kg	510	SW846 8330	No action taken. Result < action limit (AL)
RDX	0.065	J	U		0.5	0.031	mg/kg	26	SW846 8330	Result < QL. RPD between columns > 40% (89%).
Tetryl	0.21	J	U		0.65	0.095	mg/kg	10000	SW846 8330	Result < QL. RPD between columns > 40% (112%).
2,4-Dichlorophenol	0.38	U	U		0.4	0.023	mg/kg	3100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
2-Chlorophenol	0.38	U	U		0.4	0.03	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
3,3'-Dimethylbenzidine	1.9	U	U	J	2	0.073	mg/kg		SW846 8270C	Target analyte not detected at or above detection limit or QL/RL. Estimated due to MDL study conducted in 01/05.
3-Methylphenol	0.38	U	U		0.4	0.005	mg/kg	51000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Methylphenol	0.38	U	U		0.4	0.026	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Nitrophenol	1.9	U	U		2	0.13	mg/kg	7	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Acetophenone	0.38	U	U		0.4	0.01	mg/kg	100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)anthracene	0.38	U	U		0.4	0.0011	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)pyrene	0.38	U	U	J	0.4	0.0015	mg/kg	0.39	SW846 8270C	Internal standard area outside limits.
Benzo(b)fluoranthene	0.38	U	U	J	0.4	0.0014	mg/kg	3.9	SW846 8270C	Internal standard area outside limits.
Benzo(k)fluoranthene	0.38	U	U	J	0.4	0.002	mg/kg	39	SW846 8270C	Internal standard area outside limits.
Benzoic acid	1.9	U	U		2	0.28	mg/kg	4100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
bis(2-Ethylhexyl) phthalate	0.096	J	U		0.4	0.021	mg/kg	200	SW846 8270C	Result < QL. Blank contamination suspected. Analyte detected less than MDL.
Butyl benzyl phthalate	0.38	U	U		0.4	0.022	mg/kg	200000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenz(a,h)anthracene	0.38	U	U	J	0.4	0.0015	mg/kg	0.39	SW846 8270C	Internal standard area outside limits.
Dibenzofuran	0.38	U	U		0.4	0.023	mg/kg	2000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Diethyl phthalate	0.95		0.95		0.4	0.022	mg/kg	820000	SW846 8270C	Result < action limit (AL)
Dimethyl phthalate	1.2		1.2		0.4	0.024	mg/kg	10000000	SW846 8270C	Result < action limit (AL)
Di-n-butyl phthalate	1.4		1.4		0.4	0.022	mg/kg	100000	SW846 8270C	Result < action limit (AL)
Di-n-octyl phthalate	0.38	U	U	J	0.4	0.021	mg/kg	41000	SW846 8270C	Internal standard area outside limits.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-8										
Fluoranthene	0.38	U	U		0.4	0.0014	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Hexachloroethane	0.058	U	U		0.4	0.032	mg/kg	200	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Indeno(1,2,3-cd)pyrene	0.38	U	U	J	0.4	0.0017	mg/kg	3.9	SW846 8270C	Internal standard area outside limits.
Naphthalene	0.38	U	U		0.4	0.0019	mg/kg	20000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
N-Nitrosodiphenylamine	0.23	J	U		0.4	0.024	mg/kg	26000	SW846 8270C	Result < QL.
Phenol	0.38	U	U		0.4	0.029	mg/kg	310000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Pyrene	0.38	U	U		0.4	0.0013	mg/kg	31000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
1,1-Dichloroethene	0.0055	U	U	J	0.005	0.00095	mg/kg	51000	SW846 8260B	Analyte not detected. MS recovered low.
1,2-Dichloroethane	0.0055	U	U		0.005	0.00085	mg/kg	31	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Benzene	0.0012	J	U		0.005	0.00074	mg/kg	52	SW846 8260B	Result < QL.
Benzyl chloride	0.0055	U	U	J	0.005	0.0017	mg/kg		SW846 8260B	Analyte not detected. LCS/LCSD/MS recovered low.
Bromomethane	0.011	U	U		0.01	0.00072	mg/kg	15	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Carbon tetrachloride	0.0055	U	U	J	0.005	0.0013	mg/kg	22	SW846 8260B	Analyte not detected. MS recovered low.
Chlorobenzene	0.0055	U	U		0.005	0.00064	mg/kg	20000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloroform	0.0055	U	U		0.005	0.0008	mg/kg	10000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloromethane	0.011	U	U		0.01	0.00069	mg/kg	6	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Methylene chloride	0.0055	U	U		0.005	0.001	mg/kg	380	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Tetrachloroethene	0.0055	U	U		0.005	0.0017	mg/kg	5.3	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Toluene	0.0055	U	U		0.005	0.00089	mg/kg	200000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Trichloroethene	0.0055	U	U	J	0.005	0.001	mg/kg	7.2	SW846 8260B	Analyte not detected. MS recovered low.
Vinyl chloride	0.0055	U	U		0.005	0.00085	mg/kg	4	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Mercury	0.069	B	U		0.11	0.017	mg/kg	0.13	SW846 7471A	Result < QL.
Antimony	1.3	B	U	J	6	0.45	mg/kg	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank. MS/MSD recovered low.
Arsenic	2.3		2.3		1	0.35	mg/kg	16	SW846 6010B	No action taken. Result < action limit (AL)
Barium	133		133		20	0.082	mg/kg	72000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.51	B	U		0.5	0.042	mg/kg	510	SW846 6010B	Result < QL.
Chromium	18		18		1	0.23	mg/kg	3100	SW846 6010B	No action taken. Result < action limit (AL)
Lead	684		684		0.3	0.22	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	8.2	J	U		330	0.31	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.58	U	U		0.6	0.52	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.2	U	U		1	0.12	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	186	J	U		2500	1.2	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-X										
Nitroglycerin	1.5	J	U		2.5	0.26	mg/kg	200	SW846 8332	Result < QL. RPD between columns 191%.
1,3,5-Trinitrobenzene	0.028	J	U		0.25	0.024	mg/kg	31000	SW846 8330	Result < QL. Blind field duplicate for PAD-7.
1,3-Dinitrobenzene	0.16	J	U		0.25	0.029	mg/kg	100	SW846 8330	Result < QL. Blind field duplicate for PAD-7.
2,4,6-Trinitrotoluene	0.94		0.94	J	0.25	0.033	mg/kg	95	SW846 8330	Result < action limit (AL). Sample/duplicate RPD> 35 and +/- 2X RL. Blind field duplicate for PAD-7.
2,4-Dinitrotoluene	0.78		0.78		0.25	0.029	mg/kg	2000	SW846 8330	No action taken. Result < action limit (AL). Blind field duplicate for PAD-7.
2,6-Dinitrotoluene	0.26		0.26		0.25	0.028	mg/kg	1000	SW846 8330	No action taken. Result < action limit (AL). Blind field duplicate for PAD-7.
2-Amino-4,6-dinitrotoluene	0.75		0.75		0.25	0.031	mg/kg	2000	SW846 8330	No action taken. Result < action limit (AL). Blind field duplicate for PAD-7.
2-Nitrotoluene	0.15	J	U		0.25	0.037	mg/kg	12	SW846 8330	Result < QL. Blind field duplicate for PAD-7.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	20000	SW846 8330	Analyte not detected at or above detection limit. Blind field duplicate for PAD-7.
4-Amino-2,6-dinitrotoluene	0.87		0.87		0.25	0.03	mg/kg	2000	SW846 8330	No action taken. Result < action limit (AL). RPD between columns > 40% (130%). Blind field duplicate for PAD-7.
4-Nitrotoluene	0.16	J	U		0.25	0.045	mg/kg	170	SW846 8330	Result < QL. Blind field duplicate for PAD-7.
HMX	0.5	U	U		0.5	0.048	mg/kg	51000	SW846 8330	Analyte not detected at or above detection limit.
Nitrobenzene	25		25	J	0.75	0.084	mg/kg	510	SW846 8330	Result < action limit (AL). Sample/duplicate RPD> 35 and +/- 2X RL.
RDX	0.5	U	U		0.5	0.031	mg/kg	26	SW846 8330	Analyte not detected at or above detection limit.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	10000	SW846 8330	Analyte not detected at or above detection limit.
2,4-Dichlorophenol	0.38	U	U		0.4	0.023	mg/kg	3100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL. Blind field duplicate for PAD-7.
2-Chlorophenol	0.38	U	U		0.4	0.03	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL. Blind field duplicate for PAD-7.
3,3'-Dimethylbenzidine	1.8	U	U	J	2	0.072	mg/kg		SW846 8270C	Target analyte not detected at or above detection limit or QL/RL. Estimated due to MDL study conducted in 01/05. Blind field duplicate for PAD-7.
3-Methylphenol	0.38	U	U		0.4	0.0049	mg/kg	51000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL. Blind field duplicate for PAD-7.
4-Methylphenol	0.38	U	U		0.4	0.025	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL. Blind field duplicate for PAD-7.
4-Nitrophenol	1.8	U	U		2	0.13	mg/kg	7	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL. Blind field duplicate for PAD-7.
Acetophenone	0.38	U	U		0.4	0.01	mg/kg	100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL. Blind field duplicate for PAD-7.
Benzo(a)anthracene	0.38	U	U		0.4	0.0011	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL. Blind field duplicate for PAD-7.
Benzo(a)pyrene	0.38	U	U	J	0.4	0.0015	mg/kg	0.39	SW846 8270C	Internal standard area outside limits. Blind field duplicate for PAD-7.
Benzo(b)fluoranthene	0.38	U	U	J	0.4	0.0014	mg/kg	3.9	SW846 8270C	Internal standard area outside limits.
Benzo(k)fluoranthene	0.38	U	U	J	0.4	0.0019	mg/kg	39	SW846 8270C	Internal standard area outside limits.
Benzoic acid	1.8	U	U		2	0.27	mg/kg	4100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
bis(2-Ethylhexyl) phthalate	0.16	J	U		0.4	0.021	mg/kg	200	SW846 8270C	Result < QL. Blank contamination suspected. Analyte detected less than MDL.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-X										
Butyl benzyl phthalate	0.38	U	U		0.4	0.022	mg/kg	200000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenz(a,h)anthracene	0.38	U	U	J	0.4	0.0015	mg/kg	0.39	SW846 8270C	Internal standard area outside limits.
Dibenzofuran	0.38	U	U		0.4	0.023	mg/kg	2000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Diethyl phthalate	0.81		0.81		0.4	0.022	mg/kg	820000	SW846 8270C	No action taken. Result < action limit (AL)
Dimethyl phthalate	0.38	U	U		0.4	0.024	mg/kg	10000000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Di-n-butyl phthalate	0.37	J	U		0.4	0.022	mg/kg	100000	SW846 8270C	Result < QL.
Di-n-octyl phthalate	0.38	U	U	J	0.4	0.021	mg/kg	41000	SW846 8270C	Internal standard area outside limits.
Fluoranthene	0.38	U	U		0.4	0.0014	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Hexachloroethane	0.057	U	U		0.4	0.032	mg/kg	200	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Indeno(1,2,3-cd)pyrene	0.38	U	U	J	0.4	0.0017	mg/kg	3.9	SW846 8270C	Internal standard area outside limits.
Naphthalene	0.38	U	U		0.4	0.0018	mg/kg	20000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
N-Nitrosodiphenylamine	0.12	J	U		0.4	0.024	mg/kg	26000	SW846 8270C	Result < QL.
Phenol	0.38	U	U		0.4	0.029	mg/kg	310000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Pyrene	0.38	U	U		0.4	0.0013	mg/kg	31000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
1,1-Dichloroethene	0.0054	U	U	J	0.005	0.00094	mg/kg	51000	SW846 8260B	Analyte not detected. MS recovered low. Blind field duplicate for PAD-7.
1,2-Dichloroethane	0.0054	U	U		0.005	0.00083	mg/kg	31	SW846 8260B	Target analyte not detected above detection limit or QL/RL. Blind field duplicate for PAD-7.
Benzene	0.004	J	U		0.005	0.00073	mg/kg	52	SW846 8260B	Result < QL. Blind field duplicate for PAD-7.
Benzyl chloride	0.0054	U	U	J	0.005	0.0017	mg/kg		SW846 8260B	Analyte not detected. LCS/LCSD/MS recovered low.
Bromomethane	0.0023	J	U		0.01	0.00071	mg/kg	15	SW846 8260B	Result < QL.
Carbon tetrachloride	0.0054	U	U	J	0.005	0.0012	mg/kg	22	SW846 8260B	Analyte not detected. MS recovered low.
Chlorobenzene	0.0054	U	U		0.005	0.00063	mg/kg	20000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloroform	0.003	J	U		0.005	0.00079	mg/kg	10000	SW846 8260B	Result < QL.
Chloromethane	0.0024	J	U		0.01	0.00067	mg/kg	6	SW846 8260B	Result < QL.
Methylene chloride	0.0054	U	U		0.005	0.00098	mg/kg	380	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Tetrachloroethene	0.0054	U	U		0.005	0.0017	mg/kg	5.3	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Toluene	0.0025	J	U		0.005	0.00087	mg/kg	200000	SW846 8260B	Result < QL.
Trichloroethene	0.0054	U	U	J	0.005	0.001	mg/kg	7.2	SW846 8260B	Analyte not detected. MS recovered low.
Vinyl chloride	0.0054	U	U		0.005	0.00083	mg/kg	4	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
TPH (as Diesel)	25		25		10	0.27	mg/kg	11000	SW846 8015B	No action taken. Result < action limit (AL)
Mercury	0.36		0.36		0.11	0.017	mg/kg	0.13	SW846 7471A	Duplicate of PAD-7.
Antimony	0.88	B	U	J	6	0.45	mg/kg	410	SW846 6010B	Blind field duplicate for PAD-7. Result < QL. Blank contamination in the equipment blank. MS/MSD recovered low. Duplicate for PAD-7.
Arsenic	1.3		1.3		1	0.34	mg/kg	16	SW846 6010B	No action taken. Result < action limit (AL). Duplicate for PAD-7. Blind field duplicate for PAD-7.
Barium	95		95		20	0.081	mg/kg	72000	SW846 6010B	No action taken. Result < action limit (AL). Duplicate for PAD-7.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-X										
Cadmium	0.48	B	U		0.5	0.041	mg/kg	510	SW846 6010B	Result < QL. Duplicate for PAD-7.
Chromium	14.1		14.1		1	0.23	mg/kg	3100	SW846 6010B	No action taken. Result < action limit (AL). Duplicate for PAD-7.
Lead	426		426	J	0.3	0.22	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL). RPD >35 and +/- 2X RL.
Nickel	7.4	J	U		330	0.31	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg. Duplicate for PAD-7.
Selenium	0.57	U	U		0.6	0.51	mg/kg	5100	SW846 6010B	Blind field duplicate for PAD-7.
Silver	1.1	U	U		1	0.11	mg/kg	5100	SW846 6010B	Blind field duplicate for PAD-7.
Zinc	157	J	U		2500	1.1	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg. Duplicate for PAD-7.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
POND-1										
Nitroglycerin	2.5	U	U		2.5	0.26	mg/kg	200	SW846 8332	Analyte not detected at or above detection limit.
1,3,5-Trinitrobenzene	0.25	U	U		0.25	0.024	mg/kg	31000	SW846 8330	Analyte not detected at or above detection limit.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	100	SW846 8330	Analyte not detected at or above detection limit.
2,4,6-Trinitrotoluene	0.039	J	U		0.25	0.033	mg/kg	95	SW846 8330	Result < QL.
2,4-Dinitrotoluene	0.25	U	U		0.25	0.029	mg/kg	2000	SW846 8330	Analyte not detected at or above detection limit.
2,6-Dinitrotoluene	0.25	U	U		0.25	0.028	mg/kg	1000	SW846 8330	Analyte not detected at or above detection limit.
2-Amino-4,6-dinitrotoluene	0.25	U	U		0.25	0.031	mg/kg	2000	SW846 8330	Analyte not detected at or above detection limit.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	12	SW846 8330	Analyte not detected at or above detection limit.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	20000	SW846 8330	Analyte not detected at or above detection limit.
4-Amino-2,6-dinitrotoluene	0.25	U	U		0.25	0.03	mg/kg	2000	SW846 8330	Analyte not detected at or above detection limit.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	170	SW846 8330	Analyte not detected at or above detection limit.
HMX	0.5	U	U		0.5	0.048	mg/kg	51000	SW846 8330	Analyte not detected at or above detection limit.
Nitrobenzene	0.34		0.34		0.25	0.028	mg/kg	510	SW846 8330	No action taken. Result < action limit (AL)
RDX	0.5	U	U		0.5	0.031	mg/kg	26	SW846 8330	Analyte not detected at or above detection limit.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	10000	SW846 8330	Analyte not detected at or above detection limit.
2,4-Dichlorophenol	0.39	U	U		0.4	0.024	mg/kg	3100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
2-Chlorophenol	0.39	U	U		0.4	0.031	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
3,3'-Dimethylbenzidine	1.9	U	U	J	2	0.074	mg/kg		SW846 8270C	Target analyte not detected at or above detection limit or QL/RL. Estimated due to MDL study conducted in 01/05.
3-Methylphenol	0.39	U	U		0.4	0.0051	mg/kg	51000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Methylphenol	0.39	U	U		0.4	0.026	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Nitrophenol	1.9	U	U		2	0.13	mg/kg	7	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Acetophenone	0.39	U	U		0.4	0.011	mg/kg	100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)anthracene	0.39	U	U		0.4	0.0011	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)pyrene	0.39	U	U		0.4	0.0015	mg/kg	0.39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(b)fluoranthene	0.39	U	U		0.4	0.0014	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(k)fluoranthene	0.39	U	U		0.4	0.002	mg/kg	39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzoic acid	1.9	U	U		2	0.28	mg/kg	4100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
bis(2-Ethylhexyl) phthalate	0.071	J	U		0.4	0.021	mg/kg	200	SW846 8270C	Result < QL. Blank contamination suspected. Analyte detected less than MDL.
Butyl benzyl phthalate	0.39	U	U		0.4	0.022	mg/kg	200000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenz(a,h)anthracene	0.39	U	U		0.4	0.0015	mg/kg	0.39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenzofuran	0.39	U	U		0.4	0.024	mg/kg	2000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Diethyl phthalate	0.04	J	U		0.4	0.022	mg/kg	820000	SW846 8270C	Result < QL.
Dimethyl phthalate	0.39	U	U		0.4	0.025	mg/kg	10000000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Di-n-butyl phthalate	0.026	J	U		0.4	0.022	mg/kg	100000	SW846 8270C	Result < QL.
Di-n-octyl phthalate	0.39	U	U		0.4	0.021	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.

SEE LAST PAGE FOR DATA QUALIFIER DEFINITIONS.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
POND-1										
Fluoranthene	0.39	U	U		0.4	0.0014	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Hexachloroethane	0.059	U	U		0.4	0.033	mg/kg	200	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Indeno(1,2,3-cd)pyrene	0.39	U	U		0.4	0.0018	mg/kg	3.9	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Naphthalene	0.39	U	U		0.4	0.0019	mg/kg	20000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
N-Nitrosodiphenylamine	0.39	U	U		0.4	0.025	mg/kg	26000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Phenol	0.39	U	U		0.4	0.029	mg/kg	310000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Pyrene	0.39	U	U		0.4	0.0013	mg/kg	31000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
1,1-Dichloroethene	0.0054	U	U	J	0.005	0.00092	mg/kg	51000	SW846 8260B	Analyte not detected. MS recovered low.
1,2-Dichloroethane	0.0054	U	U		0.005	0.00082	mg/kg	31	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Benzene	0.0054	U	U		0.005	0.00072	mg/kg	52	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Benzyl chloride	0.0054	U	U	J	0.005	0.0017	mg/kg		SW846 8260B	Analyte not detected. LCS/LCSD/MS recovered low.
Bromomethane	0.011	U	U		0.01	0.0007	mg/kg	15	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Carbon tetrachloride	0.0054	U	U	J	0.005	0.0012	mg/kg	22	SW846 8260B	Analyte not detected. MS recovered low.
Chlorobenzene	0.0054	U	U		0.005	0.00062	mg/kg	20000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloroform	0.0054	U	U		0.005	0.00078	mg/kg	10000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloromethane	0.011	U	U		0.01	0.00067	mg/kg	6	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Methylene chloride	0.0054	U	U		0.005	0.00097	mg/kg	380	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Tetrachloroethene	0.0054	U	U		0.005	0.0017	mg/kg	5.3	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Toluene	0.0054	U	U		0.005	0.00086	mg/kg	200000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Trichloroethene	0.0054	U	U	J	0.005	0.001	mg/kg	7.2	SW846 8260B	Analyte not detected. MS recovered low.
Vinyl chloride	0.0054	U	U		0.005	0.00082	mg/kg	4	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Mercury	0.048	B	U		0.11	0.018	mg/kg	0.13	SW846 7471A	Result < QL.
Antimony	7.1	U	U	J	6	0.46	mg/kg	410	SW846 6010B	Analyte not detected. MS/MSD recovered low.
Arsenic	2.6		2.6		1	0.35	mg/kg	16	SW846 6010B	No action taken. Result < action limit (AL)
Barium	121		121		20	0.084	mg/kg	72000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.93		0.93		0.5	0.042	mg/kg	510	SW846 6010B	No action taken. Result < action limit (AL)
Chromium	13.9		13.9		1	0.24	mg/kg	3100	SW846 6010B	No action taken. Result < action limit (AL)
Lead	203		203		0.3	0.22	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	7.9	J	U		330	0.32	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.59	U	U		0.6	0.53	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.2	U	U		1	0.12	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	560	J	U		2500	1.2	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
SB-1										
Nitroglycerin	2.5	U	U		2.5	0.26	mg/kg	200	SW846 8332	Analyte not detected at or above detection limit.
1,3,5-Trinitrobenzene	0.25	U	U		0.25	0.024	mg/kg	31000	SW846 8330	Analyte not detected at or above detection limit.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	100	SW846 8330	Analyte not detected at or above detection limit.
2,4,6-Trinitrotoluene	0.25	U	U		0.25	0.033	mg/kg	95	SW846 8330	Analyte not detected at or above detection limit.
2,4-Dinitrotoluene	0.25	U	U		0.25	0.029	mg/kg	2000	SW846 8330	Analyte not detected at or above detection limit.
2,6-Dinitrotoluene	0.25	U	U		0.25	0.028	mg/kg	1000	SW846 8330	Analyte not detected at or above detection limit.
2-Amino-4,6-dinitrotoluene	0.25	U	U		0.25	0.031	mg/kg	2000	SW846 8330	Analyte not detected at or above detection limit.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	12	SW846 8330	Analyte not detected at or above detection limit.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	20000	SW846 8330	Analyte not detected at or above detection limit.
4-Amino-2,6-dinitrotoluene	0.25	U	U		0.25	0.03	mg/kg	2000	SW846 8330	Analyte not detected at or above detection limit.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	170	SW846 8330	Analyte not detected at or above detection limit.
HMX	0.5	U	U		0.5	0.048	mg/kg	51000	SW846 8330	Analyte not detected at or above detection limit.
Nitrobenzene	0.79		0.79		0.25	0.028	mg/kg	510	SW846 8330	No action taken. Result < action limit (AL)
RDX	0.5	U	U		0.5	0.031	mg/kg	26	SW846 8330	Analyte not detected at or above detection limit.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	10000	SW846 8330	Analyte not detected at or above detection limit.
2,4-Dichlorophenol	0.43	U	U		0.4	0.026	mg/kg	3100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
2-Chlorophenol	0.43	U	U		0.4	0.034	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
3,3'-Dimethylbenzidine	2.1	U	U	J	2	0.082	mg/kg		SW846 8270C	Target analyte not detected at or above detection limit or QL/RL. Estimated due to MDL study conducted in 01/05.
3-Methylphenol	0.43	U	U		0.4	0.0056	mg/kg	51000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Methylphenol	0.43	U	U		0.4	0.029	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Nitrophenol	2.1	U	U		2	0.14	mg/kg	7	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Acetophenone	0.43	U	U		0.4	0.012	mg/kg	100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)anthracene	0.054	J	U		0.4	0.0012	mg/kg	3.9	SW846 8270C	Result < QL.
Benzo(a)pyrene	0.052	J	U		0.4	0.0017	mg/kg	0.39	SW846 8270C	Result < QL.
Benzo(b)fluoranthene	0.075	J	U		0.4	0.0016	mg/kg	3.9	SW846 8270C	Result < QL.
Benzo(k)fluoranthene	0.031	J	U		0.4	0.0022	mg/kg	39	SW846 8270C	Result < QL.
Benzoic acid	2.1	U	U		2	0.31	mg/kg	4100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
bis(2-Ethylhexyl) phthalate	0.053	J	U		0.4	0.024	mg/kg	200	SW846 8270C	Result < QL. Blank contamination suspected. Analyte detected less than MDL.
Butyl benzyl phthalate	0.43	U	U		0.4	0.025	mg/kg	200000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenz(a,h)anthracene	0.43	U	U		0.4	0.0017	mg/kg	0.39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenzofuran	0.43	U	U		0.4	0.026	mg/kg	2000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Diethyl phthalate	0.43	U	U		0.4	0.025	mg/kg	820000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dimethyl phthalate	0.43	U	U		0.4	0.027	mg/kg	10000000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Di-n-butyl phthalate	0.43	U	U		0.4	0.025	mg/kg	100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Di-n-octyl phthalate	0.43	U	U		0.4	0.024	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13

Event Date: January 2008 (Second Quarter 2008)

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
SB-1										
Fluoranthene	0.092	J	U		0.4	0.0016	mg/kg	41000	SW846 8270C	Result < QL.
Hexachloroethane	0.065	U	U		0.4	0.037	mg/kg	200	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Indeno(1,2,3-cd)pyrene	0.033	J	U		0.4	0.002	mg/kg	3.9	SW846 8270C	Result < QL.
Naphthalene	0.43	U	U		0.4	0.0021	mg/kg	20000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
N-Nitrosodiphenylamine	0.43	U	U		0.4	0.027	mg/kg	26000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Phenol	0.43	U	U		0.4	0.033	mg/kg	310000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Pyrene	0.082	J	U		0.4	0.0014	mg/kg	31000	SW846 8270C	Result < QL.
1,1-Dichloroethene	0.0067	U	U	J	0.005	0.0012	mg/kg	51000	SW846 8260B	Analyte not detected. MS recovered low.
1,2-Dichloroethane	0.0067	U	U		0.005	0.001	mg/kg	31	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Benzene	0.0067	U	U		0.005	0.0009	mg/kg	52	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Benzyl chloride	0.0067	U	U	J	0.005	0.0021	mg/kg		SW846 8260B	Analyte not detected. LCS/LCSD/MS recovered low.
Bromomethane	0.013	U	U		0.01	0.00088	mg/kg	15	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Carbon tetrachloride	0.0067	U	U	J	0.005	0.0015	mg/kg	22	SW846 8260B	Analyte not detected. MS recovered low.
Chlorobenzene	0.0067	U	U		0.005	0.00078	mg/kg	20000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloroform	0.0067	U	U		0.005	0.00098	mg/kg	10000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloromethane	0.013	U	U		0.01	0.00084	mg/kg	6	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Methylene chloride	0.0067	U	U		0.005	0.0012	mg/kg	380	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Tetrachloroethene	0.0067	U	U		0.005	0.0021	mg/kg	5.3	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Toluene	0.003	J	U		0.005	0.0011	mg/kg	200000	SW846 8260B	Result < QL.
Trichloroethene	0.0067	U	U	J	0.005	0.0013	mg/kg	7.2	SW846 8260B	Analyte not detected. MS recovered low.
Vinyl chloride	0.0067	U	U		0.005	0.001	mg/kg	4	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Mercury	0.048	B	U		0.11	0.02	mg/kg	0.13	SW846 7471A	Result < QL.
Antimony	0.71	B	U	J	6	0.51	mg/kg	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank. MS/MSD recovered low.
Arsenic	2.4		2.4		1	0.39	mg/kg	16	SW846 6010B	No action taken. Result < action limit (AL)
Barium	117		117		20	0.093	mg/kg	72000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.58	B	U		0.5	0.047	mg/kg	510	SW846 6010B	Result < QL.
Chromium	21.1		21.1		1	0.26	mg/kg	3100	SW846 6010B	No action taken. Result < action limit (AL)
Lead	78.2		78.2		0.3	0.25	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	10.5	J	U		330	0.35	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.65	U	U		0.6	0.59	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.3	U	U		1	0.13	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	244	J	U		2500	1.3	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
SB-2										
Nitroglycerin	2.5	U	U		2.5	0.26	mg/kg	200	SW846 8332	Analyte not detected at or above detection limit.
1,3,5-Trinitrobenzene	0.25	U	U		0.25	0.024	mg/kg	31000	SW846 8330	Analyte not detected at or above detection limit.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	100	SW846 8330	Analyte not detected at or above detection limit.
2,4,6-Trinitrotoluene	0.25	U	U		0.25	0.033	mg/kg	95	SW846 8330	Analyte not detected at or above detection limit.
2,4-Dinitrotoluene	0.25	U	U		0.25	0.029	mg/kg	2000	SW846 8330	Analyte not detected at or above detection limit.
2,6-Dinitrotoluene	0.25	U	U		0.25	0.028	mg/kg	1000	SW846 8330	Analyte not detected at or above detection limit.
2-Amino-4,6-dinitrotoluene	0.25	U	U		0.25	0.031	mg/kg	2000	SW846 8330	Analyte not detected at or above detection limit.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	12	SW846 8330	Analyte not detected at or above detection limit.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	20000	SW846 8330	Analyte not detected at or above detection limit.
4-Amino-2,6-dinitrotoluene	0.25	U	U		0.25	0.03	mg/kg	2000	SW846 8330	Analyte not detected at or above detection limit.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	170	SW846 8330	Analyte not detected at or above detection limit.
HMX	0.5	U	U		0.5	0.048	mg/kg	51000	SW846 8330	Analyte not detected at or above detection limit.
Nitrobenzene	0.45		0.45		0.25	0.028	mg/kg	510	SW846 8330	No action taken. Result < action limit (AL)
RDX	0.5	U	U		0.5	0.031	mg/kg	26	SW846 8330	Analyte not detected at or above detection limit.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	10000	SW846 8330	Analyte not detected at or above detection limit.
2,4-Dichlorophenol	0.46	U	U		0.4	0.028	mg/kg	3100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
2-Chlorophenol	0.46	U	U		0.4	0.037	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
3,3'-Dimethylbenzidine	2.2	U	U	J	2	0.089	mg/kg		SW846 8270C	Target analyte not detected at or above detection limit or QL/RL. Estimated due to MDL study conducted in 01/05.
3-Methylphenol	0.46	U	U		0.4	0.006	mg/kg	51000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Methylphenol	0.46	U	U		0.4	0.031	mg/kg	5100	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
4-Nitrophenol	2.2	U	U		2	0.15	mg/kg	7	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Acetophenone	0.46	U	U		0.4	0.013	mg/kg	100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Benzo(a)anthracene	0.095	J	U		0.4	0.0013	mg/kg	3.9	SW846 8270C	Result < QL.
Benzo(a)pyrene	0.1	J	U		0.4	0.0018	mg/kg	0.39	SW846 8270C	Result < QL.
Benzo(b)fluoranthene	0.14	J	U		0.4	0.0017	mg/kg	3.9	SW846 8270C	Result < QL.
Benzo(k)fluoranthene	0.052	J	U		0.4	0.0024	mg/kg	39	SW846 8270C	Result < QL.
Benzoic acid	2.2	U	U		2	0.34	mg/kg	4100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
bis(2-Ethylhexyl) phthalate	0.15	J	U		0.4	0.025	mg/kg	200	SW846 8270C	Result < QL. Blank contamination suspected. Analyte detected less than MDL.
Butyl benzyl phthalate	0.46	U	U		0.4	0.027	mg/kg	200000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenz(a,h)anthracene	0.46	U	U		0.4	0.0018	mg/kg	0.39	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Dibenzofuran	0.46	U	U		0.4	0.028	mg/kg	2000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Diethyl phthalate	0.032	J	U		0.4	0.027	mg/kg	820000	SW846 8270C	Result < QL.
Dimethyl phthalate	0.46	U	U		0.4	0.03	mg/kg	10000000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Di-n-butyl phthalate	0.46	U	U		0.4	0.027	mg/kg	100000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Di-n-octyl phthalate	0.46	U	U		0.4	0.025	mg/kg	41000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.

SEE LAST PAGE FOR DATA QUALIFIER DEFINITIONS.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
SB-2										
Fluoranthene	0.18	J	U		0.4	0.0017	mg/kg	41000	SW846 8270C	Result < QL.
Hexachloroethane	0.07	U	U		0.4	0.039	mg/kg	200	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Indeno(1,2,3-cd)pyrene	0.064	J	U		0.4	0.0021	mg/kg	3.9	SW846 8270C	Result < QL.
Naphthalene	0.46	U	U		0.4	0.0022	mg/kg	20000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
N-Nitrosodiphenylamine	0.46	U	U		0.4	0.03	mg/kg	26000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Phenol	0.46	U	U		0.4	0.035	mg/kg	310000	SW846 8270C	Target analyte not detected at or above detection limit or QL/RL.
Pyrene	0.16	J	U		0.4	0.0015	mg/kg	31000	SW846 8270C	Result < QL.
1,1-Dichloroethene	0.0075	U	U	J	0.005	0.0013	mg/kg	51000	SW846 8260B	Analyte not detected. MS recovered low.
1,2-Dichloroethane	0.0075	U	U		0.005	0.0011	mg/kg	31	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Benzene	0.0012	J	U		0.005	0.001	mg/kg	52	SW846 8260B	Result < QL.
Benzyl chloride	0.0075	U	U	J	0.005	0.0023	mg/kg		SW846 8260B	Analyte not detected. LCS/LCSD/MS recovered low.
Bromomethane	0.015	U	U		0.01	0.00098	mg/kg	15	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Carbon tetrachloride	0.0075	U	U	J	0.005	0.0017	mg/kg	22	SW846 8260B	Analyte not detected. MS recovered low.
Chlorobenzene	0.0075	U	U		0.005	0.00087	mg/kg	20000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloroform	0.0075	U	U		0.005	0.0011	mg/kg	10000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloromethane	0.0042	J	U		0.01	0.00093	mg/kg	6	SW846 8260B	Result < QL.
Methylene chloride	0.0075	U	U		0.005	0.0013	mg/kg	380	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Tetrachloroethene	0.0075	U	U		0.005	0.0023	mg/kg	5.3	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Toluene	0.0034	J	U		0.005	0.0012	mg/kg	200000	SW846 8260B	Result < QL.
Trichloroethene	0.0075	U	U	J	0.005	0.0014	mg/kg	7.2	SW846 8260B	Analyte not detected. MS recovered low.
Vinyl chloride	0.0075	U	U		0.005	0.0011	mg/kg	4	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Mercury	0.061	B	U		0.11	0.021	mg/kg	0.13	SW846 7471A	Result < QL.
Antimony	1.4	B	U	J	6	0.55	mg/kg	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank. MS/MSD recovered low.
Arsenic	2.8		2.8		1	0.42	mg/kg	16	SW846 6010B	No action taken. Result < action limit (AL)
Barium	141		141		20	0.1	mg/kg	72000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.76		0.76		0.5	0.051	mg/kg	510	SW846 6010B	No action taken. Result < action limit (AL)
Chromium	24.4		24.4		1	0.28	mg/kg	3100	SW846 6010B	No action taken. Result < action limit (AL)
Lead	92.2		92.2		0.3	0.27	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	12.6	J	U		330	0.38	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.7	U	U		0.6	0.63	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.4	U	U		1	0.14	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	300	J	U		2500	1.4	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg.

SEE LAST PAGE FOR DATA QUALIFIER DEFINITIONS.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
TRIP BLANK										
1,1-Dichloroethene	1	U	U		1	0.43	ug/L	51000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
1,2-Dichloroethane	1	U	U		1	0.39	ug/L	31	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Benzene	1	U	U		1	0.39	ug/L	52	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Benzyl chloride	5	U	U		5	1	ug/L		SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Bromomethane	2	U	U		2	0.72	ug/L	15	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Carbon tetrachloride	1	U	U		1	0.41	ug/L	22	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chlorobenzene	1	U	U		1	0.33	ug/L	20000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloroform	1	U	U		1	0.35	ug/L	10000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Chloromethane	2	U	U		2	0.48	ug/L	6	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Methylene chloride	0.8	J	U		1	0.42	ug/L	380	SW846 8260B	Result < QL. Blank contamination in the trip blank (0.8 ug/l).
Tetrachloroethene	1	U	U		1	0.4	ug/L	5.3	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Toluene	1	U	U		1	0.39	ug/L	200000	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Trichloroethene	1	U	U		1	0.45	ug/L	7.2	SW846 8260B	Target analyte not detected above detection limit or QL/RL.
Vinyl chloride	2	U	U		2	0.4	ug/L	4	SW846 8260B	Target analyte not detected above detection limit or QL/RL.

SEE LAST PAGE FOR DATA QUALIFIER DEFINITIONS.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 **Event Date: January 2008 (Second Quarter 2008)**

Analyte/ Sample ID	Laboratory Result Q	Validated Result Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note

Definitions:

Data validation qualifiers:

U- Denotes the analyte was analyzed for, but was not detected at or above the project reporting level specified in the permit -Table 1 Attachment II.C-24.
J- Denotes an estimated value. See sample specific note presented on data validation report table for further explanation.
UJ- The QL should be considered estimated. See sample specific note presented on data validation report table for further explanation.
R- Denotes sample result was rejected. See sample specific note presented on data validation report table for further explanation.
Q- Denotes Data Qualifier.
QL Denotes laboratory quantitation limit.
RL Denotes project reporting level. For most analytes, the RL= QL. For several target analytes, the QL is less than the RL. For this project, all results < RL were considered estimated concentrations and were qualified as U. See permit for project reporting limits.
AL Denotes Action level (Region III RBC For Industrial Sites –dated 10/08/2004. AL is greater than QL/RL.

Laboratory data qualifiers:

B- Denotes target analyte detected <QL/RL and associated concentration is estimated. This is a laboratory data qualifier.
J- Denotes target analyte detected <QL/RL and associated concentration is estimated. This is a laboratory data qualifier.

Note-Dioxin/Furan results presented in a separate table.
All analyses performed by Test America, Formerly Severn Trent Laboratories, North Canton, OH, except where noted (see data validation reports).
PAD-X is field sample duplicate for PAD-7.

NOTE (1): The table summaries all results detected above the detection limit and results which required qualification based on data validation.
All results reported on a dryweight basis.
See laboratory report for definition of laboratory result qualifiers, if needed.

SEE LAST PAGE FOR DATA QUALIFIER DEFINITIONS.

Draper Aden Associates
Engineering • Surveying • Environmental Services
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Data Validation Summary
Fourth Quarter 2008 Soil Monitoring Event

Soil Monitoring Program for the Open Burning Ground (OBG)
Radford Facility Army Ammunition Plant, Radford, Virginia
Permit for the Treatment of Hazardous Waste by Open Burning
EPA ID# VA1210020730

Draper Aden Associates performed comprehensive data validation of the analytical results for the November 2008 soil monitoring event at the Open Burning Ground (OBG) located at the Radford Facility Army Ammunition Plant (RFAAP) in Radford, Virginia.

Results from the November 2008 soil monitoring event were compared to the then current Action Level for each target analyte (constituents) listed Table 1, in Attachment II.C-24 of the operating permit as well as the then proposed updated Action Levels, as per verbal approval by VDEQ. No target analytes were reported above either Action Level and no verification monitoring was performed for the November 2008 soil monitoring event.

A permit modification was submitted to VDEQ in December 2008 to update the Action Levels, where applicable, to the new Action Levels established in the September 2008 Environmental Protection Agency Regional Screening Table developed by Oak Ridge Laboratory. VDEQ approved the requested permit modification on December 18, 2008. Updated Action Levels were presented in the tabulation of final results submitted for the November 2008 monitoring event.

The information below summarizes the November 2008 soil monitoring event data validation.

Sample Collection/Analytical Services

Draper Aden Associates, of Blacksburg, Virginia, collected soil samples during November 19 and 24, 2008 from sample locations PAD-1 through PAD-8, NB-1, NB-2, SB-1, SB-2, BERM-1 and POND-1.

Samples were submitted for laboratory analysis via overnight courier to TestAmerica North Canton, of North Canton, Ohio. Samples were analyzed for target analytes listed in Table 1 in Attachment II.C-24 of the operating permit. Samples were analyzed for volatiles, semivolatiles, explosives, nitroglycerin, inorganics, mercury and dioxin/furans by USEPA SW-846 Test Methods for Evaluating Solid Wastes (SW-846) Methods 8260B/5035, 8270C, 8330, 8332, 6010B, 7471A and 8290, respectively. Samples PAD-1, PAD-4 and PAD-7 were also analyzed for Total Petroleum Hydrocarbons-Diesel Range Organics (TPH-DRO) by Method 8015B. As well, all samples were analyzed for total residue as percent solids by MCAWW 160.3 MOD.

Sample PAD-7 was selected as the blind field sample duplicate. The blind sample duplicate sample identification was PAD-X. PAD-4 was selected for the project specific matrix spike and

matrix spike duplicate for all methods of analysis. A trip blank was submitted for volatile organic analysis (Method 8260B/5030B). An equipment blank (water sample) was submitted for inorganic analysis only (Methods 6010B and 7470A).

TestAmerica North Canton submitted select sample aliquots for analysis to TestAmerica Austin, Austin, Texas (Method 8260B), TestAmerica Knoxville, of Knoxville, Tennessee, (Method 8330 and 8332) and TestAmerica West Sacramento, of Sacramento, California, (Method 8290). On behalf of Alliant Techsystems Inc., the laboratory submitted the certificate of analysis to Draper Aden Associates for data validation in two separate delivery groups A8K200211 and A8K250190.

Monitoring Program Notes

No constituents were detected at concentrations at or above the Action Levels, as presented in the VDEQ-approved Class 1 Permit Modification dated December 18, 2008.

Receipt of Monitoring Event Data

The original certificate of analysis for the event was received on January 5, 2009. Subsequent revisions were received from the laboratory. The revisions were associated with missing supporting documentation.

Verification Events

No verification monitoring event was required.

Summary of OBG Soil Sample Locations and Required Analytical Methods

Summary of OBG Soil Sample Locations and Required Analytical Methods

SW-846 Analytical Method	*Sample Location*													
	PAD-1	*PAD-2*	*PAD-3*	*PAD-4*	*PAD-5*	*PAD-6*	*PAD-7/PAD-X*	*PAD-8*	*NB-1*	*NB-2*	*SB-1*	*SB-2*	*BERM-1*	*POND-1*
8260B/5035 Volatiles	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8270C Semivolatiles	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8330 Explosives	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8332 Nitroglycerin	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6010B Inorganics	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7471A Mercury	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8015B –TPH-DRO	X			X			X							
8290 Dioxins/Furans	X	X	X	X	X	X	X	X	X	X	X	X	X	X

The chain of custody and permit required target analytes are provided as an attachment.

Laboratory Analysis

Samples were analyzed by *SW-846 Method requirements (Test Methods for Evaluating Solid Wastes - Physical and Chemical Methods, USEPA SW-846, 3rd edition - Final Update I, II/IIA and III).*

Data Validation

Data were evaluated in general accordance with:

- *Test Methods for Evaluating Solid Wastes - Physical and Chemical Methods*, USEPA SW-846, 3rd edition - Final Update I, II/IIA and III)
- *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*, October 1999
- *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004
- *USEPA Contract Laboratory Program National Functional Guidelines for Chlorinated Dioxin/Furan Data Review*, September 2005

Draper Aden Associates, of Blacksburg, Virginia, performed comprehensive data validation in general accordance with the above noted documents. Recalculation of approximately 10% of the data was performed. A summary table of data validation results is provided as an attachment. The comprehensive data validation report for each analytical method is provided on CD ROM in Appendix E. No results were rejected.

Reporting of Results

As required by the permit, the laboratory reported results at or above the method detection limit (MDL) for the target analytes (constituents) listed in Table 1, in Attachment II.C-24 of the operating permit. Detections between the MDL and reporting limit (RL) are considered estimated concentrations and the validated result was qualified with a "J" flag. Target analytes not detected at or above the MDL or RL are validated and qualified with a "U" flag, unless further data qualification was required based on data validation.

Results are reported on a dry weight basis with the exception of Methods 8330 and 8332 which were reported by the laboratory as a wet weight.

Method 8290 Dioxin/Furan reporting: The laboratory reports results on a dry weight basis to the estimated detection limit (EDL) for each isomer. The laboratory reports results between the EDL and sample specific reporting limit as estimated and the result was flagged "J." As per the operating permit, only concentrations above the sample specific reporting limit were used in the 2,3,7,8-TCDD Toxicity Equivalent Quotient (TEQ) calculation. TEQ calculations are submitted as an attachment.

Additional Results Discussion

3,3-dimethylbenzidine:
Additionally, VDEQ requested notification if 3,3-dimethylbenzidine is detected less than the Reporting Limit (RL), since the RL for this analyte is above the updated Action Level due to instrument limitations. For sample locations PAD-5 and PAD-6, the RL for 3,3-dimethylbenzidine was adjusted due to sample dilution required to accurately quantitate a result for another target analyte. For the November 2008 monitoring event, 3,3-dimethylbenzidine was not detected less than the RL or the adjusted RL. 3,3-Dimethylbenzidine will continue to be monitored with future events. A summary of the adjusted RLs for 3,3- dimethylbenzidine is provided below.

Summary of 3,3-Dimethylbenzidine Adjusted Reporting Limits Above the Action Level Due to Sample Dilution

Location	Result	Adjusted RL	Adjusted Detection Limit	Action Level	Action Level Basis
3,3-Dimethylbenzidine					
PAD-5	ND	7 mg/kg	0.28 mg/kg	0.16 mg/kg	Region III RBC Industrial
PAD-6	ND	12 mg/kg	0.46 mg/kg	0.16 mg/kg	Region III RBC Industrial

Note: ND Denotes not detected at or above the adjusted detection limit or RL.

Benzyl chloride:
For the November 2008 monitoring event, benzyl chloride was evaluated as a tentatively identified compound (TIC), based on the examination of the GC/MS extracted ion current profile at the appropriate retention time. The estimated RL was based on 20% of the closest internal standard concentration. Benzyl chloride was not detected in any sample. The laboratory was requested to include this target analyte in the MDL study and instrument calibration mixes for the subsequent events.

Summary of Results

No results were rejected.

No target analytes were reported above the Action Level.

Results from the November 2008 soil monitoring event were compared to the then current Action Level for each target analyte (constituents) listed Table 1, in Attachment II.C-24 of the operating permit as well as the then proposed updated Action Levels, as per verbal approval by VDEQ. Updated Action Levels were approved by VDEQ in correspondence December 18, 2008. No target analytes were reported above either Action Level and no verification monitoring was performed for the November 2008 soil monitoring event.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the laboratory control sample (LCS), matrix spike and matrix spike duplicate (MS/MSD) samples, and the surrogate spike. LCS and MS/MSD recoveries were within the acceptance criteria, except where noted on the attached data validation report.

Precision

Precision was evaluated using the relative percent difference (RPD) data obtained from the MS/MSD and sample/blind field duplicate results. For metals, a control limit of 60 RPD was used due to expected soil variability. For all other sample/blind field duplicate results, a control limit of <35% RPD and 2x the RL/QL was used, where applicable. However, for the November 2008 monitoring event, RPDs <35% were observed.

MS/MSD RPD criteria were within acceptance criteria, except where noted on the attached data validation report. Sample/blind field duplicate RPD criteria was met except where noted on the attached data validation report.

Completeness

Completeness was evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data. Valid analytical data are results not qualified as rejected.

All results were accepted. The completeness for the data set is 100%.

Representativeness

Representativeness. Data collected at the site met accuracy and precision requirements, except where noted. Samples were collected using standardized procedures. Samples were analyzed using standardized, accepted analytical methods using traceable standard to ensure that accurate and reproducible data were generated. Data from the November 2008 monitoring event were considered representative.

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Draper Aden Associates
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Table 4B
Method 8290 Dioxin/Furan Results - November 2008 Event
2,3,7,8 - TCDD Toxicity Equivalent Quotient (TEQ)
Radford Facility AAP, Open Burning Ground Soil Monitoring Program
All results presented in ng/kg =pg/g

Action Level: TEQ >16 ng/kg, pg/g (Region IX)
Action Level: TEQ >19 ng/kg, pg/g (Region III)

Sample Location ID		PAD-1				PAD-2				PAD-3				PAD-4			
Depth		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches	
Constituent	TEF	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ
1,2,3,4,6,7,8-HpCDD	0.01		J	38	0.38		J	93	0.93		J	17	0.17		J	62	0.62
1,2,3,4,6,7,8-HpCDF	0.01			6.9	0.069			14	0.14		U	ND				13	0.13
1,2,3,4,7,8,9-HpCDF	0.01		U	ND			U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDD	0.1		U	ND			U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDF	0.1	J	U	5.6		J	U	3.4			U	ND			U	ND	
1,2,3,6,7,8-HxCDD	0.1	J	U	5.1				6.2	0.62		U	ND			U	ND	
1,2,3,6,7,8-HxCDF	0.1	J	U	3.3			U	ND			U	ND			U	ND	
1,2,3,7,8,9-HxCDD	0.1	J	U	5.3				6	0.6		U	ND		J	U	2.9	
1,2,3,7,8,9-HxCDF	0.1		U	ND			U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDD	1		U	ND			U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDF	0.03	J	U	3.8			U	ND			U	ND			U	ND	
2,3,4,6,7,8-HxCDF	0.1		U	ND			U	ND			U	ND			U	ND	
2,3,4,7,8-PeCDF	0.3	J	U	4.9			U	ND			U	ND			U	ND	
2,3,7,8-TCDD	1		U	ND			U	ND			U	ND			U	ND	
2,3,7,8-TCDF	0.1	CON		7.1	0.71	CON		2.2	0.22	CON		1.1	0.11	CON		1.6	0.16
OCDD	0.0003	H	J	300	0.09	H	J	1000	0.3	H	J	260	0.078	H	J	980	0.294
OCDF	0.0003	HJ		8.3		H		30	0.009	H		ND		H		24	0.007
2,3,7,8 Toxicity Equivalence (TEQ) ng/kg			**J**		***1.249***		**J**		***2.819***		**J**		***0.358***		**J**		***1.2112***

Sample Location ID		PAD-5				PAD-6				PAD-7				PAD-8			
Depth		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches	
Constituent	TEF	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ
1,2,3,4,6,7,8-HpCDD	0.01		J	18	0.18		J	100	1		J	26	0.26		J	46	0.46
1,2,3,4,6,7,8-HpCDF	0.01	J	U	5.1				14	0.14	J	U	5.3				8.6	0.086
1,2,3,4,7,8,9-HpCDF	0.01		U	ND			U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDD	0.1		U	ND			U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDF	0.1		U	ND		J	U	3			U	ND			U	ND	
1,2,3,6,7,8-HxCDD	0.1		U	ND		J	U	4.9			U	ND			U	ND	
1,2,3,6,7,8-HxCDF	0.1		U	ND			U	ND			U	ND			U	ND	
1,2,3,7,8,9-HxCDD	0.1		U	ND				5.9	0.59		U	ND			U	ND	
1,2,3,7,8,9-HxCDF	0.1		U	ND			U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDD	1		U	ND			U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDF	0.03		U	ND			U	ND			U	ND			U	ND	
2,3,4,6,7,8-HxCDF	0.1		U	ND			U	ND			U	ND			U	ND	
2,3,4,7,8-PeCDF	0.3		U	ND			U	ND			U	ND			U	ND	
2,3,7,8-TCDD	1		U	ND			U	ND			U	ND				1.5	1.5
2,3,7,8-TCDF	0.1	J CON	U	0.75		CON		2.4	0.24	CON		1.4	0.14	CON		2.5	0.25
OCDD	0.0003	H	J	150	0.045		J	960	0.288		J	260	0.078		J	560	0.168
OCDF	0.0003	HJ	U	7.8				31	0.0093	J	U	8.2				24	0.0072
2,3,7,8 Toxicity Equivalence (TEQ) ng/kg			**J**		***0.225***		**J**		***2.2673***		**J**		***0.478***		**J**		***2.4712***

Sample Location ID		POND-1				SB-1				SB-2				PAD-X			
Depth		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches	
Constituent	TEF	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ
1,2,3,4,6,7,8-HpCDD	0.01		J	230	2.3		J	33	0.33		J	11	0.11		J	27	0.27
1,2,3,4,6,7,8-HpCDF	0.01			38	0.38		U	ND			U	ND			U	4.9	
1,2,3,4,7,8,9-HpCDF	0.01		U	ND			U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDD	0.1	J	U	4.5			U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDF	0.1	JA	U	3			U	ND			U	ND			U	ND	
1,2,3,6,7,8-HxCDD	0.1			14	1.4		U	ND			U	ND			U	ND	
1,2,3,6,7,8-HxCDF	0.1	J	U	3.3			U	ND			U	ND			U	ND	
1,2,3,7,8,9-HxCDD	0.1			10	1		U	ND			U	ND			U	ND	
1,2,3,7,8,9-HxCDF	0.1		U	ND			U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDD	1	J	U	3.1			U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDF	0.03		U	ND			U	ND			U	ND			U	ND	
2,3,4,6,7,8-HxCDF	0.1		U	ND			U	ND			U	ND			U	ND	
2,3,4,7,8-PeCDF	0.3	J	U	3.8			U	ND			U	ND			U	ND	
2,3,7,8-TCDD	1	J	U	0.98			U	ND			U	ND			U	ND	
2,3,7,8-TCDF	0.1	CON		5.7	0.57		U	ND			U	ND		CON		1.2	0.12
OCDD	0.0003		J	2600	0.78		J	1700	0.51		J	770	0.231		J	290	0.087
OCDF	0.0003		J	94	0.0282	J	J	7.7			UJ	ND			U	7.5	
2,3,7,8 Toxicity Equivalence (TEQ) ng/kg			**J**		***6.4582***		**J**		***0.84***		**J**		***0.341***		**J**		***0.477***

Sample Location ID		BERM-1				NB-1				NB-2			
Depth		Lab	Val	0-6 inches		Lab	Val	0-6 inches		Lab	Val	0-6 inches	
Constituent	TEF	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ	Flag	Flag	Result	TEQ
1,2,3,4,6,7,8-HpCDD	0.01		J	72	0.72		J	58	0.58		J	34	0.34
1,2,3,4,6,7,8-HpCDF	0.01			11	0.11			14	0.14			6.7	0.067
1,2,3,4,7,8,9-HpCDF	0.01		U	ND			U	ND			U	ND	
1,2,3,4,7,8-HxCDD	0.1	J	U	5.2			U	ND			U	ND	
1,2,3,4,7,8-HxCDF	0.1		U	ND			U	ND			U	ND	
1,2,3,6,7,8-HxCDD	0.1		U	ND		J	U	3			U	ND	
1,2,3,6,7,8-HxCDF	0.1		U	ND			U	ND			U	ND	
1,2,3,7,8,9-HxCDD	0.1	J	U	3.1			U	ND			U	ND	
1,2,3,7,8,9-HxCDF	0.1		U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDD	1		U	ND			U	ND			U	ND	
1,2,3,7,8-PeCDF	0.03		U	ND			U	ND			U	ND	
2,3,4,6,7,8-HxCDF	0.1		U	ND			U	ND			U	ND	
2,3,4,7,8-PeCDF	0.3		U	ND			U	ND			U	ND	
2,3,7,8-TCDD	1		U	ND			U	ND			U	ND	
2,3,7,8-TCDF	0.1	CON		2.1	0.21	CON		3.8	0.38	CON		2.2	0.22
OCDD	0.0003		J	820	0.246		J	640	0.192		J	350	0.105
OCDF	0.0003		J	28	0.0084		J	30	0.009		J	16	0.0048
2,3,7,8 Toxicity Equivalence (TEQ) ng/kg			**J**		***1.2944***		**J**		***1.301***		**J**		***0.7368***

Notes: Analytical Method: SW-846 8290 -TestAmerica West Sacramento, unless noted.

TEF Denotes USEPA Region 3 Toxicity Equivalence Factor based on WHO June 2005 values. (See www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/usersguide.htm). TEF factors based on noted reference reflect current research.

2,3,7,8 - TCDD Toxicity Equivalence Quotient (TEQ) ng/kg. Calculated by summing the multiplication of detections by the respective TEF

LOQ/QL-Limit of Quantitation/sample specific reporting limit. See analytical results for sample specific reporting limit.

Data Qualifiers:

U denotes not detected. See certificate of analysis for sample specific estimated detection limit.

J Denotes result reported below LOQ/Quantitation Limit.

JA Denotes result positively identified, but quantitation is estimated.

JQ (laboratory data qualifier) Denotes result estimated maximum possible concentration reported.

ND (Laboratory data qualifier) denotes analyte not detected above estimated detection limit and constituent specific TEQ was not calculated.

CON denotes confirmation analysis. H denotes OCDD/F reported from separate analytical analysis.

PAD-X is a blind duplicate for PAD-7.

"Val Flag" denotes data validation data qualifier. "Lab Flag" denotes Laboratory data qualifier.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
BERM-1										
Nitroglycerin	0.7	J	U		2.5	0.26	mg/kg	62	SW846 8332	Result < RL. Result presented on a wet weight.
1,3,5-Trinitrobenzene	0.25	U	U		0.25	0.024	mg/kg	27000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	62	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4,6-Trinitrotoluene	1.2		1.2		0.25	0.033	mg/kg	79	SW846 8330	No action taken. Result presented on a wet weight.
2,4-Dinitrotoluene	0.33		0.33		0.25	0.029	mg/kg	1200	SW846 8330	No action taken. Result presented on a wet weight.
2,6-Dinitrotoluene	0.068	J	U		0.25	0.028	mg/kg	620	SW846 8330	Result < RL. Result presented on a wet weight.
2-Amino-4,6-dinitrotoluene	0.12	J	U		0.25	0.031	mg/kg	2000	SW846 8330	Result < RL. Result presented on a wet weight.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	13	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	12000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
4-Amino-2,6-dinitrotoluene	0.22	J	U		0.25	0.03	mg/kg	1900	SW846 8330	Result < RL. Result presented on a wet weight.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	110	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
HMX	0.11	J	U		0.5	0.048	mg/kg	49000	SW846 8330	Result < RL. Result presented on a wet weight.
Nitrobenzene	0.034	J	U		0.25	0.028	mg/kg	280	SW846 8330	Result < RL. Result presented on a wet weight.
RDX	0.033	J	U		0.5	0.031	mg/kg	24	SW846 8330	Result < RL. Result presented on a wet weight.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	2500	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4-Dichlorophenol	0.38	U	U		0.4	0.023	mg/kg	1800	SW846 8270C	Analyte not detected at or above the detection limit.
2-Chlorophenol	0.38	U	U		0.4	0.03	mg/kg	5100	SW846 8270C	Analyte not detected at or above the detection limit.
3,3'-Dimethylbenzidine	1.8	U	U		2	0.072	mg/kg	0.16	SW846 8270C	Analyte not detected at or above the detection limit.
3-Methylphenol	0.38	U	U		0.4	0.0049	mg/kg	31000	SW846 8270C	Analyte not detected at or above the detection limit.
4-Methylphenol	0.38	U	U		0.4	0.025	mg/kg	3100	SW846 8270C	Analyte not detected at or above the detection limit.
4-Nitrophenol	1.8	U	U		2	0.13	mg/kg	7	SW846 8270C	Analyte not detected at or above the detection limit.
Acetophenone	0.38	U	U		0.4	0.01	mg/kg	100000	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(a)anthracene	0.38	U	U		0.4	0.0011	mg/kg	2.1	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(a)pyrene	0.0078	J	U		0.02	0.0015	mg/kg	0.21	SW846 8270C	Result < RL.
Benzo(b)fluoranthene	0.01	J	U		0.4	0.0014	mg/kg	2.1	SW846 8270C	Result < RL.
Benzo(k)fluoranthene	0.38	U	U		0.4	0.0019	mg/kg	21	SW846 8270C	Analyte not detected at or above the detection limit.
Benzoic acid	1.8	U	U		2	0.27	mg/kg	2500000	SW846 8270C	Analyte not detected at or above the detection limit.
bis(2-Ethylhexyl) phthalate	0.1	J	U		0.4	0.021	mg/kg	120	SW846 8270C	Result < RL.
Butyl benzyl phthalate	0.38	U	U		0.4	0.022	mg/kg	910	SW846 8270C	Analyte not detected at or above the detection limit.
Dibenz(a,h)anthracene	0.023	U	U		0.02	0.0015	mg/kg	0.21	SW846 8270C	Analyte not detected at or above the detection limit.
Dibenzofuran	0.38	U	U		0.4	0.023	mg/kg	2000	SW846 8270C	Analyte not detected at or above the detection limit.
Diethyl phthalate	0.73		0.73		0.4	0.022	mg/kg	490000	SW846 8270C	No action taken. Result < action limit (AL)
Dimethyl phthalate	0.38	U	U		0.4	0.024	mg/kg	10000000	SW846 8270C	Analyte not detected at or above the detection limit.
Di-n-butyl phthalate	0.83		0.83		0.4	0.022	mg/kg	62000	SW846 8270C	No action taken. Result < action limit (AL)
Di-n-octyl phthalate	0.38	U	U		0.4	0.021	mg/kg	41000	SW846 8270C	Analyte not detected at or above the detection limit.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
BERM-1										
Fluoranthene	0.0078	J	U		0.4	0.0014	mg/kg	22000	SW846 8270C	Result < RL.
Hexachloroethane	0.057	U	U		0.05	0.032	mg/kg	120	SW846 8270C	Analyte not detected at or above the detection limit.
Indeno(1,2,3-cd)pyrene	0.38	U	U		0.4	0.0017	mg/kg	2.1	SW846 8270C	Analyte not detected at or above the detection limit.
Naphthalene	0.38	U	U		0.4	0.0018	mg/kg	20	SW846 8270C	Analyte not detected at or above the detection limit.
N-Nitrosodiphenylamine	0.12	J	U		0.4	0.024	mg/kg	15000	SW846 8270C	Result < RL.
Phenol	0.38	U	U		0.4	0.029	mg/kg	180000	SW846 8270C	Analyte not detected at or above the detection limit.
Pyrene	0.38	U	U		0.4	0.0013	mg/kg	17000	SW846 8270C	Analyte not detected at or above the detection limit.
1,1-Dichloroethene	0.011	U	U	A	0.005	0.00084	mg/kg	1100	SW846 8260B	Analyte not detected. Sample analyzed in dilution.
1,2-Dichloroethane	0.011	U	U	A	0.005	0.00064	mg/kg	2.2	SW846 8260B	Analyte not detected. Sample analyzed in dilution.
Benzene	0.0021	J	U	A	0.005	0.00032	mg/kg	5.6	SW846 8260B	Result < RL. Sample analyzed in dilution.
Benzyl Chloride	20	U	U	A J	10		mg/kg	17	SW846 8260B	Analyte not detected. Sample analyzed in dilution, RL adjusted to 20 mg/kg. Reported by TIC.
Bromomethane	0.011	U	U	A	0.005	0.00073	mg/kg	35	SW846 8260B	Analyte not detected. Sample analyzed in dilution.
Carbon tetrachloride	0.011	U	U	A	0.005	0.00071	mg/kg	1.3	SW846 8260B	Analyte not detected. Sample analyzed in dilution.
Chlorobenzene	0.011	U	U	A	0.005	0.00075	mg/kg	1500	SW846 8260B	Analyte not detected. Sample analyzed in dilution.
Chloroform	0.011	U	U	A	0.005	0.00064	mg/kg	1.5	SW846 8260B	Analyte not detected. Sample analyzed in dilution.
Chloromethane	0.011	U	U	A	0.005	0.00059	mg/kg	8.4	SW846 8260B	Analyte not detected. Sample analyzed in dilution.
Methylene chloride	0.011	U	U	A	0.005	0.0023	mg/kg	54	SW846 8260B	Analyte not detected. Sample analyzed in dilution.
Tetrachloroethene	0.011	U	U	A	0.005	0.00094	mg/kg	2.7	SW846 8260B	Analyte not detected. Sample analyzed in dilution.
Toluene	0.0023	J	U	A	0.005	0.00073	mg/kg	46000	SW846 8260B	Result < RL. Sample analyzed in dilution.
Trichloroethene	0.00067	J	U	A	0.005	0.00066	mg/kg	14	SW846 8260B	Result < RL. Sample analyzed in dilution.
Vinyl chloride	0.011	U	U	A	0.005	0.00062	mg/kg	1.7	SW846 8260B	Analyte not detected. Sample analyzed in dilution.
Mercury	0.042	B	U		0.11	0.017	mg/kg	28	SW846 7471A	Result < RL.
Antimony	0.82	B	U	J	6	0.45	mg/kg	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank and calibration blank. MS/MSD recovered low.
Arsenic	1.9		1.9		1	0.34	mg/kg	15.8	SW846 6010B	No action taken. Result < action limit (AL)
Barium	98.2		98.2		20	0.081	mg/kg	190000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.2	B	U		0.5	0.041	mg/kg	810	SW846 6010B	Result < RL.
Chromium	15.9		15.9		1	0.23	mg/kg	1400	SW846 6010B	No action taken. Result < action limit (AL)
Lead	131		131		0.3	0.22	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	9.8		U		330	0.31	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.57	U	U		0.6	0.51	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.1	U	U		1	0.11	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	140		U		2500	1.1	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg. MS and MSD recovered low.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
EQUIP. BLANK 1										
Mercury	0.2	U	U		0.2	0.12	ug/L	28	SW846 7470A	Target analyte not detected above detection limit or QL/RL.
Antimony	3.2	B	U		60	1.8	ug/L	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank and calibration blank. MS/MSD recovered low.
Arsenic	10	U	U		10	3.2	ug/L	15.8	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Barium	200	U	U		200	0.67	ug/L	190000	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Cadmium	5	U	U		5	0.66	ug/L	810	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Chromium	10	U	U		10	2.2	ug/L	1400	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Lead	3	U	U		3	1.9	ug/L	800	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Nickel	40	U	U		40	3.2	ug/L	20000	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Selenium	5	U	U		5	4.1	ug/L	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	10	U	U		10	2.2	ug/L	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	20	U	U		20	5	ug/L	310000	SW846 6010B	Target analyte not detected above detection limit or RL/QL.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
NB-1										
Nitroglycerin	1.7	J	U		2.5	0.26	mg/kg	62	SW846 8332	Result < RL. Result presented on a wet weight.
1,3,5-Trinitrobenzene	0.25	U	U		0.25	0.024	mg/kg	27000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	62	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4,6-Trinitrotoluene	0.12	J	U		0.25	0.033	mg/kg	79	SW846 8330	Result < RL. Result presented on a wet weight.
2,4-Dinitrotoluene	0.062	J	U		0.25	0.029	mg/kg	1200	SW846 8330	Result < RL. Result presented on a wet weight.
2,6-Dinitrotoluene	0.25	U	U		0.25	0.028	mg/kg	620	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2-Amino-4,6-dinitrotoluene	0.25	U	U		0.25	0.031	mg/kg	2000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	13	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	12000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
4-Amino-2,6-dinitrotoluene	0.25	U	U		0.25	0.03	mg/kg	1900	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	110	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
HMX	0.058	J	U		0.5	0.048	mg/kg	49000	SW846 8330	Result < RL. Result presented on a wet weight.
Nitrobenzene	0.25	U	U		0.25	0.028	mg/kg	280	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
RDX	0.5	U	U		0.5	0.031	mg/kg	24	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	2500	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4-Dichlorophenol	0.8	U	U	A	0.4	0.048	mg/kg	1800	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
2-Chlorophenol	0.8	U	U	A	0.4	0.063	mg/kg	5100	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
3,3'-Dimethylbenzidine	3.9	U	U	A	2	0.15	mg/kg	0.16	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
3-Methylphenol	0.8	U	U	A	0.4	0.01	mg/kg	31000	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
4-Methylphenol	0.8	U	U	A	0.4	0.053	mg/kg	3100	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
4-Nitrophenol	3.9	U	U	A	2	0.27	mg/kg	7	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Acetophenone	0.8	U	U	A	0.4	0.022	mg/kg	100000	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Benzo(a)anthracene	0.8	U	U	A	0.4	0.0023	mg/kg	2.1	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Benzo(a)pyrene	0.048	U	U	A	0.02	0.0031	mg/kg	0.21	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Benzo(b)fluoranthene	0.034	J	U	A	0.4	0.0029	mg/kg	2.1	SW846 8270C	Result < adjusted RL. Sample analyzed in dilution.
Benzo(k)fluoranthene	0.02	J	U	A	0.4	0.0041	mg/kg	21	SW846 8270C	Result < adjusted RL. Sample analyzed in dilution.
Benzoic acid	3.9	U	U	A	2	0.58	mg/kg	2500000	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
bis(2-Ethylhexyl) phthalate	0.79	J	U	A	0.4	0.043	mg/kg	120	SW846 8270C	Result < adjusted RL. Sample analyzed in dilution.
Butyl benzyl phthalate	0.8	U	U	A	0.4	0.046	mg/kg	910	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Dibenz(a,h)anthracene	0.048	U	U	A	0.02	0.0031	mg/kg	0.21	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Dibenzofuran	0.8	U	U	A	0.4	0.048	mg/kg	2000	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Diethyl phthalate	2		2		0.4	0.046	mg/kg	490000	SW846 8270C	No action taken. Result < action limit (AL)
Dimethyl phthalate	0.37	J	U	A	0.4	0.051	mg/kg	10000000	SW846 8270C	Result < adjusted RL. Sample analyzed in dilution.
Di-n-butyl phthalate	0.91		0.91		0.4	0.046	mg/kg	62000	SW846 8270C	No action taken. Result < action limit (AL)
Di-n-octyl phthalate	0.8	U	U	A	0.4	0.043	mg/kg	41000	SW846 8270C	Analyte not detected. Sample analyzed in dilution.

SEE LAST PAGE FOR DATA QUALIFIER DEFINITIONS.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
NB-1										
Fluoranthene	0.018	J	U	A	0.4	0.0029	mg/kg	22000	SW846 8270C	Result < adjusted RL. Sample analyzed in dilution.
Hexachloroethane	0.12	U	U	A	0.05	0.068	mg/kg	120	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Indeno(1,2,3-cd)pyrene	0.053	J	U	A	0.4	0.0036	mg/kg	2.1	SW846 8270C	Result < adjusted RL. Sample analyzed in dilution.
Naphthalene	0.8	U	U	A	0.4	0.0039	mg/kg	20	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
N-Nitrosodiphenylamine	0.13	J	U	A	0.4	0.051	mg/kg	15000	SW846 8270C	Result < adjusted RL. Sample analyzed in dilution.
Phenol	0.8	U	U	A	0.4	0.06	mg/kg	180000	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Pyrene	0.8	U	U	A	0.4	0.0027	mg/kg	17000	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
1,1-Dichloroethene	0.0068	U	U		0.005	0.0005	mg/kg	1100	SW846 8260B	Analyte not detected at or above the detection limit.
1,2-Dichloroethane	0.0068	U	U		0.005	0.00038	mg/kg	2.2	SW846 8260B	Analyte not detected at or above the detection limit.
Benzene	0.0068	U	U		0.005	0.00019	mg/kg	5.6	SW846 8260B	Analyte not detected at or above the detection limit.
Benzyl Chloride	10	U	U	J	10		mg/kg	17	SW846 8260B	Analyte not detected. Reported by TIC.
Bromomethane	0.0068	U	U		0.005	0.00043	mg/kg	35	SW846 8260B	Analyte not detected at or above the detection limit.
Carbon tetrachloride	0.0068	U	U		0.005	0.00042	mg/kg	1.3	SW846 8260B	Analyte not detected at or above the detection limit.
Chlorobenzene	0.0068	U	U		0.005	0.00045	mg/kg	1500	SW846 8260B	Analyte not detected at or above the detection limit.
Chloroform	0.0068	U	U		0.005	0.00038	mg/kg	1.5	SW846 8260B	Analyte not detected at or above the detection limit.
Chloromethane	0.0068	U	U		0.005	0.00035	mg/kg	8.4	SW846 8260B	Analyte not detected at or above the detection limit.
Methylene chloride	0.0068	U	U		0.005	0.0014	mg/kg	54	SW846 8260B	Analyte not detected at or above the detection limit.
Tetrachloroethene	0.0068	U	U		0.005	0.00055	mg/kg	2.7	SW846 8260B	Analyte not detected at or above the detection limit.
Toluene	0.0068	U	U		0.005	0.00043	mg/kg	46000	SW846 8260B	Analyte not detected at or above the detection limit.
Trichloroethene	0.0068	U	U		0.005	0.00039	mg/kg	14	SW846 8260B	Analyte not detected at or above the detection limit.
Vinyl chloride	0.0068	U	U		0.005	0.00037	mg/kg	1.7	SW846 8260B	Analyte not detected at or above the detection limit.
Mercury	0.12	U	U		0.11	0.018	mg/kg	28	SW846 7471A	Target analyte not detected above detection limit or QL/RL.
Antimony	1.1	B	U	J	6	0.47	mg/kg	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank and calibration blank. MS/MSD recovered low.
Arsenic	2.3		2.3		1	0.36	mg/kg	15.8	SW846 6010B	No action taken. Result < action limit (AL)
Barium	135		135		20	0.086	mg/kg	190000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.35	B	U		0.5	0.043	mg/kg	810	SW846 6010B	Result < RL.
Chromium	18.2		18.2		1	0.24	mg/kg	1400	SW846 6010B	No action taken. Result < action limit (AL)
Lead	251		251		0.3	0.23	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	10.4		U		330	0.33	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.6	U	U		0.6	0.54	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.2	U	U		1	0.12	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	226		U		2500	1.2	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg.

SEE LAST PAGE FOR DATA QUALIFIER DEFINITIONS.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13

Event Date: November 2008 (Fourth Quarter 2008)

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
NB-2										
Nitroglycerin	0.95	J	U		2.5	0.26	mg/kg	62	SW846 8332	Result < RL. Result presented on a wet weight.
1,3,5-Trinitrobenzene	0.25	U	U		0.25	0.024	mg/kg	27000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	62	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4,6-Trinitrotoluene	0.25	U	U		0.25	0.033	mg/kg	79	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4-Dinitrotoluene	0.21	J	U		0.25	0.029	mg/kg	1200	SW846 8330	Result < RL. Result presented on a wet weight.
2,6-Dinitrotoluene	0.25	U	U		0.25	0.028	mg/kg	620	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2-Amino-4,6-dinitrotoluene	0.25	U	U		0.25	0.031	mg/kg	2000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	13	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	12000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
4-Amino-2,6-dinitrotoluene	0.25	U	U		0.25	0.03	mg/kg	1900	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	110	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
HMX	0.5	U	U		0.5	0.048	mg/kg	49000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
Nitrobenzene	0.25	U	U		0.25	0.028	mg/kg	280	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
RDX	0.5	U	U		0.5	0.031	mg/kg	24	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	2500	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4-Dichlorophenol	0.37	U	U		0.4	0.023	mg/kg	1800	SW846 8270C	Analyte not detected at or above the detection limit.
2-Chlorophenol	0.37	U	U		0.4	0.029	mg/kg	5100	SW846 8270C	Analyte not detected at or above the detection limit.
3,3'-Dimethylbenzidine	1.8	U	U		2	0.071	mg/kg	0.16	SW846 8270C	Analyte not detected at or above the detection limit.
3-Methylphenol	0.37	U	U		0.4	0.0049	mg/kg	31000	SW846 8270C	Analyte not detected at or above the detection limit.
4-Methylphenol	0.37	U	U		0.4	0.025	mg/kg	3100	SW846 8270C	Analyte not detected at or above the detection limit.
4-Nitrophenol	1.8	U	U		2	0.12	mg/kg	7	SW846 8270C	Analyte not detected at or above the detection limit.
Acetophenone	0.37	U	U		0.4	0.01	mg/kg	100000	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(a)anthracene	0.37	U	U		0.4	0.0011	mg/kg	2.1	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(a)pyrene	0.0089	J	U	J	0.02	0.0015	mg/kg	0.21	SW846 8270C	Result < QL. Internal standard area recovered low (%D < -50%).
Benzo(b)fluoranthene	0.027	J	U	J	0.4	0.0014	mg/kg	2.1	SW846 8270C	Result < QL. Internal standard area recovered low (%D < -50%).
Benzo(k)fluoranthene	0.013	J	U	J	0.4	0.0019	mg/kg	21	SW846 8270C	Result < QL. Internal standard area recovered low (%D < -50%).
Benzoic acid	1.8	U	U		2	0.27	mg/kg	2500000	SW846 8270C	Analyte not detected at or above the detection limit.
bis(2-Ethylhexyl) phthalate	0.11	J	U		0.4	0.02	mg/kg	120	SW846 8270C	Result < RL.
Butyl benzyl phthalate	0.37	U	U		0.4	0.021	mg/kg	910	SW846 8270C	Analyte not detected at or above the detection limit.
Dibenz(a,h)anthracene	0.023	U	U	J	0.02	0.0015	mg/kg	0.21	SW846 8270C	Analyte not detected. Internal standard area recovered low (%D < -50%).
Dibenzofuran	0.37	U	U		0.4	0.023	mg/kg	2000	SW846 8270C	Analyte not detected at or above the detection limit.
Diethyl phthalate	0.69		0.69		0.4	0.021	mg/kg	490000	SW846 8270C	No action taken. Result < action limit (AL)
Dimethyl phthalate	0.39		0.39		0.4	0.024	mg/kg	10000000	SW846 8270C	No action taken. Result < action limit (AL)
Di-n-butyl phthalate	0.33	J	U		0.4	0.021	mg/kg	62000	SW846 8270C	Result < RL.
Di-n-octyl phthalate	0.37	U	U	J	0.4	0.02	mg/kg	41000	SW846 8270C	Analyte not detected. Internal standard area recovered low (%D < -50%).

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
NB-2										
Fluoranthene	0.01	J	U		0.4	0.0014	mg/kg	22000	SW846 8270C	Result < RL.
Hexachloroethane	0.056	U	U		0.05	0.032	mg/kg	120	SW846 8270C	Analyte not detected at or above the detection limit.
Indeno(1,2,3-cd)pyrene	0.028	J	U	J	0.4	0.0017	mg/kg	2.1	SW846 8270C	Result < QL. Internal standard area recovered low (%D < -50%).
Naphthalene	0.37	U	U		0.4	0.0018	mg/kg	20	SW846 8270C	Analyte not detected at or above the detection limit.
N-Nitrosodiphenylamine	0.048	J	U		0.4	0.024	mg/kg	15000	SW846 8270C	Result < RL.
Phenol	0.37	U	U		0.4	0.028	mg/kg	180000	SW846 8270C	Analyte not detected at or above the detection limit.
Pyrene	0.0087	J	U		0.4	0.0012	mg/kg	17000	SW846 8270C	Result < RL.
1,1-Dichloroethene	0.0063	U	U		0.005	0.00047	mg/kg	1100	SW846 8260B	Analyte not detected at or above the detection limit.
1,2-Dichloroethane	0.0063	U	U		0.005	0.00035	mg/kg	2.2	SW846 8260B	Analyte not detected at or above the detection limit.
Benzene	0.0063	U	U		0.005	0.00018	mg/kg	5.6	SW846 8260B	Analyte not detected at or above the detection limit.
Benzyl Chloride	10	U	U	J	10		mg/kg	17	SW846 8260B	Analyte not detected. Reported by TIC.
Bromomethane	0.00068	J	U		0.005	0.0004	mg/kg	35	SW846 8260B	Result < RL.
Carbon tetrachloride	0.0063	U	U		0.005	0.00039	mg/kg	1.3	SW846 8260B	Analyte not detected at or above the detection limit.
Chlorobenzene	0.0063	U	U		0.005	0.00042	mg/kg	1500	SW846 8260B	Analyte not detected at or above the detection limit.
Chloroform	0.0063	U	U		0.005	0.00035	mg/kg	1.5	SW846 8260B	Analyte not detected at or above the detection limit.
Chloromethane	0.0063	U	U		0.005	0.00033	mg/kg	8.4	SW846 8260B	Analyte not detected at or above the detection limit.
Methylene chloride	0.0063	U	U		0.005	0.0013	mg/kg	54	SW846 8260B	Analyte not detected at or above the detection limit.
Tetrachloroethene	0.0063	U	U		0.005	0.00052	mg/kg	2.7	SW846 8260B	Analyte not detected at or above the detection limit.
Toluene	0.0063	U	U		0.005	0.0004	mg/kg	46000	SW846 8260B	Analyte not detected at or above the detection limit.
Trichloroethene	0.0063	U	U		0.005	0.00037	mg/kg	14	SW846 8260B	Analyte not detected at or above the detection limit.
Vinyl chloride	0.0063	U	U		0.005	0.00034	mg/kg	1.7	SW846 8260B	Analyte not detected at or above the detection limit.
Mercury	0.042	B	U		0.11	0.017	mg/kg	28	SW846 7471A	Result < RL.
Antimony	0.81	B	U	J	6	0.44	mg/kg	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank and calibration blank. MS/MSD recovered low.
Arsenic	1.5		1.5		1	0.34	mg/kg	15.8	SW846 6010B	No action taken. Result < action limit (AL)
Barium	99.6		99.6		20	0.08	mg/kg	190000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.15	B	U		0.5	0.041	mg/kg	810	SW846 6010B	Result < RL.
Chromium	12.7		12.7		1	0.23	mg/kg	1400	SW846 6010B	No action taken. Result < action limit (AL)
Lead	203		203		0.3	0.21	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	6.5		U		330	0.31	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.56	U	U		0.6	0.51	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.1	U	U		1	0.11	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	96.7		U		2500	1.1	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-1										
Nitroglycerin	2.5	U	U		2.5	0.26	mg/kg	62	SW846 8332	Analyte not detected at or above the detection limit. Result presented on a wet weight.
1,3,5-Trinitrobenzene	0.25	U	U		0.25	0.024	mg/kg	27000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	62	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4,6-Trinitrotoluene	0.069	J	U		0.25	0.033	mg/kg	79	SW846 8330	Result < RL. Result presented on a wet weight.
2,4-Dinitrotoluene	0.091	J	U		0.25	0.029	mg/kg	1200	SW846 8330	Result < RL. Result presented on a wet weight.
2,6-Dinitrotoluene	0.053	J	U		0.25	0.028	mg/kg	620	SW846 8330	Result < RL. Result presented on a wet weight.
2-Amino-4,6-dinitrotoluene	0.059	J	U		0.25	0.031	mg/kg	2000	SW846 8330	Result < RL. Result presented on a wet weight.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	13	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	12000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
4-Amino-2,6-dinitrotoluene	0.069	J	U		0.25	0.03	mg/kg	1900	SW846 8330	Result < RL. Result presented on a wet weight.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	110	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
HMX	0.048	J	U		0.5	0.048	mg/kg	49000	SW846 8330	Result < RL. Result presented on a wet weight.
Nitrobenzene	0.25	U	U		0.25	0.028	mg/kg	280	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
RDX	0.069	J	U		0.5	0.031	mg/kg	24	SW846 8330	Result < RL. Result presented on a wet weight.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	2500	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4-Dichlorophenol	0.39	U	U		0.4	0.023	mg/kg	1800	SW846 8270C	Analyte not detected at or above the detection limit.
2-Chlorophenol	0.39	U	U		0.4	0.03	mg/kg	5100	SW846 8270C	Analyte not detected at or above the detection limit.
3,3'-Dimethylbenzidine	1.9	U	U		2	0.074	mg/kg	0.16	SW846 8270C	Analyte not detected at or above the detection limit.
3-Methylphenol	0.39	U	U		0.4	0.005	mg/kg	31000	SW846 8270C	Analyte not detected at or above the detection limit.
4-Methylphenol	0.39	U	U		0.4	0.026	mg/kg	3100	SW846 8270C	Analyte not detected at or above the detection limit.
4-Nitrophenol	1.9	U	U		2	0.13	mg/kg	7	SW846 8270C	Analyte not detected at or above the detection limit.
Acetophenone	0.39	U	U		0.4	0.011	mg/kg	100000	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(a)anthracene	0.39	U	U		0.4	0.0011	mg/kg	2.1	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(a)pyrene	0.023	U	U		0.02	0.0015	mg/kg	0.21	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(b)fluoranthene	0.39	U	U		0.4	0.0014	mg/kg	2.1	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(k)fluoranthene	0.39	U	U		0.4	0.002	mg/kg	21	SW846 8270C	Analyte not detected at or above the detection limit.
Benzoic acid	1.9	U	U	J	2	0.28	mg/kg	2500000	SW846 8270C	Analyte not detected. LCS recovered low. Sample re-extracted and reanalyzed outside holding time criteria with acceptable recoveries. Original result reported.
bis(2-Ethylhexyl) phthalate	0.06	J	U		0.4	0.021	mg/kg	120	SW846 8270C	Result < RL.
Butyl benzyl phthalate	0.39	U	U		0.4	0.022	mg/kg	910	SW846 8270C	Analyte not detected at or above the detection limit.
Dibenz(a,h)anthracene	0.023	U	U		0.02	0.0015	mg/kg	0.21	SW846 8270C	Analyte not detected at or above the detection limit.
Dibenzofuran	0.39	U	U		0.4	0.023	mg/kg	2000	SW846 8270C	Analyte not detected at or above the detection limit.
Diethyl phthalate	0.23	J	U		0.4	0.022	mg/kg	490000	SW846 8270C	Result < RL.
Dimethyl phthalate	0.39	U	U		0.4	0.025	mg/kg	10000000	SW846 8270C	Analyte not detected at or above the detection limit.
Di-n-butyl phthalate	0.22	J	U		0.4	0.022	mg/kg	62000	SW846 8270C	Result < RL.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-1										
Di-n-octyl phthalate	0.39	U	U		0.4	0.021	mg/kg	41000	SW846 8270C	Analyte not detected at or above the detection limit.
Fluoranthene	0.39	U	U		0.4	0.0014	mg/kg	22000	SW846 8270C	Analyte not detected at or above the detection limit.
Hexachloroethane	0.059	U	U		0.05	0.033	mg/kg	120	SW846 8270C	Analyte not detected at or above the detection limit.
Indeno(1,2,3-cd)pyrene	0.39	U	U		0.4	0.0018	mg/kg	2.1	SW846 8270C	Analyte not detected at or above the detection limit.
Naphthalene	0.39	U	U		0.4	0.0019	mg/kg	20	SW846 8270C	Analyte not detected at or above the detection limit.
N-Nitrosodiphenylamine	0.095	J	U		0.4	0.025	mg/kg	15000	SW846 8270C	Result < RL.
Phenol	0.39	U	U		0.4	0.029	mg/kg	180000	SW846 8270C	Analyte not detected at or above the detection limit.
Pyrene	0.39	U	U		0.4	0.0013	mg/kg	17000	SW846 8270C	Analyte not detected at or above the detection limit.
1,1-Dichloroethene	0.0054	U	U		0.005	0.0004	mg/kg	1100	SW846 8260B	Analyte not detected at or above the detection limit.
1,2-Dichloroethane	0.0054	U	U		0.005	0.0003	mg/kg	2.2	SW846 8260B	Analyte not detected at or above the detection limit.
Benzene	0.00027	J	U		0.005	0.00015	mg/kg	5.6	SW846 8260B	Result < RL.
Benzyl Chloride	10	U	U	J	10		mg/kg	17	SW846 8260B	Analyte not detected. Reported by TIC.
Bromomethane	0.0054	U	U		0.005	0.00035	mg/kg	35	SW846 8260B	Analyte not detected at or above the detection limit.
Carbon tetrachloride	0.0054	U	U		0.005	0.00033	mg/kg	1.3	SW846 8260B	Analyte not detected at or above the detection limit.
Chlorobenzene	0.0054	U	U		0.005	0.00036	mg/kg	1500	SW846 8260B	Analyte not detected at or above the detection limit.
Chloroform	0.0054	U	U		0.005	0.0003	mg/kg	1.5	SW846 8260B	Analyte not detected at or above the detection limit.
Chloromethane	0.0054	U	U		0.005	0.00028	mg/kg	8.4	SW846 8260B	Analyte not detected at or above the detection limit.
Methylene chloride	0.0054	U	U		0.005	0.0011	mg/kg	54	SW846 8260B	Analyte not detected at or above the detection limit.
Tetrachloroethene	0.0054	U	U		0.005	0.00044	mg/kg	2.7	SW846 8260B	Analyte not detected at or above the detection limit.
Toluene	0.0054	U	U		0.005	0.00035	mg/kg	46000	SW846 8260B	Analyte not detected at or above the detection limit.
Trichloroethene	0.0054	U	U		0.005	0.00031	mg/kg	14	SW846 8260B	Analyte not detected at or above the detection limit.
Vinyl chloride	0.0054	U	U		0.005	0.00029	mg/kg	1.7	SW846 8260B	Analyte not detected at or above the detection limit.
TPH (as Diesel)	17		17		11	3.3	mg/kg	11000	SW846 8015B	Result < action limit (AL).
Mercury	0.042	B	U	J	0.11	0.018	mg/kg	28	SW846 7471A	Result < QL. QL standard recovery was low (69%).
Antimony	7	U	U	J	6	0.46	mg/kg	410	SW846 6010B	Target analyte not detected above detection limit or QL/RL. MS/MSD recovered low. QL standard recovery was low (60.7%).
Arsenic	1.1	B	U		1	0.35	mg/kg	15.8	SW846 6010B	Result < RL.
Barium	75.4		75.4		20	0.083	mg/kg	190000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	2.1		2.1		0.5	0.042	mg/kg	810	SW846 6010B	No action taken. Result < action limit (AL)
Chromium	18.9		18.9		1	0.23	mg/kg	1400	SW846 6010B	No action taken. Result < action limit (AL)
Lead	359		359		0.3	0.22	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	6.6		U		330	0.32	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.59	U	U		0.6	0.53	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.2	U	U		1	0.12	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	733		U	J	2500	1.2	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg. MS and MSD recovered low.

SEE LAST PAGE FOR DATA QUALIFIER DEFINITIONS.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-2										
Nitroglycerin	1	J	U		2.5	0.26	mg/kg	62	SW846 8332	Result < RL. Result presented on a wet weight.
1,3,5-Trinitrobenzene	0.51		0.51		0.25	0.024	mg/kg	27000	SW846 8330	No action taken. Result presented on a wet weight.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	62	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4,6-Trinitrotoluene	1.5		1.5		0.25	0.033	mg/kg	79	SW846 8330	No action taken. Result presented on a wet weight.
2,4-Dinitrotoluene	0.57		0.57		0.25	0.029	mg/kg	1200	SW846 8330	No action taken. Result presented on a wet weight.
2,6-Dinitrotoluene	0.49		0.49		0.25	0.028	mg/kg	620	SW846 8330	No action taken. Result presented on a wet weight.
2-Amino-4,6-dinitrotoluene	0.48		0.48		0.25	0.031	mg/kg	2000	SW846 8330	No action taken. Result presented on a wet weight.
2-Nitrotoluene	0.14	J	U		0.25	0.037	mg/kg	13	SW846 8330	Result < RL. Result presented on a wet weight.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	12000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
4-Amino-2,6-dinitrotoluene	0.58		0.58		0.25	0.03	mg/kg	1900	SW846 8330	No action taken. Result presented on a wet weight.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	110	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
HMX	0.17	J	U		0.5	0.048	mg/kg	49000	SW846 8330	Result < RL. Result presented on a wet weight.
Nitrobenzene	0.25	U	U		0.25	0.028	mg/kg	280	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
RDX	0.082	J	U		0.5	0.031	mg/kg	24	SW846 8330	Result < RL. Result presented on a wet weight.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	2500	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4-Dichlorophenol	0.37	U	U		0.4	0.023	mg/kg	1800	SW846 8270C	Analyte not detected at or above the detection limit.
2-Chlorophenol	0.37	U	U		0.4	0.029	mg/kg	5100	SW846 8270C	Analyte not detected at or above the detection limit.
3,3'-Dimethylbenzidine	1.8	U	U		2	0.071	mg/kg	0.16	SW846 8270C	Analyte not detected at or above the detection limit.
3-Methylphenol	0.37	U	U		0.4	0.0049	mg/kg	31000	SW846 8270C	Analyte not detected at or above the detection limit.
4-Methylphenol	0.37	U	U		0.4	0.025	mg/kg	3100	SW846 8270C	Analyte not detected at or above the detection limit.
4-Nitrophenol	1.8	U	U		2	0.12	mg/kg	7	SW846 8270C	Analyte not detected at or above the detection limit.
Acetophenone	0.37	U	U		0.4	0.01	mg/kg	100000	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(a)anthracene	0.37	U	U		0.4	0.0011	mg/kg	2.1	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(a)pyrene	0.023	U	U	J	0.02	0.0015	mg/kg	0.21	SW846 8270C	Internal standard area recovered low (%D < -50%).
Benzo(b)fluoranthene	0.033	J	U	J	0.4	0.0014	mg/kg	2.1	SW846 8270C	Result < RL. Analyte not detected. Sample analyzed in dilution. Internal standard area recovered low (%D < -50%).
Benzo(k)fluoranthene	0.37	U	U	J	0.4	0.0019	mg/kg	21	SW846 8270C	Internal standard area recovered low (%D < -50%).
Benzoic acid	1.8	U	U	J	2	0.27	mg/kg	2500000	SW846 8270C	Analyte not detected. LCS recovered low. Sample re-extracted and reanalyzed outside holding time criteria with acceptable recoveries. Original result reported.
bis(2-Ethylhexyl) phthalate	0.28	J	U		0.4	0.02	mg/kg	120	SW846 8270C	Result < RL.
Butyl benzyl phthalate	0.37	U	U		0.4	0.021	mg/kg	910	SW846 8270C	Analyte not detected at or above the detection limit.
Dibenz(a,h)anthracene	0.023	U	U	J	0.02	0.0015	mg/kg	0.21	SW846 8270C	Internal standard area recovered low (%D < -50%).
Dibenzofuran	0.37	U	U		0.4	0.023	mg/kg	2000	SW846 8270C	Analyte not detected at or above the detection limit.
Diethyl phthalate	0.21	J	U		0.4	0.021	mg/kg	490000	SW846 8270C	Result < RL.
Dimethyl phthalate	0.37	U	U		0.4	0.024	mg/kg	10000000	SW846 8270C	Analyte not detected at or above the detection limit.
Di-n-butyl phthalate	0.54		0.54		0.4	0.021	mg/kg	62000	SW846 8270C	No action taken. Result < action limit (AL)

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-2										
Di-n-octyl phthalate	0.37	U	U	J	0.4	0.02	mg/kg	41000	SW846 8270C	Internal standard area recovered low (%D < -50%).
Fluoranthene	0.37	U	U		0.4	0.0014	mg/kg	22000	SW846 8270C	Analyte not detected at or above the detection limit.
Hexachloroethane	0.056	U	U		0.05	0.032	mg/kg	120	SW846 8270C	Analyte not detected at or above the detection limit.
Indeno(1,2,3-cd)pyrene	0.37	U	U	J	0.4	0.0017	mg/kg	2.1	SW846 8270C	Internal standard area recovered low (%D < -50%).
Naphthalene	0.37	U	U		0.4	0.0018	mg/kg	20	SW846 8270C	Analyte not detected at or above the detection limit.
N-Nitrosodiphenylamine	0.23	J	U		0.4	0.024	mg/kg	15000	SW846 8270C	Result < RL.
Phenol	0.37	U	U		0.4	0.028	mg/kg	180000	SW846 8270C	Analyte not detected at or above the detection limit.
Pyrene	0.37	U	U		0.4	0.0012	mg/kg	17000	SW846 8270C	Analyte not detected at or above the detection limit.
1,1-Dichloroethene	0.0055	U	U		0.005	0.00041	mg/kg	1100	SW846 8260B	Analyte not detected.
1,2-Dichloroethane	0.0055	U	U		0.005	0.00031	mg/kg	2.2	SW846 8260B	Analyte not detected.
Benzene	0.0025	J	U		0.005	0.00015	mg/kg	5.6	SW846 8260B	Result < RL.
Benzyl Chloride	10	U	U		10		mg/kg	17	SW846 8260B	Analyte not detected. Reported by TIC.
Bromomethane	0.00046	J	U		0.005	0.00035	mg/kg	35	SW846 8260B	Result < RL.
Carbon tetrachloride	0.0055	U	U		0.005	0.00034	mg/kg	1.3	SW846 8260B	Analyte not detected.
Chlorobenzene	0.0055	U	U		0.005	0.00036	mg/kg	1500	SW846 8260B	Analyte not detected.
Chloroform	0.0055	U	U		0.005	0.00031	mg/kg	1.5	SW846 8260B	Analyte not detected.
Chloromethane	0.0055	U	U		0.005	0.00028	mg/kg	8.4	SW846 8260B	Analyte not detected.
Methylene chloride	0.0055	U	U		0.005	0.0011	mg/kg	54	SW846 8260B	Analyte not detected.
Tetrachloroethene	0.0055	U	U		0.005	0.00045	mg/kg	2.7	SW846 8260B	Analyte not detected.
Toluene	0.011		0.011		0.005	0.00035	mg/kg	46000	SW846 8260B	No action taken.
Trichloroethene	0.00058	J	U		0.005	0.00032	mg/kg	14	SW846 8260B	Analyte not detected.
Vinyl chloride	0.0055	U	U		0.005	0.0003	mg/kg	1.7	SW846 8260B	Analyte not detected.
Mercury	0.064	B	U	J	0.11	0.017	mg/kg	28	SW846 7471A	Result < QL. QL standard recovery was low (69%)
Antimony	0.66	B	U	J	6	0.44	mg/kg	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank and calibration blank. MS/MSD recovered low. QL standard recovery was low (60.7%).
Arsenic	2.4		2.4		1	0.34	mg/kg	15.8	SW846 6010B	No action taken. Result < action limit (AL)
Barium	113		113		20	0.08	mg/kg	190000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.61		0.61		0.5	0.041	mg/kg	810	SW846 6010B	No action taken. Result < action limit (AL)
Chromium	15.6		15.6		1	0.23	mg/kg	1400	SW846 6010B	No action taken. Result < action limit (AL)
Lead	382		382		0.3	0.21	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	8.5		U		330	0.3	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.56	U	U		0.6	0.51	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.1	U	U		1	0.11	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	396		U	J	2500	1.1	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg. MS and MSD recovered low.

SEE LAST PAGE FOR DATA QUALIFIER DEFINITIONS.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-3										
Nitroglycerin	2.5	U	U		2.5	0.26	mg/kg	62	SW846 8332	Analyte not detected at or above the detection limit. Result presented on a wet weight.
1,3,5-Trinitrobenzene	2.1		2.1		0.25	0.024	mg/kg	27000	SW846 8330	No action taken. Result presented on a wet weight.
1,3-Dinitrobenzene	0.043	J	U		0.25	0.029	mg/kg	62	SW846 8330	Result < RL. Result presented on a wet weight.
2,4,6-Trinitrotoluene	2.1		2.1		0.25	0.033	mg/kg	79	SW846 8330	No action taken. Result presented on a wet weight.
2,4-Dinitrotoluene	0.19	J	U		0.25	0.029	mg/kg	1200	SW846 8330	Result < RL. Result presented on a wet weight.
2,6-Dinitrotoluene	0.12	J	U		0.25	0.028	mg/kg	620	SW846 8330	Result < RL. Result presented on a wet weight.
2-Amino-4,6-dinitrotoluene	0.2	J	U		0.25	0.031	mg/kg	2000	SW846 8330	Result < RL. Result presented on a wet weight.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	13	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	12000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
4-Amino-2,6-dinitrotoluene	0.17	J	U		0.25	0.03	mg/kg	1900	SW846 8330	Result < RL. Result presented on a wet weight.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	110	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
HMX	0.5	U	U		0.5	0.048	mg/kg	49000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
Nitrobenzene	0.033	J	U		0.25	0.028	mg/kg	280	SW846 8330	Result < RL. Result presented on a wet weight.
RDX	0.066	J	U		0.5	0.031	mg/kg	24	SW846 8330	Result < RL. Result presented on a wet weight.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	2500	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4-Dichlorophenol	0.36	U	U		0.4	0.022	mg/kg	1800	SW846 8270C	Analyte not detected at or above the detection limit.
2-Chlorophenol	0.36	U	U		0.4	0.028	mg/kg	5100	SW846 8270C	Analyte not detected at or above the detection limit.
3,3'-Dimethylbenzidine	1.8	U	U		2	0.069	mg/kg	0.16	SW846 8270C	Analyte not detected at or above the detection limit.
3-Methylphenol	0.36	U	U		0.4	0.0047	mg/kg	31000	SW846 8270C	Analyte not detected at or above the detection limit.
4-Methylphenol	0.36	U	U		0.4	0.024	mg/kg	3100	SW846 8270C	Analyte not detected at or above the detection limit.
4-Nitrophenol	1.8	U	U		2	0.12	mg/kg	7	SW846 8270C	Analyte not detected at or above the detection limit.
Acetophenone	0.36	U	U		0.4	0.0099	mg/kg	100000	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(a)anthracene	0.36	U	U		0.4	0.001	mg/kg	2.1	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(a)pyrene	0.022	U	U		0.02	0.0014	mg/kg	0.21	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(b)fluoranthene	0.36	U	U		0.4	0.0013	mg/kg	2.1	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(k)fluoranthene	0.36	U	U		0.4	0.0019	mg/kg	21	SW846 8270C	Analyte not detected at or above the detection limit.
Benzoic acid	1.8	U	U	J	2	0.26	mg/kg	2500000	SW846 8270C	Analyte not detected. LCS recovered low. Sample re-extracted and reanalyzed outside holding time criteria with acceptable recoveries. Original result reported.
bis(2-Ethylhexyl) phthalate	0.07	J	U		0.4	0.02	mg/kg	120	SW846 8270C	Result < RL.
Butyl benzyl phthalate	0.36	U	U		0.4	0.021	mg/kg	910	SW846 8270C	Analyte not detected at or above the detection limit.
Dibenz(a,h)anthracene	0.022	U	U		0.02	0.0014	mg/kg	0.21	SW846 8270C	Analyte not detected at or above the detection limit.
Dibenzofuran	0.36	U	U		0.4	0.022	mg/kg	2000	SW846 8270C	Analyte not detected at or above the detection limit.
Diethyl phthalate	0.096	J	U		0.4	0.021	mg/kg	490000	SW846 8270C	Result < RL.
Dimethyl phthalate	0.36	U	U		0.4	0.023	mg/kg	10000000	SW846 8270C	Analyte not detected at or above the detection limit.
Di-n-butyl phthalate	0.11	J	U		0.4	0.021	mg/kg	62000	SW846 8270C	Result < RL.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-3										
Di-n-octyl phthalate	0.36	U	U		0.4	0.02	mg/kg	41000	SW846 8270C	Analyte not detected at or above the detection limit.
Fluoranthene	0.36	U	U		0.4	0.0013	mg/kg	22000	SW846 8270C	Analyte not detected at or above the detection limit.
Hexachloroethane	0.055	U	U		0.05	0.031	mg/kg	120	SW846 8270C	Analyte not detected at or above the detection limit.
Indeno(1,2,3-cd)pyrene	0.36	U	U		0.4	0.0016	mg/kg	2.1	SW846 8270C	Analyte not detected at or above the detection limit.
Naphthalene	0.013	J	U		0.4	0.0018	mg/kg	20	SW846 8270C	Result < RL.
N-Nitrosodiphenylamine	0.036	J	U		0.4	0.023	mg/kg	15000	SW846 8270C	Result < RL.
Phenol	0.36	U	U		0.4	0.027	mg/kg	180000	SW846 8270C	Analyte not detected at or above the detection limit.
Pyrene	0.36	U	U		0.4	0.0012	mg/kg	17000	SW846 8270C	Analyte not detected at or above the detection limit.
1,1-Dichloroethene	0.0052	U	U		0.005	0.00039	mg/kg	1100	SW846 8260B	Analyte not detected at or above the detection limit.
1,2-Dichloroethane	0.0052	U	U		0.005	0.00029	mg/kg	2.2	SW846 8260B	Analyte not detected at or above the detection limit.
Benzene	0.00052	J	U		0.005	0.00015	mg/kg	5.6	SW846 8260B	Result < RL.
Benzyl Chloride	10	U	U	J	10		mg/kg	17	SW846 8260B	Analyte not detected. Reported by TIC.
Bromomethane	0.0052	U	U		0.005	0.00033	mg/kg	35	SW846 8260B	Analyte not detected at or above the detection limit.
Carbon tetrachloride	0.0052	U	U		0.005	0.00032	mg/kg	1.3	SW846 8260B	Analyte not detected at or above the detection limit.
Chlorobenzene	0.0052	U	U		0.005	0.00034	mg/kg	1500	SW846 8260B	Analyte not detected at or above the detection limit.
Chloroform	0.0052	U	U		0.005	0.00029	mg/kg	1.5	SW846 8260B	Analyte not detected at or above the detection limit.
Chloromethane	0.0052	U	U		0.005	0.00027	mg/kg	8.4	SW846 8260B	Analyte not detected at or above the detection limit.
Methylene chloride	0.0052	U	U		0.005	0.001	mg/kg	54	SW846 8260B	Analyte not detected at or above the detection limit.
Tetrachloroethene	0.0052	U	U		0.005	0.00043	mg/kg	2.7	SW846 8260B	Analyte not detected at or above the detection limit.
Toluene	0.0052	U	U		0.005	0.00033	mg/kg	46000	SW846 8260B	Analyte not detected at or above the detection limit.
Trichloroethene	0.0052	U	U		0.005	0.0003	mg/kg	14	SW846 8260B	Analyte not detected at or above the detection limit.
Vinyl chloride	0.0052	U	U		0.005	0.00028	mg/kg	1.7	SW846 8260B	Analyte not detected at or above the detection limit.
Mercury	0.091	B	U	J	0.11	0.016	mg/kg	28	SW846 7471A	Result < QL. QL standard recovery was low (69%)
Antimony	6.6	U	U	J	6	0.43	mg/kg	410	SW846 6010B	Target analyte not detected above detection limit or QL/RL. MS/MSD recovered low. QL standard recovery was low (60.7%).
Arsenic	1.1		1.1		1	0.33	mg/kg	15.8	SW846 6010B	No action taken. Result < action limit (AL)
Barium	37.1		37.1		20	0.078	mg/kg	190000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.18	B	U		0.5	0.039	mg/kg	810	SW846 6010B	Result < RL.
Chromium	8.3		8.3		1	0.22	mg/kg	1400	SW846 6010B	No action taken. Result < action limit (AL)
Lead	363		363		0.3	0.21	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	4.4		U		330	0.3	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.55	U	U		0.6	0.49	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.1	U	U		1	0.11	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	254		U	J	2500	1.1	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg. MS and MSD recovered low.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13

Event Date: November 2008 (Fourth Quarter 2008)

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-4										
Nitroglycerin	5.1		5.1		2.5	0.26	mg/kg	62	SW846 8332	No action taken. Result presented on a wet weight.
1,3,5-Trinitrobenzene	0.12	J	U		0.25	0.024	mg/kg	27000	SW846 8330	Result < RL. Result presented on a wet weight.
1,3-Dinitrobenzene	0.097	J	U		0.25	0.029	mg/kg	62	SW846 8330	Result < RL. Result presented on a wet weight.
2,4,6-Trinitrotoluene	0.4		0.4		0.25	0.033	mg/kg	79	SW846 8330	No action taken. Result presented on a wet weight.
2,4-Dinitrotoluene	0.24	J	U		0.25	0.029	mg/kg	1200	SW846 8330	Result < RL. Result presented on a wet weight.
2,6-Dinitrotoluene	0.14	J	U		0.25	0.028	mg/kg	620	SW846 8330	Result < RL. Result presented on a wet weight.
2-Amino-4,6-dinitrotoluene	0.031	J	U		0.25	0.031	mg/kg	2000	SW846 8330	Result < RL. Result presented on a wet weight.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	13	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	12000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
4-Amino-2,6-dinitrotoluene	0.13	J	U		0.25	0.03	mg/kg	1900	SW846 8330	Result < RL. Result presented on a wet weight.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	110	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
HMX	0.15	J	U		0.5	0.048	mg/kg	49000	SW846 8330	Result < RL. Result presented on a wet weight.
Nitrobenzene	0.25	U	U		0.25	0.028	mg/kg	280	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
RDX	0.53		0.53		0.5	0.031	mg/kg	24	SW846 8330	No action taken. Result presented on a wet weight.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	2500	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4-Dichlorophenol	0.38	U	U		0.4	0.023	mg/kg	1800	SW846 8270C	Analyte not detected at or above the detection limit.
2-Chlorophenol	0.38	U	U		0.4	0.03	mg/kg	5100	SW846 8270C	Analyte not detected at or above the detection limit.
3,3'-Dimethylbenzidine	1.9	U	U		2	0.073	mg/kg	0.16	SW846 8270C	Analyte not detected at or above the detection limit.
3-Methylphenol	0.38	U	U		0.4	0.005	mg/kg	31000	SW846 8270C	Analyte not detected at or above the detection limit.
4-Methylphenol	0.38	U	U		0.4	0.026	mg/kg	3100	SW846 8270C	Analyte not detected at or above the detection limit.
4-Nitrophenol	1.9	U	U		2	0.13	mg/kg	7	SW846 8270C	Analyte not detected at or above the detection limit.
Acetophenone	0.38	U	U		0.4	0.01	mg/kg	100000	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(a)anthracene	0.039	J	U		0.4	0.0011	mg/kg	2.1	SW846 8270C	Result < RL.
Benzo(a)pyrene	0.057		U		0.02	0.0015	mg/kg	0.21	SW846 8270C	No action taken. Result < action limit (AL) and RL.
Benzo(b)fluoranthene	0.15	J	U		0.4	0.0014	mg/kg	2.1	SW846 8270C	Result < RL.
Benzo(k)fluoranthene	0.049	J	U		0.4	0.002	mg/kg	21	SW846 8270C	Result < RL.
Benzoic acid	1.9	U	U		2	0.28	mg/kg	2500000	SW846 8270C	Analyte not detected at or above the detection limit.
bis(2-Ethylhexyl) phthalate	0.22	J	U		0.4	0.021	mg/kg	120	SW846 8270C	Result < RL.
Butyl benzyl phthalate	0.38	U	U		0.4	0.022	mg/kg	910	SW846 8270C	Analyte not detected at or above the detection limit.
Dibenz(a,h)anthracene	0.033		U		0.02	0.0015	mg/kg	0.21	SW846 8270C	No action taken. Result < action limit (AL) and RL.
Dibenzofuran	0.38	U	U		0.4	0.023	mg/kg	2000	SW846 8270C	Analyte not detected at or above the detection limit.
Diethyl phthalate	0.44		0.44		0.4	0.022	mg/kg	490000	SW846 8270C	No action taken. Result < action limit (AL)
Dimethyl phthalate	0.81		0.81		0.4	0.024	mg/kg	10000000	SW846 8270C	No action taken. Result < action limit (AL)
Di-n-butyl phthalate	0.88		0.88		0.4	0.022	mg/kg	62000	SW846 8270C	No action taken. Result < action limit (AL)
Di-n-octyl phthalate	0.38	U	U		0.4	0.021	mg/kg	41000	SW846 8270C	Analyte not detected at or above the detection limit.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13

Event Date: November 2008 (Fourth Quarter 2008)

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-4										
Fluoranthene	0.1	J	U		0.4	0.0014	mg/kg	22000	SW846 8270C	Result < RL.
Hexachloroethane	0.058	U	U		0.05	0.032	mg/kg	120	SW846 8270C	Analyte not detected at or above the detection limit.
Indeno(1,2,3-cd)pyrene	0.065	J	U		0.4	0.0017	mg/kg	2.1	SW846 8270C	Result < RL.
Naphthalene	0.38	U	U		0.4	0.0019	mg/kg	20	SW846 8270C	Analyte not detected at or above the detection limit.
N-Nitrosodiphenylamine	0.61		0.61		0.4	0.024	mg/kg	15000	SW846 8270C	No action taken. Result < action limit (AL)
Phenol	0.38	U	U		0.4	0.029	mg/kg	180000	SW846 8270C	Analyte not detected at or above the detection limit.
Pyrene	0.077	J	U		0.4	0.0013	mg/kg	17000	SW846 8270C	Result < RL.
1,1-Dichloroethene	0.0051	U	U		0.005	0.00038	mg/kg	1100	SW846 8260B	Analyte not detected at or above the detection limit.
1,2-Dichloroethane	0.0051	U	U		0.005	0.00029	mg/kg	2.2	SW846 8260B	Analyte not detected at or above the detection limit.
Benzene	0.0012	J	U		0.005	0.00014	mg/kg	5.6	SW846 8260B	Result < RL.
Benzyl Chloride	10	U	U	J	10		mg/kg	17	SW846 8260B	Analyte not detected. Reported by TIC.
Bromomethane	0.00042	J	U		0.005	0.00033	mg/kg	35	SW846 8260B	Result < RL.
Carbon tetrachloride	0.0051	U	U		0.005	0.00032	mg/kg	1.3	SW846 8260B	Analyte not detected at or above the detection limit.
Chlorobenzene	0.0051	U	U		0.005	0.00034	mg/kg	1500	SW846 8260B	Analyte not detected at or above the detection limit.
Chloroform	0.0051	U	U		0.005	0.00029	mg/kg	1.5	SW846 8260B	Analyte not detected at or above the detection limit.
Chloromethane	0.0051	U	U		0.005	0.00027	mg/kg	8.4	SW846 8260B	Analyte not detected at or above the detection limit.
Methylene chloride	0.0014	J	U		0.005	0.001	mg/kg	54	SW846 8260B	Result < RL. Blank contamination in the trip blank (0.77 ug/l) and method blank (0.0039 mg/kg).
Tetrachloroethene	0.0051	U	U		0.005	0.00042	mg/kg	2.7	SW846 8260B	Analyte not detected at or above the detection limit.
Toluene	0.0004	J	U		0.005	0.00033	mg/kg	46000	SW846 8260B	Result < RL.
Trichloroethene	0.0051	U	U		0.005	0.0003	mg/kg	14	SW846 8260B	Analyte not detected at or above the detection limit.
Vinyl chloride	0.0051	U	U		0.005	0.00028	mg/kg	1.7	SW846 8260B	Analyte not detected at or above the detection limit.
TPH (as Diesel)	46		46		11	3.2	mg/kg	11000	SW846 8015B	Result < action limit (AL).
Mercury	0.043	B	U	J	0.11	0.017	mg/kg	28	SW846 7471A	Result < QL. QL standard recovery was low (69%)
Antimony	1.2	B	U	J	6	0.45	mg/kg	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank and calibration blank. MS/MSD recovered low. QL standard recovery was low (60.7%).
Arsenic	7.3		7.3		1	0.35	mg/kg	15.8	SW846 6010B	No action taken. Result < action limit (AL)
Barium	101		101		20	0.082	mg/kg	190000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.29	B	U		0.5	0.042	mg/kg	810	SW846 6010B	Result < RL.
Chromium	15.2		15.2		1	0.23	mg/kg	1400	SW846 6010B	No action taken. Result < action limit (AL)
Lead	346		346		0.3	0.22	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	8.3		U		330	0.31	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.58	U	U		0.6	0.52	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.2	U	U		1	0.12	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	177		U	J	2500	1.2	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg. MS and MSD recovered low.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13

Event Date: November 2008 (Fourth Quarter 2008)

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-5										
Nitroglycerin	2.1	J	U		2.5	0.26	mg/kg	62	SW846 8332	Result < RL. Result presented on a wet weight.
1,3,5-Trinitrobenzene	0.25	U	U		0.25	0.024	mg/kg	27000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	62	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4,6-Trinitrotoluene	0.25	U	U		0.25	0.033	mg/kg	79	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4-Dinitrotoluene	0.62		0.62		0.25	0.029	mg/kg	1200	SW846 8330	No action taken. Result presented on a wet weight.
2,6-Dinitrotoluene	0.25	U	U		0.25	0.028	mg/kg	620	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2-Amino-4,6-dinitrotoluene	0.25	U	U		0.25	0.031	mg/kg	2000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	13	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	12000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
4-Amino-2,6-dinitrotoluene	0.12	J	U		0.25	0.03	mg/kg	1900	SW846 8330	Result < RL. Result presented on a wet weight.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	110	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
HMX	0.5	U	U		0.5	0.048	mg/kg	49000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
Nitrobenzene	0.25	U	U		0.25	0.028	mg/kg	280	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
RDX	0.5	U	U		0.5	0.031	mg/kg	24	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	2500	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4-Dichlorophenol	1.4	U	U	A	0.4	0.088	mg/kg	1800	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
2-Chlorophenol	1.4	U	U	A	0.4	0.11	mg/kg	5100	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
3,3'-Dimethylbenzidine	7	U	U	A	2	0.28	mg/kg	0.16	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
3-Methylphenol	1.4	U	U	A	0.4	0.0047	mg/kg	31000	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
4-Methylphenol	1.4	U	U	A	0.4	0.096	mg/kg	3100	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
4-Nitrophenol	7	U	U	A	2	0.48	mg/kg	7	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Acetophenone	1.4	U	U	A	0.4	0.039	mg/kg	100000	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Benzo(a)anthracene	1.4	U	U	A	0.4	0.0042	mg/kg	2.1	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Benzo(a)pyrene	0.088	U	U	A	0.02	0.0057	mg/kg	0.21	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Benzo(b)fluoranthene	1.4	U	U	A	0.4	0.0053	mg/kg	2.1	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Benzo(k)fluoranthene	1.4	U	U	A	0.4	0.0074	mg/kg	21	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Benzoic acid	7	U	U	A J	2	1.1	mg/kg	2500000	SW846 8270C	Analyte not detected. LCS recovered low. Sample re-extracted and reanalyzed outside holding time criteria with acceptable recoveries. Original result reported. Sample analyzed in dilution.
bis(2-Ethylhexyl) phthalate	0.12	J	U	A	0.4	0.079	mg/kg	120	SW846 8270C	Result < adjusted RL. Sample analyzed in dilution.
Butyl benzyl phthalate	1.4	U	U	A	0.4	0.083	mg/kg	910	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Dibenz(a,h)anthracene	0.088	U	U	A	0.02	0.0057	mg/kg	0.21	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Dibenzofuran	1.4	U	U	A	0.4	0.088	mg/kg	2000	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Diethyl phthalate	0.15	J	U	A	0.4	0.083	mg/kg	490000	SW846 8270C	Result < adjusted RL. Sample analyzed in dilution.
Dimethyl phthalate	1.4	U	U	A	0.4	0.092	mg/kg	10000000	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Di-n-butyl phthalate	0.19	J	U	A	0.4	0.083	mg/kg	62000	SW846 8270C	Result < adjusted RL. Sample analyzed in dilution.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-5										
Di-n-octyl phthalate	1.4	U	U	A	0.4	0.079	mg/kg	41000	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Fluoranthene	1.4	U	U	A	0.4	0.0053	mg/kg	22000	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Hexachloroethane	0.22	U	U	A	0.05	0.12	mg/kg	120	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Indeno(1,2,3-cd)pyrene	1.4	U	U	A	0.4	0.0066	mg/kg	2.1	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Naphthalene	1.4	U	U	A	0.4	0.007	mg/kg	20	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
N-Nitrosodiphenylamine	1.4	U	U	A	0.4	0.092	mg/kg	15000	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Phenol	1.4	U	U	A	0.4	0.11	mg/kg	180000	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Pyrene	1.4	U	U	A	0.4	0.0048	mg/kg	17000	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
1,1-Dichloroethene	0.005	U	U		0.005	0.00037	mg/kg	1100	SW846 8260B	Analyte not detected at or above the detection limit.
1,2-Dichloroethane	0.005	U	U		0.005	0.00028	mg/kg	2.2	SW846 8260B	Analyte not detected at or above the detection limit.
Benzene	0.00086	J	U		0.005	0.00014	mg/kg	5.6	SW846 8260B	Result < RL.
Benzyl Chloride	10	U	U	J	10		mg/kg	17	SW846 8260B	Analyte not detected. Reported by TIC.
Bromomethane	0.00071	J	U		0.005	0.00032	mg/kg	35	SW846 8260B	Result < RL.
Carbon tetrachloride	0.005	U	U		0.005	0.00031	mg/kg	1.3	SW846 8260B	Analyte not detected at or above the detection limit.
Chlorobenzene	0.005	U	U		0.005	0.00033	mg/kg	1500	SW846 8260B	Analyte not detected at or above the detection limit.
Chloroform	0.005	U	U		0.005	0.00028	mg/kg	1.5	SW846 8260B	Analyte not detected at or above the detection limit.
Chloromethane	0.0013	J	U		0.005	0.00026	mg/kg	8.4	SW846 8260B	Result < RL.
Methylene chloride	0.005	U	U		0.005	0.001	mg/kg	54	SW846 8260B	Analyte not detected at or above the detection limit.
Tetrachloroethene	0.005	U	U		0.005	0.00041	mg/kg	2.7	SW846 8260B	Analyte not detected at or above the detection limit.
Toluene	0.005	U	U		0.005	0.00032	mg/kg	46000	SW846 8260B	Analyte not detected at or above the detection limit.
Trichloroethene	0.005	U	U		0.005	0.00029	mg/kg	14	SW846 8260B	Analyte not detected at or above the detection limit.
Vinyl chloride	0.005	U	U		0.005	0.00027	mg/kg	1.7	SW846 8260B	Analyte not detected at or above the detection limit.
Mercury	0.03	B	U	J	0.11	0.016	mg/kg	28	SW846 7471A	Result < QL. QL standard recovery was low (69%)
Antimony	6.6	U	U	J	6	0.43	mg/kg	410	SW846 6010B	Target analyte not detected above detection limit or QL/RL. MS/MSD recovered low. QL standard recovery was low (60.7%).
Arsenic	1	B	U		1	0.33	mg/kg	15.8	SW846 6010B	Result < RL. Adjusted RL 1.2 mg/kg. Result < adjusted RL.
Barium	26.8		26.8		20	0.078	mg/kg	190000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.061	B	U		0.5	0.039	mg/kg	810	SW846 6010B	Result < RL.
Chromium	6.6		6.6		1	0.22	mg/kg	1400	SW846 6010B	No action taken. Result < action limit (AL)
Lead	163		163		0.3	0.21	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	4	B	U		330	0.3	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.55	U	U		0.6	0.49	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.1	U	U		1	0.11	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	37.1		U	J	2500	1.1	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg. MS and MSD recovered low.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-6										
Nitroglycerin	30		30		2.5	0.26	mg/kg	62	SW846 8332	No action taken. Result presented on a wet weight.
1,3,5-Trinitrobenzene	0.15	J	U		0.25	0.024	mg/kg	27000	SW846 8330	Result < RL. Result presented on a wet weight.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	62	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4,6-Trinitrotoluene	1.7		1.7		0.25	0.033	mg/kg	79	SW846 8330	No action taken. Result presented on a wet weight.
2,4-Dinitrotoluene	1.3		1.3		0.25	0.029	mg/kg	1200	SW846 8330	No action taken. Result presented on a wet weight.
2,6-Dinitrotoluene	0.079	J	U		0.25	0.028	mg/kg	620	SW846 8330	Result < RL. Result presented on a wet weight.
2-Amino-4,6-dinitrotoluene	0.22	J	U		0.25	0.031	mg/kg	2000	SW846 8330	Result < RL. Result presented on a wet weight.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	13	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	12000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
4-Amino-2,6-dinitrotoluene	0.4	U	U		0.25	0.03	mg/kg	1900	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	110	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
HMX	0.18	J	U		0.5	0.048	mg/kg	49000	SW846 8330	Result < RL. Result presented on a wet weight.
Nitrobenzene	0.25	U	U		0.25	0.028	mg/kg	280	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
RDX	0.068	J	U		0.5	0.031	mg/kg	24	SW846 8330	Result < RL. Result presented on a wet weight.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	2500	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4-Dichlorophenol	2.4	U	U	A	0.4	0.15	mg/kg	1800	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
2-Chlorophenol	2.4	U	U	A	0.4	0.19	mg/kg	5100	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
3,3'-Dimethylbenzidine	12	U	U	A	2	0.46	mg/kg	0.16	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
3-Methylphenol	2.4	U	U	A	0.4	0.0047	mg/kg	31000	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
4-Methylphenol	2.4	U	U	A	0.4	0.16	mg/kg	3100	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
4-Nitrophenol	12	U	U	A	2	0.8	mg/kg	7	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Acetophenone	2.4	U	U	A	0.4	0.065	mg/kg	100000	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Benzo(a)anthracene	2.4	U	U	A	0.4	0.0069	mg/kg	2.1	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Benzo(a)pyrene	0.15	U	U	JA	0.02	0.0095	mg/kg	0.21	SW846 8270C	Analyte not detected. Sample analyzed in dilution. Internal standard area recovered low (%D < -50%).
Benzo(b)fluoranthene	2.4	U	U	JA	0.4	0.0087	mg/kg	2.1	SW846 8270C	Analyte not detected. Sample analyzed in dilution. Internal standard area recovered low (%D < -50%).
Benzo(k)fluoranthene	2.4	U	U	JA	0.4	0.012	mg/kg	21	SW846 8270C	Analyte not detected. Sample analyzed in dilution. Internal standard area recovered low (%D < -50%).
Benzoic acid	12	U	U	A J	2	1.7	mg/kg	2500000	SW846 8270C	Analyte not detected. LCS recovered low. Sample re-extracted and reanalyzed outside holding time criteria with acceptable recoveries. Original result reported.
bis(2-Ethylhexyl) phthalate	0.23	J	U	A	0.4	0.13	mg/kg	120	SW846 8270C	Result < adjusted RL. Sample analyzed in dilution.
Butyl benzyl phthalate	2.4	U	U	A	0.4	0.14	mg/kg	910	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Dibenz(a,h)anthracene	0.15	U	U	JA	0.02	0.0095	mg/kg	0.21	SW846 8270C	Analyte not detected. Sample analyzed in dilution. Internal standard area recovered low (%D < -50%).
Dibenzofuran	2.4	U	U	A	0.4	0.15	mg/kg	2000	SW846 8270C	Analyte not detected. Sample analyzed in dilution.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13

Event Date: November 2008 (Fourth Quarter 2008)

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-6										
Diethyl phthalate	6		6		0.4	0.14	mg/kg	490000	SW846 8270C	No action taken. Result < action limit (AL)
Dimethyl phthalate	2.4	U	U	A	0.4	0.15	mg/kg	10000000	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Di-n-butyl phthalate	7.6		7.6		0.4	0.14	mg/kg	62000	SW846 8270C	No action taken. Result < action limit (AL)
Di-n-octyl phthalate	2.4	U	U	JA	0.4	0.13	mg/kg	41000	SW846 8270C	Analyte not detected. Sample analyzed in dilution. Internal standard area recovered low (%D < -50%).
Fluoranthene	2.4	U	U	A	0.4	0.0087	mg/kg	22000	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Hexachloroethane	0.36	U	U	A	0.05	0.2	mg/kg	120	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Indeno(1,2,3-cd)pyrene	2.4	U	U	JA	0.4	0.011	mg/kg	2.1	SW846 8270C	Analyte not detected. Sample analyzed in dilution. Internal standard area recovered low (%D < -50%).
Naphthalene	2.4	U	U	A	0.4	0.012	mg/kg	20	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
N-Nitrosodiphenylamine	2	J	U	A	0.4	0.15	mg/kg	15000	SW846 8270C	Result < adjusted RL. Sample analyzed in dilution.
Phenol	2.4	U	U	A	0.4	0.18	mg/kg	180000	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
Pyrene	2.4	U	U	A	0.4	0.008	mg/kg	17000	SW846 8270C	Analyte not detected. Sample analyzed in dilution.
1,1-Dichloroethene	0.0047	U	U	J	0.005	0.00035	mg/kg	1100	SW846 8260B	Analyte not detected. Internal standard area limit % D <-50%.
1,2-Dichloroethane	0.0047	U	U	J	0.005	0.00027	mg/kg	2.2	SW846 8260B	Analyte not detected. Internal standard area limit % D <-50%.
Benzene	0.0022	J	U	J	0.005	0.00013	mg/kg	5.6	SW846 8260B	Result < RL. Internal standard area limit % D <-50%.
Benzyl Chloride	10	U	U	J	10		mg/kg	17	SW846 8260B	Analyte not detected. Reported by TIC.
Bromomethane	0.0047	U	U	J	0.005	0.0003	mg/kg	35	SW846 8260B	Analyte not detected. Internal standard area limit % D <-50%.
Carbon tetrachloride	0.0047	U	U	J	0.005	0.00029	mg/kg	1.3	SW846 8260B	Analyte not detected. Internal standard area limit % D <-50%.
Chlorobenzene	0.0047	U	U	J	0.005	0.00031	mg/kg	1500	SW846 8260B	Analyte not detected. Internal standard area limit % D <-50%.
Chloroform	0.0047	U	U	J	0.005	0.00027	mg/kg	1.5	SW846 8260B	Analyte not detected. Internal standard area limit % D <-50%.
Chloromethane	0.0047	U	U	J	0.005	0.00025	mg/kg	8.4	SW846 8260B	Analyte not detected. Internal standard area limit % D <-50%.
Methylene chloride	0.00099	J	U		0.005	0.00095	mg/kg	54	SW846 8260B	Result < RL. Blank contamination in the trip blank (0.77 ug/l) and method blank (0.0039 mg/kg). Internal standard area limit % D <-50%.
Tetrachloroethene	0.0047	U	U	J	0.005	0.00039	mg/kg	2.7	SW846 8260B	Analyte not detected. Internal standard area limit % D <-50%.
Toluene	0.0011	J	U	J	0.005	0.0003	mg/kg	46000	SW846 8260B	Result < RL. Internal standard area limit % D <-50%.
Trichloroethene	0.0047	U	U	J	0.005	0.00028	mg/kg	14	SW846 8260B	Analyte not detected. Internal standard area limit % D <-50%.
Vinyl chloride	0.0047	U	U	J	0.005	0.00026	mg/kg	1.7	SW846 8260B	Analyte not detected. Internal standard area limit % D <-50%.
Mercury	0.12		0.12	J	0.11	0.016	mg/kg	28	SW846 7471A	QL standard recovery was low (69%)
Antimony	6.6	U	U	J	6	0.43	mg/kg	410	SW846 6010B	Target analyte not detected above detection limit or QL/RL. MS/MSD recovered low. QL standard recovery was low (60.7%).
Arsenic	1.4		1.4		1	0.33	mg/kg	15.8	SW846 6010B	No action taken. Result < action limit (AL)
Barium	70.7		70.7		20	0.078	mg/kg	190000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.31	B	U		0.5	0.039	mg/kg	810	SW846 6010B	Result < RL.
Chromium	18.7		18.7		1	0.22	mg/kg	1400	SW846 6010B	No action taken. Result < action limit (AL)
Lead	792		792		0.3	0.21	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-6										
Nickel	9.4		U		330	0.29	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.55	U	U		0.6	0.49	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.1	U	U		1	0.11	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	185		U	J	2500	1.1	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg. MS and MSD recovered low.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13

Event Date: November 2008 (Fourth Quarter 2008)

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-7										
Nitroglycerin	2.4	J	2.6	J	2.5	0.26	mg/kg	62	SW846 8332	Laboratory result < RL. Dry weight result above the QL (2.6 mg/kg). RPD > 35% for sample/sample duplicate. Validated result presented on a dry weight.
1,3,5-Trinitrobenzene	0.25	U	U		0.25	0.024	mg/kg	27000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	62	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4,6-Trinitrotoluene	0.11	J	U		0.25	0.033	mg/kg	79	SW846 8330	Result < RL. Result presented on a wet weight.
2,4-Dinitrotoluene	0.054	J	U		0.25	0.029	mg/kg	1200	SW846 8330	Result < RL. Result presented on a wet weight.
2,6-Dinitrotoluene	0.25	U	U		0.25	0.028	mg/kg	620	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2-Amino-4,6-dinitrotoluene	0.17	J	U		0.25	0.031	mg/kg	2000	SW846 8330	Result < RL. Result presented on a wet weight.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	13	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	12000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
4-Amino-2,6-dinitrotoluene	0.16	J	U		0.25	0.03	mg/kg	1900	SW846 8330	Result < RL. Result presented on a wet weight.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	110	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
HMX	0.5	U	U		0.5	0.048	mg/kg	49000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
Nitrobenzene	0.25	U	U		0.25	0.028	mg/kg	280	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
RDX	0.5	U	U		0.5	0.031	mg/kg	24	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	2500	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4-Dichlorophenol	0.36	U	U		0.4	0.022	mg/kg	1800	SW846 8270C	Analyte not detected at or above the detection limit.
2-Chlorophenol	0.36	U	U		0.4	0.028	mg/kg	5100	SW846 8270C	Analyte not detected at or above the detection limit.
3,3'-Dimethylbenzidine	1.8	U	U		2	0.069	mg/kg	0.16	SW846 8270C	Analyte not detected at or above the detection limit.
3-Methylphenol	0.36	U	U		0.4	0.0047	mg/kg	31000	SW846 8270C	Analyte not detected at or above the detection limit.
4-Methylphenol	0.36	U	U		0.4	0.024	mg/kg	3100	SW846 8270C	Analyte not detected at or above the detection limit.
4-Nitrophenol	1.8	U	U		2	0.12	mg/kg	7	SW846 8270C	Analyte not detected at or above the detection limit.
Acetophenone	0.36	U	U		0.4	0.0099	mg/kg	100000	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(a)anthracene	0.36	U	U		0.4	0.001	mg/kg	2.1	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(a)pyrene	0.022	U	U		0.02	0.0014	mg/kg	0.21	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(b)fluoranthene	0.081	J	U		0.4	0.0013	mg/kg	2.1	SW846 8270C	Result < RL.
Benzo(k)fluoranthene	0.034	J	U		0.4	0.0019	mg/kg	21	SW846 8270C	Result < RL.
Benzoic acid	1.8	U	U	J	2	0.26	mg/kg	2500000	SW846 8270C	Analyte not detected. LCS recovered low. Sample re-extracted and reanalyzed outside holding time criteria with acceptable recoveries. Original result reported.
bis(2-Ethylhexyl) phthalate	0.21	J	U		0.4	0.02	mg/kg	120	SW846 8270C	Result < RL.
Butyl benzyl phthalate	0.36	U	U		0.4	0.021	mg/kg	910	SW846 8270C	Analyte not detected at or above the detection limit.
Dibenz(a,h)anthracene	0.022	U	U		0.02	0.0014	mg/kg	0.21	SW846 8270C	Analyte not detected at or above the detection limit.
Dibenzofuran	0.36	U	U		0.4	0.022	mg/kg	2000	SW846 8270C	Analyte not detected at or above the detection limit.
Diethyl phthalate	0.23	J	U		0.4	0.021	mg/kg	490000	SW846 8270C	Result < RL.
Dimethyl phthalate	0.36	U	U		0.4	0.023	mg/kg	10000000	SW846 8270C	Analyte not detected at or above the detection limit.
Di-n-butyl phthalate	0.25	J	U		0.4	0.021	mg/kg	62000	SW846 8270C	Result < RL.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-7										
Di-n-octyl phthalate	0.36	U	U		0.4	0.02	mg/kg	41000	SW846 8270C	Analyte not detected at or above the detection limit.
Fluoranthene	0.36	U	U		0.4	0.0013	mg/kg	22000	SW846 8270C	Analyte not detected at or above the detection limit.
Hexachloroethane	0.055	U	U		0.05	0.031	mg/kg	120	SW846 8270C	Analyte not detected at or above the detection limit.
Indeno(1,2,3-cd)pyrene	0.36	U	U		0.4	0.0016	mg/kg	2.1	SW846 8270C	Analyte not detected at or above the detection limit.
Naphthalene	0.36	U	U		0.4	0.0018	mg/kg	20	SW846 8270C	Analyte not detected at or above the detection limit.
N-Nitrosodiphenylamine	0.15	J	U		0.4	0.023	mg/kg	15000	SW846 8270C	Result < RL.
Phenol	0.36	U	U		0.4	0.027	mg/kg	180000	SW846 8270C	Analyte not detected at or above the detection limit.
Pyrene	0.0082	J	U		0.4	0.0012	mg/kg	17000	SW846 8270C	Result < RL.
1,1-Dichloroethene	0.0053	U	U		0.005	0.00039	mg/kg	1100	SW846 8260B	Analyte not detected at or above the detection limit.
1,2-Dichloroethane	0.0053	U	U		0.005	0.00029	mg/kg	2.2	SW846 8260B	Analyte not detected at or above the detection limit.
Benzene	0.00085	J	U		0.005	0.00015	mg/kg	5.6	SW846 8260B	Result < RL.
Benzyl Chloride	10	U	U	J	10		mg/kg	17	SW846 8260B	Analyte not detected. Reported by TIC.
Bromomethane	0.0053	U	U		0.005	0.00034	mg/kg	35	SW846 8260B	Analyte not detected at or above the detection limit.
Carbon tetrachloride	0.0053	U	U		0.005	0.00033	mg/kg	1.3	SW846 8260B	Analyte not detected at or above the detection limit.
Chlorobenzene	0.0053	U	U		0.005	0.00035	mg/kg	1500	SW846 8260B	Analyte not detected at or above the detection limit.
Chloroform	0.00031	J	U		0.005	0.00029	mg/kg	1.5	SW846 8260B	Result < RL.
Chloromethane	0.0053	U	U		0.005	0.00027	mg/kg	8.4	SW846 8260B	Analyte not detected at or above the detection limit.
Methylene chloride	0.0053	U	U		0.005	0.0011	mg/kg	54	SW846 8260B	Analyte not detected at or above the detection limit.
Tetrachloroethene	0.0053	U	U		0.005	0.00043	mg/kg	2.7	SW846 8260B	Analyte not detected at or above the detection limit.
Toluene	0.00038	J	U		0.005	0.00034	mg/kg	46000	SW846 8260B	Result < RL.
Trichloroethene	0.0053	U	U		0.005	0.0003	mg/kg	14	SW846 8260B	Analyte not detected at or above the detection limit.
Vinyl chloride	0.0053	U	U		0.005	0.00028	mg/kg	1.7	SW846 8260B	Analyte not detected at or above the detection limit.
TPH (as Diesel)	28		28		11	3.1	mg/kg	11000	SW846 8015B	Result < action limit (AL).
Mercury	0.1	B	U	J	0.11	0.016	mg/kg	28	SW846 7471A	Result < QL. QL standard recovery was low (69%). Blind field duplicate for PAD-7 - 0.2 mg/kg).
Antimony	0.67	B	U	J	6	0.43	mg/kg	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank and calibration blank. MS/MSD recovered low. QL standard recovery was low (60.7%).
Arsenic	1.1		1.1		1	0.33	mg/kg	15.8	SW846 6010B	No action taken. Result < action limit (AL)
Barium	74.6		74.6		20	0.078	mg/kg	190000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.15	B	U		0.5	0.039	mg/kg	810	SW846 6010B	Result < RL.
Chromium	11.1		11.1		1	0.22	mg/kg	1400	SW846 6010B	No action taken. Result < action limit (AL)
Lead	221		221		0.3	0.21	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	6		U		330	0.3	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.55	U	U		0.6	0.49	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.1	U	U		1	0.11	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-7										
Zinc	92.8		U	J	2500	1.1	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg. MS and MSD recovered low.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-8										
Nitroglycerin	2.5	U	U		2.5	0.26	mg/kg	62	SW846 8332	Analyte not detected at or above the detection limit. Result presented on a wet weight.
1,3,5-Trinitrobenzene	0.25	U	U		0.25	0.024	mg/kg	27000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	62	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4,6-Trinitrotoluene	0.42		0.42		0.25	0.033	mg/kg	79	SW846 8330	No action taken. Result presented on a wet weight.
2,4-Dinitrotoluene	0.055	J	U		0.25	0.029	mg/kg	1200	SW846 8330	Result < RL. Result presented on a wet weight.
2,6-Dinitrotoluene	0.25	U	U		0.25	0.028	mg/kg	620	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2-Amino-4,6-dinitrotoluene	0.035	J	U		0.25	0.031	mg/kg	2000	SW846 8330	Result < RL. Result presented on a wet weight.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	13	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	12000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
4-Amino-2,6-dinitrotoluene	0.054	J	U		0.25	0.03	mg/kg	1900	SW846 8330	Result < RL. Result presented on a wet weight.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	110	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
HMX	0.5	U	U		0.5	0.048	mg/kg	49000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
Nitrobenzene	0.25	U	U		0.25	0.028	mg/kg	280	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
RDX	0.5	U	U		0.5	0.031	mg/kg	24	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	2500	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4-Dichlorophenol	0.38	U	U		0.4	0.023	mg/kg	1800	SW846 8270C	Analyte not detected at or above the detection limit.
2-Chlorophenol	0.38	U	U		0.4	0.03	mg/kg	5100	SW846 8270C	Analyte not detected at or above the detection limit.
3,3'-Dimethylbenzidine	1.8	U	U		2	0.072	mg/kg	0.16	SW846 8270C	Analyte not detected at or above the detection limit.
3-Methylphenol	0.38	U	U		0.4	0.0049	mg/kg	31000	SW846 8270C	Analyte not detected at or above the detection limit.
4-Methylphenol	0.38	U	U		0.4	0.025	mg/kg	3100	SW846 8270C	Analyte not detected at or above the detection limit.
4-Nitrophenol	1.8	U	U		2	0.13	mg/kg	7	SW846 8270C	Analyte not detected at or above the detection limit.
Acetophenone	0.38	U	U		0.4	0.01	mg/kg	100000	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(a)anthracene	0.38	U	U		0.4	0.0011	mg/kg	2.1	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(a)pyrene	0.023	U	U		0.02	0.0015	mg/kg	0.21	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(b)fluoranthene	0.38	U	U		0.4	0.0014	mg/kg	2.1	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(k)fluoranthene	0.38	U	U		0.4	0.0019	mg/kg	21	SW846 8270C	Analyte not detected at or above the detection limit.
Benzoic acid	1.8	U	U	J	2	0.27	mg/kg	2500000	SW846 8270C	Analyte not detected. LCS recovered low. Sample re-extracted and reanalyzed outside holding time criteria with acceptable recoveries. Original result reported.
bis(2-Ethylhexyl) phthalate	0.069	J	U		0.4	0.021	mg/kg	120	SW846 8270C	Result < RL.
Butyl benzyl phthalate	0.38	U	U		0.4	0.022	mg/kg	910	SW846 8270C	Analyte not detected at or above the detection limit.
Dibenz(a,h)anthracene	0.023	U	U		0.02	0.0015	mg/kg	0.21	SW846 8270C	Analyte not detected at or above the detection limit.
Dibenzofuran	0.38	U	U		0.4	0.023	mg/kg	2000	SW846 8270C	Analyte not detected at or above the detection limit.
Diethyl phthalate	0.15	J	U		0.4	0.022	mg/kg	490000	SW846 8270C	Result < RL.
Dimethyl phthalate	0.38	U	U		0.4	0.024	mg/kg	10000000	SW846 8270C	Analyte not detected at or above the detection limit.
Di-n-butyl phthalate	0.28	J	U		0.4	0.022	mg/kg	62000	SW846 8270C	Result < RL.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-8										
Di-n-octyl phthalate	0.38	U	U		0.4	0.021	mg/kg	41000	SW846 8270C	Analyte not detected at or above the detection limit.
Fluoranthene	0.38	U	U		0.4	0.0014	mg/kg	22000	SW846 8270C	Analyte not detected at or above the detection limit.
Hexachloroethane	0.057	U	U		0.05	0.032	mg/kg	120	SW846 8270C	Analyte not detected at or above the detection limit.
Indeno(1,2,3-cd)pyrene	0.38	U	U		0.4	0.0017	mg/kg	2.1	SW846 8270C	Analyte not detected at or above the detection limit.
Naphthalene	0.38	U	U		0.4	0.0018	mg/kg	20	SW846 8270C	Analyte not detected at or above the detection limit.
N-Nitrosodiphenylamine	0.048	J	U		0.4	0.024	mg/kg	15000	SW846 8270C	Result < RL.
Phenol	0.38	U	U		0.4	0.029	mg/kg	180000	SW846 8270C	Analyte not detected at or above the detection limit.
Pyrene	0.38	U	U		0.4	0.0013	mg/kg	17000	SW846 8270C	Analyte not detected at or above the detection limit.
1,1-Dichloroethene	0.005	U	U		0.005	0.00037	mg/kg	1100	SW846 8260B	Analyte not detected at or above the detection limit.
1,2-Dichloroethane	0.005	U	U		0.005	0.00028	mg/kg	2.2	SW846 8260B	Analyte not detected at or above the detection limit.
Benzene	0.00054	J	U		0.005	0.00014	mg/kg	5.6	SW846 8260B	Result < RL.
Benzyl Chloride	10	U	U	J	10		mg/kg	17	SW846 8260B	Analyte not detected. Reported by TIC.
Bromomethane	0.005	U	U		0.005	0.00032	mg/kg	35	SW846 8260B	Analyte not detected at or above the detection limit.
Carbon tetrachloride	0.005	U	U		0.005	0.00031	mg/kg	1.3	SW846 8260B	Analyte not detected at or above the detection limit.
Chlorobenzene	0.005	U	U		0.005	0.00033	mg/kg	1500	SW846 8260B	Analyte not detected at or above the detection limit.
Chloroform	0.00051	J	U		0.005	0.00028	mg/kg	1.5	SW846 8260B	Result < RL.
Chloromethane	0.005	U	U		0.005	0.00026	mg/kg	8.4	SW846 8260B	Analyte not detected at or above the detection limit.
Methylene chloride	0.005	U	U		0.005	0.001	mg/kg	54	SW846 8260B	Analyte not detected at or above the detection limit.
Tetrachloroethene	0.005	U	U		0.005	0.00041	mg/kg	2.7	SW846 8260B	Analyte not detected at or above the detection limit.
Toluene	0.0005	J	U		0.005	0.00032	mg/kg	46000	SW846 8260B	Result < RL.
Trichloroethene	0.005	U	U		0.005	0.00029	mg/kg	14	SW846 8260B	Analyte not detected at or above the detection limit.
Vinyl chloride	0.005	U	U		0.005	0.00027	mg/kg	1.7	SW846 8260B	Analyte not detected at or above the detection limit.
Mercury	0.088	B	U	J	0.11	0.017	mg/kg	28	SW846 7471A	Result < QL. QL standard recovery was low (69%)
Antimony	2	B	U	J	6	0.45	mg/kg	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank and calibration blank. MS/MSD recovered low. QL standard recovery was low (60.7%).
Arsenic	2.2		2.2		1	0.34	mg/kg	15.8	SW846 6010B	No action taken. Result < action limit (AL)
Barium	125		125		20	0.081	mg/kg	190000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.056	B	U		0.5	0.041	mg/kg	810	SW846 6010B	Result < RL.
Chromium	11.8		11.8		1	0.23	mg/kg	1400	SW846 6010B	No action taken. Result < action limit (AL)
Lead	239		239		0.3	0.22	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	4.7		U		330	0.31	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.57	U	U		0.6	0.51	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	0.17	B	U		1	0.11	mg/kg	5100	SW846 6010B	Result < RL.
Zinc	81.4		U	J	2500	1.1	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg. MS and MSD recovered low.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13

Event Date: November 2008 (Fourth Quarter 2008)

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-X										
Nitroglycerin	59		64	J	2.5	0.26	mg/kg	62	SW846 8332	Result estimated due to disparity of sample/blind field duplicate result. Dry weight result above the AL (64 mg/kg). Duplicate for PAD-7. PAD-7 results used for reporting. Validated result presented on a dry weight.
1,3,5-Trinitrobenzene	0.031	J	U		0.25	0.024	mg/kg	27000	SW846 8330	Result < RL. Result presented on a wet weight.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	62	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4,6-Trinitrotoluene	0.17	J	U		0.25	0.033	mg/kg	79	SW846 8330	Result < RL. Result presented on a wet weight.
2,4-Dinitrotoluene	0.06	J	U		0.25	0.029	mg/kg	1200	SW846 8330	Result < RL. Result presented on a wet weight.
2,6-Dinitrotoluene	0.25	U	U		0.25	0.028	mg/kg	620	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2-Amino-4,6-dinitrotoluene	0.13	J	U		0.25	0.031	mg/kg	2000	SW846 8330	Result < RL. Result presented on a wet weight.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	13	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	12000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
4-Amino-2,6-dinitrotoluene	0.18	J	U		0.25	0.03	mg/kg	1900	SW846 8330	Result < RL. Result presented on a wet weight.
4-Nitrotoluene	0.05	J	U		0.25	0.045	mg/kg	110	SW846 8330	Result < RL. Result presented on a wet weight.
HMX	0.5	U	U		0.5	0.048	mg/kg	49000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
Nitrobenzene	0.25	U	U		0.25	0.028	mg/kg	280	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
RDX	0.5	U	U		0.5	0.031	mg/kg	24	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	2500	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4-Dichlorophenol	0.37	U	U		0.4	0.022	mg/kg	1800	SW846 8270C	Analyte not detected at or above the detection limit.
2-Chlorophenol	0.37	U	U		0.4	0.029	mg/kg	5100	SW846 8270C	Analyte not detected at or above the detection limit.
3,3'-Dimethylbenzidine	1.8	U	U		2	0.07	mg/kg	0.16	SW846 8270C	Analyte not detected at or above the detection limit.
3-Methylphenol	0.37	U	U		0.4	0.0048	mg/kg	31000	SW846 8270C	Analyte not detected at or above the detection limit.
4-Methylphenol	0.37	U	U		0.4	0.024	mg/kg	3100	SW846 8270C	Analyte not detected at or above the detection limit.
4-Nitrophenol	1.8	U	U		2	0.12	mg/kg	7	SW846 8270C	Analyte not detected at or above the detection limit.
Acetophenone	0.37	U	U		0.4	0.01	mg/kg	100000	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(a)anthracene	0.012	J	U		0.4	0.0011	mg/kg	2.1	SW846 8270C	Result < RL.
Benzo(a)pyrene	0.022	U	U		0.02	0.0014	mg/kg	0.21	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(b)fluoranthene	0.062	J	U		0.4	0.0013	mg/kg	2.1	SW846 8270C	Result < RL.
Benzo(k)fluoranthene	0.022	J	U		0.4	0.0019	mg/kg	21	SW846 8270C	Result < RL.
Benzoic acid	1.8	U	U	J	2	0.27	mg/kg	2500000	SW846 8270C	Analyte not detected. LCS recovered low. Sample re-extracted and reanalyzed outside holding time criteria with acceptable recoveries. Original result reported.
bis(2-Ethylhexyl) phthalate	0.15	J	U		0.4	0.02	mg/kg	120	SW846 8270C	Result < RL.
Butyl benzyl phthalate	0.37	U	U		0.4	0.021	mg/kg	910	SW846 8270C	Analyte not detected at or above the detection limit.
Dibenz(a,h)anthracene	0.022	U	U		0.02	0.0014	mg/kg	0.21	SW846 8270C	Analyte not detected at or above the detection limit.
Dibenzofuran	0.37	U	U		0.4	0.022	mg/kg	2000	SW846 8270C	Analyte not detected at or above the detection limit.
Diethyl phthalate	0.47		0.47		0.4	0.021	mg/kg	490000	SW846 8270C	No action taken. Result < action limit (AL)
Dimethyl phthalate	0.37	U	U		0.4	0.023	mg/kg	10000000	SW846 8270C	Analyte not detected at or above the detection limit.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-X										
Di-n-butyl phthalate	0.18	J	U		0.4	0.021	mg/kg	62000	SW846 8270C	Result < RL.
Di-n-octyl phthalate	0.37	U	U		0.4	0.02	mg/kg	41000	SW846 8270C	Analyte not detected at or above the detection limit.
Fluoranthene	0.027	J	U		0.4	0.0013	mg/kg	22000	SW846 8270C	Result < RL.
Hexachloroethane	0.055	U	U		0.05	0.031	mg/kg	120	SW846 8270C	Analyte not detected at or above the detection limit.
Indeno(1,2,3-cd)pyrene	0.37	U	U		0.4	0.0017	mg/kg	2.1	SW846 8270C	Analyte not detected at or above the detection limit.
Naphthalene	0.37	U	U		0.4	0.0018	mg/kg	20	SW846 8270C	Analyte not detected at or above the detection limit.
N-Nitrosodiphenylamine	0.13	J	U		0.4	0.023	mg/kg	15000	SW846 8270C	Result < RL.
Phenol	0.37	U	U		0.4	0.028	mg/kg	180000	SW846 8270C	Analyte not detected at or above the detection limit.
Pyrene	0.025	J	U		0.4	0.0012	mg/kg	17000	SW846 8270C	Result < RL.
1,1-Dichloroethene	0.0058	U	U		0.005	0.00043	mg/kg	1100	SW846 8260B	Analyte not detected at or above the detection limit.
1,2-Dichloroethane	0.0058	U	U		0.005	0.00033	mg/kg	2.2	SW846 8260B	Analyte not detected at or above the detection limit.
Benzene	0.00088	J	U		0.005	0.00016	mg/kg	5.6	SW846 8260B	Result < RL.
Benzyl Chloride	10	U	U	J	10		mg/kg	17	SW846 8260B	Analyte not detected. Reported by TIC.
Bromomethane	0.00052	J	U		0.005	0.00037	mg/kg	35	SW846 8260B	Result < RL.
Carbon tetrachloride	0.0058	U	U		0.005	0.00036	mg/kg	1.3	SW846 8260B	Analyte not detected at or above the detection limit.
Chlorobenzene	0.0058	U	U		0.005	0.00038	mg/kg	1500	SW846 8260B	Analyte not detected at or above the detection limit.
Chloroform	0.0058	U	U		0.005	0.00033	mg/kg	1.5	SW846 8260B	Analyte not detected at or above the detection limit.
Chloromethane	0.0058	U	U		0.005	0.0003	mg/kg	8.4	SW846 8260B	Analyte not detected at or above the detection limit.
Methylene chloride	0.0058	U	U		0.005	0.0012	mg/kg	54	SW846 8260B	Analyte not detected at or above the detection limit.
Tetrachloroethene	0.0058	U	U		0.005	0.00048	mg/kg	2.7	SW846 8260B	Analyte not detected at or above the detection limit.
Toluene	0.0058	U	U		0.005	0.00037	mg/kg	46000	SW846 8260B	Analyte not detected at or above the detection limit.
Trichloroethene	0.0058	U	U		0.005	0.00034	mg/kg	14	SW846 8260B	Analyte not detected at or above the detection limit.
Vinyl chloride	0.0058	U	U		0.005	0.00031	mg/kg	1.7	SW846 8260B	Analyte not detected at or above the detection limit.
TPH (as Diesel)	32		32		11	3.1	mg/kg	11000	SW846 8015B	Result < action limit (AL).
Mercury	0.22		0.22	J	0.11	0.017	mg/kg	28	SW846 7471A	QL standard recovery was low (69%). Blind field duplicate for PAD-X.
Antimony	6.6	U	U	J	6	0.43	mg/kg	410	SW846 6010B	Target analyte not detected above detection limit or QL/RL. MS/MSD recovered low. QL standard recovery was low (60.7%). Field duplicate (blind) for PAD-7.
Arsenic	1.1		1.1		1	0.33	mg/kg	15.8	SW846 6010B	No action taken. Result < action limit (AL) Field duplicate (blind) for PAD-7.
Barium	80.9		80.9		20	0.079	mg/kg	190000	SW846 6010B	No action taken. Result < action limit (AL) Field duplicate (blind) for PAD-7.
Cadmium	0.14	B	U		0.5	0.04	mg/kg	810	SW846 6010B	Result < QL. Field duplicate (blind) for PAD-7.
Chromium	12.1		12.1		1	0.22	mg/kg	1400	SW846 6010B	No action taken. Result < action limit (AL) Field duplicate (blind) for PAD-7.
Lead	226		226		0.3	0.21	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL) Field duplicate (blind) for PAD-7.
Nickel	7.2		U		330	0.3	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg. Field duplicate (blind) for PAD-7.
Selenium	0.55	U	U		0.6	0.5	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL. Field duplicate (blind) for PAD-7.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
PAD-X										
Silver	1.1	U	U		1	0.11	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL. Field duplicate (blind) for PAD-7.
Zinc	89		U	J	2500	1.1	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg. MS and MSD recovered low. Field duplicate (blind) for PAD-7.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13

Event Date: November 2008 (Fourth Quarter 2008)

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
POND-1										
Nitroglycerin	3.9		3.9		2.5	0.26	mg/kg	62	SW846 8332	No action taken. Result presented on a wet weight.
1,3,5-Trinitrobenzene	0.069	J	U		0.25	0.024	mg/kg	27000	SW846 8330	Result < RL. Result presented on a wet weight.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	62	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4,6-Trinitrotoluene	2		2		0.25	0.033	mg/kg	79	SW846 8330	No action taken. Result presented on a wet weight.
2,4-Dinitrotoluene	0.42		0.42		0.25	0.029	mg/kg	1200	SW846 8330	No action taken. Result presented on a wet weight.
2,6-Dinitrotoluene	0.13	J	U		0.25	0.028	mg/kg	620	SW846 8330	Result < RL. Result presented on a wet weight.
2-Amino-4,6-dinitrotoluene	0.17	J	U		0.25	0.031	mg/kg	2000	SW846 8330	Result < RL. Result presented on a wet weight.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	13	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	12000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
4-Amino-2,6-dinitrotoluene	0.28		0.28		0.25	0.03	mg/kg	1900	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	110	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
HMX	0.14	J	U		0.5	0.048	mg/kg	49000	SW846 8330	Result < RL. Result presented on a wet weight.
Nitrobenzene	0.25	U	U		0.25	0.028	mg/kg	280	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
RDX	0.044	J	U		0.5	0.031	mg/kg	24	SW846 8330	Result < RL. Result presented on a wet weight.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	2500	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4-Dichlorophenol	0.4	U	U		0.4	0.024	mg/kg	1800	SW846 8270C	Analyte not detected at or above the detection limit.
2-Chlorophenol	0.4	U	U		0.4	0.032	mg/kg	5100	SW846 8270C	Analyte not detected at or above the detection limit.
3,3'-Dimethylbenzidine	2	U	U		2	0.077	mg/kg	0.16	SW846 8270C	Analyte not detected at or above the detection limit.
3-Methylphenol	0.4	U	U		0.4	0.0052	mg/kg	31000	SW846 8270C	Analyte not detected at or above the detection limit.
4-Methylphenol	0.4	U	U		0.4	0.027	mg/kg	3100	SW846 8270C	Analyte not detected at or above the detection limit.
4-Nitrophenol	2	U	U		2	0.13	mg/kg	7	SW846 8270C	Analyte not detected at or above the detection limit.
Acetophenone	0.4	U	U		0.4	0.011	mg/kg	100000	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(a)anthracene	0.4	U	U		0.4	0.0012	mg/kg	2.1	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(a)pyrene	0.011	J	U		0.02	0.0016	mg/kg	0.21	SW846 8270C	Result < RL.
Benzo(b)fluoranthene	0.018	J	U		0.4	0.0015	mg/kg	2.1	SW846 8270C	Result < RL.
Benzo(k)fluoranthene	0.4	U	U		0.4	0.0021	mg/kg	21	SW846 8270C	Analyte not detected at or above the detection limit.
Benzoic acid	2	U	U		2	0.29	mg/kg	2500000	SW846 8270C	Analyte not detected at or above the detection limit.
bis(2-Ethylhexyl) phthalate	0.2	J	U		0.4	0.022	mg/kg	120	SW846 8270C	Result < RL.
Butyl benzyl phthalate	0.4	U	U		0.4	0.023	mg/kg	910	SW846 8270C	Analyte not detected at or above the detection limit.
Dibenz(a,h)anthracene	0.024	U	U		0.02	0.0016	mg/kg	0.21	SW846 8270C	Analyte not detected at or above the detection limit.
Dibenzofuran	0.4	U	U		0.4	0.024	mg/kg	2000	SW846 8270C	Analyte not detected at or above the detection limit.
Diethyl phthalate	0.38	J	U		0.4	0.023	mg/kg	490000	SW846 8270C	Result < RL.
Dimethyl phthalate	0.4	U	U		0.4	0.026	mg/kg	10000000	SW846 8270C	Analyte not detected at or above the detection limit.
Di-n-butyl phthalate	0.82		0.82		0.4	0.023	mg/kg	62000	SW846 8270C	No action taken. Result < action limit (AL)
Di-n-octyl phthalate	0.4	U	U		0.4	0.022	mg/kg	41000	SW846 8270C	Analyte not detected at or above the detection limit.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
POND-1										
Fluoranthene	0.014	J	U		0.4	0.0015	mg/kg	22000	SW846 8270C	Result < RL.
Hexachloroethane	0.061	U	U		0.05	0.034	mg/kg	120	SW846 8270C	Analyte not detected at or above the detection limit.
Indeno(1,2,3-cd)pyrene	0.025	J	U		0.4	0.0018	mg/kg	2.1	SW846 8270C	Result < RL.
Naphthalene	0.4	U	U		0.4	0.002	mg/kg	20	SW846 8270C	Analyte not detected at or above the detection limit.
N-Nitrosodiphenylamine	0.28	J	U		0.4	0.026	mg/kg	15000	SW846 8270C	Result < RL.
Phenol	0.4	U	U		0.4	0.03	mg/kg	180000	SW846 8270C	Analyte not detected at or above the detection limit.
Pyrene	0.011	J	U		0.4	0.0013	mg/kg	17000	SW846 8270C	Result < RL.
1,1-Dichloroethene	0.0072	U	U		0.005	0.00053	mg/kg	1100	SW846 8260B	Analyte not detected at or above the detection limit.
1,2-Dichloroethane	0.0072	U	U		0.005	0.0004	mg/kg	2.2	SW846 8260B	Analyte not detected at or above the detection limit.
Benzene	0.00087	J	U		0.005	0.0002	mg/kg	5.6	SW846 8260B	Result < RL.
Benzyl Chloride	10	U	U	J	10		mg/kg	17	SW846 8260B	Analyte not detected. Reported by TIC.
Bromomethane	0.0072	U	U		0.005	0.00046	mg/kg	35	SW846 8260B	Analyte not detected at or above the detection limit.
Carbon tetrachloride	0.0072	U	U		0.005	0.00045	mg/kg	1.3	SW846 8260B	Analyte not detected at or above the detection limit.
Chlorobenzene	0.0072	U	U		0.005	0.00047	mg/kg	1500	SW846 8260B	Analyte not detected at or above the detection limit.
Chloroform	0.0072	U	U		0.005	0.0004	mg/kg	1.5	SW846 8260B	Analyte not detected at or above the detection limit.
Chloromethane	0.0072	U	U		0.005	0.00037	mg/kg	8.4	SW846 8260B	Analyte not detected at or above the detection limit.
Methylene chloride	0.0072	U	U		0.005	0.0014	mg/kg	54	SW846 8260B	Analyte not detected at or above the detection limit.
Tetrachloroethene	0.0072	U	U		0.005	0.00059	mg/kg	2.7	SW846 8260B	Analyte not detected at or above the detection limit.
Toluene	0.0072	U	U		0.005	0.00046	mg/kg	46000	SW846 8260B	Analyte not detected at or above the detection limit.
Trichloroethene	0.0072	U	U		0.005	0.00042	mg/kg	14	SW846 8260B	Analyte not detected at or above the detection limit.
Vinyl chloride	0.0072	U	U		0.005	0.00039	mg/kg	1.7	SW846 8260B	Analyte not detected at or above the detection limit.
Mercury	0.067	B	U		0.11	0.018	mg/kg	28	SW846 7471A	Result < RL.
Antimony	1.1	B	U	J	6	0.48	mg/kg	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank and calibration blank. MS/MSD recovered low.
Arsenic	2.6		2.6		1	0.37	mg/kg	15.8	SW846 6010B	No action taken. Result < action limit (AL)
Barium	120		120		20	0.087	mg/kg	190000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.48	B	U		0.5	0.044	mg/kg	810	SW846 6010B	Result < RL.
Chromium	18.6		18.6		1	0.24	mg/kg	1400	SW846 6010B	No action taken. Result < action limit (AL)
Lead	256		256		0.3	0.23	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	11.6		U		330	0.33	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.61	U	U		0.6	0.55	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.2	U	U		1	0.12	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	243		U		2500	1.2	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
SB-1										
Nitroglycerin	2.5	U	U		2.5	0.26	mg/kg	62	SW846 8332	Analyte not detected at or above the detection limit. Result presented on a wet weight.
1,3,5-Trinitrobenzene	0.25	U	U		0.25	0.024	mg/kg	27000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	62	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4,6-Trinitrotoluene	0.25	U	U		0.25	0.033	mg/kg	79	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4-Dinitrotoluene	0.25	U	U		0.25	0.029	mg/kg	1200	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,6-Dinitrotoluene	0.25	U	U		0.25	0.028	mg/kg	620	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2-Amino-4,6-dinitrotoluene	0.25	U	U		0.25	0.031	mg/kg	2000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	13	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	12000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
4-Amino-2,6-dinitrotoluene	0.25	U	U		0.25	0.03	mg/kg	1900	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	110	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
HMX	0.5	U	U		0.5	0.048	mg/kg	49000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
Nitrobenzene	0.25	U	U		0.25	0.028	mg/kg	280	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
RDX	0.5	U	U		0.5	0.031	mg/kg	24	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	2500	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4-Dichlorophenol	0.48	U	U		0.4	0.029	mg/kg	1800	SW846 8270C	Analyte not detected at or above the detection limit.
2-Chlorophenol	0.48	U	U		0.4	0.038	mg/kg	5100	SW846 8270C	Analyte not detected at or above the detection limit.
3,3'-Dimethylbenzidine	2.4	U	U		2	0.093	mg/kg	0.16	SW846 8270C	Analyte not detected at or above the detection limit.
3-Methylphenol	0.48	U	U		0.4	0.0063	mg/kg	31000	SW846 8270C	Analyte not detected at or above the detection limit.
4-Methylphenol	0.48	U	U		0.4	0.032	mg/kg	3100	SW846 8270C	Analyte not detected at or above the detection limit.
4-Nitrophenol	2.4	U	U		2	0.16	mg/kg	7	SW846 8270C	Analyte not detected at or above the detection limit.
Acetophenone	0.48	U	U		0.4	0.013	mg/kg	100000	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(a)anthracene	0.062	J	U		0.4	0.0014	mg/kg	2.1	SW846 8270C	Result < RL.
Benzo(a)pyrene	0.071		U		0.02	0.0019	mg/kg	0.21	SW846 8270C	No action taken. Result < action limit (AL) and RL.
Benzo(b)fluoranthene	0.11	J	U		0.4	0.0018	mg/kg	2.1	SW846 8270C	Result < RL.
Benzo(k)fluoranthene	0.051	J	U		0.4	0.0025	mg/kg	21	SW846 8270C	Result < RL.
Benzoic acid	2.4	U	U		2	0.35	mg/kg	2500000	SW846 8270C	Analyte not detected at or above the detection limit.
bis(2-Ethylhexyl) phthalate	0.026	J	U		0.4	0.026	mg/kg	120	SW846 8270C	Result < RL.
Butyl benzyl phthalate	0.48	U	U		0.4	0.028	mg/kg	910	SW846 8270C	Analyte not detected at or above the detection limit.
Dibenz(a,h)anthracene	0.04		U		0.02	0.0019	mg/kg	0.21	SW846 8270C	No action taken. Result < action limit (AL) and RL.
Dibenzofuran	0.48	U	U		0.4	0.029	mg/kg	2000	SW846 8270C	Analyte not detected at or above the detection limit.
Diethyl phthalate	0.48	U	U		0.4	0.028	mg/kg	490000	SW846 8270C	Analyte not detected at or above the detection limit.
Dimethyl phthalate	0.48	U	U		0.4	0.031	mg/kg	10000000	SW846 8270C	Analyte not detected at or above the detection limit.
Di-n-butyl phthalate	0.48	U	U		0.4	0.028	mg/kg	62000	SW846 8270C	Analyte not detected at or above the detection limit.
Di-n-octyl phthalate	0.48	U	U		0.4	0.026	mg/kg	41000	SW846 8270C	Analyte not detected at or above the detection limit.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
SB-1										
Fluoranthene	0.1	J	U		0.4	0.0018	mg/kg	22000	SW846 8270C	Result < RL.
Hexachloroethane	0.073	U	U		0.05	0.041	mg/kg	120	SW846 8270C	Analyte not detected at or above the detection limit.
Indeno(1,2,3-cd)pyrene	0.067	J	U		0.4	0.0022	mg/kg	2.1	SW846 8270C	Result < RL.
Naphthalene	0.48	U	U		0.4	0.0024	mg/kg	20	SW846 8270C	Analyte not detected at or above the detection limit.
N-Nitrosodiphenylamine	0.48	U	U		0.4	0.031	mg/kg	15000	SW846 8270C	Analyte not detected at or above the detection limit.
Phenol	0.48	U	U		0.4	0.037	mg/kg	180000	SW846 8270C	Analyte not detected at or above the detection limit.
Pyrene	0.078	J	U		0.4	0.0016	mg/kg	17000	SW846 8270C	Result < RL.
1,1-Dichloroethene	0.012	U	U		0.005	0.00086	mg/kg	1100	SW846 8260B	Analyte not detected at or above the detection limit.
1,2-Dichloroethane	0.012	U	U		0.005	0.00065	mg/kg	2.2	SW846 8260B	Analyte not detected at or above the detection limit.
Benzene	0.00072	J	U		0.005	0.00033	mg/kg	5.6	SW846 8260B	Result < RL.
Benzyl Chloride	10	U	U	J	10		mg/kg	17	SW846 8260B	Analyte not detected. Reported by TIC.
Bromomethane	0.012	U	U		0.005	0.00074	mg/kg	35	SW846 8260B	Analyte not detected at or above the detection limit.
Carbon tetrachloride	0.012	U	U		0.005	0.00072	mg/kg	1.3	SW846 8260B	Analyte not detected at or above the detection limit.
Chlorobenzene	0.012	U	U		0.005	0.00077	mg/kg	1500	SW846 8260B	Analyte not detected at or above the detection limit.
Chloroform	0.00093	J	U		0.005	0.00065	mg/kg	1.5	SW846 8260B	Result < RL.
Chloromethane	0.012	U	U		0.005	0.0006	mg/kg	8.4	SW846 8260B	Analyte not detected at or above the detection limit.
Methylene chloride	0.012	U	U		0.005	0.0023	mg/kg	54	SW846 8260B	Analyte not detected at or above the detection limit.
Tetrachloroethene	0.012	U	U		0.005	0.00095	mg/kg	2.7	SW846 8260B	Analyte not detected at or above the detection limit.
Toluene	0.0066	J	U		0.005	0.00074	mg/kg	46000	SW846 8260B	Result < RL.
Trichloroethene	0.012	U	U		0.005	0.00067	mg/kg	14	SW846 8260B	Analyte not detected at or above the detection limit.
Vinyl chloride	0.012	U	U		0.005	0.00063	mg/kg	1.7	SW846 8260B	Analyte not detected at or above the detection limit.
Mercury	0.071	B	U		0.11	0.022	mg/kg	28	SW846 7471A	Result < RL.
Antimony	1	B	1	J	6	0.57	mg/kg	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank and calibration blank. MS/MSD recovered low.
Arsenic	3.9		3.9		1	0.44	mg/kg	15.8	SW846 6010B	No action taken. Result < action limit (AL)
Barium	147		147		20	0.1	mg/kg	190000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.2	B	U		0.5	0.053	mg/kg	810	SW846 6010B	Result < RL.
Chromium	25.7		25.7		1	0.29	mg/kg	1400	SW846 6010B	No action taken. Result < action limit (AL)
Lead	93.9		93.9		0.3	0.28	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	15.8		U		330	0.4	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.73	U	U		0.6	0.66	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Silver	1.5	U	U		1	0.15	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	313		U		2500	1.5	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg.

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Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
SB-2										
Nitroglycerin	2.5	U	U		2.5	0.26	mg/kg	62	SW846 8332	Analyte not detected at or above the detection limit. Result presented on a wet weight.
1,3,5-Trinitrobenzene	0.25	U	U		0.25	0.024	mg/kg	27000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
1,3-Dinitrobenzene	0.25	U	U		0.25	0.029	mg/kg	62	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4,6-Trinitrotoluene	0.25	U	U		0.25	0.033	mg/kg	79	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4-Dinitrotoluene	0.25	U	U		0.25	0.029	mg/kg	1200	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,6-Dinitrotoluene	0.25	U	U		0.25	0.028	mg/kg	620	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2-Amino-4,6-dinitrotoluene	0.25	U	U		0.25	0.031	mg/kg	2000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2-Nitrotoluene	0.25	U	U		0.25	0.037	mg/kg	13	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
3-Nitrotoluene	0.25	U	U		0.25	0.03	mg/kg	12000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
4-Amino-2,6-dinitrotoluene	0.25	U	U		0.25	0.03	mg/kg	1900	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
4-Nitrotoluene	0.25	U	U		0.25	0.045	mg/kg	110	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
HMX	0.5	U	U		0.5	0.048	mg/kg	49000	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
Nitrobenzene	0.25	U	U		0.25	0.028	mg/kg	280	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
RDX	0.5	U	U		0.5	0.031	mg/kg	24	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
Tetryl	0.65	U	U		0.65	0.095	mg/kg	2500	SW846 8330	Analyte not detected at or above the detection limit. Result presented on a wet weight.
2,4-Dichlorophenol	0.41	U	U		0.4	0.025	mg/kg	1800	SW846 8270C	Analyte not detected at or above the detection limit.
2-Chlorophenol	0.41	U	U		0.4	0.032	mg/kg	5100	SW846 8270C	Analyte not detected at or above the detection limit.
3,3'-Dimethylbenzidine	2	U	U		2	0.078	mg/kg	0.16	SW846 8270C	Analyte not detected at or above the detection limit.
3-Methylphenol	0.41	U	U		0.4	0.0053	mg/kg	31000	SW846 8270C	Analyte not detected at or above the detection limit.
4-Methylphenol	0.41	U	U		0.4	0.027	mg/kg	3100	SW846 8270C	Analyte not detected at or above the detection limit.
4-Nitrophenol	2	U	U		2	0.14	mg/kg	7	SW846 8270C	Analyte not detected at or above the detection limit.
Acetophenone	0.41	U	U		0.4	0.011	mg/kg	100000	SW846 8270C	Analyte not detected at or above the detection limit.
Benzo(a)anthracene	0.0094	J	U		0.4	0.0012	mg/kg	2.1	SW846 8270C	Result < RL.
Benzo(a)pyrene	0.0088	J	U		0.02	0.0016	mg/kg	0.21	SW846 8270C	Result < RL.
Benzo(b)fluoranthene	0.012	J	U		0.4	0.0015	mg/kg	2.1	SW846 8270C	Result < RL.
Benzo(k)fluoranthene	0.41	U	U		0.4	0.0021	mg/kg	21	SW846 8270C	Analyte not detected at or above the detection limit.
Benzoic acid	2	U	U		2	0.3	mg/kg	2500000	SW846 8270C	Analyte not detected at or above the detection limit.
bis(2-Ethylhexyl) phthalate	0.41	U	U		0.4	0.022	mg/kg	120	SW846 8270C	Analyte not detected at or above the detection limit.
Butyl benzyl phthalate	0.41	U	U		0.4	0.024	mg/kg	910	SW846 8270C	Analyte not detected at or above the detection limit.
Dibenz(a,h)anthracene	0.025	U	U		0.02	0.0016	mg/kg	0.21	SW846 8270C	Analyte not detected at or above the detection limit.
Dibenzofuran	0.41	U	U		0.4	0.025	mg/kg	2000	SW846 8270C	Analyte not detected at or above the detection limit.
Diethyl phthalate	0.41	U	U		0.4	0.024	mg/kg	490000	SW846 8270C	Analyte not detected at or above the detection limit.
Dimethyl phthalate	0.41	U	U		0.4	0.026	mg/kg	10000000	SW846 8270C	Analyte not detected at or above the detection limit.
Di-n-butyl phthalate	0.41	U	U		0.4	0.024	mg/kg	62000	SW846 8270C	Analyte not detected at or above the detection limit.
Di-n-octyl phthalate	0.41	U	U		0.4	0.022	mg/kg	41000	SW846 8270C	Analyte not detected at or above the detection limit.

SEE LAST PAGE FOR DATA QUALIFIER DEFINITIONS.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13 — **Event Date: November 2008 (Fourth Quarter 2008)**

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
SB-2										
Fluoranthene	0.015	J	U		0.4	0.0015	mg/kg	22000	SW846 8270C	Result < RL.
Hexachloroethane	0.062	U	U		0.05	0.035	mg/kg	120	SW846 8270C	Analyte not detected at or above the detection limit.
Indeno(1,2,3-cd)pyrene	0.025	J	U		0.4	0.0019	mg/kg	2.1	SW846 8270C	Result < RL.
Naphthalene	0.41	U	U		0.4	0.002	mg/kg	20	SW846 8270C	Analyte not detected at or above the detection limit.
N-Nitrosodiphenylamine	0.41	U	U		0.4	0.026	mg/kg	15000	SW846 8270C	Analyte not detected at or above the detection limit.
Phenol	0.41	U	U		0.4	0.031	mg/kg	180000	SW846 8270C	Analyte not detected at or above the detection limit.
Pyrene	0.011	J	U		0.4	0.0014	mg/kg	17000	SW846 8270C	Result < RL.
1,1-Dichloroethene	0.0056	U	U		0.005	0.00041	mg/kg	1100	SW846 8260B	Analyte not detected at or above the detection limit.
1,2-Dichloroethane	0.0056	U	U		0.005	0.00031	mg/kg	2.2	SW846 8260B	Analyte not detected at or above the detection limit.
Benzene	0.00042	J	U		0.005	0.00016	mg/kg	5.6	SW846 8260B	Result < RL.
Benzyl Chloride	10	U	U	J	10		mg/kg	17	SW846 8260B	Analyte not detected. Reported by TIC.
Bromomethane	0.0056	U	U		0.005	0.00036	mg/kg	35	SW846 8260B	Analyte not detected at or above the detection limit.
Carbon tetrachloride	0.0056	U	U		0.005	0.00035	mg/kg	1.3	SW846 8260B	Analyte not detected at or above the detection limit.
Chlorobenzene	0.0056	U	U		0.005	0.00037	mg/kg	1500	SW846 8260B	Analyte not detected at or above the detection limit.
Chloroform	0.0056	U	U		0.005	0.00031	mg/kg	1.5	SW846 8260B	Analyte not detected at or above the detection limit.
Chloromethane	0.0056	U	U		0.005	0.00029	mg/kg	8.4	SW846 8260B	Analyte not detected at or above the detection limit.
Methylene chloride	0.0056	U	U		0.005	0.0011	mg/kg	54	SW846 8260B	Analyte not detected at or above the detection limit.
Tetrachloroethene	0.0056	U	U		0.005	0.00046	mg/kg	2.7	SW846 8260B	Analyte not detected at or above the detection limit.
Toluene	0.0013	J	U		0.005	0.00036	mg/kg	46000	SW846 8260B	Result < RL.
Trichloroethene	0.0056	U	U		0.005	0.00032	mg/kg	14	SW846 8260B	Analyte not detected at or above the detection limit.
Vinyl chloride	0.0056	U	U		0.005	0.0003	mg/kg	1.7	SW846 8260B	Analyte not detected at or above the detection limit.
Mercury	0.1	B	U		0.11	0.019	mg/kg	28	SW846 7471A	Result < RL.
Antimony	0.82	B	U	J	6	0.49	mg/kg	410	SW846 6010B	Result < QL. Blank contamination in the equipment blank and calibration blank. MS/MSD recovered low.
Arsenic	8.3		8.3		1	0.37	mg/kg	15.8	SW846 6010B	No action taken. Result < action limit (AL)
Barium	247		247		20	0.088	mg/kg	190000	SW846 6010B	No action taken. Result < action limit (AL)
Cadmium	0.77		0.77		0.5	0.045	mg/kg	810	SW846 6010B	No action taken. Result < action limit (AL)
Chromium	19.5		19.5		1	0.25	mg/kg	1400	SW846 6010B	No action taken. Result < action limit (AL)
Lead	188		188		0.3	0.24	mg/kg	800	SW846 6010B	No action taken. Result < action limit (AL)
Nickel	26.8		U		330	0.34	mg/kg	20000	SW846 6010B	Result < reporting limit (RL) (330 mg/kg) and action limit (AL). QL is 4 mg/kg.
Selenium	0.69		0.69		0.6	0.56	mg/kg	5100	SW846 6010B	No action taken. Result < action limit (AL)
Silver	1.2	U	U		1	0.12	mg/kg	5100	SW846 6010B	Target analyte not detected above detection limit or QL/RL.
Zinc	719		U		2500	1.2	mg/kg	310000	SW846 6010B	Result < reporting limit (RL) (2500 mg/kg) and action limit (AL). QL is 2 mg/kg.

SEE LAST PAGE FOR DATA QUALIFIER DEFINITIONS.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13

Event Date: November 2008 (Fourth Quarter 2008)

Analyte/ Sample ID	Laboratory Result	Q	Validated Result	Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note
TRIP BLANK										
1,1-Dichloroethene	5	U	U		5	0.19	ug/L	1100	SW846 8260B	Analyte not detected at or above the detection limit.
1,1-Dichloroethene	5	U	U		5	0.19	ug/L	1100	SW846 8260B	Analyte not detected at or above the detection limit.
1,2-Dichloroethane	5	U	U		5	0.22	ug/L	2.2	SW846 8260B	Analyte not detected at or above the detection limit.
1,2-Dichloroethane	5	U	U		5	0.22	ug/L	2.2	SW846 8260B	Analyte not detected at or above the detection limit.
Benzene	5	U	U		5	0.13	ug/L	5.6	SW846 8260B	Analyte not detected at or above the detection limit.
Benzene	5	U	U		5	0.13	ug/L	5.6	SW846 8260B	Analyte not detected at or above the detection limit.
Benzyl chloride	10	U	U	J	10		ug/L	17	SW846 8260B	Analyte not detected. Reported by TIC.
Bromomethane	5	U	U		5	0.41	ug/L	35	SW846 8260B	Analyte not detected at or above the detection limit.
Bromomethane	5	U	U		5	0.41	ug/L	35	SW846 8260B	Analyte not detected at or above the detection limit.
Carbon tetrachloride	5	U	U		5	0.13	ug/L	1.3	SW846 8260B	Analyte not detected at or above the detection limit.
Carbon tetrachloride	5	U	U		5	0.13	ug/L	1.3	SW846 8260B	Analyte not detected at or above the detection limit.
Chlorobenzene	5	U	U		5	0.15	ug/L	1500	SW846 8260B	Analyte not detected at or above the detection limit.
Chlorobenzene	5	U	U		5	0.15	ug/L	1500	SW846 8260B	Analyte not detected at or above the detection limit.
Chloroform	5	U	U		5	0.16	ug/L	1.5	SW846 8260B	Analyte not detected at or above the detection limit.
Chloroform	5	U	U		5	0.16	ug/L	1.5	SW846 8260B	Analyte not detected at or above the detection limit.
Chloromethane	5	U	U		5	0.3	ug/L	8.4	SW846 8260B	Analyte not detected at or above the detection limit.
Chloromethane	5	U	U		5	0.3	ug/L	8.4	SW846 8260B	Analyte not detected at or above the detection limit.
Methylene chloride	5	U	U		5	0.33	ug/L	54	SW846 8260B	Analyte not detected at or above the detection limit.
Methylene chloride	0.77	J	U		5	0.33	ug/L	54	SW846 8260B	Result < RL. Blank contamination in the trip blank (0.77 ug/l) and method blank (0.0039 mg/kg).
Tetrachloroethene	5	U	U		5	0.29	ug/L	2.7	SW846 8260B	Analyte not detected at or above the detection limit.
Tetrachloroethene	5	U	U		5	0.29	ug/L	2.7	SW846 8260B	Analyte not detected at or above the detection limit.
Toluene	5	U	U		5	0.13	ug/L	46000	SW846 8260B	Analyte not detected at or above the detection limit.
Toluene	5	U	U		5	0.13	ug/L	46000	SW846 8260B	Analyte not detected at or above the detection limit.
Trichloroethene	5	U	U		5	0.17	ug/L	14	SW846 8260B	Analyte not detected at or above the detection limit.
Trichloroethene	5	U	U		5	0.17	ug/L	14	SW846 8260B	Analyte not detected at or above the detection limit.
Vinyl chloride	5	U	U		5	0.22	ug/L	1.7	SW846 8260B	Analyte not detected at or above the detection limit.
Vinyl chloride	5	U	U		5	0.22	ug/L	1.7	SW846 8260B	Analyte not detected at or above the detection limit.

SEE LAST PAGE FOR DATA QUALIFIER DEFINITIONS.

Summary of Analytical Results By Sample Location

Open Burning Ground (OBG) Soil Monitoring Program-HWMU 13

Event Date: November 2008 (Fourth Quarter 2008)

Analyte/ Sample ID	Laboratory Result Q	Validated Result Q	QL/RL	DL	Unit	AL mg/kg	Method	Data Validation Note

Definitions:

Data validation qualifiers:

U- Denotes the analyte was analyzed for, but was not detected at or above the project reporting level specified in the permit -Table 1 Attachment II.C-24.
J- Denotes an estimated value. See sample specific note presented on data validation report table for further explanation.
UJ- The QL should be considered estimated. See sample specific note presented on data validation report table for further explanation.
R- Denotes sample result was rejected. See sample specific note presented on data validation report table for further explanation.
Q- Denotes Data Qualifier.
QL Denotes laboratory quantitation limit.
RL Denotes project reporting level. For most analytes, the RL= QL. For several target analytes, the QL is less than the RL. For this project, all results < RL were considered estimated concentrations and were qualified as U. See permit for project reporting limits.
AL Denotes Action level (Region III RBC For Industrial Sites –VDEQ Permit Modification dated 10/18/2008. AL is greater than QL/RL.

Laboratory data qualifiers:

B- Denotes target analyte detected <QL/RL and associated concentration is estimated. This is a laboratory data qualifier.
J- Denotes target analyte detected <QL/RL and associated concentration is estimated. This is a laboratory data qualifier.

Note-Dioxin/Furan results presented in a separate table.
All analyses performed by Test America, Formerly Severn Trent Laboratories, North Canton, OH, except where noted (see data validation reports).
PAD-X is field sample duplicate for PAD-7.

NOTE (1): The table summaries all results detected above the detection limit and results which required qualification based on data validation.
All results reported on a dry weight basis, except where noted.
See laboratory report for definition of laboratory result qualifiers, if needed.

SEE LAST PAGE FOR DATA QUALIFIER DEFINITIONS.

APPENDIX F

SUMMARIES OF DETECTED NON-CARCINOGENIC CONSTITUENTS OF POTENTIAL CONCERN (COPCs)

Summary of Non-carcinogenic Compounds of Potential Concern (COPC)
Verses 1/10 Region III Risk Based Concentrations (RBC)
January 2008 Sampling Event

SampleID	CAS#	Concentration	RBC	1/10 RBC	MethodRef
1,3,5-Trinitrobenzene					
PAD-3	99-35-4	0.45	31000	3100	SW846 8330
PAD-8	99-35-4	0.54	31000	3100	SW846 8330
2,4-Dinitrotoluene					
PAD-1	121-14-2	0.34	2000	200	SW846 8330
PAD-8	121-14-2	0.73	2000	200	SW846 8330
NB-1	121-14-2		2000	200	SW846 8330
2,6-Dinitrotoluene					
PAD-8	606-20-2	0.31	1000	100	SW846 8330
Barium					
PAD-1	7440-39-3	172	200000	20000	SW846 6010B
PAD-2	7440-39-3	73.4	200000	20000	SW846 6010B
PAD-3	7440-39-3	81.9	200000	20000	SW846 6010B
PAD-4	7440-39-3	70.8	200000	20000	SW846 6010B
PAD-5	7440-39-3	38	200000	20000	SW846 6010B
PAD-6	7440-39-3	30.3	200000	20000	SW846 6010B
PAD-7	7440-39-3	85.4	200000	20000	SW846 6010B
PAD-8	7440-39-3	133	200000	20000	SW846 6010B
BERM-1	7440-39-3	91.3	200000	20000	SW846 6010B
POND-1	7440-39-3	121	200000	20000	SW846 6010B
NB-1	7440-39-3	147	200000	20000	SW846 6010B
NB-2	7440-39-3	108	200000	20000	SW846 6010B
SB-1	7440-39-3	117	200000	20000	SW846 6010B
SB-2	7440-39-3	141	200000	20000	SW846 6010B
Bromomethane					
PAD-2	74-83-9	0.02	15	1.5	SW846 8260B
Cadmium					
PAD-1	7440-43-9	1.5	510	51	SW846 6010B
POND-1	7440-43-9	0.93	510	51	SW846 6010B
SB-2	7440-43-9	0.76	510	51	SW846 6010B
Diethyl phthalate					
PAD-8	84-66-2	0.95	820000	82000	SW846 8270C
BERM-1	84-66-2	0.34	820000	82000	SW846 8270C
NB-1	84-66-2	0.84	820000	82000	SW846 8270C
NB-2	84-66-2	0.43	820000	82000	SW846 8270C
Di-n-butyl phthalate					
PAD-1	84-74-2	1.2	100000	10000	SW846 8270C
PAD-7	84-74-2	2	100000	10000	SW846 8270C
PAD-8	84-74-2	1.4	100000	10000	SW846 8270C
Nitrobenzene					
PAD-1	98-95-3	0.43	510	51	SW846 8330
PAD-2	98-95-3	1.1	510	51	SW846 8330
PAD-3	98-95-3	2	510	51	SW846 8330
PAD-4	98-95-3	2.5	510	51	SW846 8330
PAD-5	98-95-3	0.53	510	51	SW846 8330
PAD-6	98-95-3	0.46	510	51	SW846 8330
PAD-7	98-95-3	0.61	510	51	SW846 8330
PAD-8	98-95-3	0.91	510	51	SW846 8330
BERM-1	98-95-3	0.34	510	51	SW846 8330

POND-1	98-95-3	0.34	510	51	SW846 8330
NB-1	98-95-3	0.99	510	51	SW846 8330
NB-2	98-95-3	1.3	510	51	SW846 8330
SB-1	98-95-3	0.79	510	51	SW846 8330
SB-2	98-95-3	0.45	510	51	SW846 8330
Nitroglycerin					
PAD-4	55-63-0	6.5	200	20	SW846 8332
PAD-7	55-63-0	3.2	200	20	SW846 8332
PAD-8	55-63-0	5.2	200	20	SW846 8332

All results in mg/kg

Summary of Non-carcinogenic Compounds of Potential Concern (COPC)
Verses 1/10 Region III Risk Based Concentrations (RBC)
November 2008 Sampling Event

SampleID	CAS#	Concentration	RBC	1/10 RBC	MethodRef
1,3,5-Trinitrobenzene					
PAD-2	99-35-4	0.51	27000	2700	SW846 8330
PAD-3	99-35-4	2.1	27000	2700	SW846 8330
2,4-Dinitrotoluene					
PAD-2	121-14-2	0.57	1200	120	SW846 8330
PAD-5	121-14-2	0.62	1200	120	SW846 8330
PAD-6	121-14-2	1.3	1200	120	SW846 8330
POND-1	121-14-2	0.42	1200	120	SW846 8330
BERM-1	121-14-2	0.33	1200	120	SW846 8330
2,6-Dinitrotoluene					
PAD-2	606-20-2	0.49	620	62	SW846 8330
2-Amino-4,6-dinitrotoluene					
PAD-2	35572-78-2	0.48	2000	200	SW846 8330
4-Amino-4,6-dinitrotoluene					
PAD-2	19406-51-0	0.58	1900	190	SW846 8330
POND-1	19406-51-0	0.28	1900	190	SW846 8330
Barium					
PAD-1	7440-39-3	75.4	190000	19000	SW846 6010B
PAD-2	7440-39-3	113	190000	19000	SW846 6010B
PAD-3	7440-39-3	37.1	190000	19000	SW846 6010B
PAD-4	7440-39-3	101	190000	19000	SW846 6010B
PAD-5	7440-39-3	16.8	190000	19000	SW846 6010B
PAD-6	7440-39-3	70.7	190000	19000	SW846 6010B
PAD-7	7440-39-3	74.6	190000	19000	SW846 6010B
PAD-8	7440-39-3	125	190000	19000	SW846 6010B
BERM-1	7440-39-3	98.2	190000	19000	SW846 6010B
POND-1	7440-39-3	120	190000	19000	SW846 6010B
NB-1	7440-39-3	135	190000	19000	SW846 6010B
NB-2	7440-39-3	99.6	190000	19000	SW846 6010B
SB-1	7440-39-3	147	190000	19000	SW846 6010B
SB-2	7440-39-3	247	190000	19000	SW846 6010B
Cadmium					
PAD-1	7440-43-9	2.1	810	81	SW846 6010B
PAD-2	7440-43-9	0.61	810	81	SW846 6010B
SB-2	7440-43-9	0.77	810	81	SW846 6010B
Diethyl phthalate					
PAD-4	84-66-2	0.44	490000	49000	SW846 8270C
PAD-6	84-66-2	6	490000	49000	SW846 8270C
BERM-1	84-66-2	0.73	490000	49000	SW846 8270C
NB-1	84-66-2	2	490000	49000	SW846 8270C
NB-2	84-66-2	0.69	490000	49000	SW846 8270C
Di-n-butyl phthalate					
PAD-2	84-74-2	0.54	62000	6200	SW846 8270C
PAD-4	84-74-2	0.88	62000	6200	SW846 8270C
PAD-6	84-74-2	7.6	62000	6200	SW846 8270C
POND-1	84-74-2	0.82	62000	6200	SW846 8270C
BERM-1	84-74-2	0.83	62000	6200	SW846 8270C
NB-1	84-74-2	0.91	62000	6200	SW846 8270C

SampleID	CAS#	Concentration	RBC	1/10 RBC	MethodRef
Mercury					
PAD-6	7439-97-6	0.12	28	2.8	SW846 7471A
Nitroglycerin					
PAD-4	55-63-0	5.1	62	6.2	SW846 8332
PAD-6	55-63-0	30	62	6.2	SW846 8332
POND-1	55-63-0	3.9	62	6.2	SW846 8332

All results in mg/kg

APPENDIX G

CORRESPONDENCE

received
11-5-07

07-150

COMMONWEALTH of VIRGINIA

L. Preston Bryant, Jr.
Secretary of Natural Resources

DEPARTMENT OF ENVIRONMENTAL QUALITY
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David K. Paylor
Director

(804) 698-4000
1-800-592-5482

Suspense Date: 12/18/07

October 31, 2007

Ms. Paige Holt
Environmental Manager
Alliant Ammunition and Powder Company, LLC
Radford Army Ammunition Plant
Route 114, P.O. Box 1
Radford, Virginia 24143-0100

Re: **Hazardous Waste Class 3 Permit Modification Request – Review Response**
Post-Closure Care Permit – Hazardous Waste Management Units (HWMUs) 5, 7, 10, & 16; Open Burning Ground (OBG) Permit – HWMU 13
Radford Army Ammunition Plant, Radford, VA
EPA ID No. VA1210020730

Dear Ms. Holt:

The Virginia Department of Environmental Quality, Office of Hazardous Waste (the Department) received the Class 3 permit modification request for the *Post-Closure Care Permit – Hazardous Waste Management Units (HWMUs) 5, 7, 10, & 16; and Open Burning Ground (OBG) Permit – HWMU 13,* associated with Radford Army Ammunition Plant (RFAAP) located in Radford, Virginia. RFAAP's Class 3 permit modification request was received by the Department on August 13, 2007. The Department has completed a review of the *Permit Modification Summary* and corresponding attachments included with the Class 3 permit modification request and has provided the following comments:

Item 1: The Department has reviewed the Closure Plan Amendment (CPA) for HWMU-7, revised June 2007, and concurs that the information presented in the CPA is technically adequate. Final approval of the CPA is contingent upon the Director's decision to grant or deny the Class 3 permit modification request after conclusion of the 45-day public comment period. Should the Director approve the Class 3 permit modification; at that time RFAAP will be advised to prepare and submit a Closure Report for HWMU-7. The Department's groundwater staff has provided comments included in Enclosure 1 to assist in the Closure Report preparation.

Item 2: The Department's groundwater staff has reviewed the Alternate Source Demonstration (ASD) for HWMU-5 and has provided a summary of that review in Enclosure 2. The Department has determined that the ASD does not provide sufficient information to demonstrate that the trichloroethene (TCE) present in the groundwater near HWMU-5 is from an alternate source. Therefore, upon receipt of this letter, RFAAP is advised to submit to the Director a permit modification to establish a corrective action program meeting **40 CFR Part 264.100** requirements within 180 days for HWMU-5.

Item 3: In the Permit Modification Summary, Item 3, RFAAP states, "RFAAP is requesting that DEQ review the data that RFAAP will submit to DEQ and incorporate the recommended reductions in monitoring constituents in the revised permit." RFAAP is advised to submit the referenced data to the Department for review.

Item 4: The Department's groundwater staff has reviewed the Constituent Background Values for the Compliance Groundwater Monitoring Program and Module V – Groundwater Compliance Monitoring Plan. Comments and revisions to Module V, Groundwater Compliance Monitoring, are provided in Enclosure 3.

Item 5: The Department's groundwater staff has reviewed the Source Area Evaluation Sampling and Analysis Plan (SAP) in support of the Open Burning Ground Corrective Action Plan and has provided a summary of that review in Enclosure 4. The Department has provided the following comments in addition to the summary in Enclosure 4.

Section 2.3, Soil Sample Selection Criteria, page 5: The following soil sample selection criteria should be utilized for both VOC and perchlorate analysis. At each boring location a 6" soil sample shall be collected at the interface of the fill material soils and underlying native soil (base of former burn pit), as well as a 6" sample of the native soil just above the water table. If there are no obvious differences between the burn pits fill material and the native soil, and the base of the former burn pit cannot be determined, then the first 6" soil sample will be collected at the first confining layer of soils or clay. If contamination is evident from a single boring, based on PID readings as well as visual and olfactory observations, then additional soil samples will be taken every 6' in the soil boring. If no obvious signs of contamination are observed in a boring, then only the two above-mentioned soil samples shall be taken.

Section 3.6, Disposition of Investigation Derived Waste, page 10: Disposition of Investigation Derived Waste should be in accordance with the Department's Guidance on the Handling of Investigation Derived Waste (IDW). Please include a reference to this guidance in Section 3.6. For your convenience the above-referenced guidance has been included in Enclosure 5.

Item 6: RFAAP has sufficiently established that no constituents were detected at concentrations above the Soil Monitoring Program (SMP) Action Limits (ALs). Based on this information, the Department concurs with RFAAP to decrease the soil sampling frequency from semiannually to annually.

The Department does not concur with RFAAP to cease random sampling at the northern and southern OBG boundaries (NB-1, NB-2, SB-1, and SB-2), at the berm located on the southeast side of the site (Berm-1), and in the center of the sediment pond (Pond-1). Although no ALs were exceeded, some constituents were detected well above their reporting limit (RL) at these locations. In particular, lead exhibited concentrations to warrant continual monitoring in these locations. RFAAP is advised to continue sampling these locations annually.

RFAAP requested eight Constituents of Potential Concern (COPC) to be removed from the monitoring events that were not detected above ALs in any of the 2005 through 2007 soil monitoring events. These eight constituents include antimony, benzoic acid, dibenzofuran, di-n-octyl phthalate, nickel, nitroglycerin, pyrene, and zinc. The Department concurs with removing seven of the eight constituents from the sampling events with the one exception being nitroglycerin. Although nitroglycerin did not exceed its AL, the concentrations exhibited warrant its inclusion on the COPC list.

Should the Director approve the Class 3 permit modification; at that time RFAAP will be advised to implement the above-mentioned changes and to submit a revised SMP to be incorporated into the Open Burning Grounds Permit.

Item 7: At their earliest convenience, the facility is advised to contact the Department in order to schedule a meeting between John Lowe of CH2MHill (representing RFAAP) and Sanjay Thirunagari, the Department's Office of Waste Technical Support Manager.

Please review and address each comment within forty-five (45) days of your receipt of this letter. If you have any questions regarding the information presented in this letter, please contact me at (804) 698-4026 or you may e-mail me at mmstepien@deq.virginia.gov.

Sincerely,

Matthew M. Stepien

Matthew M. Stepien
Environmental Engineer Senior
Office of Hazardous Waste

Attachments:

Enclosure 1 – Comments on HWMU-7 Closure Report Preparation
Enclosure 2 – Summary of Alternate Source Demonstration Review for HWMU-5
Enclosure 3 – Comments and Revisions to Module V, Groundwater Compliance Monitoring
Enclosure 4 – Comments on Alternate Source Demonstration Review for the OBG
Enclosure 5 – Guidance on the Handling of Investigation Derived Waste (IDW)

cc: Robert N. Davie, III
Radford Army Ammunition Plant
SMARF-OP, P. O. Box 2
Radford, Virginia 24141-0099

Tom Uybarreta – EPA Region III (3WC21)
Aziz Farahmand – DEQ, WCRO
Leslie A. Romanchik – DEQ, CO (w/o attachments)
Jutta Schneider – DEQ, CO
Fuxing Zhou – DEQ, CO
Sanjay Thirunagari – DEQ, CO (w/o attachments)
Sonal Iyer – DEQ, CO (w/o attachments)
Julia King-Collins – DEQ, CO (w/o attachments)
Central Hazardous Waste File

Ross Miller

From: Flint, Jeremy [Jeremy.Flint@ATK.COM]
Sent: Wednesday, January 30, 2008 8:20 AM
To: Janet Frazier; Mike Lawless; Ross Miller
Subject: FW: RFAAP - Class 3 Mod, Item #6 OBG Soil Monitoring Program

Importance: High

FYI,

From: Stepien,Matthew [mailto:mmstepien@deq.virginia.gov]
Sent: Wednesday, January 30, 2008 7:52 AM
To: Flint, Jeremy
Cc: Schneider,Jutta; Vakili,Hassan; McKenna, Jim; Redder, Jerome
Subject: RFAAP - Class 3 Mod, Item #6 OBG Soil Monitoring Program
Importance: High

Good Morning Jeremy,

The Department has completed its review of the *Class 3 Mod – Item #6 OBG Soil Monitoring Program response (12-14-07)* and concurs with reducing the constituent list at non-pad locations: NB-1, NB-2, SB-1, SB-2, Berm-1, and Pond-1. Upon director's approval of the Class 3 Mod the constituents below will continue to be monitored and sampled for in the above-referenced non-pad locations. The Department did not concur with removing mercury and dimethyl phthalate since these were detected at one point and there is not enough data to discontinue.

Arsenic
Barium
Cadmium
Chromium
Lead
Selenium
Mercury
Bromomethane
Trichloroethene
Bis(2-Ethylexyl) phthalate
Diethyl phthalate
Dimethyl phthalate
Di-n-butyl phthalate
N-Nitrosodiphenylamine
Dioxins/furans
2,4,6-Trinitrotoluene
2-Amino-4, 6-dinitrotoluene
4-Amino-2, 6-dinitrotoluene
HMX
Nitroglycerin

RFAAP is advised to submit a revised OBG Soil Monitoring Program to the Department for review. This revision shall incorporate the changes discussed during the Class 3 Mod period up to this point and should include a statement similar to, "RFAAP will re-evaluate the OBG Soil Monitoring Program every 3 years and at that time may request to modify the monitoring and sampling locations and/or constituent list in accordance with 40 CFR 270.42." A redline strikeout version of this revision will assist the Department when conducting our review.

Thank you for your assistance on this matter and please feel free to contact me with any questions. Thanks,

Matthew M. Stepien

VDEQ Office of Hazardous Waste
direct dial: (804) 698-4026
fax: (804) 698-4234
mmstepien@deq.virginia.gov

Ammunition Systems Group
Energetic Systems Division
Radford Army Ammunition Plant
Route 114, P.O. Box 1
Radford, VA 24143-0100

www.atk.com

March 5, 2008

Matthew M. Stepien
Environmental Engineer Senior
Office of Hazardous Waste Permitting
Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219

Subject: Semiannual Soil Monitoring Event – Notification of Verification Event
Permit for the Treatment of Hazardous Waste by Open Burning
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

Dear Mr. Stepien:

During First Quarter 2008, Radford Army Ammunition Plant (Radford AAP), located in Radford, Virginia, completed a soil sampling event at the Open Burning Ground (OBG). Laboratory results indicated the following constituents were detected at concentrations at or above Action Limits:

Location/ Analyte	Result (1,2)	RL (3)	Action Limit	Action Limit Basis
PAD-1				
Dioxin	32.4 ng/kg	0.42 ng/kg	16 ng/kg	USEPA Region IX - PRG - Oct 2004
Lead	869 mg/kg	0.3 mg/kg	800 mg/kg	Adult Lead Methodology
PAD-7				
Mercury	0.3 mg/kg	0.11 mg/kg	0.13 mg/kg	Facility Wide Background Study

Notes:
(1) Event Date: January 7, 2008
(2) Result reported on a dry weight basis
(3) RL denotes Reporting Limit, reported on a dry weight basis. Also may be referenced as Quantitation Limit (QL) or Limit of Quantitation (LOQ).

A verification event to confirm or refute the initial results noted above will be scheduled within the next two weeks.

08-815-45
JFlint

If you have any questions or concerns, please contact Mr. Jeremy Flint at 540/639-7668 (jeremy.flint@atk.com).

Sincerely,

Paige Holt, Environmental Manager
Alliant Techsystems Inc.

Coordination: _____
J. McKenna

_____
M. A. Miano

bc: Administrative File
P. W. Holt
J. McKenna, ACO Staff
Jeremy Flint
Mike Lawless, Draper Aden Associates
Env. File

08-815-45
JFlint

Concerning the following:

Verification Event Notification
Open Burning Ground (OBG) – Soil Monitoring Program
For the January 7-8, 2008 Monitoring Event

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE:

PRINTED NAME: Jon R. Drushal
TITLE: Lieutenant Colonel, US Army
Commanding

SIGNATURE:

PRINTED NAME: Kent D. Holiday
TITLE: Vice President and General Manager
ATK Energetics Systems

08-815-45
JFlint

Ammunition Systems Group
Energetic Systems Division
Radford Army Ammunition Plant
Route 114, P.O. Box 1
Radford, VA 24143-0100

www.atk.com

May 20, 2008

Matthew M. Stepien
Environmental Engineer Senior
Office of Hazardous Waste Permitting
Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219

Subject: Semiannual Soil Monitoring Event –Verification Event Results
Notification of Action Limit Exceedance
Permit for the Treatment of Hazardous Waste by Open Burning
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

Dear Mr. Stepien:

During First Quarter 2008, Radford Army Ammunition Plant (Radford AAP), located in Radford, Virginia, completed a soil sampling event at the Open Burning Ground (OBG). A verification event to confirm the initial results that exceeded the Action Limit was performed on March 25, 2008. The verification sample results were received on May 13, 2008 and were transmitted by e-mail on May 20, 2008 to meet the 7-day notification deadline. The Table below presents the initial result, the verification result, the reporting limit, the action limit, and the basis of the action limit.

Location/ Analyte	Initial Result (1,3)	Verification Result (2,3)	RL (4)	Action Limit	Action Limit Basis
PAD-1					
Dioxin	32.4 ng/kg	6.4 ng/kg	0.4 ng/kg	16 ng/kg	USEPA Region IX - PRG - Oct 2004
Lead	869 mg/kg	417 mg/kg	0.3 mg/kg	800 mg/kg	Adult Lead Methodology
PAD-7					
Mercury	**0.3 mg/kg**	**0.34 mg/kg**	0.1 mg/kg	**0.13 mg/kg**	Facility Wide Background Study

Notes:
(1) Event Date: January 7, 2008
(2) Event Date: March 25, 2008
(3) Sample results reported on a dry weight basis
(4) RL denotes Reporting Limit. Also may be referenced as Quantitation Limit (QL) or Limit of Quantitation (LOQ)

The verification sample results did not exceed Action Limits for dioxin and lead at PAD-1. Therefore, no further action is required at this location.

The verification sample result for mercury at PAD-7 exceeded the Action Limit. Based on the PAD-7

mercury verification result, Radford AAP intends to re-sample PAD-7 and collect the required additional samples for mercury analysis in accordance with Section 7.4 of the Soil Monitoring Program (Attachment II.C of the permit). The results from the re-sampling event will determine the need to submit a proposed interim measures corrective action work plan. If you have any questions or concerns, please contact Mr. Jeremy Flint at 540/639-7668 (jeremy.flint@atk.com).

Sincerely,

Paige Holt, Environmental Manager
Alliant Techsystems Inc.

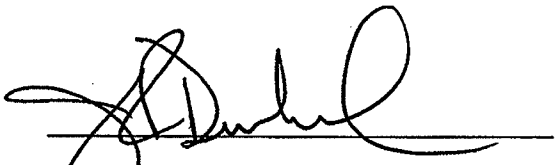
c: Jutta Schneider
Fuxing Zhou
Elizabeth Lohman

08-815-89
JFlint

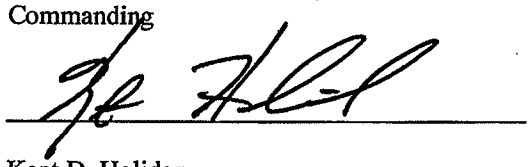
Concerning the following:

Verification Event Results Notification
Exceedance of Mercury Action Limit
Open Burning Ground (OBG) – Soil Monitoring Program
For the March 25, 2008 Monitoring Event

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE: 

PRINTED NAME: Jon R. Drushal
TITLE: Lieutenant Colonel, US Army
Commanding

SIGNATURE: 

PRINTED NAME: Kent D. Holiday
TITLE: Vice President and General Manager
ATK Energetics Systems

08-815-89
JFlint

received
6-10-08
08-63

COMMONWEALTH of VIRGINIA

L. Preston Bryant, Jr.
Secretary of Natural Resources

DEPARTMENT OF ENVIRONMENTAL QUALITY
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www.deq.virginia.gov

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

June 5, 2008

Ms. Paige Holt
Environmental Manager
Alliant Ammunition and Powder Company, LLC
Radford Army Ammunition Plant
Route 114, P.O. Box 1
Radford, Virginia 24143-0100

Re: **Semiannual Soil Monitoring Event, Verification Event Results – Notification of Action Limit Exceedance at the Open Burning Grounds**
Radford Army Ammunition Plant, Radford, VA
EPA ID No. VA1210020730

Dear Ms. Holt:

The Virginia Department of Environmental Quality, Office of Hazardous Waste (the Department) has received the *Semiannual Soil Monitoring Event, Verification Event Results* – Notification of Action Limit Exceedance letter (the Notification letter) for the Open Burning Grounds (OBG), associated with the Radford Army Ammunition Plant located in Radford, Virginia. The Notification letter was received by the Department on June 3, 2008. The facility is advised to proceed with the additional sample collection in accordance with the Permit for the Treatment of Hazardous Waste by Open Burning (2005), Attachment II.C, Section 7.4.

If you have any questions regarding the information presented in this letter, please contact me at (804) 698-4026 or you may e-mail me at mmstepien@deq.virginia.gov.

Sincerely,

Matthew M. Stepien

Matthew M. Stepien
Environmental Engineer Senior
Office of Hazardous Waste

cc: Robert N. Davie, III
Radford Army Ammunition Plant
SMARF-OP, P. O. Box 2
Radford, Virginia 24141-0099

Tom Uybarreta – EPA Region III (3WC21)
Aziz Farahmand – DEQ, WCRO
Leslie A. Romanchik – DEQ, CO
Jutta Schneider – DEQ, CO
Fuxing Zhou – DEQ, CO
Julia King-Collins – DEQ, CO
Cynthia Houchens – DEQ, CO
Central Hazardous Waste File

Ammunition Systems Group
Energetic Systems Division
Radford Army Ammunition Plant
Route 114, P.O. Box 1
Radford, VA 24143-0100

www.atk.com

September 19, 2008

Matthew M. Stepien, Environmental Engineer Senior
Office of Hazardous Waste Permitting
Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219

Subject: PAD-7 Evaluation of Mercury in Soil, Notification of Action Limit Exceedance
Permit for the Treatment of Hazardous Waste by Open Burning
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

Dear Mr. Stepien:

During First Quarter 2008, Radford Army Ammunition Plant (Radford AAP), located in Radford, Virginia completed a soil sampling event at the Open Burning Ground (OBG). A verification event to confirm the initial mercury result that exceeded the Action Limit at location PAD-7 was performed on March 25, 2008. The verification sample result for mercury at PAD-7 exceeded the Action Limit. An assessment of the horizontal extent of mercury in soil at PAD-7 was conducted on August 18, 2008 in general accordance with Section 7.4 of the Soil Monitoring Program for the OBG (Permit Attachment II.C). This assessment was performed to determine the need to conduct Interim Measures as specified in Section 8.0 of the Soil Monitoring Program.

Five soil samples were collected in duplicate on August 18, 2008 and were sent to TestAmerica of North Canton, Ohio and to CompuChem of Cary, North Carolina for analysis for mercury. Final analytical results were received from TestAmerica on September 2, 2008, and final analytical results were received from CompuChem on September 11, 2008. The mercury results for the soil samples collected at PAD-7 are summarized in Table 1.

Table 1. Summary of Meccury Soil Sampling Results.

Sample ID	Result mg/kg	RL mg/kg	Action Limit mg/kg	Action Limit Basis
January 7, 2007 Result				
PAD-7	0.3	0.1	0.13	Facility Wide Background Study
March 25, 2008 Result				
PAD-7	0.34	0.1	0.13	Facility Wide Background Study
August 18, 2008 Result (TestAmerica)				
PAD-7 (Center/Original Pt.)	**2.2***	0.22	0.13	Facility Wide Background Study
PAD-7 (North)	**1.9**	0.13	0.13	Facility Wide Background Study
PAD-7 (South)	**0.2**	0.14	0.13	Facility Wide Background Study
PAD-7 (West)	**0.21**	0.12	0.13	Facility Wide Background Study
PAD-7 (East II)	U	0.12	0.13	Facility Wide Background Study
August 18, 2008 Result (CompuChem)				
PAD-7 (Center/Original Pt.)	**0.34**	0.1	0.13	Facility Wide Background Study
PAD-7 (North)	**1.1**	0.1	0.13	Facility Wide Background Study
PAD-7 (South)	0.12	0.1	0.13	Facility Wide Background Study
PAD-7 (West)	**0.18**	0.1	0.13	Facility Wide Background Study
PAD-7 (East II)	NA	0.1	0.13	Facility Wide Background Study

08-815-141
JFlint

Notes:

- Sample results reported on a dry weight basis.
- RL – Reporting Limit. Also may be referenced as Quantitation Limit (QL) or Limit of Quantitation (LOQ).
- * – Sample diluted 1:2. The result for the sample duplicate (CompuChem Lab) was 0.3 mg/kg.
- U – Mercury was not detected above the RL.
- NA – Sample was not analyzed.

As summarized above, both laboratories reported mercury above the Action Limit in three of the five soil samples. Further discussion regarding the assessment of the horizontal extent of mercury in soil at PAD-7 will be presented in the forthcoming Annual Soil Monitoring Report for the OBG. The action limit established in the permit is from the Facility Wide background study. A review of the EPA Region 3 Regional Screening Table developed by Oak Ridge National Laboratory indicates that the **residential** soil screening values range from a low of 4.9 mg/kg for phenylmercuric acetate to 23 mg/kg for inorganic mercury salts. The lowest residential screening value is higher than the highest concentration detected.

In accordance with Section 7.4 of the Soil Monitoring Program for the OBG, Radford AAP will submit a proposed interim measure corrective action work plan in accordance with Section 8.0 of the Soil Monitoring Program within 90 days.

If you have any questions or concerns, please contact Mr. Jeremy Flint at 540/639-7668 (jeremy.flint@atk.com).

Sincerely,

Paige Holt, Environmental Manager
Alliant Techsystems Inc.

c: Jutta Schneider
Fuxing Zhou
Elizabeth Lohman

Coordination: J. McKenna

M. A. Miano

bc: Administrative File
P. W. Holt
J. McKenna, ACO Staff
Jeremy Flint
Mike Lawless, Draper Aden Associates
Env. File

08-815-141
JFlint

Concerning the following:

PAD-7 Evaluation of Mercury in Soil
Open Burning Ground (OBG) – Soil Monitoring Program

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE:

PRINTED NAME: Jon R. Drushal
TITLE: Lieutenant Colonel, US Army
Commanding

SIGNATURE:

PRINTED NAME: Kent D. Holiday
TITLE: Vice President and General Manager
ATK Energetics Systems

08-815-141
JFlint

Received
10-8-08

08-101

COMMONWEALTH of VIRGINIA

Susp: 12/29/08

DEPARTMENT OF ENVIRONMENTAL QUALITY
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L. Preston Bryant, Jr.
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

October 2, 2008

Ms. Paige Holt
Environmental Manager
Alliant Ammunition and Powder Company, LLC
Radford Army Ammunition Plant
Route 114, P.O. Box 1
Radford, Virginia 24143-0100

Re: **Pad-7 Evaluation of Mercury in Soil: Notification of Action Limit Exceedance**
Permit for Treatment of Hazardous Waste by Open Burning
Radford Army Ammunition Plant, Radford, VA
EPA ID No. VA1210020730

Dear Ms. Holt:

The Virginia Department of Environmental Quality, Office of Hazardous Waste (the Department) has received the *Pad-7 Evaluation of Mercury in Soil: Notification of Action Limit Exceedance* letter (Pad-7 Evaluation Letter) for the Open Burning Grounds, associated with the Radford Army Ammunition Plant (RFAAP) located in Radford, Virginia. The Pad-7 Evaluation Letter was received by the Department, via electronic mail, on September 29, 2008. The Department has reviewed the Pad-7 Evaluation Letter and concurs that RFAAP will have to submit an interim measures corrective action plan in accordance with the Permit for the Treatment of Hazardous Waste by Open Burning (2005), Attachment II.C, Section 8.0. Please submit the interim measures corrective action work plan to the Department by December 29, 2008.

If you have any questions regarding the information presented in this letter, please contact me at (804) 698-4026 or you may e-mail me at mmstepien@deq.virginia.gov.

Sincerely,

Matthew M. Stepien

Matthew M. Stepien
Environmental Engineer Senior
Office of Hazardous Waste

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
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Mailing address: P.O. Box 1105, Richmond, Virginia 23218
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L. Preston Bryant, Jr
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

December 18, 2008

Ms. Paige Holt
Environmental Manager
Alliant Ammunition and Powder Company, LLC
Radford Army Ammunition Plant
Route 114, P.O. Box 1
Radford, Virginia 24143-0100

Re: **Class 1 Permit Modification – Approval**
Permit for the Treatment of Hazardous Waste at the Open Burning Ground
Radford Army Ammunition Plant, Radford, VA
EPA ID No. VA1210020730

Dear Ms. Holt:

The Virginia Department of Environmental Quality, Office of Hazardous Waste (the Department) has received the *Class 1 Permit Modification* (Class 1 Permit Mod) associated with the Permit for the Treatment of Hazardous Waste at the Open Burning Ground (OB Permit); for Radford Army Ammunition Plant (RFAAP) located in Radford, Virginia. RFAAP's Class 1 Permit Mod was received by the Department on December 12, 2008 and would allow RFAAP to update, 1) the Action Levels in Attachment II.C, Soil Monitoring Plan of the OB Permit to the new Action Levels established in the September 2008 Environmental Protection Agency Regional Screening Table developed by Oak Ridge Laboratory; and 2) Table 3: Notification Action Summary in Attachment II.F, Contingency Plan of the OB Permit.

Based upon the information submitted, the Department concurs that the requested modifications constitute Class 1 Permit Modifications pursuant to 40 CFR 270.42(d) and 40 CFR 270.42, Appendix I.A.6.d. The Department has modified Table 1 of Attachment II.C (Soil Monitoring Plan) and Table 3 of Attachment II.F (Contingency Plan) of its copies of the OB Permit with the replacement pages included in Enclosure 1. Please insure that RFAAP's copy of the OB Permit is also updated accordingly. All persons on the facility mailing lists (Enclosure 2) must receive a notice of these modifications in accordance with 40 CFR 270.42(a)(1)(ii) within 90 days upon receipt of this letter.

In addition, RFAAP is no longer required to submit an interim measures corrective action work plan for the mercury exceedance at PAD-7 of the open burning grounds. Analytical results for mercury at PAD-7 of the open burning grounds ranged from 0.30 to 2.20 mg/kg, which was above

the old Action Level established during the issuance of the OB Permit in September 2005. The above-referenced Class 1 Permit Mod allows RFAAP to update their Action Level of mercury from 0.13 mg/kg to 28 mg/kg. The new Action Level would not require RFAAP to conduct further investigation on the mercury exceedance.

As provided by Rule 2A:2 of the Supreme Court of Virginia, you have 30 days from the date of service of this decision to initiate an appeal by filing a notice of appeal with:

David K. Paylor
Director, Virginia Department of Environmental Quality
P.O. Box 1105
Richmond, Virginia 23218

In the event that this decision is served to you by mail, three days are added to this period. Please refer to Part 2A of the rules of the Supreme Court of Virginia, which describes the required contents of the Notice of Appeal, including specification of the Circuit Court to which the appeal is taken, and additional requirements governing appeals from decisions of administrative agencies.

If you have questions concerning any of the above, please contact Matthew M. Stepien of my staff at (804) 698-4026 or by e-mail at mmstepien@deq.virginia.gov.

Sincerely,

Leslie A. Romanchik

Leslie A. Romanchik
Director, Office of Hazardous Waste

Attachments:
Enclosure 1 – Replacement Pages
Enclosure 2 – Facility Mailing List

cc: Robert N. Davie, III
Radford Army Ammunition Plant
SMARF-OP, P. O. Box 2
Radford, Virginia 24141-0099

Tom Uybarreta – EPA, Region III (3LC50)
Aziz Farahmand – DEQ, BRRO-Roanoke
Matthew M. Stepien – DEQ, CO
Jutta Schneider – DEQ, CO
Fuxing Zhou – DEQ, CO
Julia King-Collins – DEQ, CO
Cynthia Houchens – DEQ, CO
Central Hazardous Waste File

Table 1: Page 1 of 2
Identification of Constituents of Potential Concern
Open Burning Ground Soil Monitoring Program
Radford Army Ammunition Plant

Constituent	CASRN	Type of Constituent	In Waste?	Reported in Bang Box Database?	On GW List	To be Sampled?	SW-846 Method	Proposed RL mg/kg	Action Level mg/kg	Updated Action Level mg/kg	Source of Updated A.L.
1,2-Dichloroethane	107-06-2	PIC		Yes		***Yes***	8260B	0.005	31	2.2	R3 RBC Ind
1,3,5-Trinitrobenzene	99-35-4	PIC		Yes		***Yes***	8330	0.25	31000	27000	R3 RBC Ind
2,4,6-Trinitrotoluene	118-96-7	ENER				***Yes***	8330	0.25	95	79	R3 RBC Ind
2-amino-4,6-dinitrotoluene	35572-78-2	ENER				***Yes***	8330	0.25	2000	2000	R3 RBC Ind
4-amino-2,6-dinitrotoluene	19406-51-0	ENER				***Yes***	8330	0.25	2000	1900	R3 RBC Ind
2,4-Dichlorophenol	120-83-2	PIC		Yes	*	***Yes***	8270C	0.33	3100	1800	R3 RBC Ind
1,3-Dinitrobenzene	99-65-0	ENER				***Yes***	8330	0.25	100	62	R3 RBC Ind
2,4-Dinitrotoluene	121-14-2	Both	Yes		Yes	***Yes***	8330	0.25	2000	1200	R3 RBC Ind
2,6-Dinitrotoluene	606-20-2	PIC		Yes	Yes	***Yes***	8330	0.25	1000	620	R3 RBC Ind
2-Chlorophenol	95-57-8	PIC		Yes	*	***Yes***	8270C	0.33	5100	5100	R3 RBC Ind
3-Methylphenol	108-39-4	PIC		Yes		***Yes***	8270C	0.33	51000	31000	R3 RBC Ind
4-Methylphenol	106-44-5	PIC		Yes		***Yes***	8270C	0.33	5100	3100	R3 RBC Ind
2-Nitrotoluene (ortho)	88-72-2	ENER				***Yes***	8330	0.25	12	13	R3 RBC Ind
3-Nitrotoluene (meta)	99-08-1	ENER				***Yes***	8330	0.25	20000	12000	R3 RBC Ind
4-Nitrotoluene (para)	99-99-0	ENER				***Yes***	8330	0.25	170	110	R3 RBC Ind
3,3-Dimethylbenzidine	119-93-7	PIC		Yes		***Yes***	8270C	1.6	--	0.16	R3 RBC Ind
4-Nitrophenol	100-02-7	PIC		Yes		***Yes***	8270C	1.6	7	7	ECO Risk
Acetophenone	98-86-2	PIC		Yes		***Yes***	8270C	0.33	100000	100000	R3 RBC Ind
Arsenic	7440-38-2	Propellant ingredient	Yes		Yes	***Yes***	6010B	1	15.8	15.8	FWB
Barium	7440-39-3	Propellant ingredient	Yes	Yes	Yes	***Yes***	6010B	20	72000	190000	R3 RBC Ind
Benz(a)anthracene	56-55-3	PIC		Yes		***Yes***	8270C	0.33	3.9	2.1	R3 RBC Ind
Benzene	71-43-2	Propellant ingredient	Yes		Yes	***Yes***	8260B	0.005	52	5.6	R3 RBC Ind
Benzo(a)pyrene	50-32-8	PIC		Yes		***Yes***	8270C	0.02	0.39	0.21	R3 RBC Ind
Benzo(b)fluoranthene	205-99-2	PIC		Yes		***Yes***	8270C	0.33	3.9	2.1	R3 RBC Ind
Benzo(k)fluoranthene	207-08-9	PIC		Yes		***Yes***	8270C	0.33	39	21	R3 RBC Ind
Benzyl chloride	100-44-7	PIC		Yes		***Yes***	8260B	0.005	--	17	R3 RBC Ind
bis(2-Ethylhexyl)phthalate	117-81-7	PIC		Yes		***Yes***	8270C	0.33	200	120	R3 RBC Ind
Butylbenzylphthalate	85-68-7	PIC		Yes		***Yes***	8270C	0.33	200000	910	R3 RBC Ind
Cadmium	7440-43-9	PIC		Yes		***Yes***	6010B	0.5	510	810	R3 RBC Ind
Carbon tetrachloride	56-23-5	PIC		Yes	Yes	***Yes***	8260B	0.005	22	1.3	R3 RBC Ind
Chlorobenzene	108-90-7	Both	Yes	Yes	Yes	***Yes***	8260B	0.005	20000	1500	R3 RBC Ind
Chloroform	67-66-3	PIC		Yes		***Yes***	8260B	0.005	10000	1.5	R3 RBC Ind
Chromium	7740-47-3	PIC		Yes	Yes	***Yes***	6010B	1	3100	1400	R3 RBC Ind
Dibenz(a,h)anthracene	53-70-3	PIC		Yes		***Yes***	8270C	0.02	0.39	0.21	R3 RBC Ind
Diethylphthalate	84-66-2	Propellant ingredient	Yes			***Yes***	8270C	0.33	820000	490000	R3 RBC Ind
Dimethyl phthalate	131-11-3	PIC		Yes		***Yes***	8270C	0.33	10000000	10000000	R3 RBC Ind*
Di-n-butyl phthalate	84-74-2	PIC		Yes	Yes	***Yes***	8270C	0.33	100000	62000	R3 RBC Ind
Diphenylamine	122-39-4	Both	Yes	Yes	Yes	***Yes***	8270C	1.6	26000	15000	R3 RBC Ind
Ethanol	64-17-5	Propellant ingredient	Yes				NCA				
Fluoranthene	206-44-0	PIC		Yes		***Yes***	8270C	0.33	41000	22000	R3 RBC Ind
Hexachloroethane	67-72-1	Propellant ingredient	Yes		Yes	***Yes***	8260B	0.005	200	120	R3 RBC Ind
HMX	2691-41-0	ENER				***Yes***	8330	2.2	51000	49000	R3 RBC Ind
Indeno(1,2,3-cd)pyrene	193-39-5	PIC		Yes		***Yes***	8270C	0.33	3.9	2.1	R3 RBC Ind
Lead	7439-92-1	PIC		Yes	Yes	***Yes***	6010B	0.3	800	800	ALM
Mercury	7439-97-6	Propellant ingredient	Yes		Yes	***Yes***	6010B	0.1	0.13	28	R3 RBC Ind
Methyl bromide (Bromomethane)	74-83-9	PIC		Yes		***Yes***	8260B	0.005	15	35	R3 RBC Ind
Methyl chloride (Chloromethane)	74-87-3	Both	Yes	Yes	Yes	***Yes***	8260B	0.005	6	8.4	R3 RBC Ind
Methylene chloride	75-09-2	Both	Yes	Yes	Yes	***Yes***	8260B	0.005	380	54	R3 RBC Ind
Naphthalene	91-20-3	PIC		Yes		***Yes***	8270C	0.33	20000	20	R3 RBC Ind
Nitrobenzene	98-95-3	ENER				***Yes***	8330	0.25	510	280	R3 RBC Ind
Nitrogen dioxide (peroxide)	10102-44-0	PIC		Yes			NCA				
Phenol	108-95-2	PIC		Yes	*	***Yes***	8270C	0.33	310000	180000	R3 RBC Ind
RDX	121-82-4	ENER				***Yes***	8330	1	26	24	R3 RBC Ind
Silver	7440-22-4	Propellant ingredient	Yes		Yes	***Yes***	6010B	1	5100	5100	R3 RBC Ind
Selenium	7782-49-2	Background				***Yes***	6010B	0.5	5100	5100	R3 RBC Ind

Constituent	CASRN	Type of Constituent	In Waste?	Reported in Bang Box Database?	On GW List	To be Sampled?	Method SW-846	Proposed RL mg/kg	Action Level mg/kg	Updated Action Level mg/kg	Source of A.L.
Total Petroleum Hydrocarbons - DRO		Site Accelerant				***Yes***	8015B	10	11000	11000	DEQ qd
Tetrachloroethylene	127-18-4	PIC		Yes		***Yes***	8260B	0.005	5.3	2.7	R3 RBC Ind
Tetryl	479-45-8	ENER				***Yes***	8330	0.65	10000	2500	R3 RBC Ind
Toluene	108-88-3	Both	Yes	Yes	Yes	***Yes***	8260B	0.005	200000	46000	R3 RBC Ind
Trichloroethylene	79-01-6	PIC		Yes		***Yes***	8260B	0.005	7.2	14	R3 RBC Ind
Vinyl chloride	75-01-4	PIC		Yes		***Yes***	8260B	0.005	4	1.7	R3 RBC Ind
Vinylidene chloride (1,1-Dichloroethene)	75-35-4	PIC		Yes		***Yes***	8260B	0.005	51000	1100	R3 RBC Ind
Polychlorinated Dibenzo(p)dioxins and furans											
1,2,3,4,5,7,8,9-Octachlorodibenzo(p)dioxin (OCDD)	3268-87-9	PIC		Yes		***Yes***	8920	See Note 5			
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	39001-02-0	PIC		Yes		***Yes***	8920	See Note 5			
1,2,3,4,6,7,8-Heptachlorodibenzo(p)dioxin (HpCDD)	35822-46-9	PIC		Yes		***Yes***	8920	See Note 5			
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	67562-39-4	PIC		Yes		***Yes***	8920	See Note 5			
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	55673-89-7	PIC		Yes		***Yes***	8920	See Note 5			
1,2,3,4,7,8-Hexachlorodibenzo(p)dioxin (HxCDD)	39227-28-6	PIC		Yes		***Yes***	8920	See Note 5			
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	70648-26-9	PIC		Yes		***Yes***	8920	See Note 5			
1,2,3,6,7,8-Hexachlorodibenzo(p)dioxin (HxCDD)	57653-85-7	PIC		Yes		***Yes***	8920	See Note 5			
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	57117-44-9	PIC		Yes		***Yes***	8920	See Note 5			
1,2,3,7,8,9-Hexachlorodibenzo(p)dioxin (HxCDD)	19408-74-3	PIC		Yes		***Yes***	8920	See Note 5			
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	72918-21-9	PIC		Yes		***Yes***	8920	See Note 5			
1,2,3,7,8-Pentachlorodibenzo(p)dioxin (PeCDD)	40321-76-4	PIC		Yes		***Yes***	8920	See Note 5			
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	57117-31-4	PIC		Yes		***Yes***	8920	See Note 5			
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	60851-34-5	PIC		Yes		***Yes***	8920	See Note 5			
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	57117-31-4	PIC		Yes		***Yes***	8920	See Note 5			
2,3,7,8-Tetrachlorodibenzo(p)dioxin (TCDD)	1746-01-6	PIC		Yes		***Yes***	8920	See Note 5			
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	51207-31-9	PIC		Yes		***Yes***	8920	See Note 5			
*** Constituents to be sampled first 2 semi-annual events (see Section 3.3 of this plan)**											
Antimony	7440-36-0	PIC			Yes	**** Yes***	6010B	10	410	410	R3 RBC Ind
Benzoic acid	65-85-0	Propellant ingredient	Yes			**** Yes***	8270C	3.3	4100000	2500000	R3 RBC Ind
Dibenzofuran	132-64-9	PIC		Yes		**** Yes***	8270C	0.33	2000	2000	R3 RBC Ind*
Di-n-octyl phthalate	117-84-0	PIC				**** Yes***	8270C	0.33	41000	41000	R3 RBC Ind*
Nickel	7440-02-0	PIC		Yes		**** Yes***	6010B	330	20000	20000	R3 RBC Ind
Nitroglycerin	55-63-0	ENER	Yes		Yes	**** Yes***	8330	2.5	200	62	R3 RBC Ind
Pyrene	129-00-0	PIC		Yes		**** Yes***	8270C	0.33	31000	17000	R3 RBC Ind
Zinc	7440-06-6	PIC		Yes		**** Yes***	6010B	2500	310000	310000	R3 RBC Ind

NOTES:

1. Highlighted Constituent — AL changed as part of update of Region III RBCs for Industrial Sites dated September 12, 2008.
2. Type of Constituent — "Propellant Ingredient" = Ingredient in propellant compound.
   "PIC" Product of Incomplete Combustion": means that it was reported in the Bangbox Database (see Appendix A-2).
   "Both" Both PIC and Propellant Ingredient.
   "ENER" - Energetic on SW-846 Method 8330 parameter List.
3. In Waste — "Yes" - means it was reported in Radford AAP's waste characterization.
4. **BOLD** Constituent — Constituent not in 40 CFR 261 Appendix VIII List of Hazardous Substances.
5. Dioxins — Reporting Limit and Action Level will be calculated for each sample and detection, respectively. See Table 2 for example reporting format.
6. NCA — Constituent is not analyzed by commercial laboratories.
7. Source of Action Levels — **"R3 RBC Ind"** - Region III RBC for Industrial Sites - Dated September 12, 2008.
   "R3 RBC Ind*" - These constituents were removed from the September 12, 2008 RBC table. The previous AL (Region III RBC for Industrial Sites from October 2004) is listed.
   "DEQ qd" - Table 5-5 Soil Saturation Values, Page 5-27 of VDEQ Storage Tank Program Technical Manual, Rev 3, October 4, 2001.
   "FWB" - Facility Wide Background Study.
   "ALM" is the Adult Lead Methodology (ALM). NHANES III (National Health and Nutrition Evaluation Survey) is a lead study. ALM identifies 800 mg/kg as a screening value and states that it is based on an analysis of the NHANES III study and that it is "a cleanup goal protective of all subpopulations."
   "ECO RISK" - June 23, 2000 EPA memorandum Entitled *Amended Guidance on Ecological Risk Assessment at Military Bases: Process Considerations, Timing of Activities and Inclusion of Stakeholders.*
8. RL and AL — "RL" is the laboratory reporting limit and is analogous to the Limit of Quantitation (LOQ). "AL" is the Action Level based on published risk based values.
9. Reporting level changed — for 3,3-Dimethylbenzidine the action level was previously blank. For Benzo(a)pyrene and Dibenz(a,h)anthracene the laboratory changed their operating ranges to achieve a reporting limit less than the action level.
10. Action Level adjusted — for 3,3-Dimethylbenzidine the Action Level of 0.16 is below the Proposed Reporting Level of 1.6. The Proposed Reporting Level in this case is set to the level at which the laboratory feels most confident detecting this chemical at. Therefore any result above the Action Level and below the Proposed Reporting Limit will be discussed with the Virginia DEQ to determine if additional evaluation is necessary.

ATK Ammunition Systems
Energetic Systems
Radford Army Ammunition Plant
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Radford, VA 24143-0100

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January 9, 2009

Matthew M. Stepien, Environmental Engineer Senior
Office of Hazardous Waste Permitting
Virginia Department of Environmental Quality
629 East Main Street
Richmond, Virginia 23219

Subject: Semiannual Soil Sampling Results Notification - Soil Monitoring Program
Open Burning Ground (OBG)
Radford Army Ammunition Plant, Radford, Virginia
EPA ID#: VA1210020730

Dear Mr. Stepien:

In November 2008, Alliant Techsystems Inc. completed a semiannual soil sampling event at the Open Burning Ground (OBG) located at the Radford Army Ammunition Plant in Radford, Virginia. No constituents were detected at concentrations at or above the permit-specified Action Limits, as presented in the VDEQ-approved Class 1 Permit Modification dated December 18, 2008 (revised January 9, 2008). Therefore, no further action is necessary at this time. Further discussion regarding the November 2008 semiannual soil sampling event will be presented in the forthcoming Annual Soil Monitoring Report for the OBG.

If you have any questions or concerns, please contact Mr. Jeremy Flint at 540/639-7668 (jeremy.flint@atk.com).

Sincerely,

Paige Holt, Environmental Manager
Alliant Techsystems Inc.

c: Jutta Schneider
Fuxing Zhou
Elizabeth Lohman

Coordination: J. McKenna

M. A. Miano

bc: Administrative File
P. W. Holt
J. McKenna, ACO Staff
Jeremy Flint
Mike Lawless, Draper Aden Associates
Env. File

09-815-5
JFlint

Concerning the following:

Semiannual Soil Sampling Results Notification
Permit for Treatment of Hazardous Waste by Open Burning
January 9, 2009

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

SIGNATURE:

PRINTED NAME: Jon R. Drushal
TITLE: Lieutenant Colonel (P), US Army
Commanding

SIGNATURE:

PRINTED NAME: Kent D. Holiday
TITLE: Vice President and General Manager
ATK Energetics Systems

09-815-5
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APPENDIX H
(See CD at back of report)

ANALYTICAL DATA EVALUATION

APPENDIX H.1

DATA QUALITY OBJECTIVES

APPENDIX H.2

DATA VALIDATION REPORTS
AND LABORATORY ANALYTICAL DATA (FORM 1s)

APPENDIX H.2.1
SITE SCREENING PROCESS SAMPLING
2003

APPENDIX H.2.2
RCRA FACILITY INVESTIGATION SAMPLING
2008

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APPENDIX H.1
DATA QUALITY OBJECTIVES

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TABLE H.1-1
DATA USABILITY WORKSHEET
SITE: SWMU 13
MEDIUM: Soil

Activity	Comment
Field Sampling	
Discuss sampling problems and field conditions that affect data usability.	There were no problems identified during field sampling that affected data usability.
Are samples representative of receptor exposure for this medium (e.g., sample depth, grab vs. composite, filtered vs. unfiltered, low flow, etc.)?	Yes. Samples are representative of receptor exposure. Surface soil samples and subsurface soil samples were collected from discrete intervals.
Assess the effect of field QC results on data usability.	Field duplicate samples were collected at the rate of 1 per 10 soil samples. The average concentration of the soil sample and its duplicate sample were used in the risk assessments. Equipment rinsate blank samples were collected at the rate of 1 per 20 soil samples. Low-level detections at concentrations below the laboratory reporting limit were reported in one or more of the equipment blank samples for selected metals, VOCs, and SVOCs. No significant impact on data usability resulted from these detections. Matrix spike (MS)/matrix spike duplicate (MSD) samples were at the rate of 1 per 20 soil samples. No significant impact on data usability was identified based on the matrix spike results.
Summarize the effect of field sampling issues on the risk assessment, if applicable.	No significant sampling issues were noted. See Sections 6.0 and 7.0 of the RFI/CMS Report discuss the uncertainty analysis for the human health and ecological risk assessments for sampling and analysis.
Analytical Techniques	
Were the analytical methods appropriate for quantitative risk assessment?	Yes. Low-level SW-846 analytical methods were used for soil analysis in accordance with the MWP and WPA 023. Soil samples were analyzed for VOCs by SW-846 Method 8260B, SVOCs by SW-846 Method 8270C, PAHs by SW-846 Method 8310, explosives by SW-846 Methods 8330 and 8332, pesticides by SW-846 Method 8081A, PCBs by SW-846 Method 8082, herbicides by SW-846 Method 8151, dioxin/furans by SW-846 Method 8290, and metals by SW-846 6010B, 6020, 7471A, and 9012A.
Were detection limits adequate?	Low-level SW-846 Methods were used. The detection limits were adequate for screening against adjusted RBCs except as noted in Table E.1-2.3. As discussed in the uncertainties in Sections 6.0 and 7.0, the lack of sensitivity could lead to an underestimation of risk at the site.

TABLE H.1-1
DATA USABILITY WORKSHEET
SITE: SWMU 13
MEDIUM: Soil

Activity	Comment
Summarize the effect of analytical technique issues on risk assessment, if applicable.	There were no analytical technical issues which significantly affected the risk assessments. Sections 6.0 and 7.0 of the RFI/CMS Report discuss the uncertainty analysis for the human health and ecological risk assessments for sampling and analysis.
Data Quality Objectives	
Precision – How were duplicates handled?	Field duplicate samples were collected at the rate of 1 per 10 soil samples. The average concentration of the soil sample and its duplicate sample were used in the risk assessments.
Accuracy – How were split samples handled?	Split samples were not collected.
Representativeness – Indicate any problems associated with data representativeness (e.g., trip blank or rinsate blank contamination, COC problems, etc.).	No significant issues regarding data representativeness were noted.
Completeness – Indicate any problems associated with data completeness (e.g., incorrect sample analysis, incomplete sample records, problems with field procedures, etc.).	No significant issues regarding completeness of the data were noted. The overall completeness goal of 90±2% for field activities was exceeded for analytical analysis and field data collection.
Comparability – Indicate any problems associated with data comparability.	No significant issues regarding comparability of the data were noted.
Were the DQOs specified in the QAPP satisfied?	Yes, the DQOs specified in the QAPP were satisfied.
Summarize the effect of DQO issues on the risk assessment, if applicable.	Not applicable.
Data Validation and Interpretation	
What are the data validation requirements for this region?	EPA Region III modifications to the National Functional Guidelines for Data Validation.
What method or guidance was used to validate the data?	EPA Region III National Functional Guidelines for Data Validation.
Was the data validation method consistent with regional guidance? Discuss any discrepancies.	Yes, there were no discrepancies.
Were all data qualifiers defined? Discuss those which were not.	Yes, they were defined in the guidance document, data validation reports included in Appendix I.2 of the RFI/CMS Report, and in the data tables included in Section 4.0 of the RFI/CMS Report.
Which qualifiers represent usable data?	B, E, J, K, L, U, UJ, UL
Which qualifiers represent unusable data?	R
How are tentatively identified compounds handled?	Detected tentatively identified compounds are qualified NJ. These compounds are not used in the risk assessments.

TABLE H.1-1
DATA USABILITY WORKSHEET
SITE: SWMU 13
MEDIUM: Soil

Activity	Comment
Summarize the effect of data validation and interpretation issues on the risk assessment, if applicable.	Section 6.0 of the RFI/CMS Report discusses uncertainties associated with qualified data.
Additional notes:	None.

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Table H.1-1
Summary of Soil Analytes Detected in Field Quality Control Samples
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID	EQB4		MDL	RL	EQB5		MDL	RL	EQB6		MDL	RL	Trip Blank 4		MDL	RL	Trip Blank 5		MDL	RL	Trip Blank 6		MDL	RL	EQBK-1		MDL	RL	EQBK-2		MDL	RL
Sample Date	10/9/2003				10/10/2003				10/10/2003				10/10/2003				10/10/2003				10/10/2003				11/12/2008				11/12/2008			
	Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r		
TAL Metals (µg/L)																																
Barium	NT				<10	U	1.82	10	<10	U	1.82	10	NT				NT				NT				0.27	J	0.23	2	NT			
Beryllium	NT				0.3	J,B,p	0.295	4	<4	U	0.295	4	NT				NT				NT				<2	U	0.23	2	NT			
Calcium	NT				<500	U	33.9	500	<500	U	33.9	500	NT				NT				NT				220	J,L,o	69	500	NT			
Chromium	NT				4.5		0.554	1	0.9	J,B,p	0.554	1	NT				NT				NT				<2	U,UL,o	0.33	2	NT			
Copper	NT				<10	U	5.36	10	<10	U	5.36	10	NT				NT				NT				1.3		0.29	1	NT			
Iron	NT				21	J,B,p	2.95	100	7.6	J,B,p	2.95	100	NT				NT				NT				<20	U	9.6	20	NT			
Lead	NT				<1	U	0.281	1	<1	U	0.281	1	NT				NT				NT				0.62	J	0.29	1	<75	U	25	75
Manganese	NT				<10	U	3.16	10	<10	U	3.16	10	NT				NT				NT				0.83	J	0.3	3	NT			
Nickel	NT				<1	U	0.41	1	<1	U	0.41	1	NT				NT				NT				0.4	J	0.35	2	NT			
Potassium	NT				<200	U	59.7	200	<200	U	59.7	200	NT				NT				NT				98	J,B,o	62	200	NT			
Sodium	NT				280	J,B,p	76.9	500	180	J,B,p	76.9	500	NT				NT				NT				<500	U	210	500	NT			
Thallium	NT				0.5	J	0.208	1	0.4	J	0.208	1	NT				NT				NT				<0.2	U	0.05	0.2	NT			
Zinc	NT				<20	U	4.55	20	4.6	J	4.55	20	NT				NT				NT				18		1.8	10	NT			
TCL VOCs (µg/L)																																
Acetone	NT				1.6	J,J,c	1.07	20	1.4	J,J,c	1.07	20	<20	U,UJ,c	1.07	20	<20	U,UJ,c	1.07	20	<20	U	1.07	20	NT				NT			
Methylene chloride	NT				0.6	J,B,z	0.117	4	0.68	J,B,z	0.117	4	1.2	J,B,z	0.117	4	1.1	J,B,z	0.117	4	0.96	J,B,z	0.117	4	NT				NT			
Toluene	NT				<1	U	0.214	1	<1	U	0.214	1	0.24	J	0.214	1	<1	U	0.214	1	<1	U	0.214	1	NT				NT			
TCL SVOCs (µg/L)																																
4-Chloro-3-Methylphenol	NT				<5	U	0.018	5	<5	U	0.018	5	NT				NT				NT				<5	U	0.021	5	NT			
Acetophenone	NT				<5	U	0.011	5	<5	U	0.011	5	NT				NT				NT				<5	U	0.043	5	NT			
Anthracene	NT				NT				NT				NT				NT				NT				0.031	J	0.014	0.5	NT			
Benzo(a)anthracene	NT				NT				NT				NT				NT				NT				0.083	J,B,z	0.037	0.5	NT			
Benzo(a)pyrene	NT				NT				NT				NT				NT				NT				0.083	J	0.023	0.5	NT			
Benzo(b)fluoranthene	NT				NT				NT				NT				NT				NT				0.062	J	0.04	0.5	NT			
Benzo(g,h,i)perylene	NT				NT				NT				NT				NT				NT				0.031	J	0.022	0.5	NT			
Benzo(k)fluoranthene	NT				NT				NT				NT				NT				NT				0.083	J,B,z	0.036	0.5	NT			
Bis(2-ethylhexyl)phthalate	NT				0.35	J,B,z	0.149	5	0.29	J,B,z	0.149	5	NT				NT				NT				<5	U	0.41	5	NT			
Butylbenzylphthalate	NT				0.06	J,B,z	0.015	5	0.05	J,B,z	0.015	5	NT				NT				NT				0.042	J	0.029	5	NT			
Carbazole	NT				<5	U,UJ,c	0.015	5	<5	U,UJ,c	0.015	5	NT				NT				NT				0.16	J	0.018	5	NT			
Chrysene	NT				NT				NT				NT				NT				NT				0.094	J,B,z	0.02	0.5	NT			
Dibenz(a,h)anthracene	NT				NT				NT				NT				NT				NT				0.042	J	0.026	0.5	NT			
Diethylphthalate	NT				<5	U	0.074	5	<5	U	0.074	5	NT				NT				NT				0.073	J,B,z	0.034	5	NT			
Fluoranthene	NT				NT				NT				NT				NT				NT				0.052	J	0.016	0.5	NT			
Indeno(1,2,3-cd)pyrene	NT				NT				NT				NT				NT				NT				0.042	J	0.014	0.5	NT			
Isophorone	NT				NT				NT				NT				NT				NT				0.11	J,B,z	0.031	5	NT			
Naphthalene	NT				NT				NT				NT				NT				NT				<0.5	U	0.023	0.5	NT			
Phenanthrene	NT				NT				NT				NT				NT				NT				0.042	J	0.015	0.5	NT			
Pyrene	NT				NT				NT				NT				NT				NT				0.052	J	0.047	0.5	NT			
TCL SVOC TICs (µg/L)																																
1-HEXACOSANOL	NT				0.64	E,NJ,t	0	0.01	0.65	E,NJ,t	0	0.01	NT				NT				NT				NT				NT			
1,2-Benzenedicarboxylicacid, bis(2-methy	NT				0.57	E,NJ,t	0	0.01	NI				NT				NT				NT				NT				NT			
2,4,6-Triallyloxy-1,3,5-triazine	NT				1.22	E,NJ,t	0	0.1	0.75	E,NJ,t	0	0.1	NT				NT				NT				NT				NT			
Erucylamide	NT				9.63	E,NJ,t	0	0.1	6.94	E,NJ,t	0	0.1	NT				NT				NT				NT				NT			
TCL Dioxin/Furans (ng/L)																																
Total TCDFs	0.00768	J	0.00493	0.05	NT				NT				NT				NT				NT				NT				NT			

Table H.1-1
Summary of Soil Analytes Detected in Field Quality Control Samples
Study Area at SWMU 13 RFI Report
Radford Army Ammunition Plant, Radford, Virginia

Sample ID	EQBK-3				EQBK-4				EQBK-5				EQBK-6				EQBK-7				EQBK-8				EQBK-9				EQBK7			
Sample Date	11/12/2008		MDL	RL	11/13/2008		MDL	RL	11/14/2008		MDL	RL	11/14/2008		MDL	RL	11/14/2008		MDL	RL	11/14/2008		MDL	RL	11/14/2008		MDL	RL	12/17/2008		MDL	RL
	Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r			Result	LQ, VQ, r		
TAL Metals (µg/L)																																
Barium	NT				NT				<2	U	0.23	2	<2	U	0.23	2	NT				NT				NT				NT			
Beryllium	NT				NT				<2	U	0.23	2	<2	U	0.23	2	NT				NT				NT				NT			
Calcium	NT				NT				<500	U,UL,o	69	500	96	J,L,o	69	500	NT				NT				NT				NT			
Chromium	NT				NT				<2	U,UL,o	0.33	2	0.37	J,L,o	0.33	2	NT				NT				NT				NT			
Copper	NT				NT				<1	U	0.29	1	0.46	J	0.29	1	NT				NT				NT				NT			
Iron	NT				NT				<20	U	9.6	20	13	J	9.6	20	NT				NT				NT				NT			
Lead	<75	U	25	75	<75	U	25	75	<1	U	0.29	1	<1	U	0.29	1	<75	U	25	75	<75	U	25	75	<75	U	25	75	<75	U	25	75
Manganese	NT				NT				0.4	J	0.3	3	0.95	J	0.3	3	NT				NT				NT				NT			
Nickel	NT				NT				<2	U	0.35	2	<2	U	0.35	2	NT				NT				NT				NT			
Potassium	NT				NT				<200	U	62	200	<200	U	62	200	NT				NT				NT				NT			
Sodium	NT				NT				<500	U	210	500	<500	U	210	500	NT				NT				NT				NT			
Thallium	NT				NT				<0.2	U	0.05	0.2	<0.2	U	0.05	0.2	NT				NT				NT				NT			
Zinc	NT				NT				12		1.8	10	16		1.8	10	NT				NT				NT				NT			
TCL VOCs (µg/L)																																
Acetone	NT				NT				NT				NT				NT				NT				NT				NT			
Methylene chloride	NT				NT				NT				NT				NT				NT				NT				NT			
Toluene	NT				NT				NT				NT				NT				NT				NT				NT			
TCL SVOCs (µg/L)																																
4-Chloro-3-Methylphenol	NT				NT				<5	U	0.021	5	<5.4	U	0.023	5.4	NT				NT				NT				NT			
Acetophenone	NT				NT				0.052	J,B,z	0.043	5	0.065	J,B,z	0.046	5.4	NT				NT				NT				NT			
Anthracene	NT				NT				<0.5	U	0.014	0.5	<0.54	U	0.015	0.54	NT				NT				NT				NT			
Benzo(a)anthracene	NT				NT				0.042	J,B,z	0.037	0.5	<0.54	U	0.041	0.54	NT				NT				NT				NT			
Benzo(a)pyrene	NT				NT				0.042	J	0.023	0.5	0.033	J	0.025	0.54	NT				NT				NT				NT			
Benzo(b)fluoranthene	NT				NT				<0.5	U	0.04	0.5	<0.54	U	0.043	0.54	NT				NT				NT				NT			
Benzo(g,h,i)perylene	NT				NT				<0.5	U	0.022	0.5	<0.54	U	0.024	0.54	NT				NT				NT				NT			
Benzo(k)fluoranthene	NT				NT				0.042	J,B,z	0.036	0.5	<0.54	U	0.039	0.54	NT				NT				NT				NT			
Bis(2-ethylhexyl)phthalate	NT				NT				<5	U	0.41	5	<5.4	U	0.45	5.4	NT				NT				NT				NT			
Butylbenzylphthalate	NT				NT				<5	U	0.029	5	<5.4	U	0.032	5.4	NT				NT				NT				NT			
Carbazole	NT				NT				<5	U	0.018	5	<5.4	U	0.02	5.4	NT				NT				NT				NT			
Chrysene	NT				NT				0.021	J,B,z	0.02	0.5	<0.54	U	0.022	0.54	NT				NT				NT				NT			
Dibenz(a,h)anthracene	NT				NT				<0.5	U	0.026	0.5	<0.54	U	0.028	0.54	NT				NT				NT				NT			
Diethylphthalate	NT				NT				0.062	J,B,z	0.034	5	0.065	J,B,z	0.037	5.4	NT				NT				NT				NT			
Fluoranthene	NT				NT				<0.5	U	0.016	0.5	<0.54	U	0.017	0.54	NT				NT				NT				NT			
Indeno(1,2,3-cd)pyrene	NT				NT				<0.5	U	0.014	0.5	<0.54	U	0.015	0.54	NT				NT				NT				NT			
Isophorone	NT				NT				0.11	J,B,z	0.031	5	0.12	J,B,z	0.033	5.4	NT				NT				NT				NT			
Naphthalene	NT				NT				0.062	J	0.023	0.5	<0.54	U	0.025	0.54	NT				NT				NT				NT			
Phenanthrene	NT				NT				<0.5	U	0.015	0.5	<0.54	U	0.016	0.54	NT				NT				NT				NT			
Pyrene	NT				NT				<0.5	U	0.047	0.5	<0.54	U	0.051	0.54	NT				NT				NT				NT			
TCL SVOC TICs (µg/L)																																
1-HEXACOSANOL	NT				NT				NT				NT				NT				NT				NT				NT			
1,2-Benzenedicarboxylicacid, bis(2-methy	NT				NT				NT				NT				NT				NT				NT				NT			
2,4,6-Triallyloxy-1,3,5-triazine	NT				NT				NT				NT				NT				NT				NT				NT			
Erucylamide	NT				NT				NT				NT				NT				NT				NT				NT			
TCL Dioxin/Furans (ng/L)																																
Total TCDFs	NT				NT				NT				NT				NT				NT				NT				NT			

Notes:

CAS = Chemical Abstracts Service
µg/L = Microgram Per Liter
TAL = Target Analyte List
TCL = Target Compound List
VOC = Volatile Organic Compound
SVOC = Semi-volatile Organic Compound
TIC = Tentatively Identified Compound
MDL = Method Detection Limit
RL = Reporting Limit
LQ = Laboratory Qualifier
VQ = Validation Qualifier
r = Reason Code
NI = Not Identified
NT = Not Tested

Data Qualifiers

B	Analyte found in associated blank as well as in the sample.
E	Estimated value when the serial dilution results are not within 10%.
J	Estimated value.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
U	The compound was analyzed for but not detected. The reporting limit will be adjusted to reflect any dilution, and for soil, the percent moisture.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
c	Calibration failure; poor (RRF) or unstable (%D) response
o	Calibration blank contamination
p	Preparation blank contamination
t	Tentatively identified compound
y	Trip blank contamination
z	Method blank and/or storage blank contamination

APPENDIX H.2
DATA VALIDATION REPORTS
AND LABORATORY ANALYTICAL DATA (FORM 1s)

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APPENDIX H.2.1
SITE SCREENING PROCESS SAMPLING
2003

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DATA VALIDATION REPORT - Level III Review

SDG No.: 36440-5 **Fraction:** VOCs, SVOCs, PAHs, Explosives, Pesticides, PCBs, Herbicides, Metals, & Cyanide

Lab: TriMatrix **Project Name:** Radford_SSP

Reviewer: AS **Date:** February_13,_2004

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific Quality Assurance Project Plan (QAPP).

Major Anomalies: None.

Minor Anomalies: For the VOC analyses, the method blank for batch 90061-120 contained acetone at 23 ug/Kg and methylene chloride at 4.0 ug/Kg. The method blank for batch 90061-121 contained acetone at 10 ug/Kg. The method blank for batch 90257-121 contained acetone at 10 ug/Kg. The method blank for batch 90037-122 contained methylene chloride at 27 ug/Kg. Positive results less than ten times the blank concentration were flagged "B,z" in the associated samples.

The associated equipment blank EQB5 submitted with sample delivery group 36440-6 displayed positive detections for acetone at 1.6 ug/L and methylene chloride at 0.60 ug/L. The field blank detection for methylene chloride was previously qualified due to a method blank detection. Positive associated soil boring sample results for acetone less than ten times the field blank concentration were previously flagged for method blank detections. No further data qualifying action was taken.

The continuing calibration analyzed on 10/20/03 at 1115 displayed a percent difference greater than the control limit (i.e., 20%) with a negative bias for methyl acetate at 23.6%. The associated field sample results were non-detect and were flagged "UJ,c". This continuing calibration also displayed percent differences greater than the control limit with a positive bias for methyl-tert-butyl ether at 22.0%, bromochloromethane at 24.0%, trans-1,3-dichloropropene at 23.3%, dibromochloromethane at 34.3%, bromoform at 33.1%, and 1,2-dibromo-3-chloropropane at 29.0%. The associated field sample results were non-detect, thus, no data qualifying action was required.

The continuing calibration analyzed on 10/21/03 at 0901 displayed a percent difference greater than the control limit with a negative bias for chloroethane at 24.1%. The associated field sample results were non-detect and were flagged "UJ,c". This continuing calibration also displayed percent differences greater than the control limit with a positive bias for trans-1,3-dichloropropene at 23.1%, dibromochloromethane at 24.8%, bromoform at 20.7%, and 1,2-dibromo-3-chloropropane at 31.6%. The associated field sample results were non-detect, thus, no data qualifying action was required.

The continuing calibration analyzed on 10/22/03 at 1151 displayed percent differences greater than the control limit with a negative bias for acetone at 28.4%, 4-methyl-2-pentanone at 26.8%, and 2-hexanone at 27.7%. The associated field sample results were non-detect and were flagged "UJ,c". This continuing calibration also displayed percent differences greater than the control limit with a positive bias for dichlorodifluoromethane at 20.3% and carbon disulfide at 22.5%. The associated field sample results were non-detect, thus, no data qualifying action was required.

The laboratory control spike for batch 90061-120 displayed recoveries greater than the laboratory generated upper control limits for bromoform at 133% and chlorodibromomethane at 135%. The laboratory control spike for batch 90061-121 displayed recoveries greater than the laboratory generated upper control limits for 1,2-dibromo-3-chloropropane at 132% and methyl acetate at 131%. The laboratory control spike for batch 90257-121 displayed recoveries greater than the laboratory generated upper control limits for 1,2-dibromo-3-chloropropane at 132% and methyl acetate at 131%. The laboratory control spike for batch 90037-122 displayed recoveries greater than the laboratory generated upper control limit (i.e., 139%) for carbon disulfide at 142%. The associated field sample results were non-detect while the laboratory control spike displayed a positive bias. No data qualifying action was required.

The matrix spike pair for sample 13SB7C displayed several percent recoveries less than the laboratory generated lower control limits. The matrix spike pair was reanalyzed and both of the matrix spikes displayed low recoveries again. The parent sample results for acetone and methylene chloride were previously flagged for method blank detections and no further data qualifying action was taken. All other parent sample results were non-detect and were flagged "UJ,m" for all recoveries that indicated a negative bias. This matrix spike pair also displayed relative percent differences greater than the laboratory generated control limits. The parent sample was positive for methyl ethyl ketone and this result was flagged "J,d". The matrix spike displayed a recovery greater than the upper control limit (i.e., 130%) for 1,2-dibromo-3-chloropropane. The laboratory control spike for this batch displayed a similar recovery and the associated parent sample result was non-detect. No data qualifying action was taken based on the matrix spike anomaly for 1,2-dibromo-3-chloropropane.

Sample 13SB12C displayed an internal standard area count less than the lower control limit (i.e., 50%) for 1,4-dichlorobenzene-d_4 at 42%. This sample was reanalyzed with similar results. Only the initial analysis was reported and should be used for data interpretation. All associated field sample results were non-detect and were flagged "UJ,i".

For the SVOC analyses, the method blank for extraction batch 90482-114 displayed positive detections for bis(2-ethylhexyl)phthalate at 26 ug/Kg and di-n-butylphthalate at 11 ug/Kg. Positive associated field sample results less than ten times the blank concentrations were flagged "B,z".

The equipment blank EQB5 contained bis(2-ethylhexyl)phthalate at 0.35 ug/L, butyl benzyl phthalate at 0.060 ug/L, and several tentatively identified compounds (TICs). The equipment blank detections for these phthalates were previously flagged due to method blank detections and no further data qualifying action was taken. Positive results less than five times the blank concentration of the TICs were flagged "B,x" in the associated soil boring field samples.

The continuing calibration analyzed on 11/01/03 at 0653 displayed a percent difference greater than the control limit (i.e., 20%) with a negative bias for 4-chloroaniline at 21.7%. The

continuing calibration analyzed on 11/01/03 at 2117 displayed a percent difference greater than the control limit with a negative bias for 2,4-dinitrophenol at 39.2%. The continuing calibration analyzed on 11/02/03 at 1249 displayed percent differences greater than the control limit with a negative bias for hexachlorocyclopentadiene at 28.0% and 2,4-dinitrophenol at 22.4%. The associated field sample results were non-detect and were flagged "UJ,c".

The laboratory control spike for batch 90482-114 displayed recoveries greater than the laboratory generated upper control limits for 2,4,5-trichlorophenol at 128%, 2,6-dinitrotoluene at 123%, 2-nitroaniline at 127%, 3,3'-dichlorobenzidine at 117%, acenaphthylene at 118%, benzo(b)fluoranthene at 125%, benzo(g,h,i)perylene at 130%, carbazole at 127%, dibenzo(a,h) anthracene at 126%, diethylphthalate at 119%, dimethylphthalate at 118%, fluorene at 121%, hexachlorocyclopentadiene at 115%, and indeno(1,2,3-cd)pyrene at 125%. The laboratory control spike for batch 90572-114 displayed a recovery greater than the laboratory generated upper control limit (i.e., 113%) for 3,3'-dichlorobenzidine at 120%. Positive associated field sample results were flagged "J,l".

The matrix spike pair for sample 13SB7C displayed percent recoveries less than the laboratory generated lower control limits for 2,4-dinitrophenol (15%/23%), 4-chloroaniline (26%), and hexachlorocyclopentadiene (12%/12%). The parent sample result for 2,4-dinitrophenol was previously flagged for a negative bias anomaly in the continuing calibration. Since the matrix spike recoveries were greater than the project QAPP lower limit (i.e., 10%), no data qualifying action was taken based on these anomalies. This matrix spike pair displayed percent recoveries greater than the laboratory generated upper control limits for 4-bromophenyl phenyl ether (114%), atrazine (124%/128%), benzo(k)fluoranthene (127%/134%), bis(2-ethylhexyl) phthalate (125%), butyl benzyl phthalate (121%), and fluorene (131%/127%). This matrix spike pair also displayed a relative percent difference greater than the laboratory generated control limit (i.e., 32%) for 2,4-dinitrophenol at 39%. All associated parent sample results were non-detect or previously flagged due to a method blank detection for bis(2-ethylhexyl) phthalate while the matrix spike recoveries exhibited a positive bias or imprecision. Since the matrix spike recoveries were less than the project QAPP upper limit (i.e., 150%), no data qualifying action was taken based on these anomalies.

The field duplicate pair (13SB12B and SBD8) displayed a relative percent difference greater than the control limit (i.e., 35%) for di-n-butylphthalate at 37.5%. These two results were flagged positive and were flagged "J,f".

Samples 13SB12B and SBD8 displayed concentrations that exceed the linear range of the analytical instrument initial calibration. These results were flagged "J,g". The samples were re-analyzed at a dilution factor of two and display acceptable results for these compounds that should be used for data interpretation.

For the PAH analyses, the 2-fluorobiphenyl surrogate percent recoveries were less than the laboratory generated lower control limit (i.e., 49%) for 69SB2B at 47%, 69SB2C at 46%, and 13SB11B at 45%. Positive associated field sample results were flagged "L,s" while non-detects were flagged "UL,s".

The field duplicate pair (13SB9A and SBD9) displayed relative percent differences greater than the control limit (i.e., 35%) for benzo(g,h,i)perylene at 77%, fluoranthene at 83%, and pyrene at 74%. The field duplicate pair results were positive for these compounds and were flagged "J,f".

For the explosive analyses, the continuing calibration analyzed on 10/23/03 at 0859 displayed a percent difference greater than the control limit (i.e., 15%) with a negative bias for 3-nitrotoluene at 16.5%. The continuing calibration analyzed on 10/23/03 at 1358 displayed a percent difference greater than the control limit with a negative bias for RDX at 23.0%. The continuing calibration analyzed on 10/23/03 at 1426 displayed a percent difference greater than the control limit with a negative bias for 3-nitrotoluene at 15.1%. The continuing calibration analyzed on 10/23/03 at 1952 displayed a percent difference greater than the control limit with a negative bias for RDX at 21.0%. The continuing calibration analyzed on 10/23/03 at 2019 displayed a percent difference greater than the control limit with a negative bias for 3-nitrotoluene at 18.3%. The positive associated field sample result was flagged "J,c" while non-detects were flagged "UJ,c". The continuing calibrations analyzed on 10/24/03 at 0119 and 0646 displayed percent differences greater than the control limit with a positive bias for 2,6-dinitrotoluene at 16.0% and 15.2%, respectively. The associated field sample results were non-detect for 2,6-dinitrotoluene while the continuing calibration displayed a positive bias. No data qualifying action was required.

The confirmation opening continuing calibration analyzed on 11/11/03 at 0817 displayed a percent difference greater than the control limit with a negative bias for RDX at 20.8%. The confirmation closing continuing calibration analyzed on 11/11/03 at 1317 displayed percent differences greater than the control limit with a negative bias for 2,4-dinitrotoluene at 15.1% and RDX at 35.8%. The laboratory reported the higher of the two concentrations for the positive 2,4-dinitrotoluene results from the primary column. The associated field sample results for RDX were previously flagged for a negative bias for the primary column continuing calibration. No further data qualifying action was taken based on these confirmation continuing calibration anomalies.

For the pesticide analyses, the continuing calibration analyzed on 10/31/03 at 0413 displayed percent differences greater than the control limit (i.e., 15%) with a positive bias for endrin at 21.6% and 4,4'-DDD at 19.9% on the front column. The associated field sample results were non-detect for endrin and 4,4'-DDD while the continuing calibration displayed a positive bias. No data qualifying action was required.

For the PCB analyses, the continuing calibration analyzed on 10/17/03 at 2007 displayed percent differences greater than the control limit (i.e., 15%) with a positive bias for aroclor 1016 at 17.7% and aroclor 1260 at 25.0% on the front column. The associated field sample results were non-detect while the continuing calibration displayed a positive bias. No data qualifying action was required.

For the herbicide analyses, the laboratory control spike for batch 90218-110 displayed a recovery less than the laboratory generated lower control limit (i.e., 50%) for dinoseb at 0% and a recovery greater than the laboratory generated upper control limit (i.e., 91%) for MCPP at 117%. The associated field sample results were non-detect for MCPP while the laboratory control spike displayed a positive bias, therefore, no data qualifying action was required. All dinoseb results from the original extraction were rejected and manually removed from the result forms by the reviewer. Only dinoseb results from the re-extraction should be used for data interpretation.

The surrogate recoveries were greater than the upper laboratory generated control limit (i.e., 114%) for both the original and re-extraction of sample 69SB2A. Since the associated field sample results were non-detect, no data qualifying action was required.

The closing continuing calibration displayed a percent difference greater than the control limit (i.e., 15%) with a positive bias for dicamba at 29.6% on column one and silvex at 17.0% on column two. The associated field sample results were non-detect. No data qualifying action was required.

For the metal analyses by 6020, the method blank for batch 90043-117 contained antimony at 0.082 mg/Kg and silver at 0.0060 mg/Kg. The method blank for batch 90112-120 contained lead at 0.098 mg/Kg. The associated positive field sample results less than five times the method blank concentrations were flagged "B,p". The equipment blank EQB5 contained chromium at 4.5 ug/L and thallium at 0.5 ug/L. The associated positive field sample results less than five times the equipment blank concentrations were flagged "B,x".

Samples 13SB11B and 13SB8A contained concentration of lead that interfered with the internal standard response for bismuth. The bismuth internal standard is used to quantitate thallium detections. TriMatrix used an alternate internal standard, holmium, and performed a seven replicate method detection limit (MDL) study for thallium using this alternate internal standard. The MDL for thallium using the holmium internal standard (0.0358 mg/Kg) could not be incorporated into the electronic data deliverable (EDD). The concentration of the thallium MDL for these two samples was manually corrected by URS within the EDD.

For the metal analyses by 6010B, the method blank for batch 90177-120 contained cobalt at 0.374 mg/Kg and sodium at 8.95 mg/Kg. The method blank for batch 90187-117 contained cobalt at 0.43 mg/Kg and iron at 14.9 mg/Kg. The associated positive field sample results were greater than five times the blank concentrations. No data qualifying action was required. The equipment blank EQB5 contained beryllium at 0.3 ug/L, iron at 7.6 ug/L, and sodium at 280 ug/L. The equipment blank results for beryllium, iron, and sodium were previously qualified due to method blank detections. No further data qualifying action was required.

The matrix spike pair performed on sample 13SB7C displayed percent recoveries greater than the laboratory generated upper control limits for calcium (133/129%), chromium (119/114%), and magnesium (127/142%). The associated field sample results were positive and were flagged "J,m", unless previously flagged for due to an equipment blank detection. The serial dilution performed on sample 13SB7C displayed percent differences greater than the control limit (i.e., 10%) for cobalt at 53.8% and copper at 21.1%. All associated field sample results were positive and were flagged "J,s".

The internal standard recovery was greater than the laboratory upper control limit (i.e., 120%) for yttrium during the neat analyses of samples 13SB7A at 135%, 13SB7B at 138%, 13SB7C at 149%, 13SB11A at 146%, 13SB11C at 152%, 13SB10A at 134%, 13SB10B at 137%, 13SB9A at 151%, and SBD9 at 151%. The samples were reanalyzed at a dilution factor of five and display acceptable internal standard recoveries. The associated field sample results for beryllium were reported from the dilution and display elevated method detection limits. Since the reporting limits were greater than three times the elevated method detection limits, the reporting limits were not elevated based on the dilution factor.

Correctable Anomalies: None.

Comments: Field coolers were received at the laboratory with internal temperatures less than the lower control limit (i.e., 2°C) at 0.9, 0.8, and 0.4 °C. Since the sample aliquots were not frozen and the containers were intact, no data qualifying action was taken.

Sample 69SB2C was analyzed at a medium level for VOC due to severe loss of internal standards for a neat original and a neat re-analysis. The sample reporting limits are appropriately elevated.

It should be noted that TIC results were flagged "NJ,t" in the associated samples. TIC results that were identified as unknown were manually lined out by the reviewer. The GIS-Key format is limited to 12 characters for a TIC CAS number. One SVOC TIC detection exceeded this limitation for samples 13SB10A and SBD9. The laboratory reported the CAS number without the dashes. The reviewer manually entered the dashes for evaluation purposes on the hardcopy result forms included in this report.

The concentrations reported for lead by SW6020 for samples 13SB11B at 26500 mg/Kg, 13SB8A at 8620 mg/Kg, 13SB12C at 1140 mg/Kg, and 13SB9A at 434 mg/Kg were greater than the concentrations not reported for lead from the SW6010B analyses for the same samples at 277 mg/Kg, 101 mg/Kg, 956 mg/Kg, and 378 mg/Kg, respectively. The two analyses have separate digestates. There was no evidence of laboratory contamination present in the method blanks. Due to the small initial volumes used for digestion, there may be fragments of lead that create heterogeneity.

No anomalies were encountered if a given fraction was not mentioned. All data are usable, as qualified, for their intended purpose based on the data reviewed.

Signed: Andrea Sansom

Andrea Sansom

Radford SSP
Duplicate Statistics

13SB9A and SBD9

	Units	RL	5xRL	Sample Conc		Duplicate Conc		%RPD	Delta	4xRL	Pass/Fail
Volatiles											
methyl ethyl ketone	ug/Kg	26	130	41		33		22%	8.0	104	Pass
acetone	ug/Kg	26	130	140		130		7.4%	10	104	Pass
methylene chloride	ug/Kg	26	130	5.7	J	5.7	J	0.0%	0.0	104	N/A
toluene	ug/Kg	6.4	32	2.7	J	0.69	J	119%	**2.0**	26	N/A
Semi-Volatiles											
2,4-dinitrotoluene	ug/Kg	220	1100	220		23	J	162%	197	880	N/A
4-chloro-3-methylphenol	ug/Kg	220	1100	25	J	8	J	103%	17	880	N/A
acenaphthene	ug/Kg	220	1100	10	J	7	J	35%	3.0	880	N/A
acephthylene	ug/Kg	220	1100	7.0	J	3	J	80%	4.0	880	N/A
anthracene	ug/Kg	220	1100	25	J	18	J	33%	7.0	880	N/A
benzo(a)anthracene	ug/Kg	220	1100	200	J	140	J	35%	60	880	N/A
benxo(a)pyrene	ug/Kg	220	1100	140	J	120	J	15%	20	880	N/A
benzo(b)fluoranthene	ug/Kg	220	1100	240		170	J	34%	70	880	N/A
benzo(g,h,i)perylene	ug/Kg	220	1100	46	J	58	J	23%	12	880	N/A
benzo(k)fluoranthene	ug/Kg	220	1100	93	J	85	J	9.0%	8.0	880	N/A
bis(2-ethylhexyl)phthalate	ug/Kg	220	1100	43	J	33	J	26%	10	880	N/A
carbazole	ug/Kg	220	1100	220	U	37	J	142%	183	880	N/A
chrysene	ug/Kg	220	1100	220		160	J	32%	60	880	N/A
dibenzo(a,h)anthracene	ug/Kg	220	1100	13	J	18	J	32%	5.0	880	N/A
diethylphthalate	ug/Kg	220	1100	230		44	J	136%	186	880	N/A
dimethylphthalate	ug/Kg	220	1100	18	J	210	U	168%	192	880	N/A
di-n-butylphthalate	ug/Kg	220	1100	580		430		30%	**150**	880	Pass
fluoranthene	ug/Kg	220	1100	260		190	J	31%	70	880	N/A
fluorene	ug/Kg	220	1100	6.0	J	4.0	J	40%	2.0	880	N/A
indeno(1,2,3-cd)pyrene	ug/Kg	220	1100	43	J	52	J	19%	9.0	880	N/A
n-nitroso-di-phenylamine	ug/Kg	220	1100	25	J	46	J	59%	21	880	N/A
phenanthene	ug/Kg	220	1100	79	J	60	J	27%	19.0	880	N/A
pyrene	ug/Kg	220	1100	230		170	J	30%	60.0	880	N/A
Polyaromatic Hydrocarbons											
acenaphthene	ug/Kg	130	650	17	J	130	U	154%	113	520	N/A
anthracene	ug/Kg	26	130	38		15		87%	**23**	104	N/A
benzo(a)anthracene	ug/Kg	26	130	130		61		72%	**69**	104	N/A
benxo(a)pyrene	ug/Kg	26	130	170		73		80%	**97**	104	N/A
benzo(b)fluoranthene	ug/Kg	26	130	120		56		73%	**64**	104	N/A
benzo(g,h,i)perylene	ug/Kg	26	130	540		240		**77%**	300	104	**Fail**
benzo(k)fluoranthene	ug/Kg	26	130	77		36		73%	**41**	104	N/A
chrysene	ug/Kg	26	130	150		74		68%	**76**	104	N/A
fluoranthene	ug/Kg	26	130	290		120		**83%**	170	104	**Fail**
fluorene	ug/Kg	26	130	11	J	26	U	81%	15	104	N/A
indeno(1,2,3-cd)pyrene	ug/Kg	26	130	100		46		74%	**54**	104	N/A
phenanthene	ug/Kg	26	130	130		50		89%	**80**	104	N/A
pyrene	ug/Kg	26	130	240		110		**74%**	130	104	**Fail**
Explosives											
BDL											
Pesticides											
BDL											
Polychlorinated Biphenyls											
BDL											
Herbicides											
BDL											
Metals											
aluminum	mg/Kg	50	250	20400		18600		9.2%	1800	200	Pass
antimony	mg/Kg	0.50	2.5	0.095	J	0.10	J	5.1%	0.005	2	N/A
arsenic	mg/Kg	0.40	2.0	2.7		2.4		12%	0.3	1.6	Pass
barium	mg/Kg	5.0	25	175		178		2%	3	20	Pass
beryllium	mg/Kg	1.0	5.0	1.2		1.1		9%	0.1	4	Pass
cadmium	mg/Kg	1.0	5.0	2.2		2.4		9%	0.2	4	Pass
calcium	mg/Kg	250	1250	1890		2070		9%	180	1000	Pass
chromium	mg/Kg	5.0	25	36		34		6%	2	20	Pass
cobalt	mg/Kg	1.0	5.0	13		13		0.0%	0	4	Pass
copper	mg/Kg	2.0	10.0	25		26		3.9%	1	8	Pass
iron	mg/Kg	200	1000	36500		35900		1.7%	600	800	Pass
lead	mg/Kg	50.0	250.0	434		396		9%	38	200	Pass
magnesium	mg/Kg	250	1250	3690		3690		0.0%	0	1000	Pass
manganese	mg/Kg	25.0	125	1240		1390		11%	150	100	Pass
mercury	mg/Kg	0.10	0.50	0.043	J	0.043	J	0%	0	0.4	N/A
nickel	mg/Kg	0.50	2.5	19		17		11%	2	2	Pass
potassium	mg/Kg	100	500	1980		1910		3.6%	70	400	Pass
selenium	mg/Kg	1.0	5.0	0.93	J	0.84	J	10%	0.09	4	N/A
silver	mg/Kg	3.0	15	0.12	J	0.12	J	0.0%	0	12	N/A
sodium	mg/Kg	100	500	44	J	45	J	2.2%	1	400	N/A
thallium	mg/Kg	0.50	2.5	0.78		0.95		20%	0.17	2	Pass
vanadium	mg/Kg	1.0	5.0	37		35		6%	2	4	Pass
zinc	mg/Kg	100	500	1010		969		4%	41	400	Pass
Cyanide											
Total Cyanide	mg/Kg	0.50	2.5	0.35	J	0.26	J	30%	0.09	2	N/A

Soil Control Limits

[sample] > 5 x RL, use 35%
[sample] < 5 x RL, use 4 x RL

URS
Measurement Systems DV Service

Radford SSP
Duplicate Statistics

13SB12B and SBD8

	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
Volatiles									
methyl ethyl ketone	ug/Kg	28	140	25 J	27 J	7.7%	2	112	N/A
acetone	ug/Kg	28	140	55 B	62 B	12%	7	112	N/A
methylene chloride	ug/Kg	28	140	6.9 B	6.1 B	12%	0.8	112	N/A
benzene	ug/Kg	7.0	35	7.0 U	1.0 J	150%	**6**	28	N/A
Semi-Volatiles									
2,4-dinitrotoluene	ug/Kg	240	1200	700	1500	73%	**800**	960	Pass
2,6-dinitrotoluene	ug/Kg	240	1200	61 J	56 J	8.5%	5	960	N/A
4-chloro-3-methylphenol	ug/Kg	240	1200	18 J	23 J	24%	5	960	N/A
bis(2-ethylhexyl)phthalate	ug/Kg	240	1200	360	300	18%	60	960	Pass
diethylphthalate	ug/Kg	240	1200	2200	2400	8.7%	200	960	Pass
dimethylphthalate	ug/Kg	240	1200	32 J	250 U	155%	218	960	N/A
di-n-butylphthalate	ug/Kg	240	1200	1300	1900	**37.5%**	600	960	**Fail**
fluoranthene	ug/Kg	240	1200	240 U	21 J	168%	219	960	N/A
n-nitroso-di-phenylamine	ug/Kg	240	1200	900	700	25%	200	960	Pass
phenanthrene	ug/Kg	240	1200	240 U	9.0 J	186%	231	960	N/A
pyrene	ug/Kg	240	1200	240 U	16 J	175%	224	960	N/A
Polyaromatic Hydrocarbons									
benzo(a)anthracene	ug/Kg	30	150	1.7 J	6 J	116%	4.7	120	N/A
benzo(a)pyrene	ug/Kg	30	150	30 U	8 J	116%	22	120	N/A
benzo(b)fluoranthene	ug/Kg	30	150	30 U	7 J	127%	23.3	120	N/A
benzo(g,h,i)perylene	ug/Kg	30	150	30 U	21 J	35%	9	120	N/A
chrysene	ug/Kg	30	150	30 U	7 J	127%	23.3	120	N/A
fluoranthene	ug/Kg	30	150	7.4 J	16 J	74%	8.6	120	N/A
indeon(1,2,3-cd)pyrene	ug/Kg	30	150	30 U	7 J	126%	23.2	120	N/A
phenanthrene	ug/Kg	30	150	2.2 J	3 J	20%	0.5	120	N/A
pyrene	ug/Kg	30	150	3.9 J	10 J	88%	6.1	120	N/A
Explosives									
fluoranthene	mg/Kg	0.50	2.5	0.50 U	0.32 J	44%	0.18	2	N/A
indeon(1,2,3-cd)pyrene	mg/Kg	0.50	2.5	0.55	0.56	2%	0.01	2	Pass
phenanthrene	mg/Kg	0.50	2.5	0.19 J	0.50 U	90%	0.31	2	N/A
pyrene	mg/Kg	0.50	2.5	0.29 J	0.50 U	53%	0.21	2	N/A
Metals									
aluminum	mg/Kg	50	250	9910	8930	10%	980	200	Pass
antimony	mg/Kg	0.50	2.5	1.1	1.30	17%	0.2	2	Pass
arsenic	mg/Kg	0.40	2.0	1.2	1.2	0.0%	0	1.6	Pass
barium	mg/Kg	5.0	25	106	102	3.8%	4	20	Pass
cadmium	mg/Kg	1.0	5.0	1.4	1.6	13%	0.2	4	Pass
calcium	mg/Kg	250	1250	4820	4640	3.8%	180	1000	Pass
chromium	mg/Kg	5.0	25	27	26	3.8%	1	20	Pass
cobalt	mg/Kg	1.0	5.0	6.4	6	1.6%	0.1	4	Pass
copper	mg/Kg	2.0	10.0	37	36	2.7%	1	8	Pass
iron	mg/Kg	100	500	15000	14700	2.0%	300	400	Pass
lead	mg/Kg	50.0	250.0	325	318	2.2%	7	200	Pass
magnesium	mg/Kg	250	1250	3270	3050	7.0%	220	1000	Pass
manganese	mg/Kg	5.0	25	280	291	3.9%	11	20	Pass
mercury	mg/Kg	0.10	0.50	0.041 J	0.035 J	16%	0.006	0.4	N/A
nickel	mg/Kg	0.50	2.5	11	10	14%	1.4	2	Pass
potassium	mg/Kg	100	500	1420	1290	9.6%	130	400	Pass
selenium	mg/Kg	1.0	5.0	0.39 J	0.41 J	5%	0.02	4	N/A
silver	mg/Kg	3.0	15	0.027 J	0.030 J	11%	0.003	12	N/A
sodium	mg/Kg	100	500	252	88 J	96%	**164**	400	N/A
thallium	mg/Kg	0.50	2.5	0.23 J	0.15 J	42%	0.08	2	N/A
vanadium	mg/Kg	1.0	5.0	17	17	0.0%	0	4	Pass
zinc	mg/Kg	4.0	20	377	426	12%	49	16	Pass
Cyanide									
Total Cyanide	mg/Kg	0.50	2.5	0.39 J	0.23 J	52%	0.16	2	N/A

Soil Control Limits

[sample] > 5 x RL, use 35%
[sample] < 5 x RL, use 4 x RL

URS
Measurement Systems DV Service

Radford SSP

Submittal No.	Lab Sample ID	Field Sample ID	Matrix (Code)	Sample Date
36440-5	345745	69SB2A	SO	10/08/03
36440-5	345746	69SB2B	SO	10/08/03
36440-5	345747	69SB2C	SO	10/08/03
36440-5	345748	57SB4B	SO	10/08/03
36440-5	345883	13SB7A	SO	10/09/03
36440-5	345884	13SB7B	SO	10/09/03
36440-5	345885	13SB7C	SO	10/09/03
36440-5	345886	13SB12A	SO	10/09/03
36440-5	345887	13SB12B	SO	10/09/03
36440-5	345888	SBD8	SO	10/09/03
36440-5	345889	13SB12C	SO	10/09/03
36440-5	345890	13SB11A	SO	10/09/03
36440-5	345891	13SB11B	SO	10/09/03
36440-5	345892	13SB11C	SO	10/09/03
36440-5	345893	13SB10A	SO	10/09/03
36440-5	345894	13SB10B	SO	10/09/03
36440-5	345895	13SB10C	SO	10/09/03
36440-5	345896	13SB9A	SO	10/09/03
36440-5	345897	SBD9	SO	10/09/03
36440-5	345898	13SB9B	SO	10/09/03
36440-5	345899	13SB9C	SO	10/09/03
36440-5	345900	13SB8A	SO	10/09/03
36440-5	345901	13SB8B	SO	10/09/03

TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**69SB2A**	QC Batch:	90061 -120
Sample #:	**345745**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.0 U		6.0	0.511
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.0 U		6.0	0.911
79-34-5	1,1,2,2-Tetrachloroethane	6.0 U		6.0	0.784
79-00-5	1,1,2-Trichloroethane	6.0 U		6.0	0.712
75-34-3	1,1-Dichloroethane	6.0 U		6.0	0.869
75-35-4	1,1-Dichloroethylene	6.0 U		6.0	0.880
106-93-4	1,2-Dibromoethane	6.0 U		6.0	0.822
96-12-8	1,2-Dibromo-3-chloropropane	12 U		12	2.50
95-50-1	1,2-Dichlorobenzene	6.0 U		6.0	0.581
107-06-2	1,2-Dichloroethane	6.0 U		6.0	0.517
156-59-2	cis-1,2-Dichloroethene	6.0 U		6.0	0.852
156-60-5	trans-1,2-Dichloroethene	6.0 U		6.0	0.844
78-87-5	1,2-Dichloropropane	6.0 U		6.0	0.703
87-61-6	1,2,3-Trichlorobenzene	6.0 U		6.0	0.653
120-82-1	1,2,4-Trichlorobenzene	6.0 U		6.0	0.492
541-73-1	1,3-Dichlorobenzene	6.0 U		6.0	0.322
106-46-7	1,4-Dichlorobenzene	6.0 U		6.0	0.852
78-93-3	**Methyl Ethyl Ketone**	**30**		24	6.00
591-78-6	2-Hexanone	12 U		12	2.71
108-10-1	4-Methyl-2-Pentanone	12 U		12	1.75
67-64-1	***Acetone**	**110 B**	B,Z	24	6.00
71-43-2	Benzene	6.0 U		6.0	0.632
74-97-5	Bromochloromethane	6.0 U		6.0	0.913
75-27-4	Dichlorobromomethane	6.0 U		6.0	0.601
75-25-2	Bromoform	6.0 U		6.0	0.694
74-83-9	Bromomethane	6.0 U		6.0	1.80
75-15-0	Carbon Disulfide	6.0 U		6.0	1.74
56-23-5	Carbon Tetrachloride	6.0 U		6.0	0.559
108-90-7	Chlorobenzene	6.0 U		6.0	0.793
75-00-3	Chloroethane	6.0 U		6.0	1.62
67-66-3	Chloroform	6.0 U		6.0	0.535

* See attached Statement of Data Qualifications.

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Individual sample results relate only to the sample tested.

TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**69SB2A**	QC Batch:	90061 -120
Sample #:	**345745**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
74-87-3	Chloromethane	6.0 U		6.0	1.00
110-82-7	Cyclohexane	12 U		12	0.379
10061-01-5	cis-1,3-Dichloropropene	6.0 U		6.0	0.589
10061-02-6	trans-1,3-Dichloropropene	6.0 U		6.0	0.625
75-71-8	Dichlorodifluoromethane	6.0 U		6.0	0.802
124-48-1	Chlorodibromomethane	6.0 U		6.0	0.620
100-41-4	Ethylbenzene	6.0 U		6.0	0.508
98-82-8	Isopropylbenzene	6.0 U		6.0	0.655
79-20-9	Methyl Acetate	24 U	UJ,c	24	4.16
108-87-2	Methylcyclohexane	12 U		12	1.01
1634-04-4	Methyl(tert)butyl Ether	6.0 U		6.0	0.769
75-09-2	Methylene Chloride	24 U		24	3.37
100-42-5	Styrene	6.0 U		6.0	0.530
127-18-4	Tetrachloroethene	6.0 U		6.0	0.736
108-88-3	Toluene	6.0 U		6.0	0.557
79-01-6	Trichloroethene	6.0 U		6.0	0.812
75-69-4	Trichlorofluoromethane	6.0 U		6.0	0.892
75-01-4	Vinyl Chloride	6.0 U		6.0	0.444
1330-20-7	Xylene (Total)	6.0 U		6.0	0.505

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**69SB2A**	QC Batch:	90061 -120
Sample #:	**345745**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	83
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
Hexanal	66-25-1	17	E	NJ, +

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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Individual sample results relate only to the sample tested.

TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/09/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/20/03 by JDM
		Anal. Method:	USEPA-8260B
Sample ID:	**69SB2B**	QC Batch:	90061 -120
Sample #:	**345746**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	79
Unit:	ug/kg dry	Dilution Factor:	1.26

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.3 U		6.3	0.537
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.3 U		6.3	0.956
79-34-5	1,1,2,2-Tetrachloroethane	6.3 U		6.3	0.823
79-00-5	1,1,2-Trichloroethane	6.3 U		6.3	0.747
75-34-3	1,1-Dichloroethane	6.3 U		6.3	0.912
75-35-4	1,1-Dichloroethylene	6.3 U		6.3	0.924
106-93-4	1,2-Dibromoethane	6.3 U		6.3	0.863
96-12-8	1,2-Dibromo-3-chloropropane	13 U		13	2.62
95-50-1	1,2-Dichlorobenzene	6.3 U		6.3	0.610
107-06-2	1,2-Dichloroethane	6.3 U		6.3	0.543
156-59-2	cis-1,2-Dichloroethene	6.3 U		6.3	0.895
156-60-5	trans-1,2-Dichloroethene	6.3 U		6.3	0.886
78-87-5	1,2-Dichloropropane	6.3 U		6.3	0.738
87-61-6	1,2,3-Trichlorobenzene	6.3 U		6.3	0.685
120-82-1	1,2,4-Trichlorobenzene	6.3 U		6.3	0.517
541-73-1	1,3-Dichlorobenzene	6.3 U		6.3	0.338
106-46-7	1,4-Dichlorobenzene	6.3 U		6.3	0.895
78-93-3	**Methyl Ethyl Ketone**	**23 J**		26	6.30
591-78-6	2-Hexanone	13 U		13	2.85
108-10-1	4-Methyl-2-Pentanone	13 U		13	1.84
67-64-1	***Acetone**	**65 B**	B,Z	26	6.30
71-43-2	Benzene	6.3 U		6.3	0.664
74-97-5	Bromochloromethane	6.3 U		6.3	0.959
75-27-4	Dichlorobromomethane	6.3 U		6.3	0.631
75-25-2	Bromoform	6.3 U		6.3	0.728
74-83-9	Bromomethane	6.3 U		6.3	1.89
75-15-0	Carbon Disulfide	6.3 U		6.3	1.83
56-23-5	Carbon Tetrachloride	6.3 U		6.3	0.587
108-90-7	Chlorobenzene	6.3 U		6.3	0.833
75-00-3	Chloroethane	6.3 U		6.3	1.70
67-66-3	Chloroform	6.3 U		6.3	0.562

* See attached Statement of Data Qualifications.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**69SB2B**	QC Batch:	90061 -120
Sample #:	**345746**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	79
Unit:	ug/kg dry	Dilution Factor:	1.26

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
74-87-3	Chloromethane	6.3 U	6.3	1.05
110-82-7	Cyclohexane	13 U	13	0.398
10061-01-5	cis-1,3-Dichloropropene	6.3 U	6.3	0.619
10061-02-6	trans-1,3-Dichloropropene	6.3 U	6.3	0.656
75-71-8	Dichlorodifluoromethane	6.3 U	6.3	0.842
124-48-1	Chlorodibromomethane	6.3 U	6.3	0.651
100-41-4	Ethylbenzene	6.3 U	6.3	0.533
98-82-8	Isopropylbenzene	6.3 U	6.3	0.688
79-20-9	Methyl Acetate	26 U	UJ,C 26	4.37
108-87-2	Methylcyclohexane	13 U	13	1.06
1634-04-4	Methyl(tert)butyl Ether	6.3 U	6.3	0.808
75-09-2	Methylene Chloride	26 U	26	3.54
100-42-5	Styrene	6.3 U	6.3	0.557
127-18-4	Tetrachloroethene	6.3 U	6.3	0.772
108-88-3	Toluene	6.3 U	6.3	0.585
79-01-6	Trichloroethene	6.3 U	6.3	0.853
75-69-4	Trichlorofluoromethane	6.3 U	6.3	0.936
75-01-4	Vinyl Chloride	6.3 U	6.3	0.466
1330-20-7	Xylene (Total)	6.3 U	6.3	0.530

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**69SB2B**	QC Batch:	90061 -120
Sample #:	**345746**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	79
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	CAS Number	Result (ug/kg dr	Qualifier
No compound was detected.			

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:30
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/09/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/22/03 by JDM
		Anal. Method:	USEPA-8260B
Sample ID:	**69SB2C**	QC Batch:	90037 -122
Sample #:	**345747**	Anal. Batch:	208078
Matrix:	Soil	Percent Solids:	75
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	67 U		67	9.23
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	67 U		67	11.6
79-34-5	1,1,2,2-Tetrachloroethane	67 U		67	9.62
79-00-5	1,1,2-Trichloroethane	67 U		67	9.23
75-34-3	1,1-Dichloroethane	67 U		67	3.71
75-35-4	1,1-Dichloroethylene	67 U		67	8.65
106-93-4	1,2-Dibromoethane	67 U		67	11.1
96-12-8	1,2-Dibromo-3-chloropropane	130 U		130	17.6
95-50-1	1,2-Dichlorobenzene	67 U		67	10.7
107-06-2	1,2-Dichloroethane	67 U		67	7.22
156-59-2	cis-1,2-Dichloroethene	67 U		67	9.04
156-60-5	trans-1,2-Dichloroethene	67 U		67	9.30
78-87-5	1,2-Dichloropropane	67 U		67	16.6
87-61-6	1,2,3-Trichlorobenzene	67 U		67	14.8
120-82-1	1,2,4-Trichlorobenzene	67 U		67	12.3
541-73-1	1,3-Dichlorobenzene	67 U		67	10.4
106-46-7	1,4-Dichlorobenzene	67 U		67	8.06
78-93-3	**Methyl Ethyl Ketone**	**260 J**		670	27.0
591-78-6	2-Hexanone	670 U	UJ,c	670	29.6
108-10-1	4-Methyl-2-Pentanone	670 U	UJ,c	670	23.7
67-64-1	Acetone	670 U	UJ,c	670	69.6
71-43-2	Benzene	67 U		67	1.40
74-97-5	Bromochloromethane	67 U		67	4.93
75-27-4	Dichlorobromomethane	130 U		130	28.1
75-25-2	Bromoform	67 U		67	7.15
74-83-9	Bromomethane	67 U		67	17.4
75-15-0	Carbon Disulfide	67 U		67	3.86
56-23-5	Carbon Tetrachloride	67 U		67	7.48
108-90-7	Chlorobenzene	67 U		67	10.2
75-00-3	Chloroethane	67 U		67	11.7
67-66-3	Chloroform	67 U		67	6.57

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**69SB2C**	QC Batch:	90037 -122
Sample #:	**345747**	Anal. Batch:	208078
Matrix:	Soil	Percent Solids:	75
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
74-87-3	Chloromethane	67 U	67	6.70
110-82-7	Cyclohexane	670 U	670	14.0
10061-01-5	cis-1,3-Dichloropropene	67 U	67	12.3
10061-02-6	trans-1,3-Dichloropropene	67 U	67	7.61
75-71-8	Dichlorodifluoromethane	67 U	67	7.80
124-48-1	Chlorodibromomethane	67 U	67	7.02
100-41-4	Ethylbenzene	67 U	67	12.7
98-82-8	Isopropylbenzene	67 U	67	5.86
79-20-9	Methyl Acetate	670 U	670	15.1
108-87-2	Methylcyclohexane	670 U	670	10.9
1634-04-4	Methyl(tert)butyl Ether	67 U	67	5.01
75-09-2	**Methylene Chloride**	**42 J** B,2	67	7.61
100-42-5	Styrene	67 U	67	8.91
127-18-4	Tetrachloroethene	67 U	67	12.5
108-88-3	Toluene	67 U	67	13.9
79-01-6	Trichloroethene	67 U	67	13.8
75-69-4	Trichlorofluoromethane	67 U	67	3.30
75-01-4	Vinyl Chloride	67 U	67	7.74
1330-20-7	Xylene (Total)	200 U	200	34.5

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**69SB2C**	QC Batch:	90037 -122
Sample #:	**345747**	Anal. Batch:	208078
Matrix:	Soil	Percent Solids:	75
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**

No compound was detected.

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Individual sample results relate only to the sample tested.

TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 16:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**57SB4B**	QC Batch:	90061 -120
Sample #:	**345748**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	74
Unit:	ug/kg dry	Dilution Factor:	1.35

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.8 U		6.8	0.575
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.8 U		6.8	1.02
79-34-5	1,1,2,2-Tetrachloroethane	6.8 U		6.8	0.882
79-00-5	1,1,2-Trichloroethane	6.8 U		6.8	0.801
75-34-3	1,1-Dichloroethane	6.8 U		6.8	0.977
75-35-4	1,1-Dichloroethylene	6.8 U		6.8	0.990
106-93-4	1,2-Dibromoethane	6.8 U		6.8	0.925
96-12-8	1,2-Dibromo-3-chloropropane	14 U		14	2.81
95-50-1	1,2-Dichlorobenzene	6.8 U		6.8	0.653
107-06-2	1,2-Dichloroethane	6.8 U		6.8	0.582
156-59-2	cis-1,2-Dichloroethene	6.8 U		6.8	0.959
156-60-5	trans-1,2-Dichloroethene	6.8 U		6.8	0.949
78-87-5	1,2-Dichloropropane	6.8 U		6.8	0.791
87-61-6	1,2,3-Trichlorobenzene	6.8 U		6.8	0.734
120-82-1	1,2,4-Trichlorobenzene	6.8 U		6.8	0.554
541-73-1	1,3-Dichlorobenzene	6.8 U		6.8	0.362
106-46-7	1,4-Dichlorobenzene	6.8 U		6.8	0.959
78-93-3	**Methyl Ethyl Ketone**	**27 J**		28	6.75
591-78-6	2-Hexanone	14 U		14	3.05
108-10-1	4-Methyl-2-Pentanone	14 U		14	1.97
67-64-1	***Acetone**	**66 B**	B, Z	28	6.75
71-43-2	Benzene	6.8 U		6.8	0.711
74-97-5	Bromochloromethane	6.8 U		6.8	1.03
75-27-4	Dichlorobromomethane	6.8 U		6.8	0.676
75-25-2	Bromoform	6.8 U		6.8	0.780
74-83-9	Bromomethane	6.8 U		6.8	2.03
75-15-0	Carbon Disulfide	6.8 U		6.8	1.96
56-23-5	Carbon Tetrachloride	6.8 U		6.8	0.629
108-90-7	Chlorobenzene	6.8 U		6.8	0.892
75-00-3	Chloroethane	6.8 U		6.8	1.82
67-66-3	Chloroform	6.8 U		6.8	0.602

* See attached Statement of Data Qualifications.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 16:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**57SB4B**	QC Batch:	90061 -120
Sample #:	**345748**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	74
Unit:	ug/kg dry	Dilution Factor:	1.35

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
74-87-3	Chloromethane	6.8 U		6.8	1.13
110-82-7	Cyclohexane	14 U		14	0.427
10061-01-5	cis-1,3-Dichloropropene	6.8 U		6.8	0.663
10061-02-6	trans-1,3-Dichloropropene	6.8 U		6.8	0.703
75-71-8	Dichlorodifluoromethane	6.8 U		6.8	0.902
124-48-1	Chlorodibromomethane	6.8 U		6.8	0.698
100-41-4	Ethylbenzene	6.8 U		6.8	0.571
98-82-8	Isopropylbenzene	6.8 U		6.8	0.737
79-20-9	Methyl Acetate	28 U	UJ, C	28	4.68
108-87-2	Methylcyclohexane	14 U		14	1.14
1634-04-4	Methyl(tert)butyl Ether	6.8 U		6.8	0.865
75-09-2	Methylene Chloride	28 U		28	3.79
100-42-5	Styrene	6.8 U		6.8	0.597
127-18-4	Tetrachloroethene	6.8 U		6.8	0.828
108-88-3	Toluene	6.8 U		6.8	0.626
79-01-6	Trichloroethene	6.8 U		6.8	0.914
75-69-4	Trichlorofluoromethane	6.8 U		6.8	1.00
75-01-4	Vinyl Chloride	6.8 U		6.8	0.500
1330-20-7	Xylene (Total)	6.8 U		6.8	0.568

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 16:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**57SB4B**	QC Batch:	90061 -120
Sample #:	**345748**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	74
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**
No compound was detected.			

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 09:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB7A**	QC Batch:	90061 -120
Sample #:	**345883**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	82
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.1 U		6.1	0.511
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.1 U		6.1	0.911
79-34-5	1,1,2,2-Tetrachloroethane	6.1 U		6.1	0.784
79-00-5	1,1,2-Trichloroethane	6.1 U		6.1	0.712
75-34-3	1,1-Dichloroethane	6.1 U		6.1	0.869
75-35-4	1,1-Dichloroethylene	6.1 U		6.1	0.880
106-93-4	1,2-Dibromoethane	6.1 U		6.1	0.822
96-12-8	1,2-Dibromo-3-chloropropane	12 U		12	2.50
95-50-1	1,2-Dichlorobenzene	6.1 U		6.1	0.581
107-06-2	1,2-Dichloroethane	6.1 U		6.1	0.517
156-59-2	cis-1,2-Dichloroethene	6.1 U		6.1	0.852
156-60-5	trans-1,2-Dichloroethene	6.1 U		6.1	0.844
78-87-5	1,2-Dichloropropane	6.1 U		6.1	0.703
87-61-6	1,2,3-Trichlorobenzene	6.1 U		6.1	0.653
120-82-1	1,2,4-Trichlorobenzene	6.1 U		6.1	0.492
541-73-1	1,3-Dichlorobenzene	6.1 U		6.1	0.322
106-46-7	1,4-Dichlorobenzene	6.1 U		6.1	0.852
78-93-3	**Methyl Ethyl Ketone**	**38**		24	6.00
591-78-6	2-Hexanone	12 U		12	2.71
108-10-1	4-Methyl-2-Pentanone	12 U		12	1.75
67-64-1	**Acetone**	**140**	B,Z	24	6.00
71-43-2	Benzene	6.1 U		6.1	0.632
74-97-5	Bromochloromethane	6.1 U		6.1	0.913
75-27-4	Dichlorobromomethane	6.1 U		6.1	0.601
75-25-2	Bromoform	6.1 U		6.1	0.694
74-83-9	Bromomethane	6.1 U		6.1	1.80
75-15-0	Carbon Disulfide	6.1 U		6.1	1.74
56-23-5	Carbon Tetrachloride	6.1 U		6.1	0.559
108-90-7	Chlorobenzene	6.1 U		6.1	0.793
75-00-3	Chloroethane	6.1 U		6.1	1.62
67-66-3	Chloroform	6.1 U		6.1	0.535

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 09:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB7A**	QC Batch:	90061 -120
Sample #:	**345883**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	82
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
74-87-3	Chloromethane	6.1 U		6.1	1.00
110-82-7	Cyclohexane	12 U		12	0.379
10061-01-5	cis-1,3-Dichloropropene	6.1 U		6.1	0.589
10061-02-6	trans-1,3-Dichloropropene	6.1 U		6.1	0.625
75-71-8	Dichlorodifluoromethane	6.1 U		6.1	0.802
124-48-1	Chlorodibromomethane	6.1 U		6.1	0.620
100-41-4	Ethylbenzene	6.1 U		6.1	0.508
98-82-8	Isopropylbenzene	6.1 U		6.1	0.655
79-20-9	Methyl Acetate	24 U	UJ,C	24	4.16
108-87-2	Methylcyclohexane	12 U		12	1.01
1634-04-4	Methyl(tert)butyl Ether	6.1 U		6.1	0.769
75-09-2	**Methylene Chloride**	**6.4 J**	B,Z	24	3.37
100-42-5	Styrene	6.1 U		6.1	0.530
127-18-4	Tetrachloroethene	6.1 U		6.1	0.736
108-88-3	Toluene	6.1 U		6.1	0.557
79-01-6	Trichloroethene	6.1 U		6.1	0.812
75-69-4	Trichlorofluoromethane	6.1 U		6.1	0.892
75-01-4	Vinyl Chloride	6.1 U		6.1	0.444
1330-20-7	Xylene (Total)	6.1 U		6.1	0.505

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5560 Corporate Exchange Court SE • Grand Rapids, MI 49512 • (616) 975-4500 • Fax (616) 942-7463

TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 09:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB7A**	QC Batch:	90061 -120
Sample #:	**345883**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	82
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**
Hexanal	66-25-1	13	E NJ, +

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB7B**	QC Batch:	90061 -120
Sample #:	**345884**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.2 U		6.2	0.511
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.2 U		6.2	0.911
79-34-5	1,1,2,2-Tetrachloroethane	6.2 U		6.2	0.784
79-00-5	1,1,2-Trichloroethane	6.2 U		6.2	0.712
75-34-3	1,1-Dichloroethane	6.2 U		6.2	0.869
75-35-4	1,1-Dichloroethylene	6.2 U		6.2	0.880
106-93-4	1,2-Dibromoethane	6.2 U		6.2	0.822
96-12-8	1,2-Dibromo-3-chloropropane	12 U		12	2.50
95-50-1	1,2-Dichlorobenzene	6.2 U		6.2	0.581
107-06-2	1,2-Dichloroethane	6.2 U		6.2	0.517
156-59-2	cis-1,2-Dichloroethene	6.2 U		6.2	0.852
156-60-5	trans-1,2-Dichloroethene	6.2 U		6.2	0.844
78-87-5	1,2-Dichloropropane	6.2 U		6.2	0.703
87-61-6	1,2,3-Trichlorobenzene	6.2 U		6.2	0.653
120-82-1	1,2,4-Trichlorobenzene	6.2 U		6.2	0.492
541-73-1	1,3-Dichlorobenzene	6.2 U		6.2	0.322
106-46-7	1,4-Dichlorobenzene	6.2 U		6.2	0.852
78-93-3	**Methyl Ethyl Ketone**	**37**		25	6.00
591-78-6	2-Hexanone	12 U		12	2.71
108-10-1	4-Methyl-2-Pentanone	12 U		12	1.75
67-64-1	**Acetone**	**130**	B,Z	25	6.00
71-43-2	Benzene	6.2 U		6.2	0.632
74-97-5	Bromochloromethane	6.2 U		6.2	0.913
75-27-4	Dichlorobromomethane	6.2 U		6.2	0.601
75-25-2	Bromoform	6.2 U		6.2	0.694
74-83-9	Bromomethane	6.2 U		6.2	1.80
75-15-0	Carbon Disulfide	6.2 U		6.2	1.74
56-23-5	Carbon Tetrachloride	6.2 U		6.2	0.559
108-90-7	Chlorobenzene	6.2 U		6.2	0.793
75-00-3	Chloroethane	6.2 U		6.2	1.62
67-66-3	Chloroform	6.2 U		6.2	0.535

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB7B**	QC Batch:	90061 -120
Sample #:	**345884**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
74-87-3	Chloromethane	6.2 U		6.2	1.00
110-82-7	Cyclohexane	12 U		12	0.379
10061-01-5	cis-1,3-Dichloropropene	6.2 U		6.2	0.589
10061-02-6	trans-1,3-Dichloropropene	6.2 U		6.2	0.625
75-71-8	Dichlorodifluoromethane	6.2 U		6.2	0.802
124-48-1	Chlorodibromomethane	6.2 U		6.2	0.620
100-41-4	Ethylbenzene	6.2 U		6.2	0.508
98-82-8	Isopropylbenzene	6.2 U		6.2	0.655
79-20-9	Methyl Acetate	25 U	UJ,C	25	4.16
108-87-2	Methylcyclohexane	12 U		12	1.01
1634-04-4	Methyl(tert)butyl Ether	6.2 U		6.2	0.769
75-09-2	**Methylene Chloride**	**6.8 J**	B,Z	25	3.37
100-42-5	Styrene	6.2 U		6.2	0.530
127-18-4	Tetrachloroethene	6.2 U		6.2	0.736
108-88-3	Toluene	6.2 U		6.2	0.557
79-01-6	Trichloroethene	6.2 U		6.2	0.812
75-69-4	Trichlorofluoromethane	6.2 U		6.2	0.892
75-01-4	Vinyl Chloride	6.2 U		6.2	0.444
1330-20-7	Xylene (Total)	6.2 U		6.2	0.505

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/20/03 JDM
		Anal. Method:	USEPA-8260B
Sample ID:	**13SB7B**	QC Batch:	90061 -120
Sample #:	**345884**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	80
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**

No compound was detected.

TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB7C**	QC Batch:	90061 -120
Sample #:	**345885**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	79
Unit:	ug/kg dry	Dilution Factor:	1.26

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	*1,1,1-Trichloroethane	6.3 U	UJ,M	6.3	0.537
76-13-1	*1,1,2-Trichloro-1,2,2-trifluoroethane	6.3 U	UJ,M	6.3	0.956
79-34-5	*1,1,2,2-Tetrachloroethane	6.3 U		6.3	0.823
79-00-5	1,1,2-Trichloroethane	6.3 U		6.3	0.747
75-34-3	1,1-Dichloroethane	6.3 U		6.3	0.912
75-35-4	*1,1-Dichloroethylene	6.3 U	UJ,M	6.3	0.924
106-93-4	*1,2-Dibromoethane	6.3 U	UJ,M	6.3	0.863
96-12-8	*1,2-Dibromo-3-chloropropane	13 U		13	2.62
95-50-1	*1,2-Dichlorobenzene	6.3 U	UJ,M	6.3	0.610
107-06-2	1,2-Dichloroethane	6.3 U		6.3	0.543
156-59-2	cis-1,2-Dichloroethene	6.3 U		6.3	0.895
156-60-5	*trans-1,2-Dichloroethene	6.3 U	UJ,M	6.3	0.886
78-87-5	1,2-Dichloropropane	6.3 U		6.3	0.738
87-61-6	*1,2,3-Trichlorobenzene	6.3 U	UJ,M	6.3	0.685
120-82-1	*1,2,4-Trichlorobenzene	6.3 U	UJ,M	6.3	0.517
541-73-1	*1,3-Dichlorobenzene	6.3 U	UJ,M	6.3	0.338
106-46-7	*1,4-Dichlorobenzene	6.3 U	UJ,M	6.3	0.895
78-93-3	***Methyl Ethyl Ketone**	**29**	J,d	25	6.30
591-78-6	*2-Hexanone	13 U		13	2.85
108-10-1	4-Methyl-2-Pentanone	13 U		13	1.84
67-64-1	***Acetone**	**110 B**	B,Z	25	6.30
71-43-2	*Benzene	6.3 U	UJ,M	6.3	0.664
74-97-5	Bromochloromethane	6.3 U		6.3	0.959
75-27-4	*Dichlorobromomethane	6.3 U		6.3	0.631
75-25-2	*Bromoform	6.3 U		6.3	0.728
74-83-9	Bromomethane	6.3 U		6.3	1.89
75-15-0	*Carbon Disulfide	6.3 U	UJ,M	6.3	1.83
56-23-5	*Carbon Tetrachloride	6.3 U	UJ,M	6.3	0.587
108-90-7	*Chlorobenzene	6.3 U	UJ,M	6.3	0.833
75-00-3	*Chloroethane	6.3 U	UJ,M	6.3	1.70
67-66-3	Chloroform	6.3 U		6.3	0.562

* See attached Statement of Data Qualifications.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB7C**	QC Batch:	90061 -120
Sample #:	**345885**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	79
Unit:	ug/kg dry	Dilution Factor:	1.26

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
74-87-3	Chloromethane	6.3 U		6.3	1.05
110-82-7	*Cyclohexane	13 U	UJ,M	13	0.398
10061-01-5	*cis-1,3-Dichloropropene	6.3 U		6.3	0.619
10061-02-6	*trans-1,3-Dichloropropene	6.3 U		6.3	0.656
75-71-8	*Dichlorodifluoromethane	6.3 U	UJ,M	6.3	0.842
124-48-1	*Chlorodibromomethane	6.3 U		6.3	0.651
100-41-4	*Ethylbenzene	6.3 U	UJ,M	6.3	0.533
98-82-8	*Isopropylbenzene	6.3 U	UJ,M	6.3	0.688
79-20-9	*Methyl Acetate	25 U	UJ,C	25	4.37
108-87-2	*Methylcyclohexane	13 U		13	1.06
1634-04-4	Methyl(tert)butyl Ether	6.3 U		6.3	0.808
75-09-2	***Methylene Chloride**	**7.2 J**	B,Z	25	3.54
100-42-5	*Styrene	6.3 U	UJ,M	6.3	0.557
127-18-4	*Tetrachloroethene	6.3 U	UJ,M	6.3	0.772
108-88-3	*Toluene	6.3 U	UJ,M	6.3	0.585
79-01-6	*Trichloroethene	6.3 U		6.3	0.853
75-69-4	*Trichlorofluoromethane	6.3 U	UJ,M	6.3	0.936
75-01-4	Vinyl Chloride	6.3 U		6.3	0.466
1330-20-7	*Xylene (Total)	6.3 U	UJ,M	6.3	0.530

* See attached Statement of Data Qualifications.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB7C**	QC Batch:	90061 -120
Sample #:	**345885**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	79
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**

No compound was detected.

TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB12A**	QC Batch:	90061 -120
Sample #:	**345886**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.4 U		6.4	0.554
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.4 U		6.4	0.987
79-34-5	1,1,2,2-Tetrachloroethane	6.4 U		6.4	0.849
79-00-5	1,1,2-Trichloroethane	6.4 U		6.4	0.771
75-34-3	1,1-Dichloroethane	6.4 U		6.4	0.941
75-35-4	1,1-Dichloroethylene	6.4 U		6.4	0.953
106-93-4	1,2-Dibromoethane	6.4 U		6.4	0.891
96-12-8	1,2-Dibromo-3-chloropropane	13 U		13	2.70
95-50-1	1,2-Dichlorobenzene	6.4 U		6.4	0.629
107-06-2	1,2-Dichloroethane	6.4 U		6.4	0.560
156-59-2	cis-1,2-Dichloroethene	6.4 U		6.4	0.923
156-60-5	trans-1,2-Dichloroethene	6.4 U		6.4	0.914
78-87-5	1,2-Dichloropropane	6.4 U		6.4	0.762
87-61-6	1,2,3-Trichlorobenzene	6.4 U		6.4	0.707
120-82-1	1,2,4-Trichlorobenzene	6.4 U		6.4	0.533
541-73-1	1,3-Dichlorobenzene	6.4 U		6.4	0.348
106-46-7	1,4-Dichlorobenzene	6.4 U		6.4	0.923
78-93-3	**Methyl Ethyl Ketone**	**26**		26	6.50
591-78-6	2-Hexanone	13 U		13	2.94
108-10-1	4-Methyl-2-Pentanone	13 U		13	1.90
67-64-1	***Acetone**	**49 B**	B, Z	26	6.50
71-43-2	Benzene	6.4 U		6.4	0.685
74-97-5	Bromochloromethane	6.4 U		6.4	0.989
75-27-4	Dichlorobromomethane	6.4 U		6.4	0.651
75-25-2	Bromoform	6.4 U		6.4	0.751
74-83-9	Bromomethane	6.4 U		6.4	1.95
75-15-0	Carbon Disulfide	6.4 U		6.4	1.89
56-23-5	Carbon Tetrachloride	6.4 U		6.4	0.606
108-90-7	Chlorobenzene	6.4 U		6.4	0.859
75-00-3	Chloroethane	6.4 U		6.4	1.76
67-66-3	Chloroform	6.4 U		6.4	0.580

* See attached Statement of Data Qualifications.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB12A**	QC Batch:	90061 -120
Sample #:	**345886**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
74-87-3	Chloromethane	6.4 U		6.4	1.08
110-82-7	Cyclohexane	13 U		13	0.411
10061-01-5	cis-1,3-Dichloropropene	6.4 U		6.4	0.638
10061-02-6	trans-1,3-Dichloropropene	6.4 U		6.4	0.677
75-71-8	Dichlorodifluoromethane	6.4 U		6.4	0.868
124-48-1	Chlorodibromomethane	6.4 U		6.4	0.672
100-41-4	Ethylbenzene	6.4 U		6.4	0.550
98-82-8	Isopropylbenzene	6.4 U		6.4	0.710
79-20-9	Methyl Acetate	26 U	UJ, C	26	4.51
108-87-2	Methylcyclohexane	13 U		13	1.10
1634-04-4	Methyl(tert)butyl Ether	6.4 U		6.4	0.833
75-09-2	**Methylene Chloride**	**4.7 J**	B, Z	26	3.65
100-42-5	Styrene	6.4 U		6.4	0.575
127-18-4	Tetrachloroethene	6.4 U		6.4	0.797
108-88-3	**Toluene**	**1.2 J**		6.4	0.603
79-01-6	Trichloroethene	6.4 U		6.4	0.880
75-69-4	Trichlorofluoromethane	6.4 U		6.4	0.966
75-01-4	Vinyl Chloride	6.4 U		6.4	0.481
1330-20-7	Xylene (Total)	6.4 U		6.4	0.547

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB12A**	QC Batch:	90061 -120
Sample #:	**345886**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	78
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**

No compound was detected.

TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 11:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB12B**	QC Batch:	90061 -120
Sample #:	**345887**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	71
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	7.0 U		7.0	0.596
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	7.0 U		7.0	1.06
79-34-5	1,1,2,2-Tetrachloroethane	7.0 U		7.0	0.914
79-00-5	1,1,2-Trichloroethane	7.0 U		7.0	0.830
75-34-3	1,1-Dichloroethane	7.0 U		7.0	1.01
75-35-4	1,1-Dichloroethylene	7.0 U		7.0	1.03
106-93-4	1,2-Dibromoethane	7.0 U		7.0	0.959
96-12-8	1,2-Dibromo-3-chloropropane	14 U		14	2.91
95-50-1	1,2-Dichlorobenzene	7.0 U		7.0	0.678
107-06-2	1,2-Dichloroethane	7.0 U		7.0	0.603
156-59-2	cis-1,2-Dichloroethene	7.0 U		7.0	0.994
156-60-5	trans-1,2-Dichloroethene	7.0 U		7.0	0.984
78-87-5	1,2-Dichloropropane	7.0 U		7.0	0.820
87-61-6	1,2,3-Trichlorobenzene	7.0 U		7.0	0.762
120-82-1	1,2,4-Trichlorobenzene	7.0 U		7.0	0.574
541-73-1	1,3-Dichlorobenzene	7.0 U		7.0	0.375
106-46-7	1,4-Dichlorobenzene	7.0 U		7.0	0.994
78-93-3	**Methyl Ethyl Ketone**	**25 J**		28	7.00
591-78-6	2-Hexanone	14 U		14	3.16
108-10-1	4-Methyl-2-Pentanone	14 U		14	2.04
67-64-1	***Acetone**	**55 B**	B,Z	28	7.00
71-43-2	Benzene	7.0 U		7.0	0.738
74-97-5	Bromochloromethane	7.0 U		7.0	1.07
75-27-4	Dichlorobromomethane	7.0 U		7.0	0.701
75-25-2	Bromoform	7.0 U		7.0	0.809
74-83-9	Bromomethane	7.0 U		7.0	2.10
75-15-0	Carbon Disulfide	7.0 U		7.0	2.03
56-23-5	Carbon Tetrachloride	7.0 U		7.0	0.652
108-90-7	Chlorobenzene	7.0 U		7.0	0.925
75-00-3	Chloroethane	7.0 U		7.0	1.89
67-66-3	Chloroform	7.0 U		7.0	0.624

* See attached Statement of Data Qualifications.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 11:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB12B**	QC Batch:	90061 -120
Sample #:	**345887**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	71
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
74-87-3	Chloromethane	7.0 U		7.0	1.17
110-82-7	Cyclohexane	14 U		14	0.442
10061-01-5	cis-1,3-Dichloropropene	7.0 U		7.0	0.687
10061-02-6	trans-1,3-Dichloropropene	7.0 U		7.0	0.729
75-71-8	Dichlorodifluoromethane	7.0 U		7.0	0.935
124-48-1	Chlorodibromomethane	7.0 U		7.0	0.724
100-41-4	Ethylbenzene	7.0 U		7.0	0.592
98-82-8	Isopropylbenzene	7.0 U		7.0	0.764
79-20-9	Methyl Acetate	28 U	VJ/c	28	4.86
108-87-2	Methylcyclohexane	14 U		14	1.18
1634-04-4	Methyl(tert)butyl Ether	7.0 U		7.0	0.897
75-09-2	**Methylene Chloride**	**6.9 J**	B,Z	28	3.93
100-42-5	Styrene	7.0 U		7.0	0.619
127-18-4	Tetrachloroethene	7.0 U		7.0	0.858
108-88-3	Toluene	7.0 U		7.0	0.650
79-01-6	Trichloroethene	7.0 U		7.0	0.948
75-69-4	Trichlorofluoromethane	7.0 U		7.0	1.04
75-01-4	Vinyl Chloride	7.0 U		7.0	0.518
1330-20-7	Xylene (Total)	7.0 U		7.0	0.589

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 11:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB12B**	QC Batch:	90061 -120
Sample #:	**345887**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	71
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**
No compound was detected.			

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**SBD8**	QC Batch:	90061 -120
Sample #:	**345888**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	67
Unit:	ug/kg dry	Dilution Factor:	1.5

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	7.5 U	7.5	0.639
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	7.5 U	7.5	1.14
79-34-5	1,1,2,2-Tetrachloroethane	7.5 U	7.5	0.980
79-00-5	1,1,2-Trichloroethane	7.5 U	7.5	0.890
75-34-3	1,1-Dichloroethane	7.5 U	7.5	1.09
75-35-4	1,1-Dichloroethylene	7.5 U	7.5	1.10
106-93-4	1,2-Dibromoethane	7.5 U	7.5	1.03
96-12-8	1,2-Dibromo-3-chloropropane	15 U	15	3.12
95-50-1	1,2-Dichlorobenzene	7.5 U	7.5	0.726
107-06-2	1,2-Dichloroethane	7.5 U	7.5	0.647
156-59-2	cis-1,2-Dichloroethene	7.5 U	7.5	1.07
156-60-5	trans-1,2-Dichloroethene	7.5 U	7.5	1.05
78-87-5	1,2-Dichloropropane	7.5 U	7.5	0.879
87-61-6	1,2,3-Trichlorobenzene	7.5 U	7.5	0.816
120-82-1	1,2,4-Trichlorobenzene	7.5 U	7.5	0.615
541-73-1	1,3-Dichlorobenzene	7.5 U	7.5	0.402
106-46-7	1,4-Dichlorobenzene	7.5 U	7.5	1.07
78-93-3	**Methyl Ethyl Ketone**	**27 J**	30	7.50
591-78-6	2-Hexanone	15 U	15	3.39
108-10-1	4-Methyl-2-Pentanone	15 U	15	2.19
67-64-1	***Acetone**	**62 B** B,Z	30	7.50
71-43-2	**Benzene**	**1.0 J**	7.5	0.791
74-97-5	Bromochloromethane	7.5 U	7.5	1.14
75-27-4	Dichlorobromomethane	7.5 U	7.5	0.752
75-25-2	Bromoform	7.5 U	7.5	0.867
74-83-9	Bromomethane	7.5 U	7.5	2.25
75-15-0	Carbon Disulfide	7.5 U	7.5	2.18
56-23-5	Carbon Tetrachloride	7.5 U	7.5	0.699
108-90-7	Chlorobenzene	7.5 U	7.5	0.992
75-00-3	Chloroethane	7.5 U	7.5	2.03
67-66-3	Chloroform	7.5 U	7.5	0.669

* See attached Statement of Data Qualifications.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**SBD8**	QC Batch:	90061 -120
Sample #:	**345888**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	67
Unit:	ug/kg dry	Dilution Factor:	1.5

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
74-87-3	Chloromethane	7.5 U		7.5	1.25
110-82-7	Cyclohexane	15 U		15	0.474
10061-01-5	cis-1,3-Dichloropropene	7.5 U		7.5	0.737
10061-02-6	trans-1,3-Dichloropropene	7.5 U		7.5	0.782
75-71-8	Dichlorodifluoromethane	7.5 U		7.5	1.00
124-48-1	Chlorodibromomethane	7.5 U		7.5	0.776
100-41-4	Ethylbenzene	7.5 U		7.5	0.635
98-82-8	Isopropylbenzene	7.5 U		7.5	0.819
79-20-9	Methyl Acetate	30 U	VJ,C	30	5.21
108-87-2	Methylcyclohexane	15 U		15	1.27
1634-04-4	Methyl(tert)butyl Ether	7.5 U		7.5	0.962
75-09-2	**Methylene Chloride**	**6.1 J**	B,Z	30	4.22
100-42-5	Styrene	7.5 U		7.5	0.663
127-18-4	Tetrachloroethene	7.5 U		7.5	0.920
108-88-3	Toluene	7.5 U		7.5	0.696
79-01-6	Trichloroethene	7.5 U		7.5	1.02
75-69-4	Trichlorofluoromethane	7.5 U		7.5	1.11
75-01-4	Vinyl Chloride	7.5 U		7.5	0.555
1330-20-7	Xylene (Total)	7.5 U		7.5	0.632

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**SBD8**	QC Batch:	90061 -120
Sample #:	**345888**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	67
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**

No compound was detected.

TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 11:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB12C**	QC Batch:	90061 -120
Sample #:	**345889**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	62
Unit:	ug/kg dry	Dilution Factor:	1.6

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	8.1 U		8.1	0.682
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	8.1 U		8.1	1.21
79-34-5	*1,1,2,2-Tetrachloroethane	8.1 UJ	UJ,i	8.1	1.04
79-00-5	1,1,2-Trichloroethane	8.1 U		8.1	0.949
75-34-3	1,1-Dichloroethane	8.1 U		8.1	1.16
75-35-4	1,1-Dichloroethylene	8.1 U		8.1	1.17
106-93-4	1,2-Dibromoethane	8.1 U		8.1	1.10
96-12-8	*1,2-Dibromo-3-chloropropane	16 UJ	UJ,i	16	3.33
95-50-1	*1,2-Dichlorobenzene	8.1 UJ	UJ,i	8.1	0.774
107-06-2	1,2-Dichloroethane	8.1 U		8.1	0.690
156-59-2	cis-1,2-Dichloroethene	8.1 U		8.1	1.14
156-60-5	trans-1,2-Dichloroethene	8.1 U		8.1	1.12
78-87-5	1,2-Dichloropropane	8.1 U		8.1	0.938
87-61-6	*1,2,3-Trichlorobenzene	8.1 UJ	UJ,i	8.1	0.870
120-82-1	*1,2,4-Trichlorobenzene	8.1 UJ	UJ,i	8.1	0.656
541-73-1	*1,3-Dichlorobenzene	8.1 UJ	UJ,i	8.1	0.429
106-46-7	*1,4-Dichlorobenzene	8.1 UJ	UJ,i	8.1	1.14
78-93-3	Methyl Ethyl Ketone	32 U		32	8.00
591-78-6	2-Hexanone	16 U		16	3.62
108-10-1	4-Methyl-2-Pentanone	16 U		16	2.34
67-64-1	***Acetone**	**63 B**	B,z	32	8.00
71-43-2	Benzene	8.1 U		8.1	0.843
74-97-5	Bromochloromethane	8.1 U		8.1	1.22
75-27-4	Dichlorobromomethane	8.1 U		8.1	0.802
75-25-2	Bromoform	8.1 U		8.1	0.925
74-83-9	Bromomethane	8.1 U		8.1	2.40
75-15-0	Carbon Disulfide	8.1 U		8.1	2.32
56-23-5	Carbon Tetrachloride	8.1 U		8.1	0.746
108-90-7	Chlorobenzene	8.1 U		8.1	1.06
75-00-3	Chloroethane	8.1 U		8.1	2.16
67-66-3	Chloroform	8.1 U		8.1	0.714

* See attached Statement of Data Qualifications.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 11:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB12C**	QC Batch:	90061 -120
Sample #:	**345889**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	62
Unit:	ug/kg dry	Dilution Factor:	1.6

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
74-87-3	Chloromethane	8.1 U		8.1	1.33
110-82-7	Cyclohexane	16 U		16	0.506
10061-01-5	cis-1,3-Dichloropropene	8.1 U		8.1	0.786
10061-02-6	trans-1,3-Dichloropropene	8.1 U		8.1	0.834
75-71-8	Dichlorodifluoromethane	8.1 U		8.1	1.07
124-48-1	Chlorodibromomethane	8.1 U		8.1	0.827
100-41-4	Ethylbenzene	8.1 U		8.1	0.677
98-82-8	*Isopropylbenzene	8.1 UJ	UJ;	8.1	0.874
79-20-9	Methyl Acetate	32 U	UJ,C	32	5.55
108-87-2	Methylcyclohexane	16 U		16	1.35
1634-04-4	Methyl(tert)butyl Ether	8.1 U		8.1	1.03
75-09-2	Methylene Chloride	32 U		32	4.50
100-42-5	Styrene	8.1 U		8.1	0.707
127-18-4	Tetrachloroethene	8.1 U		8.1	0.981
108-88-3	Toluene	8.1 U		8.1	0.742
79-01-6	Trichloroethene	8.1 U		8.1	1.08
75-69-4	Trichlorofluoromethane	8.1 U		8.1	1.19
75-01-4	Vinyl Chloride	8.1 U		8.1	0.592
1330-20-7	Xylene (Total)	8.1 U		8.1	0.674

* See attached Statement of Data Qualifications.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 11:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB12C**	QC Batch:	90061 -120
Sample #:	**345889**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	62
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
Ethyl Ether	60-29-7	28	Q	NJ, +

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB11A**	QC Batch:	90061 -120
Sample #:	**345890**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.5 U	6.5	0.554
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.5 U	6.5	0.987
79-34-5	1,1,2,2-Tetrachloroethane	6.5 U	6.5	0.849
79-00-5	1,1,2-Trichloroethane	6.5 U	6.5	0.771
75-34-3	1,1-Dichloroethane	6.5 U	6.5	0.941
75-35-4	1,1-Dichloroethylene	6.5 U	6.5	0.953
106-93-4	1,2-Dibromoethane	6.5 U	6.5	0.891
96-12-8	1,2-Dibromo-3-chloropropane	13 U	13	2.70
95-50-1	1,2-Dichlorobenzene	6.5 U	6.5	0.629
107-06-2	1,2-Dichloroethane	6.5 U	6.5	0.560
156-59-2	cis-1,2-Dichloroethene	6.5 U	6.5	0.923
156-60-5	trans-1,2-Dichloroethene	6.5 U	6.5	0.914
78-87-5	1,2-Dichloropropane	6.5 U	6.5	0.762
87-61-6	1,2,3-Trichlorobenzene	6.5 U	6.5	0.707
120-82-1	1,2,4-Trichlorobenzene	6.5 U	6.5	0.533
541-73-1	1,3-Dichlorobenzene	6.5 U	6.5	0.348
106-46-7	1,4-Dichlorobenzene	6.5 U	6.5	0.923
78-93-3	**Methyl Ethyl Ketone**	**45**	26	6.50
591-78-6	2-Hexanone	13 U	13	2.94
108-10-1	4-Methyl-2-Pentanone	13 U	13	1.90
67-64-1	**Acetone**	**240**	26	6.50
71-43-2	**Benzene**	**0.91 J**	6.5	0.685
74-97-5	Bromochloromethane	6.5 U	6.5	0.989
75-27-4	Dichlorobromomethane	6.5 U	6.5	0.651
75-25-2	Bromoform	6.5 U	6.5	0.751
74-83-9	Bromomethane	6.5 U	6.5	1.95
75-15-0	Carbon Disulfide	6.5 U	6.5	1.89
56-23-5	Carbon Tetrachloride	6.5 U	6.5	0.606
108-90-7	Chlorobenzene	6.5 U	6.5	0.859
75-00-3	Chloroethane	6.5 U	6.5	1.76
67-66-3	Chloroform	6.5 U	6.5	0.580

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB11A**	QC Batch:	90061 -120
Sample #:	**345890**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
74-87-3	Chloromethane	6.5 U		6.5	1.08
110-82-7	Cyclohexane	13 U		13	0.411
10061-01-5	cis-1,3-Dichloropropene	6.5 U		6.5	0.638
10061-02-6	trans-1,3-Dichloropropene	6.5 U		6.5	0.677
75-71-8	Dichlorodifluoromethane	6.5 U		6.5	0.868
124-48-1	Chlorodibromomethane	6.5 U		6.5	0.672
100-41-4	Ethylbenzene	6.5 U		6.5	0.550
98-82-8	Isopropylbenzene	6.5 U		6.5	0.710
79-20-9	Methyl Acetate	26 U	VJ,C	26	4.51
108-87-2	Methylcyclohexane	13 U		13	1.10
1634-04-4	Methyl(tert)butyl Ether	6.5 U		6.5	0.833
75-09-2	**Methylene Chloride**	**7.3 J**	B,Z	26	3.65
100-42-5	Styrene	6.5 U		6.5	0.575
127-18-4	Tetrachloroethene	6.5 U		6.5	0.797
108-88-3	**Toluene**	**1.9 J**		6.5	0.603
79-01-6	**Trichloroethene**	**9.6**		6.5	0.880
75-69-4	Trichlorofluoromethane	6.5 U		6.5	0.966
75-01-4	Vinyl Chloride	6.5 U		6.5	0.481
1330-20-7	Xylene (Total)	6.5 U		6.5	0.547

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB11A**	QC Batch:	90061 -120
Sample #:	**345890**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	77
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**

No compound was detected.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB11B**	QC Batch:	90061 -120
Sample #:	**345891**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	88
Unit:	ug/kg dry	Dilution Factor:	1.1

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	5.7 U		5.7	0.469
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.7 U		5.7	0.835
79-34-5	1,1,2,2-Tetrachloroethane	5.7 U		5.7	0.718
79-00-5	1,1,2-Trichloroethane	5.7 U		5.7	0.652
75-34-3	1,1-Dichloroethane	5.7 U		5.7	0.796
75-35-4	1,1-Dichloroethylene	5.7 U		5.7	0.806
106-93-4	1,2-Dibromoethane	5.7 U		5.7	0.754
96-12-8	1,2-Dibromo-3-chloropropane	11 U		11	2.29
95-50-1	1,2-Dichlorobenzene	5.7 U		5.7	0.532
107-06-2	1,2-Dichloroethane	5.7 U		5.7	0.474
156-59-2	**cis-1,2-Dichloroethene**	**1.9 J**		5.7	0.781
156-60-5	trans-1,2-Dichloroethene	5.7 U		5.7	0.773
78-87-5	1,2-Dichloropropane	5.7 U		5.7	0.645
87-61-6	1,2,3-Trichlorobenzene	5.7 U		5.7	0.598
120-82-1	1,2,4-Trichlorobenzene	5.7 U		5.7	0.451
541-73-1	1,3-Dichlorobenzene	5.7 U		5.7	0.295
106-46-7	1,4-Dichlorobenzene	5.7 U		5.7	0.781
78-93-3	**Methyl Ethyl Ketone**	**32**		23	5.50
591-78-6	2-Hexanone	11 U		11	2.49
108-10-1	4-Methyl-2-Pentanone	11 U		11	1.61
67-64-1	**Acetone**	**150**	B,Z	23	5.50
71-43-2	**Benzene**	**1.5 J**		5.7	0.580
74-97-5	Bromochloromethane	5.7 U		5.7	0.837
75-27-4	Dichlorobromomethane	5.7 U		5.7	0.551
75-25-2	Bromoform	5.7 U		5.7	0.636
74-83-9	Bromomethane	5.7 U		5.7	1.65
75-15-0	Carbon Disulfide	5.7 U		5.7	1.60
56-23-5	Carbon Tetrachloride	5.7 U		5.7	0.513
108-90-7	Chlorobenzene	5.7 U		5.7	0.727
75-00-3	Chloroethane	5.7 U		5.7	1.49
67-66-3	Chloroform	5.7 U		5.7	0.491

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB11B**	QC Batch:	90061 -120
Sample #:	**345891**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	88
Unit:	ug/kg dry	Dilution Factor:	1.1

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
74-87-3	Chloromethane	5.7 U		5.7	0.917
110-82-7	Cyclohexane	11 U		11	0.348
10061-01-5	cis-1,3-Dichloropropene	5.7 U		5.7	0.540
10061-02-6	trans-1,3-Dichloropropene	5.7 U		5.7	0.573
75-71-8	Dichlorodifluoromethane	5.7 U		5.7	0.735
124-48-1	Chlorodibromomethane	5.7 U		5.7	0.569
100-41-4	Ethylbenzene	5.7 U		5.7	0.465
98-82-8	Isopropylbenzene	5.7 U		5.7	0.601
79-20-9	Methyl Acetate	23 U	UJ, C	23	3.82
108-87-2	Methylcyclohexane	11 U		11	0.930
1634-04-4	Methyl(tert)butyl Ether	5.7 U		5.7	0.705
75-09-2	**Methylene Chloride**	**6.1 J**	B, Z	23	3.09
100-42-5	Styrene	5.7 U		5.7	0.486
127-18-4	Tetrachloroethene	5.7 U		5.7	0.674
108-88-3	**Toluene**	**1.4 J**		5.7	0.510
79-01-6	**Trichloroethene**	**31**		5.7	0.745
75-69-4	Trichlorofluoromethane	5.7 U		5.7	0.817
75-01-4	Vinyl Chloride	5.7 U		5.7	0.407
1330-20-7	Xylene (Total)	5.7 U		5.7	0.463

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB11B**	QC Batch:	90061 -120
Sample #:	**345891**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	88
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**
Hexanal	66-25-1	8.9	E

NJ+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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Individual sample results relate only to the sample tested.

TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:45
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/20/03 by JDM
		Anal. Method:	USEPA-8260B
Sample ID:	**13SB11C**	QC Batch:	90061 -120
Sample #:	**345892**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.5 U	6.5	0.554
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.5 U	6.5	0.987
79-34-5	1,1,2,2-Tetrachloroethane	6.5 U	6.5	0.849
79-00-5	1,1,2-Trichloroethane	6.5 U	6.5	0.771
75-34-3	1,1-Dichloroethane	6.5 U	6.5	0.941
75-35-4	1,1-Dichloroethylene	6.5 U	6.5	0.953
106-93-4	1,2-Dibromoethane	6.5 U	6.5	0.891
96-12-8	1,2-Dibromo-3-chloropropane	13 U	13	2.70
95-50-1	1,2-Dichlorobenzene	6.5 U	6.5	0.629
107-06-2	1,2-Dichloroethane	6.5 U	6.5	0.560
156-59-2	**cis-1,2-Dichloroethene**	**4.2 J**	6.5	0.923
156-60-5	trans-1,2-Dichloroethene	6.5 U	6.5	0.914
78-87-5	1,2-Dichloropropane	6.5 U	6.5	0.762
87-61-6	1,2,3-Trichlorobenzene	6.5 U	6.5	0.707
120-82-1	1,2,4-Trichlorobenzene	6.5 U	6.5	0.533
541-73-1	1,3-Dichlorobenzene	6.5 U	6.5	0.348
106-46-7	1,4-Dichlorobenzene	6.5 U	6.5	0.923
78-93-3	**Methyl Ethyl Ketone**	**40**	26	6.50
591-78-6	2-Hexanone	13 U	13	2.94
108-10-1	4-Methyl-2-Pentanone	13 U	13	1.90
67-64-1	**Acetone**	**200** B,Z	26	6.50
71-43-2	**Benzene**	**1.5 J**	6.5	0.685
74-97-5	Bromochloromethane	6.5 U	6.5	0.989
75-27-4	Dichlorobromomethane	6.5 U	6.5	0.651
75-25-2	Bromoform	6.5 U	6.5	0.751
74-83-9	Bromomethane	6.5 U	6.5	1.95
75-15-0	Carbon Disulfide	6.5 U	6.5	1.89
56-23-5	Carbon Tetrachloride	6.5 U	6.5	0.606
108-90-7	Chlorobenzene	6.5 U	6.5	0.859
75-00-3	Chloroethane	6.5 U	6.5	1.76
67-66-3	Chloroform	6.5 U	6.5	0.580

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB11C**	QC Batch:	90061 -120
Sample #:	**345892**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
74-87-3	Chloromethane	6.5 U		6.5	1.08
110-82-7	Cyclohexane	13 U		13	0.411
10061-01-5	cis-1,3-Dichloropropene	6.5 U		6.5	0.638
10061-02-6	trans-1,3-Dichloropropene	6.5 U		6.5	0.677
75-71-8	Dichlorodifluoromethane	6.5 U		6.5	0.868
124-48-1	Chlorodibromomethane	6.5 U		6.5	0.672
100-41-4	Ethylbenzene	6.5 U		6.5	0.550
98-82-8	Isopropylbenzene	6.5 U		6.5	0.710
79-20-9	Methyl Acetate	26 U	UJ,C	26	4.51
108-87-2	Methylcyclohexane	13 U		13	1.10
1634-04-4	Methyl(tert)butyl Ether	6.5 U		6.5	0.833
75-09-2	**Methylene Chloride**	**5.8 J**	B,Z	26	3.65
100-42-5	Styrene	6.5 U		6.5	0.575
127-18-4	Tetrachloroethene	6.5 U		6.5	0.797
108-88-3	**Toluene**	**1.1 J**		6.5	0.603
79-01-6	**Trichloroethene**	**57**		6.5	0.880
75-69-4	Trichlorofluoromethane	6.5 U		6.5	0.966
75-01-4	Vinyl Chloride	6.5 U		6.5	0.481
1330-20-7	Xylene (Total)	6.5 U		6.5	0.547

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB11C**	QC Batch:	90061 -120
Sample #:	**345892**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	77
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**
Hexanal	66-25-1	4.7	E

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/20/03 by JDM
		Anal. Method:	USEPA-8260B
Sample ID:	**13SB10A**	QC Batch:	90061 -120
Sample #:	**345893**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	71
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	7.0 U	7.0	0.596
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	7.0 U	7.0	1.06
79-34-5	1,1,2,2-Tetrachloroethane	7.0 U	7.0	0.914
79-00-5	1,1,2-Trichloroethane	7.0 U	7.0	0.830
75-34-3	1,1-Dichloroethane	7.0 U	7.0	1.01
75-35-4	1,1-Dichloroethylene	7.0 U	7.0	1.03
106-93-4	1,2-Dibromoethane	7.0 U	7.0	0.959
96-12-8	1,2-Dibromo-3-chloropropane	14 U	14	2.91
95-50-1	1,2-Dichlorobenzene	7.0 U	7.0	0.678
107-06-2	1,2-Dichloroethane	7.0 U	7.0	0.603
156-59-2	cis-1,2-Dichloroethene	7.0 U	7.0	0.994
156-60-5	trans-1,2-Dichloroethene	7.0 U	7.0	0.984
78-87-5	1,2-Dichloropropane	7.0 U	7.0	0.820
87-61-6	1,2,3-Trichlorobenzene	7.0 U	7.0	0.762
120-82-1	**1,2,4-Trichlorobenzene**	**0.96 J**	7.0	0.574
541-73-1	1,3-Dichlorobenzene	7.0 U	7.0	0.375
106-46-7	1,4-Dichlorobenzene	7.0 U	7.0	0.994
78-93-3	**Methyl Ethyl Ketone**	**39**	28	7.00
591-78-6	2-Hexanone	14 U	14	3.16
108-10-1	4-Methyl-2-Pentanone	14 U	14	2.04
67-64-1	**Acetone**	**320**	28	7.00
71-43-2	Benzene	7.0 U	7.0	0.738
74-97-5	Bromochloromethane	7.0 U	7.0	1.07
75-27-4	Dichlorobromomethane	7.0 U	7.0	0.701
75-25-2	Bromoform	7.0 U	7.0	0.809
74-83-9	Bromomethane	7.0 U	7.0	2.10
75-15-0	Carbon Disulfide	7.0 U	7.0	2.03
56-23-5	Carbon Tetrachloride	7.0 U	7.0	0.652
108-90-7	Chlorobenzene	7.0 U	7.0	0.925
75-00-3	Chloroethane	7.0 U	7.0	1.89
67-66-3	Chloroform	7.0 U	7.0	0.624

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB10A**	QC Batch:	90061 -120
Sample #:	**345893**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	71
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
74-87-3	Chloromethane	7.0 U		7.0	1.17
110-82-7	Cyclohexane	14 U		14	0.442
10061-01-5	cis-1,3-Dichloropropene	7.0 U		7.0	0.687
10061-02-6	trans-1,3-Dichloropropene	7.0 U		7.0	0.729
75-71-8	Dichlorodifluoromethane	7.0 U		7.0	0.935
124-48-1	Chlorodibromomethane	7.0 U		7.0	0.724
100-41-4	Ethylbenzene	7.0 U		7.0	0.592
98-82-8	Isopropylbenzene	7.0 U		7.0	0.764
79-20-9	Methyl Acetate	28 U	VJ,C	28	4.86
108-87-2	Methylcyclohexane	14 U		14	1.18
1634-04-4	Methyl(tert)butyl Ether	7.0 U		7.0	0.897
75-09-2	**Methylene Chloride**	**11 J**	B,Z	28	3.93
100-42-5	Styrene	7.0 U		7.0	0.619
127-18-4	Tetrachloroethene	7.0 U		7.0	0.858
108-88-3	**Toluene**	**3.5 J**		7.0	0.650
79-01-6	Trichloroethene	7.0 U		7.0	0.948
75-69-4	Trichlorofluoromethane	7.0 U		7.0	1.04
75-01-4	Vinyl Chloride	7.0 U		7.0	0.518
1330-20-7	Xylene (Total)	7.0 U		7.0	0.589

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB10A**	QC Batch:	90061 -120
Sample #:	**345893**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	71
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
Hexanal	66-25-1	350	E	NJ/+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/20/03 by JDM
		Anal. Method:	USEPA-8260B
Sample ID:	**13SB10B**	QC Batch:	90061 -120
Sample #:	**345894**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.5 U		6.5	0.554
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.5 U		6.5	0.987
79-34-5	1,1,2,2-Tetrachloroethane	6.5 U		6.5	0.849
79-00-5	1,1,2-Trichloroethane	6.5 U		6.5	0.771
75-34-3	1,1-Dichloroethane	6.5 U		6.5	0.941
75-35-4	1,1-Dichloroethylene	6.5 U		6.5	0.953
106-93-4	1,2-Dibromoethane	6.5 U		6.5	0.891
96-12-8	1,2-Dibromo-3-chloropropane	13 U		13	2.70
95-50-1	1,2-Dichlorobenzene	6.5 U		6.5	0.629
107-06-2	1,2-Dichloroethane	6.5 U		6.5	0.560
156-59-2	cis-1,2-Dichloroethene	6.5 U		6.5	0.923
156-60-5	trans-1,2-Dichloroethene	6.5 U		6.5	0.914
78-87-5	1,2-Dichloropropane	6.5 U		6.5	0.762
87-61-6	1,2,3-Trichlorobenzene	6.5 U		6.5	0.707
120-82-1	1,2,4-Trichlorobenzene	6.5 U		6.5	0.533
541-73-1	1,3-Dichlorobenzene	6.5 U		6.5	0.348
106-46-7	1,4-Dichlorobenzene	6.5 U		6.5	0.923
78-93-3	**Methyl Ethyl Ketone**	**39**		26	6.50
591-78-6	2-Hexanone	13 U		13	2.94
108-10-1	4-Methyl-2-Pentanone	13 U		13	1.90
67-64-1	**Acetone**	**180**	B,Z	26	6.50
71-43-2	Benzene	6.5 U		6.5	0.685
74-97-5	Bromochloromethane	6.5 U		6.5	0.989
75-27-4	Dichlorobromomethane	6.5 U		6.5	0.651
75-25-2	Bromoform	6.5 U		6.5	0.751
74-83-9	Bromomethane	6.5 U		6.5	1.95
75-15-0	Carbon Disulfide	6.5 U		6.5	1.89
56-23-5	Carbon Tetrachloride	6.5 U		6.5	0.606
108-90-7	Chlorobenzene	6.5 U		6.5	0.859
75-00-3	Chloroethane	6.5 U		6.5	1.76
67-66-3	Chloroform	6.5 U		6.5	0.580

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/20/03 by JDM
		Anal. Method:	USEPA-8260B
Sample ID:	**13SB10B**	QC Batch:	90061 -120
Sample #:	**345894**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
74-87-3	Chloromethane	6.5 U		6.5	1.08
110-82-7	Cyclohexane	13 U		13	0.411
10061-01-5	cis-1,3-Dichloropropene	6.5 U		6.5	0.638
10061-02-6	trans-1,3-Dichloropropene	6.5 U		6.5	0.677
75-71-8	Dichlorodifluoromethane	6.5 U		6.5	0.868
124-48-1	Chlorodibromomethane	6.5 U		6.5	0.672
100-41-4	Ethylbenzene	6.5 U		6.5	0.550
98-82-8	Isopropylbenzene	6.5 U		6.5	0.710
79-20-9	Methyl Acetate	26 U	VJC	26	4.51
108-87-2	Methylcyclohexane	13 U		13	1.10
1634-04-4	Methyl(tert)butyl Ether	6.5 U		6.5	0.833
75-09-2	**Methylene Chloride**	**6.6 J**	B/Z	26	3.65
100-42-5	Styrene	6.5 U		6.5	0.575
127-18-4	Tetrachloroethene	6.5 U		6.5	0.797
108-88-3	**Toluene**	**1.0 J**		6.5	0.603
79-01-6	Trichloroethene	6.5 U		6.5	0.880
75-69-4	Trichlorofluoromethane	6.5 U		6.5	0.966
75-01-4	Vinyl Chloride	6.5 U		6.5	0.481
1330-20-7	Xylene (Total)	6.5 U		6.5	0.547

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB10B**	QC Batch:	90061 -120
Sample #:	**345894**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	77
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**
Hexanal	66-25-1	9.0	E

NJ,+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:30
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/20/03 by JDM
		Anal. Method:	USEPA-8260B
Sample ID:	**13SB10C**	QC Batch:	90061 -120
Sample #:	**345895**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	73
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.8 U		6.8	0.596
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.8 U		6.8	1.06
79-34-5	1,1,2,2-Tetrachloroethane	6.8 U		6.8	0.914
79-00-5	1,1,2-Trichloroethane	6.8 U		6.8	0.830
75-34-3	1,1-Dichloroethane	6.8 U		6.8	1.01
75-35-4	1,1-Dichloroethylene	6.8 U		6.8	1.03
106-93-4	1,2-Dibromoethane	6.8 U		6.8	0.959
96-12-8	1,2-Dibromo-3-chloropropane	14 U		14	2.91
95-50-1	1,2-Dichlorobenzene	6.8 U		6.8	0.678
107-06-2	1,2-Dichloroethane	6.8 U		6.8	0.603
156-59-2	cis-1,2-Dichloroethene	6.8 U		6.8	0.994
156-60-5	trans-1,2-Dichloroethene	6.8 U		6.8	0.984
78-87-5	1,2-Dichloropropane	6.8 U		6.8	0.820
87-61-6	1,2,3-Trichlorobenzene	6.8 U		6.8	0.762
120-82-1	1,2,4-Trichlorobenzene	6.8 U		6.8	0.574
541-73-1	1,3-Dichlorobenzene	6.8 U		6.8	0.375
106-46-7	1,4-Dichlorobenzene	6.8 U		6.8	0.994
78-93-3	**Methyl Ethyl Ketone**	**36**		27	7.00
591-78-6	2-Hexanone	14 U		14	3.16
108-10-1	4-Methyl-2-Pentanone	14 U		14	2.04
67-64-1	**Acetone**	**160**	B,Z	27	7.00
71-43-2	Benzene	6.8 U		6.8	0.738
74-97-5	Bromochloromethane	6.8 U		6.8	1.07
75-27-4	Dichlorobromomethane	6.8 U		6.8	0.701
75-25-2	Bromoform	6.8 U		6.8	0.809
74-83-9	Bromomethane	6.8 U		6.8	2.10
75-15-0	Carbon Disulfide	6.8 U		6.8	2.03
56-23-5	Carbon Tetrachloride	6.8 U		6.8	0.652
108-90-7	Chlorobenzene	6.8 U		6.8	0.925
75-00-3	Chloroethane	6.8 U		6.8	1.89
67-66-3	Chloroform	6.8 U		6.8	0.624

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB10C**	QC Batch:	90061 -120
Sample #:	**345895**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	73
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
74-87-3	Chloromethane	6.8 U		6.8	1.17
110-82-7	Cyclohexane	14 U		14	0.442
10061-01-5	cis-1,3-Dichloropropene	6.8 U		6.8	0.687
10061-02-6	trans-1,3-Dichloropropene	6.8 U		6.8	0.729
75-71-8	Dichlorodifluoromethane	6.8 U		6.8	0.935
124-48-1	Chlorodibromomethane	6.8 U		6.8	0.724
100-41-4	Ethylbenzene	6.8 U		6.8	0.592
98-82-8	Isopropylbenzene	6.8 U		6.8	0.764
79-20-9	Methyl Acetate	27 U		27	4.86
108-87-2	Methylcyclohexane	14 U		14	1.18
1634-04-4	Methyl(tert)butyl Ether	6.8 U		6.8	0.897
75-09-2	**Methylene Chloride**	**7.4 J**	B,Z	27	3.93
100-42-5	Styrene	6.8 U		6.8	0.619
127-18-4	Tetrachloroethene	6.8 U		6.8	0.858
108-88-3	Toluene	6.8 U		6.8	0.650
79-01-6	Trichloroethene	6.8 U		6.8	0.948
75-69-4	Trichlorofluoromethane	6.8 U		6.8	1.04
75-01-4	Vinyl Chloride	6.8 U		6.8	0.518
1330-20-7	Xylene (Total)	6.8 U		6.8	0.589

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/20/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB10C**	QC Batch:	90061 -120
Sample #:	**345895**	Anal. Batch:	208021
Matrix:	Soil	Percent Solids:	73
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**
No compound was detected.			

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/21/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB9A**	QC Batch:	90061 -121
Sample #:	**345896**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.4 U		6.4	0.554
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.4 U		6.4	0.987
79-34-5	1,1,2,2-Tetrachloroethane	6.4 U		6.4	0.849
79-00-5	1,1,2-Trichloroethane	6.4 U		6.4	0.771
75-34-3	1,1-Dichloroethane	6.4 U		6.4	0.941
75-35-4	1,1-Dichloroethylene	6.4 U		6.4	0.953
106-93-4	1,2-Dibromoethane	6.4 U		6.4	0.891
96-12-8	1,2-Dibromo-3-chloropropane	13 U		13	2.70
95-50-1	1,2-Dichlorobenzene	6.4 U		6.4	0.629
107-06-2	1,2-Dichloroethane	6.4 U		6.4	0.560
156-59-2	cis-1,2-Dichloroethene	6.4 U		6.4	0.923
156-60-5	trans-1,2-Dichloroethene	6.4 U		6.4	0.914
78-87-5	1,2-Dichloropropane	6.4 U		6.4	0.762
87-61-6	1,2,3-Trichlorobenzene	6.4 U		6.4	0.707
120-82-1	1,2,4-Trichlorobenzene	6.4 U		6.4	0.533
541-73-1	1,3-Dichlorobenzene	6.4 U		6.4	0.348
106-46-7	1,4-Dichlorobenzene	6.4 U		6.4	0.923
78-93-3	**Methyl Ethyl Ketone**	**41**		26	6.50
591-78-6	2-Hexanone	13 U		13	2.94
108-10-1	4-Methyl-2-Pentanone	13 U		13	1.90
67-64-1	**Acetone**	**140**		26	6.50
71-43-2	Benzene	6.4 U		6.4	0.685
74-97-5	Bromochloromethane	6.4 U		6.4	0.989
75-27-4	Dichlorobromomethane	6.4 U		6.4	0.651
75-25-2	Bromoform	6.4 U		6.4	0.751
74-83-9	Bromomethane	6.4 U		6.4	1.95
75-15-0	Carbon Disulfide	6.4 U		6.4	1.89
56-23-5	Carbon Tetrachloride	6.4 U		6.4	0.606
108-90-7	Chlorobenzene	6.4 U		6.4	0.859
75-00-3	Chloroethane	6.4 U	VJ,c	6.4	1.76
67-66-3	Chloroform	6.4 U		6.4	0.580

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/21/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB9A**	QC Batch:	90061 -121
Sample #:	**345896**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
74-87-3	Chloromethane	6.4 U	6.4	1.08
110-82-7	Cyclohexane	13 U	13	0.411
10061-01-5	cis-1,3-Dichloropropene	6.4 U	6.4	0.638
10061-02-6	trans-1,3-Dichloropropene	6.4 U	6.4	0.677
75-71-8	Dichlorodifluoromethane	6.4 U	6.4	0.868
124-48-1	Chlorodibromomethane	6.4 U	6.4	0.672
100-41-4	Ethylbenzene	6.4 U	6.4	0.550
98-82-8	Isopropylbenzene	6.4 U	6.4	0.710
79-20-9	Methyl Acetate	26 U	26	4.51
108-87-2	Methylcyclohexane	13 U	13	1.10
1634-04-4	Methyl(tert)butyl Ether	6.4 U	6.4	0.833
75-09-2	**Methylene Chloride**	**5.7 J**	26	3.65
100-42-5	Styrene	6.4 U	6.4	0.575
127-18-4	Tetrachloroethene	6.4 U	6.4	0.797
108-88-3	**Toluene**	**2.7 J**	6.4	0.603
79-01-6	Trichloroethene	6.4 U	6.4	0.880
75-69-4	Trichlorofluoromethane	6.4 U	6.4	0.966
75-01-4	Vinyl Chloride	6.4 U	6.4	0.481
1330-20-7	Xylene (Total)	6.4 U	6.4	0.547

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/21/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB9A**	QC Batch:	90061 -121
Sample #:	**345896**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	78
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**

No compound was detected.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/21/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**SBD9**	QC Batch:	90061 -121
Sample #:	**345897**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.2 U		6.2	0.511
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.2 U		6.2	0.911
79-34-5	1,1,2,2-Tetrachloroethane	6.2 U		6.2	0.784
79-00-5	1,1,2-Trichloroethane	6.2 U		6.2	0.712
75-34-3	1,1-Dichloroethane	6.2 U		6.2	0.869
75-35-4	1,1-Dichloroethylene	6.2 U		6.2	0.880
106-93-4	1,2-Dibromoethane	6.2 U		6.2	0.822
96-12-8	1,2-Dibromo-3-chloropropane	12 U		12	2.50
95-50-1	1,2-Dichlorobenzene	6.2 U		6.2	0.581
107-06-2	1,2-Dichloroethane	6.2 U		6.2	0.517
156-59-2	cis-1,2-Dichloroethene	6.2 U		6.2	0.852
156-60-5	trans-1,2-Dichloroethene	6.2 U		6.2	0.844
78-87-5	1,2-Dichloropropane	6.2 U		6.2	0.703
87-61-6	1,2,3-Trichlorobenzene	6.2 U		6.2	0.653
120-82-1	1,2,4-Trichlorobenzene	6.2 U		6.2	0.492
541-73-1	1,3-Dichlorobenzene	6.2 U		6.2	0.322
106-46-7	1,4-Dichlorobenzene	6.2 U		6.2	0.852
78-93-3	**Methyl Ethyl Ketone**	**33**		25	6.00
591-78-6	2-Hexanone	12 U		12	2.71
108-10-1	4-Methyl-2-Pentanone	12 U		12	1.75
67-64-1	**Acetone**	**130**		25	6.00
71-43-2	Benzene	6.2 U		6.2	0.632
74-97-5	Bromochloromethane	6.2 U		6.2	0.913
75-27-4	Dichlorobromomethane	6.2 U		6.2	0.601
75-25-2	Bromoform	6.2 U		6.2	0.694
74-83-9	Bromomethane	6.2 U		6.2	1.80
75-15-0	Carbon Disulfide	6.2 U		6.2	1.74
56-23-5	Carbon Tetrachloride	6.2 U		6.2	0.559
108-90-7	Chlorobenzene	6.2 U		6.2	0.793
75-00-3	Chloroethane	6.2 U	VJc	6.2	1.62
67-66-3	Chloroform	6.2 U		6.2	0.535

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/21/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**SBD9**	QC Batch:	90061 -121
Sample #:	**345897**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
74-87-3	Chloromethane	6.2 U	6.2	1.00
110-82-7	Cyclohexane	12 U	12	0.379
10061-01-5	cis-1,3-Dichloropropene	6.2 U	6.2	0.589
10061-02-6	trans-1,3-Dichloropropene	6.2 U	6.2	0.625
75-71-8	Dichlorodifluoromethane	6.2 U	6.2	0.802
124-48-1	Chlorodibromomethane	6.2 U	6.2	0.620
100-41-4	Ethylbenzene	6.2 U	6.2	0.508
98-82-8	Isopropylbenzene	6.2 U	6.2	0.655
79-20-9	Methyl Acetate	25 U	25	4.16
108-87-2	Methylcyclohexane	12 U	12	1.01
1634-04-4	Methyl(tert)butyl Ether	6.2 U	6.2	0.769
75-09-2	**Methylene Chloride**	**5.7 J**	25	3.37
100-42-5	Styrene	6.2 U	6.2	0.530
127-18-4	Tetrachloroethene	6.2 U	6.2	0.736
108-88-3	**Toluene**	**0.69 J**	6.2	0.557
79-01-6	Trichloroethene	6.2 U	6.2	0.812
75-69-4	Trichlorofluoromethane	6.2 U	6.2	0.892
75-01-4	Vinyl Chloride	6.2 U	6.2	0.444
1330-20-7	Xylene (Total)	6.2 U	6.2	0.505

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/21/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**SBD9**	QC Batch:	90061 -121
Sample #:	**345897**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	80
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**
No compound was detected.			

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/21/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB9B**	QC Batch:	90061 -121
Sample #:	**345898**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	73
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.8 U		6.8	0.596
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.8 U		6.8	1.06
79-34-5	1,1,2,2-Tetrachloroethane	6.8 U		6.8	0.914
79-00-5	1,1,2-Trichloroethane	6.8 U		6.8	0.830
75-34-3	1,1-Dichloroethane	6.8 U		6.8	1.01
75-35-4	1,1-Dichloroethylene	6.8 U		6.8	1.03
106-93-4	1,2-Dibromoethane	6.8 U		6.8	0.959
96-12-8	1,2-Dibromo-3-chloropropane	14 U		14	2.91
95-50-1	1,2-Dichlorobenzene	6.8 U		6.8	0.678
107-06-2	1,2-Dichloroethane	6.8 U		6.8	0.603
156-59-2	cis-1,2-Dichloroethene	6.8 U		6.8	0.994
156-60-5	trans-1,2-Dichloroethene	6.8 U		6.8	0.984
78-87-5	1,2-Dichloropropane	6.8 U		6.8	0.820
87-61-6	1,2,3-Trichlorobenzene	6.8 U		6.8	0.762
120-82-1	1,2,4-Trichlorobenzene	6.8 U		6.8	0.574
541-73-1	1,3-Dichlorobenzene	6.8 U		6.8	0.375
106-46-7	1,4-Dichlorobenzene	6.8 U		6.8	0.994
78-93-3	**Methyl Ethyl Ketone**	**400**		27	7.00
591-78-6	2-Hexanone	14 U		14	3.16
108-10-1	4-Methyl-2-Pentanone	14 U		14	2.04
67-64-1	**Acetone**	**140**		27	7.00
71-43-2	Benzene	6.8 U		6.8	0.738
74-97-5	Bromochloromethane	6.8 U		6.8	1.07
75-27-4	Dichlorobromomethane	6.8 U		6.8	0.701
75-25-2	Bromoform	6.8 U		6.8	0.809
74-83-9	Bromomethane	6.8 U		6.8	2.10
75-15-0	Carbon Disulfide	6.8 U		6.8	2.03
56-23-5	Carbon Tetrachloride	6.8 U		6.8	0.652
108-90-7	Chlorobenzene	6.8 U		6.8	0.925
75-00-3	Chloroethane	6.8 U	VJ,C	6.8	1.89
67-66-3	Chloroform	6.8 U		6.8	0.624

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/21/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB9B**	QC Batch:	90061 -121
Sample #:	**345898**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	73
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
74-87-3	Chloromethane	6.8 U	6.8	1.17
110-82-7	Cyclohexane	14 U	14	0.442
10061-01-5	cis-1,3-Dichloropropene	6.8 U	6.8	0.687
10061-02-6	trans-1,3-Dichloropropene	6.8 U	6.8	0.729
75-71-8	Dichlorodifluoromethane	6.8 U	6.8	0.935
124-48-1	Chlorodibromomethane	6.8 U	6.8	0.724
100-41-4	Ethylbenzene	6.8 U	6.8	0.592
98-82-8	Isopropylbenzene	6.8 U	6.8	0.764
79-20-9	Methyl Acetate	27 U	27	4.86
108-87-2	Methylcyclohexane	14 U	14	1.18
1634-04-4	Methyl(tert)butyl Ether	6.8 U	6.8	0.897
75-09-2	**Methylene Chloride**	**5.5 J**	27	3.93
100-42-5	Styrene	6.8 U	6.8	0.619
127-18-4	Tetrachloroethene	6.8 U	6.8	0.858
108-88-3	Toluene	6.8 U	6.8	0.650
79-01-6	Trichloroethene	6.8 U	6.8	0.948
75-69-4	Trichlorofluoromethane	6.8 U	6.8	1.04
75-01-4	Vinyl Chloride	6.8 U	6.8	0.518
1330-20-7	Xylene (Total)	6.8 U	6.8	0.589

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/21/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB9B**	QC Batch:	90061 -121
Sample #:	**345898**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	73
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**
Hexanal	66-25-1	8.6	E NJ+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/21/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB9C**	QC Batch:	90257 -121
Sample #:	**345899**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.4 U		6.4	0.554
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.4 U		6.4	0.987
79-34-5	1,1,2,2-Tetrachloroethane	6.4 U		6.4	0.849
79-00-5	1,1,2-Trichloroethane	6.4 U		6.4	0.771
75-34-3	1,1-Dichloroethane	6.4 U		6.4	0.941
75-35-4	1,1-Dichloroethylene	6.4 U		6.4	0.953
106-93-4	1,2-Dibromoethane	6.4 U		6.4	0.891
96-12-8	1,2-Dibromo-3-chloropropane	13 U		13	2.70
95-50-1	1,2-Dichlorobenzene	6.4 U		6.4	0.629
107-06-2	1,2-Dichloroethane	6.4 U		6.4	0.560
156-59-2	cis-1,2-Dichloroethene	6.4 U		6.4	0.923
156-60-5	trans-1,2-Dichloroethene	6.4 U		6.4	0.914
78-87-5	1,2-Dichloropropane	6.4 U		6.4	0.762
87-61-6	1,2,3-Trichlorobenzene	6.4 U		6.4	0.707
120-82-1	1,2,4-Trichlorobenzene	6.4 U		6.4	0.533
541-73-1	1,3-Dichlorobenzene	6.4 U		6.4	0.348
106-46-7	1,4-Dichlorobenzene	6.4 U		6.4	0.923
78-93-3	**Methyl Ethyl Ketone**	**24 J**		26	6.50
591-78-6	2-Hexanone	13 U		13	2.94
108-10-1	4-Methyl-2-Pentanone	13 U		13	1.90
67-64-1	**Acetone**	**31**	B,Z	26	6.50
71-43-2	Benzene	6.4 U		6.4	0.685
74-97-5	Bromochloromethane	6.4 U		6.4	0.989
75-27-4	Dichlorobromomethane	6.4 U		6.4	0.651
75-25-2	Bromoform	6.4 U		6.4	0.751
74-83-9	Bromomethane	6.4 U		6.4	1.95
75-15-0	Carbon Disulfide	6.4 U		6.4	1.89
56-23-5	Carbon Tetrachloride	6.4 U		6.4	0.606
108-90-7	Chlorobenzene	6.4 U		6.4	0.859
75-00-3	Chloroethane	6.4 U	VJ,C	6.4	1.76
67-66-3	Chloroform	6.4 U		6.4	0.580

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/21/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB9C**	QC Batch:	90257 -121
Sample #:	**345899**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
74-87-3	Chloromethane	6.4 U	6.4	1.08
110-82-7	Cyclohexane	13 U	13	0.411
10061-01-5	cis-1,3-Dichloropropene	6.4 U	6.4	0.638
10061-02-6	trans-1,3-Dichloropropene	6.4 U	6.4	0.677
75-71-8	Dichlorodifluoromethane	6.4 U	6.4	0.868
124-48-1	Chlorodibromomethane	6.4 U	6.4	0.672
100-41-4	Ethylbenzene	6.4 U	6.4	0.550
98-82-8	Isopropylbenzene	6.4 U	6.4	0.710
79-20-9	Methyl Acetate	26 U	26	4.51
108-87-2	Methylcyclohexane	13 U	13	1.10
1634-04-4	Methyl(tert)butyl Ether	6.4 U	6.4	0.833
75-09-2	**Methylene Chloride**	**5.0 J**	26	3.65
100-42-5	Styrene	6.4 U	6.4	0.575
127-18-4	Tetrachloroethene	6.4 U	6.4	0.797
108-88-3	Toluene	6.4 U	6.4	0.603
79-01-6	Trichloroethene	6.4 U	6.4	0.880
75-69-4	Trichlorofluoromethane	6.4 U	6.4	0.966
75-01-4	Vinyl Chloride	6.4 U	6.4	0.481
1330-20-7	Xylene (Total)	6.4 U	6.4	0.547

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/21/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB9C**	QC Batch:	90257 -121
Sample #:	**345899**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	78
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	CAS Number	Result (ug/kg dr	Qualifier
No compound was detected.			

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Individual sample results relate only to the sample tested.

TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 15:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/21/03 by JDM
		Anal. Method:	USEPA-8260B
Sample ID:	**13SB8A**	QC Batch:	90257 -121
Sample #:	**345900**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.5 U	6.5	0.554
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.5 U	6.5	0.987
79-34-5	1,1,2,2-Tetrachloroethane	6.5 U	6.5	0.849
79-00-5	1,1,2-Trichloroethane	6.5 U	6.5	0.771
75-34-3	1,1-Dichloroethane	6.5 U	6.5	0.941
75-35-4	1,1-Dichloroethylene	6.5 U	6.5	0.953
106-93-4	1,2-Dibromoethane	6.5 U	6.5	0.891
96-12-8	1,2-Dibromo-3-chloropropane	13 U	13	2.70
95-50-1	1,2-Dichlorobenzene	6.5 U	6.5	0.629
107-06-2	1,2-Dichloroethane	6.5 U	6.5	0.560
156-59-2	cis-1,2-Dichloroethene	6.5 U	6.5	0.923
156-60-5	trans-1,2-Dichloroethene	6.5 U	6.5	0.914
78-87-5	1,2-Dichloropropane	6.5 U	6.5	0.762
87-61-6	1,2,3-Trichlorobenzene	6.5 U	6.5	0.707
120-82-1	1,2,4-Trichlorobenzene	6.5 U	6.5	0.533
541-73-1	1,3-Dichlorobenzene	6.5 U	6.5	0.348
106-46-7	1,4-Dichlorobenzene	6.5 U	6.5	0.923
78-93-3	**Methyl Ethyl Ketone**	**30**	26	6.50
591-78-6	2-Hexanone	13 U	13	2.94
108-10-1	4-Methyl-2-Pentanone	13 U	13	1.90
67-64-1	**Acetone**	**120**	26	6.50
71-43-2	Benzene	6.5 U	6.5	0.685
74-97-5	Bromochloromethane	6.5 U	6.5	0.989
75-27-4	Dichlorobromomethane	6.5 U	6.5	0.651
75-25-2	Bromoform	6.5 U	6.5	0.751
74-83-9	Bromomethane	6.5 U	6.5	1.95
75-15-0	Carbon Disulfide	6.5 U	6.5	1.89
56-23-5	Carbon Tetrachloride	6.5 U	6.5	0.606
108-90-7	Chlorobenzene	6.5 U	6.5	0.859
75-00-3	Chloroethane	6.5 U VJC	6.5	1.76
67-66-3	Chloroform	6.5 U	6.5	0.580

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 15:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/21/03 by JDM
		Anal. Method:	USEPA-8260B
Sample ID:	**13SB8A**	QC Batch:	90257 -121
Sample #:	**345900**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
74-87-3	Chloromethane	6.5 U	6.5	1.08
110-82-7	Cyclohexane	13 U	13	0.411
10061-01-5	cis-1,3-Dichloropropene	6.5 U	6.5	0.638
10061-02-6	trans-1,3-Dichloropropene	6.5 U	6.5	0.677
75-71-8	Dichlorodifluoromethane	6.5 U	6.5	0.868
124-48-1	Chlorodibromomethane	6.5 U	6.5	0.672
100-41-4	Ethylbenzene	6.5 U	6.5	0.550
98-82-8	Isopropylbenzene	6.5 U	6.5	0.710
79-20-9	Methyl Acetate	26 U	26	4.51
108-87-2	Methylcyclohexane	13 U	13	1.10
1634-04-4	Methyl(tert)butyl Ether	6.5 U	6.5	0.833
75-09-2	**Methylene Chloride**	**4.1 J**	26	3.65
100-42-5	Styrene	6.5 U	6.5	0.575
127-18-4	Tetrachloroethene	6.5 U	6.5	0.797
108-88-3	**Toluene**	**0.66 J**	6.5	0.603
79-01-6	Trichloroethene	6.5 U	6.5	0.880
75-69-4	Trichlorofluoromethane	6.5 U	6.5	0.966
75-01-4	Vinyl Chloride	6.5 U	6.5	0.481
1330-20-7	Xylene (Total)	6.5 U	6.5	0.547

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 15:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/21/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB8A**	QC Batch:	90257 -121
Sample #:	**345900**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	77
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	CAS Number	Result (ug/kg dr	Qualifier
No compound was detected.			

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 15:30
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/21/03 by JDM
		Anal. Method:	USEPA-8260B
Sample ID:	**13SB8B**	QC Batch:	90257 -121
Sample #:	**345901**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.5 U		6.5	0.554
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.5 U		6.5	0.987
79-34-5	1,1,2,2-Tetrachloroethane	6.5 U		6.5	0.849
79-00-5	1,1,2-Trichloroethane	6.5 U		6.5	0.771
75-34-3	1,1-Dichloroethane	6.5 U		6.5	0.941
75-35-4	1,1-Dichloroethylene	6.5 U		6.5	0.953
106-93-4	1,2-Dibromoethane	6.5 U		6.5	0.891
96-12-8	1,2-Dibromo-3-chloropropane	13 U		13	2.70
95-50-1	1,2-Dichlorobenzene	6.5 U		6.5	0.629
107-06-2	1,2-Dichloroethane	6.5 U		6.5	0.560
156-59-2	cis-1,2-Dichloroethene	6.5 U		6.5	0.923
156-60-5	trans-1,2-Dichloroethene	6.5 U		6.5	0.914
78-87-5	1,2-Dichloropropane	6.5 U		6.5	0.762
87-61-6	1,2,3-Trichlorobenzene	6.5 U		6.5	0.707
120-82-1	1,2,4-Trichlorobenzene	6.5 U		6.5	0.533
541-73-1	1,3-Dichlorobenzene	6.5 U		6.5	0.348
106-46-7	1,4-Dichlorobenzene	6.5 U		6.5	0.923
78-93-3	**Methyl Ethyl Ketone**	**25 J**		26	6.50
591-78-6	2-Hexanone	13 U		13	2.94
108-10-1	4-Methyl-2-Pentanone	13 U		13	1.90
67-64-1	**Acetone**	**77**	B,Z	26	6.50
71-43-2	Benzene	6.5 U		6.5	0.685
74-97-5	Bromochloromethane	6.5 U		6.5	0.989
75-27-4	Dichlorobromomethane	6.5 U		6.5	0.651
75-25-2	Bromoform	6.5 U		6.5	0.751
74-83-9	Bromomethane	6.5 U		6.5	1.95
75-15-0	Carbon Disulfide	6.5 U		6.5	1.89
56-23-5	Carbon Tetrachloride	6.5 U		6.5	0.606
108-90-7	Chlorobenzene	6.5 U		6.5	0.859
75-00-3	Chloroethane	6.5 U	UJ,C	6.5	1.76
67-66-3	Chloroform	6.5 U		6.5	0.580

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 15:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/21/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SB8B**	QC Batch:	90257 -121
Sample #:	**345901**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
74-87-3	Chloromethane	6.5 U	6.5	1.08
110-82-7	Cyclohexane	13 U	13	0.411
10061-01-5	cis-1,3-Dichloropropene	6.5 U	6.5	0.638
10061-02-6	trans-1,3-Dichloropropene	6.5 U	6.5	0.677
75-71-8	Dichlorodifluoromethane	6.5 U	6.5	0.868
124-48-1	Chlorodibromomethane	6.5 U	6.5	0.672
100-41-4	Ethylbenzene	6.5 U	6.5	0.550
98-82-8	Isopropylbenzene	6.5 U	6.5	0.710
79-20-9	Methyl Acetate	26 U	26	4.51
108-87-2	Methylcyclohexane	13 U	13	1.10
1634-04-4	Methyl(tert)butyl Ether	6.5 U	6.5	0.833
75-09-2	**Methylene Chloride**	**5.6 J**	26	3.65
100-42-5	Styrene	6.5 U	6.5	0.575
127-18-4	Tetrachloroethene	6.5 U	6.5	0.797
108-88-3	Toluene	6.5 U	6.5	0.603
79-01-6	Trichloroethene	6.5 U	6.5	0.880
75-69-4	Trichlorofluoromethane	6.5 U	6.5	0.966
75-01-4	Vinyl Chloride	6.5 U	6.5	0.481
1330-20-7	Xylene (Total)	6.5 U	6.5	0.547

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 15:30
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	n/a
Submittal #:	**36440-5**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/21/03 JDM
		Anal. Method:	USEPA-8260B
Sample ID:	**13SB8B**	QC Batch:	90257 -121
Sample #:	**345901**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	78
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**
No compound was detected.			

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/09/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/01/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**69SB2A**	QC Batch:	90482 -114
Sample #:	**345745**	Anal. Batch:	208743
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	200 U	200	2.95
95-94-3	1,2,4,5-Tetrachloro-benzene	200 U	200	34.4
108-60-1	Bis (2-Chloroisopropyl)-Ether	200 U	200	1.58
95-95-4	2,4,5-Trichlorophenol	200 U	200	4.01
88-06-2	2,4,6-Trichlorophenol	200 U	200	3.14
120-83-2	2,4-Dichlorophenol	200 U	200	4.22
105-67-9	2,4-Dimethylphenol	200 U	200	9.53
51-28-5	2,4-Dinitrophenol	400 U	400	3.84
121-14-2	2,4-Dinitrotoluene	200 U	200	3.78
606-20-2	2,6-Dinitrotoluene	200 U	200	33.2
91-58-7	2-Chloronaphthalene	200 U	200	2.76
95-57-8	2-Chlorophenol	200 U	200	2.41
91-57-6	2-Methylnaphthalene	200 U	200	3.29
95-48-7	2-Methylphenol	200 U	200	5.81
88-74-4	2-Nitroaniline	200 U	200	5.52
88-75-5	2-Nitrophenol	200 U	200	2.04
91-94-1	3,3'-Dichlorobenzidine	200 U	200	66.5
99-09-2	3-Nitroaniline	200 U	200	22.0
534-52-1	4,6-Dinitro-2-Methylphenol	200 U	200	5.41
101-55-3	4-Bromophenyl Phenylether	200 U	200	4.06
59-50-7	**4-Chloro-3-Methylphenol**	**12 J**	200	6.25
106-47-8	4-Chloroaniline	200 U	200	1.51
7005-72-3	4-Chlorophenylphenyl-Ether	200 U	200	3.92
106-44-5	4-Methylphenol	200 U	200	7.64
100-01-6	4-Nitroaniline	200 U	200	8.70
100-02-7	4-Nitrophenol	400 U	400	3.40
83-32-9	Acenaphthene	200 U	200	2.06
208-96-8	Acenaphthylene	200 U	200	1.80
98-86-2	Acetophenone	200 U	200	2.28

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/09/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/01/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**69SB2A**	QC Batch:	90482 -114
Sample #:	**345745**	Anal. Batch:	208743
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	200 U		200	5.54
1912-24-9	Atrazine	200 U		200	8.26
100-52-7	Benzaldehyde	200 U		200	4.86
56-55-3	Benzo (a) Anthracene	200 U		200	16.0
50-32-8	Benzo (a) Pyrene	200 U		200	6.85
205-99-2	Benzo (b) Fluoranthene	200 U		200	11.7
191-24-2	Benzo (g,h,i,) Perylene	200 U		200	10.5
207-08-9	Benzo (k) Fluoranthene	200 U		200	16.1
111-91-1	Bis (2-Chloroethoxy)-Methane	200 U		200	3.77
111-44-4	Bis (2-Chloroethyl) Ether	200 U		200	2.08
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**22 J**	B,Z	200	2.48
85-68-7	Butyl Benzyl Phthalate	200 U		200	5.38
105-60-2	Caprolactam	400 U		400	7.66
86-74-8	Carbazole	200 U		200	7.32
218-01-9	Chrysene	200 U		200	12.2
53-70-3	Dibenzo (a,h) Anthracene	200 U		200	7.08
132-64-9	Dibenzofuran	200 U		200	3.79
84-66-2	**Diethylphthalate**	**6.0 J**	J,I	200	2.28
131-11-3	Dimethylphthalate	200 U		200	3.97
84-74-2	**Di-n-Butylphthalate**	**53 J**	B,Z	200	4.58
117-84-0	Di-n-Octylphthalate	200 U		200	3.72
206-44-0	**Fluoranthene**	**8.0 J**		200	2.82
86-73-7	Fluorene	200 U		200	2.02
118-74-1	Hexachlorobenzene	200 U		200	3.01
87-68-3	Hexachlorobutadiene	200 U		200	4.64
77-47-4	Hexachlorocyclopentadiene	200 U		200	2.38
67-72-1	Hexachloroethane	200 U		200	2.80
193-39-5	Indeno (1,2,3-cd) Pyrene	200 U		200	4.70
78-59-1	Isophorone	200 U		200	2.08
91-20-3	Naphthalene	200 U		200	3.30
98-95-3	Nitrobenzene	200 U		200	3.84

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/09/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/01/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**69SB2A**	QC Batch:	90482 -114
Sample #:	**345745**	Anal. Batch:	208743
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	200 U	200	3.95
86-30-6	N-Nitroso-di-Phenylamine	200 U	200	5.70
87-86-5	Pentachlorophenol	400 U	400	5.27
85-01-8	**Phenanthrene**	**5.0 J**	200	2.76
108-95-2	Phenol	200 U	200	4.75
129-00-0	**Pyrene**	**9.0 J**	200	1.78

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/01/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**69SB2A**	QC Batch:	90482 -114
Sample #:	**345745**	Anal. Batch:	208743
Matrix:	Soil	Percent Solids:	83
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
(Z)-9-Octadecenamide	301-02-0	190	E	NJ,+
2,4,6-Triallyloxy-1,3,5-triazine	101-37-1	38	E	B,X
D-Friedoolean-14-ene, 3-methoxy-, (3.beta.)-	14021-23-9	210	E	NJ,+
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~600~~	~~E~~	AS 2/18/03

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/09/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/01/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**69SB2B**	QC Batch:	90482 -114
Sample #:	**345746**	Anal. Batch:	208743
Matrix:	Soil	Percent Solids:	79
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	220 U		220	3.20
95-94-3	1,2,4,5-Tetrachloro-benzene	220 U		220	37.3
108-60-1	Bis (2-Chloroisopropyl)-Ether	220 U		220	1.72
95-95-4	2,4,5-Trichlorophenol	220 U		220	4.34
88-06-2	2,4,6-Trichlorophenol	220 U		220	3.41
120-83-2	2,4-Dichlorophenol	220 U		220	4.58
105-67-9	2,4-Dimethylphenol	220 U		220	10.3
51-28-5	2,4-Dinitrophenol	420 U		420	4.16
121-14-2	2,4-Dinitrotoluene	220 U		220	4.10
606-20-2	2,6-Dinitrotoluene	220 U		220	36.0
91-58-7	2-Chloronaphthalene	220 U		220	2.99
95-57-8	2-Chlorophenol	220 U		220	2.61
91-57-6	2-Methylnaphthalene	220 U		220	3.56
95-48-7	2-Methylphenol	220 U		220	6.29
88-74-4	2-Nitroaniline	220 U		220	5.98
88-75-5	2-Nitrophenol	220 U		220	2.21
91-94-1	3,3'-Dichlorobenzidine	220 U		220	72.0
99-09-2	3-Nitroaniline	220 U		220	23.8
534-52-1	4,6-Dinitro-2-Methylphenol	220 U		220	5.86
101-55-3	4-Bromophenyl Phenylether	220 U		220	4.39
59-50-7	**4-Chloro-3-Methylphenol**	**12 J**		220	6.77
106-47-8	4-Chloroaniline	220 U	VJ,e	220	1.64
7005-72-3	4-Chlorophenylphenyl-Ether	220 U		220	4.25
106-44-5	4-Methylphenol	220 U		220	8.28
100-01-6	4-Nitroaniline	220 U		220	9.43
100-02-7	4-Nitrophenol	420 U		420	3.68
83-32-9	Acenaphthene	220 U		220	2.24
208-96-8	Acenaphthylene	220 U		220	1.95
98-86-2	Acetophenone	220 U		220	2.47

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/09/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/01/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**69SB2B**	QC Batch:	90482 -114
Sample #:	**345746**	Anal. Batch:	208743
Matrix:	Soil	Percent Solids:	79
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	220 U		220	6.01
1912-24-9	Atrazine	220 U		220	8.94
100-52-7	Benzaldehyde	220 U		220	5.27
56-55-3	Benzo (a) Anthracene	220 U		220	17.3
50-32-8	Benzo (a) Pyrene	220 U		220	7.42
205-99-2	Benzo (b) Fluoranthene	220 U		220	12.7
191-24-2	Benzo (g,h,i,) Perylene	220 U		220	11.3
207-08-9	Benzo (k) Fluoranthene	220 U		220	17.4
111-91-1	Bis (2-Chloroethoxy)-Methane	220 U		220	4.08
111-44-4	Bis (2-Chloroethyl) Ether	220 U		220	2.25
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**15 J**	B,Z	220	2.69
85-68-7	Butyl Benzyl Phthalate	220 U		220	5.82
105-60-2	Caprolactam	420 U		420	8.29
86-74-8	Carbazole	220 U		220	7.93
218-01-9	Chrysene	220 U		220	13.3
53-70-3	Dibenzo (a,h) Anthracene	220 U		220	7.67
132-64-9	Dibenzofuran	220 U		220	4.11
84-66-2	**Diethylphthalate**	**4.0 J**	J,1	220	2.47
131-11-3	Dimethylphthalate	220 U		220	4.30
84-74-2	**Di-n-Butylphthalate**	**50 J**	B,Z	220	4.97
117-84-0	Di-n-Octylphthalate	220 U		220	4.03
206-44-0	Fluoranthene	220 U		220	3.06
86-73-7	Fluorene	220 U		220	2.18
118-74-1	Hexachlorobenzene	220 U		220	3.26
87-68-3	Hexachlorobutadiene	220 U		220	5.03
77-47-4	Hexachlorocyclopentadiene	220 U		220	2.57
67-72-1	Hexachloroethane	220 U		220	3.03
193-39-5	Indeno (1,2,3-cd) Pyrene	220 U		220	5.10
78-59-1	Isophorone	220 U		220	2.25
91-20-3	Naphthalene	220 U		220	3.58
98-95-3	Nitrobenzene	220 U		220	4.16

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/01/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**69SB2B**	QC Batch:	90482 -114
Sample #:	**345746**	Anal. Batch:	208743
Matrix:	Soil	Percent Solids:	79
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	220 U	220	4.28
86-30-6	N-Nitroso-di-Phenylamine	220 U	220	6.18
87-86-5	Pentachlorophenol	420 U	420	5.71
85-01-8	Phenanthrene	220 U	220	2.99
108-95-2	Phenol	220 U	220	5.15
129-00-0	Pyrene	220 U	220	1.92

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/01/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**69SB2B**	QC Batch:	90482 -114
Sample #:	**345746**	Anal. Batch:	208743
Matrix:	Soil	Percent Solids:	79
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
(Z)-9-Octadecenamide	301-02-0	57	E	NJ,+
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	34	E	NJ,+
Erucylamide	112-84-5	190	E	B,X
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~270~~	~~E~~	

AS 2/18/04

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:30
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/09/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/01/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**69SB2C**	QC Batch:	90482 -114
Sample #:	**345747**	Anal. Batch:	208743
Matrix:	Soil	Percent Solids:	75
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	230 U		230	3.20
95-94-3	1,2,4,5-Tetrachloro-benzene	230 U		230	37.3
108-60-1	Bis (2-Chloroisopropyl)-Ether	230 U		230	1.72
95-95-4	2,4,5-Trichlorophenol	230 U		230	4.34
88-06-2	2,4,6-Trichlorophenol	230 U		230	3.41
120-83-2	2,4-Dichlorophenol	230 U		230	4.58
105-67-9	2,4-Dimethylphenol	230 U		230	10.3
51-28-5	2,4-Dinitrophenol	440 U		440	4.16
121-14-2	2,4-Dinitrotoluene	230 U		230	4.10
606-20-2	2,6-Dinitrotoluene	230 U		230	36.0
91-58-7	2-Chloronaphthalene	230 U		230	2.99
95-57-8	2-Chlorophenol	230 U		230	2.61
91-57-6	2-Methylnaphthalene	230 U		230	3.56
95-48-7	2-Methylphenol	230 U		230	6.29
88-74-4	2-Nitroaniline	230 U		230	5.98
88-75-5	2-Nitrophenol	230 U		230	2.21
91-94-1	3,3'-Dichlorobenzidine	230 U		230	72.0
99-09-2	3-Nitroaniline	230 U		230	23.8
534-52-1	4,6-Dinitro-2-Methylphenol	230 U		230	5.86
101-55-3	4-Bromophenyl Phenylether	230 U		230	4.39
59-50-7	**4-Chloro-3-Methylphenol**	**16 J**		230	6.77
106-47-8	4-Chloroaniline	230 U	UJ,C	230	1.64
7005-72-3	4-Chlorophenylphenyl-Ether	230 U		230	4.25
106-44-5	4-Methylphenol	230 U		230	8.28
100-01-6	4-Nitroaniline	230 U		230	9.43
100-02-7	4-Nitrophenol	440 U		440	3.68
83-32-9	Acenaphthene	230 U		230	2.24
208-96-8	Acenaphthylene	230 U		230	1.95
98-86-2	Acetophenone	230 U		230	2.47

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/01/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**69SB2C**	QC Batch:	90482 -114
Sample #:	**345747**	Anal. Batch:	208743
Matrix:	Soil	Percent Solids:	75
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	230 U		230	6.01
1912-24-9	Atrazine	230 U		230	8.94
100-52-7	Benzaldehyde	230 U		230	5.27
56-55-3	Benzo (a) Anthracene	230 U		230	17.3
50-32-8	Benzo (a) Pyrene	230 U		230	7.42
205-99-2	Benzo (b) Fluoranthene	230 U		230	12.7
191-24-2	Benzo (g,h,i,) Perylene	230 U		230	11.3
207-08-9	Benzo (k) Fluoranthene	230 U		230	17.4
111-91-1	Bis (2-Chloroethoxy)-Methane	230 U		230	4.08
111-44-4	Bis (2-Chloroethyl) Ether	230 U		230	2.25
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**16 J**	B,Z	230	2.69
85-68-7	Butyl Benzyl Phthalate	230 U		230	5.82
105-60-2	Caprolactam	440 U		440	8.29
86-74-8	Carbazole	230 U		230	7.93
218-01-9	Chrysene	230 U		230	13.3
53-70-3	Dibenzo (a,h) Anthracene	230 U		230	7.67
132-64-9	Dibenzofuran	230 U		230	4.11
84-66-2	**Diethylphthalate**	**5.0 J**	J,1	230	2.47
131-11-3	Dimethylphthalate	230 U		230	4.30
84-74-2	**Di-n-Butylphthalate**	**70 J**	B,Z	230	4.97
117-84-0	Di-n-Octylphthalate	230 U		230	4.03
206-44-0	Fluoranthene	230 U		230	3.06
86-73-7	Fluorene	230 U		230	2.18
118-74-1	Hexachlorobenzene	230 U		230	3.26
87-68-3	Hexachlorobutadiene	230 U		230	5.03
77-47-4	Hexachlorocyclopentadiene	230 U		230	2.57
67-72-1	Hexachloroethane	230 U		230	3.03
193-39-5	Indeno (1,2,3-cd) Pyrene	230 U		230	5.10
78-59-1	Isophorone	230 U		230	2.25
91-20-3	Naphthalene	230 U		230	3.58
98-95-3	Nitrobenzene	230 U		230	4.16

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/01/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**69SB2C**	QC Batch:	90482 -114
Sample #:	**345747**	Anal. Batch:	208743
Matrix:	Soil	Percent Solids:	75
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	230 U	230	4.28
86-30-6	N-Nitroso-di-Phenylamine	230 U	230	6.18
87-86-5	Pentachlorophenol	440 U	440	5.71
85-01-8	Phenanthrene	230 U	230	2.99
108-95-2	Phenol	230 U	230	5.15
129-00-0	Pyrene	230 U	230	1.92

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:30
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/09/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/01/03 JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**69SB2C**	QC Batch:	90482 -114
Sample #:	**345747**	Anal. Batch:	208743
Matrix:	Soil	Percent Solids:	75
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
(Z)-9-Octadecenamide	301-02-0	76	E	NJ,+
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	63	E	NJ,+
Erucylamide	112-84-5	380	E	BX
Ethanol, 2-(hexadecyloxy)-	2136-71-2	42	E	NJ,+
Squalene	7683-64-9	46	E	NJ,+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 16:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/09/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/01/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**57SB4B**	QC Batch:	90482 -114
Sample #:	**345748**	Anal. Batch:	208743
Matrix:	Soil	Percent Solids:	74
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	230 U	230	3.44
95-94-3	1,2,4,5-Tetrachloro-benzene	230 U	230	40.2
108-60-1	Bis (2-Chloroisopropyl)-Ether	230 U	230	1.85
95-95-4	2,4,5-Trichlorophenol	230 U	230	4.68
88-06-2	2,4,6-Trichlorophenol	230 U	230	3.67
120-83-2	2,4-Dichlorophenol	230 U	230	4.93
105-67-9	2,4-Dimethylphenol	230 U	230	11.1
51-28-5	2,4-Dinitrophenol	440 U	440	4.48
121-14-2	2,4-Dinitrotoluene	230 U	230	4.41
606-20-2	2,6-Dinitrotoluene	230 U	230	38.8
91-58-7	2-Chloronaphthalene	230 U	230	3.22
95-57-8	2-Chlorophenol	230 U	230	2.81
91-57-6	2-Methylnaphthalene	230 U	230	3.84
95-48-7	2-Methylphenol	230 U	230	6.78
88-74-4	2-Nitroaniline	230 U	230	6.44
88-75-5	2-Nitrophenol	230 U	230	2.38
91-94-1	3,3'-Dichlorobenzidine	230 U	230	77.6
99-09-2	3-Nitroaniline	230 U	230	25.6
534-52-1	4,6-Dinitro-2-Methylphenol	230 U	230	6.31
101-55-3	4-Bromophenyl Phenylether	230 U	230	4.73
59-50-7	**4-Chloro-3-Methylphenol**	**18 J**	230	7.29
106-47-8	4-Chloroaniline	230 U UJ,C	230	1.76
7005-72-3	4-Chlorophenylphenyl-Ether	230 U	230	4.58
106-44-5	4-Methylphenol	230 U	230	8.92
100-01-6	4-Nitroaniline	230 U	230	10.2
100-02-7	4-Nitrophenol	440 U	440	3.96
83-32-9	Acenaphthene	230 U	230	2.41
208-96-8	Acenaphthylene	230 U	230	2.10
98-86-2	Acetophenone	230 U	230	2.66

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 16:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/01/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**57SB4B**	QC Batch:	90482 -114
Sample #:	**345748**	Anal. Batch:	208743
Matrix:	Soil	Percent Solids:	74
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	230 U		230	6.47
1912-24-9	Atrazine	230 U		230	9.63
100-52-7	Benzaldehyde	230 U		230	5.67
56-55-3	Benzo (a) Anthracene	230 U		230	18.6
50-32-8	Benzo (a) Pyrene	230 U		230	7.99
205-99-2	Benzo (b) Fluoranthene	230 U		230	13.7
191-24-2	Benzo (g,h,i,) Perylene	230 U		230	12.2
207-08-9	Benzo (k) Fluoranthene	230 U		230	18.8
111-91-1	Bis (2-Chloroethoxy)-Methane	230 U		230	4.40
111-44-4	Bis (2-Chloroethyl) Ether	230 U		230	2.42
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**24 J**	B,2	230	2.90
85-68-7	Butyl Benzyl Phthalate	230 U		230	6.27
105-60-2	Caprolactam	440 U		440	8.93
86-74-8	Carbazole	230 U		230	8.54
218-01-9	Chrysene	230 U		230	14.3
53-70-3	Dibenzo (a,h) Anthracene	230 U		230	8.26
132-64-9	Dibenzofuran	230 U		230	4.42
84-66-2	**Diethylphthalate**	**6.0 J**	J,1	230	2.66
131-11-3	Dimethylphthalate	230 U		230	4.63
84-74-2	**Di-n-Butylphthalate**	**76 J**	B,2	230	5.35
117-84-0	Di-n-Octylphthalate	230 U		230	4.34
206-44-0	Fluoranthene	230 U		230	3.29
86-73-7	Fluorene	230 U		230	2.35
118-74-1	Hexachlorobenzene	230 U		230	3.51
87-68-3	Hexachlorobutadiene	230 U		230	5.42
77-47-4	Hexachlorocyclopentadiene	230 U		230	2.77
67-72-1	Hexachloroethane	230 U		230	3.27
193-39-5	Indeno (1,2,3-cd) Pyrene	230 U		230	5.49
78-59-1	Isophorone	230 U		230	2.42
91-20-3	Naphthalene	230 U		230	3.85
98-95-3	Nitrobenzene	230 U		230	4.48

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 16:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/01/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**57SB4B**	QC Batch:	90482 -114
Sample #:	**345748**	Anal. Batch:	208743
Matrix:	Soil	Percent Solids:	74
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	230 U	230	4.61
86-30-6	N-Nitroso-di-Phenylamine	230 U	230	6.65
87-86-5	Pentachlorophenol	440 U	440	6.15
85-01-8	Phenanthrene	230 U	230	3.22
108-95-2	Phenol	230 U	230	5.54
129-00-0	Pyrene	230 U	230	2.07

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 16:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/01/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**57SB4B**	QC Batch:	90482 -114
Sample #:	**345748**	Anal. Batch:	208743
Matrix:	Soil	Percent Solids:	74
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
1,2-Benzenedicarboxylic acid, butyl 2-methylpropyl ester	17851-53-5	160	E	NJ,+
1-Hexadecanol	36653-82-4	48	E	NJ,+
2,4,6-Triallyloxy-1,3,5-triazine	101-37-1	58	E	NJ,+
4-(1,1,3,3-Tetramethyl Butyl)-Phenol	140-66-9	29	E	NJ,+
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~150~~	~~E~~	~~+~~ KS 2/18/04
Phenol, 4-(1,1-dimethylpropyl)-	80-46-6	720	E	NJ,+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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Individual sample results relate only to the sample tested.

TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 09:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/01/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB7A**	QC Batch:	90482 -114
Sample #:	**345883**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	82
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	210 U		210	2.95
95-94-3	1,2,4,5-Tetrachloro-benzene	210 U		210	34.4
108-60-1	Bis (2-Chloroisopropyl)-Ether	210 U		210	1.58
95-95-4	2,4,5-Trichlorophenol	210 U		210	4.01
88-06-2	2,4,6-Trichlorophenol	210 U		210	3.14
120-83-2	2,4-Dichlorophenol	210 U		210	4.22
105-67-9	2,4-Dimethylphenol	210 U		210	9.53
51-28-5	2,4-Dinitrophenol	400 U	UJ,c	400	3.84
121-14-2	2,4-Dinitrotoluene	210 U		210	3.78
606-20-2	2,6-Dinitrotoluene	210 U		210	33.2
91-58-7	2-Chloronaphthalene	210 U		210	2.76
95-57-8	2-Chlorophenol	210 U		210	2.41
91-57-6	2-Methylnaphthalene	210 U		210	3.29
95-48-7	2-Methylphenol	210 U		210	5.81
88-74-4	2-Nitroaniline	210 U		210	5.52
88-75-5	2-Nitrophenol	210 U		210	2.04
91-94-1	3,3'-Dichlorobenzidine	210 U		210	66.5
99-09-2	3-Nitroaniline	210 U		210	22.0
534-52-1	4,6-Dinitro-2-Methylphenol	210 U		210	5.41
101-55-3	4-Bromophenyl Phenylether	210 U		210	4.06
59-50-7	**4-Chloro-3-Methylphenol**	**19 J**		210	6.25
106-47-8	4-Chloroaniline	210 U		210	1.51
7005-72-3	4-Chlorophenylphenyl-Ether	210 U		210	3.92
106-44-5	4-Methylphenol	210 U		210	7.64
100-01-6	4-Nitroaniline	210 U		210	8.70
100-02-7	4-Nitrophenol	400 U		400	3.40
83-32-9	Acenaphthene	210 U		210	2.06
208-96-8	Acenaphthylene	210 U		210	1.80
98-86-2	Acetophenone	210 U		210	2.28

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 09:45
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/01/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB7A**	QC Batch:	90482 -114
Sample #:	**345883**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	82
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	210 U		210	5.54
1912-24-9	Atrazine	210 U		210	8.26
100-52-7	Benzaldehyde	210 U		210	4.86
56-55-3	Benzo (a) Anthracene	210 U		210	16.0
50-32-8	**Benzo (a) Pyrene**	**18 J**		210	6.85
205-99-2	**Benzo (b) Fluoranthene**	**25 J**	J,1	210	11.7
191-24-2	**Benzo (g,h,i,) Perylene**	**11 J**	J,1	210	10.5
207-08-9	Benzo (k) Fluoranthene	210 U		210	16.1
111-91-1	Bis (2-Chloroethoxy)-Methane	210 U		210	3.77
111-44-4	Bis (2-Chloroethyl) Ether	210 U		210	2.08
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**19 J**	B,2	210	2.48
85-68-7	**Butyl Benzyl Phthalate**	**6.0 J**		210	5.38
105-60-2	Caprolactam	400 U		400	7.66
86-74-8	Carbazole	210 U		210	7.32
218-01-9	**Chrysene**	**24 J**		210	12.2
53-70-3	Dibenzo (a,h) Anthracene	210 U		210	7.08
132-64-9	Dibenzofuran	210 U		210	3.79
84-66-2	**Diethylphthalate**	**9.0 J**	J,1	210	2.28
131-11-3	Dimethylphthalate	210 U		210	3.97
84-74-2	**Di-n-Butylphthalate**	**70 J**	B,2	210	4.58
117-84-0	Di-n-Octylphthalate	210 U		210	3.72
206-44-0	**Fluoranthene**	**9.0 J**		210	2.82
86-73-7	Fluorene	210 U		210	2.02
118-74-1	Hexachlorobenzene	210 U		210	3.01
87-68-3	Hexachlorobutadiene	210 U		210	4.64
77-47-4	Hexachlorocyclopentadiene	210 U		210	2.38
67-72-1	Hexachloroethane	210 U		210	2.80
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**10 J**	J,1	210	4.70
78-59-1	Isophorone	210 U		210	2.08
91-20-3	Naphthalene	210 U		210	3.30
98-95-3	Nitrobenzene	210 U		210	3.84

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 09:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/01/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB7A**	QC Batch:	90482 -114
Sample #:	**345883**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	82
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	210 U	210	3.95
86-30-6	N-Nitroso-di-Phenylamine	210 U	210	5.70
87-86-5	Pentachlorophenol	400 U	400	5.27
85-01-8	**Phenanthrene**	**4.0 J**	210	2.76
108-95-2	Phenol	210 U	210	4.75
129-00-0	**Pyrene**	**6.0 J**	210	1.78

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 09:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/01/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB7A**	QC Batch:	90482 -114
Sample #:	**345883**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	82
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
1,2-Benzenedicarboxylic acid, butyl 2-methylpropyl ester	17851-53-5	69	E	NJ,+
2,4,6-Triallyloxy-1,3,5-triazine	101-37-1	50	E	B,X
Erucylamide	112-84-5	300	E	B,X
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~170~~	~~E~~	AS 2/18/04

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/01/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB7B**	QC Batch:	90482 -114
Sample #:	**345884**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	210 U		210	2.95
95-94-3	1,2,4,5-Tetrachloro-benzene	210 U		210	34.4
108-60-1	Bis (2-Chloroisopropyl)-Ether	210 U		210	1.58
95-95-4	2,4,5-Trichlorophenol	210 U		210	4.01
88-06-2	2,4,6-Trichlorophenol	210 U		210	3.14
120-83-2	2,4-Dichlorophenol	210 U		210	4.22
105-67-9	2,4-Dimethylphenol	210 U		210	9.53
51-28-5	2,4-Dinitrophenol	410 U	VJC	410	3.84
121-14-2	2,4-Dinitrotoluene	210 U		210	3.78
606-20-2	2,6-Dinitrotoluene	210 U		210	33.2
91-58-7	2-Chloronaphthalene	210 U		210	2.76
95-57-8	2-Chlorophenol	210 U		210	2.41
91-57-6	2-Methylnaphthalene	210 U		210	3.29
95-48-7	2-Methylphenol	210 U		210	5.81
88-74-4	2-Nitroaniline	210 U		210	5.52
88-75-5	2-Nitrophenol	210 U		210	2.04
91-94-1	3,3'-Dichlorobenzidine	210 U		210	66.5
99-09-2	3-Nitroaniline	210 U		210	22.0
534-52-1	4,6-Dinitro-2-Methylphenol	210 U		210	5.41
101-55-3	4-Bromophenyl Phenylether	210 U		210	4.06
59-50-7	**4-Chloro-3-Methylphenol**	**16 J**		210	6.25
106-47-8	4-Chloroaniline	210 U		210	1.51
7005-72-3	4-Chlorophenylphenyl-Ether	210 U		210	3.92
106-44-5	4-Methylphenol	210 U		210	7.64
100-01-6	4-Nitroaniline	210 U		210	8.70
100-02-7	4-Nitrophenol	410 U		410	3.40
83-32-9	Acenaphthene	210 U		210	2.06
208-96-8	Acenaphthylene	210 U		210	1.80
98-86-2	Acetophenone	210 U		210	2.28

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/01/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB7B**	QC Batch:	90482 -114
Sample #:	**345884**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	210 U		210	5.54
1912-24-9	Atrazine	210 U		210	8.26
100-52-7	Benzaldehyde	210 U		210	4.86
56-55-3	Benzo (a) Anthracene	210 U		210	16.0
50-32-8	**Benzo (a) Pyrene**	**11 J**		210	6.85
205-99-2	**Benzo (b) Fluoranthene**	**17 J**	J,1	210	11.7
191-24-2	Benzo (g,h,i,) Perylene	210 U		210	10.5
207-08-9	Benzo (k) Fluoranthene	210 U		210	16.1
111-91-1	Bis (2-Chloroethoxy)-Methane	210 U		210	3.77
111-44-4	Bis (2-Chloroethyl) Ether	210 U		210	2.08
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**18 J**	B,2	210	2.48
85-68-7	Butyl Benzyl Phthalate	210 U		210	5.38
105-60-2	Caprolactam	410 U		410	7.66
86-74-8	Carbazole	210 U		210	7.32
218-01-9	**Chrysene**	**16 J**		210	12.2
53-70-3	Dibenzo (a,h) Anthracene	210 U		210	7.08
132-64-9	Dibenzofuran	210 U		210	3.79
84-66-2	**Diethylphthalate**	**8.0 J**	J,1	210	2.28
131-11-3	Dimethylphthalate	210 U		210	3.97
84-74-2	**Di-n-Butylphthalate**	**85 J**	B,2	210	4.58
117-84-0	Di-n-Octylphthalate	210 U		210	3.72
206-44-0	Fluoranthene	210 U		210	2.82
86-73-7	Fluorene	210 U		210	2.02
118-74-1	Hexachlorobenzene	210 U		210	3.01
87-68-3	Hexachlorobutadiene	210 U		210	4.64
77-47-4	Hexachlorocyclopentadiene	210 U		210	2.38
67-72-1	Hexachloroethane	210 U		210	2.80
193-39-5	Indeno (1,2,3-cd) Pyrene	210 U		210	4.70
78-59-1	Isophorone	210 U		210	2.08
91-20-3	Naphthalene	210 U		210	3.30
98-95-3	Nitrobenzene	210 U		210	3.84

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/01/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB7B**	QC Batch:	90482 -114
Sample #:	**345884**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	210 U	210	3.95
86-30-6	N-Nitroso-di-Phenylamine	210 U	210	5.70
87-86-5	Pentachlorophenol	410 U	410	5.27
85-01-8	Phenanthrene	210 U	210	2.76
108-95-2	Phenol	210 U	210	4.75
129-00-0	Pyrene	210 U	210	1.78

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/01/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB7B**	QC Batch:	90482 -114
Sample #:	**345884**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	80
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	140	E	NJ,+
2,4,6-Triallyloxy-1,3,5-triazine	101-37-1	42	E	B,X
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~330~~	~~E~~	2/18/04

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB7C**	QC Batch:	90482 -114
Sample #:	**345885**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	79
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	220 U		220	3.20
95-94-3	1,2,4,5-Tetrachloro-benzene	220 U		220	37.3
108-60-1	Bis (2-Chloroisopropyl)-Ether	220 U		220	1.72
95-95-4	2,4,5-Trichlorophenol	220 U		220	4.34
88-06-2	2,4,6-Trichlorophenol	220 U		220	3.41
120-83-2	2,4-Dichlorophenol	220 U		220	4.58
105-67-9	2,4-Dimethylphenol	220 U		220	10.3
51-28-5	2,4-Dinitrophenol	420 U	UJ,C	420	4.16
121-14-2	2,4-Dinitrotoluene	220 U		220	4.10
606-20-2	2,6-Dinitrotoluene	220 U		220	36.0
91-58-7	2-Chloronaphthalene	220 U		220	2.99
95-57-8	2-Chlorophenol	220 U		220	2.61
91-57-6	2-Methylnaphthalene	220 U		220	3.56
95-48-7	2-Methylphenol	220 U		220	6.29
88-74-4	2-Nitroaniline	220 U		220	5.98
88-75-5	2-Nitrophenol	220 U		220	2.21
91-94-1	3,3'-Dichlorobenzidine	220 U		220	72.0
99-09-2	3-Nitroaniline	220 U		220	23.8
534-52-1	4,6-Dinitro-2-Methylphenol	220 U		220	5.86
101-55-3	4-Bromophenyl Phenylether	220 U		220	4.39
59-50-7	**4-Chloro-3-Methylphenol**	**8.0 J**		220	6.77
106-47-8	4-Chloroaniline	220 U		220	1.64
7005-72-3	4-Chlorophenylphenyl-Ether	220 U		220	4.25
106-44-5	4-Methylphenol	220 U		220	8.28
100-01-6	4-Nitroaniline	220 U		220	9.43
100-02-7	4-Nitrophenol	420 U		420	3.68
83-32-9	Acenaphthene	220 U		220	2.24
208-96-8	Acenaphthylene	220 U		220	1.95
98-86-2	Acetophenone	220 U		220	2.47

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB7C**	QC Batch:	90482 -114
Sample #:	**345885**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	79
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	220 U		220	6.01
1912-24-9	Atrazine	220 U		220	8.94
100-52-7	Benzaldehyde	220 U		220	5.27
56-55-3	Benzo (a) Anthracene	220 U		220	17.3
50-32-8	Benzo (a) Pyrene	220 U		220	7.42
205-99-2	Benzo (b) Fluoranthene	220 U		220	12.7
191-24-2	Benzo (g,h,i,) Perylene	220 U		220	11.3
207-08-9	Benzo (k) Fluoranthene	220 U		220	17.4
111-91-1	Bis (2-Chloroethoxy)-Methane	220 U		220	4.08
111-44-4	Bis (2-Chloroethyl) Ether	220 U		220	2.25
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**17 J**	B,Z	220	2.69
85-68-7	Butyl Benzyl Phthalate	220 U		220	5.82
105-60-2	Caprolactam	420 U		420	8.29
86-74-8	Carbazole	220 U		220	7.93
218-01-9	Chrysene	220 U		220	13.3
53-70-3	Dibenzo (a,h) Anthracene	220 U		220	7.67
132-64-9	Dibenzofuran	220 U		220	4.11
84-66-2	**Diethylphthalate**	**6.0 J**	J,I	220	2.47
131-11-3	Dimethylphthalate	220 U		220	4.30
84-74-2	**Di-n-Butylphthalate**	**120 J**	B,Z	220	4.97
117-84-0	Di-n-Octylphthalate	220 U		220	4.03
206-44-0	Fluoranthene	220 U		220	3.06
86-73-7	Fluorene	220 U		220	2.18
118-74-1	Hexachlorobenzene	220 U		220	3.26
87-68-3	Hexachlorobutadiene	220 U		220	5.03
77-47-4	Hexachlorocyclopentadiene	220 U		220	2.57
67-72-1	Hexachloroethane	220 U		220	3.03
193-39-5	Indeno (1,2,3-cd) Pyrene	220 U		220	5.10
78-59-1	Isophorone	220 U		220	2.25
91-20-3	Naphthalene	220 U		220	3.58
98-95-3	Nitrobenzene	220 U		220	4.16

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB7C**	QC Batch:	90482 -114
Sample #:	**345885**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	79
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	220 U	220	4.28
86-30-6	N-Nitroso-di-Phenylamine	220 U	220	6.18
87-86-5	Pentachlorophenol	420 U	420	5.71
85-01-8	Phenanthrene	220 U	220	2.99
108-95-2	Phenol	220 U	220	5.15
129-00-0	Pyrene	220 U	220	1.92

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB7C**	QC Batch:	90482 -114
Sample #:	**345885**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	79
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	200	E	NJ+
2,4,6-Triallyloxy-1,3,5-triazine	101-37-1	36	E	B,X
Erucylamide	112-84-5	120	E	B,X
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~500~~	~~E~~	~~B,X~~ ts 2/18/04

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:45
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB12A**	QC Batch:	90572 -114
Sample #:	**345886**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	220 U		220	3.20
95-94-3	1,2,4,5-Tetrachloro-benzene	220 U		220	37.3
108-60-1	Bis (2-Chloroisopropyl)-Ether	220 U		220	1.72
95-95-4	2,4,5-Trichlorophenol	220 U		220	4.34
88-06-2	2,4,6-Trichlorophenol	220 U		220	3.41
120-83-2	2,4-Dichlorophenol	220 U		220	4.58
105-67-9	2,4-Dimethylphenol	220 U		220	10.3
51-28-5	2,4-Dinitrophenol	420 U	VJ,c	420	4.16
121-14-2	**2,4-Dinitrotoluene**	**710**		220	4.10
606-20-2	**2,6-Dinitrotoluene**	**210 J**		220	36.0
91-58-7	2-Chloronaphthalene	220 U		220	2.99
95-57-8	2-Chlorophenol	220 U		220	2.61
91-57-6	2-Methylnaphthalene	220 U		220	3.56
95-48-7	2-Methylphenol	220 U		220	6.29
88-74-4	2-Nitroaniline	220 U		220	5.98
88-75-5	2-Nitrophenol	220 U		220	2.21
91-94-1	3,3'-Dichlorobenzidine	220 U		220	72.0
99-09-2	3-Nitroaniline	220 U		220	23.8
534-52-1	4,6-Dinitro-2-Methylphenol	220 U		220	5.86
101-55-3	4-Bromophenyl Phenylether	220 U		220	4.39
59-50-7	**4-Chloro-3-Methylphenol**	**19 J**		220	6.77
106-47-8	4-Chloroaniline	220 U		220	1.64
7005-72-3	4-Chlorophenylphenyl-Ether	220 U		220	4.25
106-44-5	4-Methylphenol	220 U		220	8.28
100-01-6	4-Nitroaniline	220 U		220	9.43
100-02-7	4-Nitrophenol	420 U		420	3.68
83-32-9	Acenaphthene	220 U		220	2.24
208-96-8	Acenaphthylene	220 U		220	1.95
98-86-2	Acetophenone	220 U		220	2.47

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:45
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB12A**	QC Batch:	90572 -114
Sample #:	**345886**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
120-12-7	Anthracene	220 U	220	6.01
1912-24-9	Atrazine	220 U	220	8.94
100-52-7	Benzaldehyde	220 U	220	5.27
56-55-3	Benzo (a) Anthracene	220 U	220	17.3
50-32-8	Benzo (a) Pyrene	220 U	220	7.42
205-99-2	**Benzo (b) Fluoranthene**	**13 J**	220	12.7
191-24-2	Benzo (g,h,i,) Perylene	220 U	220	11.3
207-08-9	Benzo (k) Fluoranthene	220 U	220	17.4
111-91-1	Bis (2-Chloroethoxy)-Methane	220 U	220	4.08
111-44-4	Bis (2-Chloroethyl) Ether	220 U	220	2.25
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**71 J**	220	2.69
85-68-7	Butyl Benzyl Phthalate	220 U	220	5.82
105-60-2	Caprolactam	420 U	420	8.29
86-74-8	Carbazole	220 U	220	7.93
218-01-9	Chrysene	220 U	220	13.3
53-70-3	Dibenzo (a,h) Anthracene	220 U	220	7.67
132-64-9	Dibenzofuran	220 U	220	4.11
84-66-2	**Diethylphthalate**	**950**	220	2.47
131-11-3	Dimethylphthalate	220 U	220	4.30
84-74-2	**Di-n-Butylphthalate**	**680**	220	4.97
117-84-0	Di-n-Octylphthalate	220 U	220	4.03
206-44-0	**Fluoranthene**	**25 J**	220	3.06
86-73-7	Fluorene	220 U	220	2.18
118-74-1	Hexachlorobenzene	220 U	220	3.26
87-68-3	Hexachlorobutadiene	220 U	220	5.03
77-47-4	Hexachlorocyclopentadiene	220 U	220	2.57
67-72-1	Hexachloroethane	220 U	220	3.03
193-39-5	Indeno (1,2,3-cd) Pyrene	220 U	220	5.10
78-59-1	Isophorone	220 U	220	2.25
91-20-3	Naphthalene	220 U	220	3.58
98-95-3	Nitrobenzene	220 U	220	4.16

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB12A**	QC Batch:	90572 -114
Sample #:	**345886**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	220 U	220	4.28
86-30-6	**N-Nitroso-di-Phenylamine**	**630**	220	6.18
87-86-5	Pentachlorophenol	420 U	420	5.71
85-01-8	**Phenanthrene**	**15 J**	220	2.99
108-95-2	Phenol	220 U	220	5.15
129-00-0	**Pyrene**	**21 J**	220	1.92

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:45
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB12A**	QC Batch:	90572 -114
Sample #:	**345886**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	78
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
(Z)-9-Octadecenamide	301-02-0	120	E	NJ,+
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	290	E	NJ,+
Benzene, 2-methyl-1,3,5-trinitro-	118-96-7	350	E	NJ,+
Benzeneamine, 2-nitro-N-phenyl-	119-75-5	280	E	NJ,+
Erucylamide	112-84-5	330	E	B,X
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~670~~	~~E~~	~~A~~ 2/18/04
Triacetin	102-76-1	140	E	NJ,+
Urea, N,N'-dimethyl-N,N'-diphenyl-	611-92-7	910	E	NJ,+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 11:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB12B**	QC Batch:	90572 -114
Sample #:	**345887**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	71
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	240 U		240	3.44
95-94-3	1,2,4,5-Tetrachloro-benzene	240 U		240	40.2
108-60-1	Bis (2-Chloroisopropyl)-Ether	240 U		240	1.85
95-95-4	2,4,5-Trichlorophenol	240 U		240	4.68
88-06-2	2,4,6-Trichlorophenol	240 U		240	3.67
120-83-2	2,4-Dichlorophenol	240 U		240	4.93
105-67-9	2,4-Dimethylphenol	240 U		240	11.1
51-28-5	2,4-Dinitrophenol	460 U	UJ,C	460	4.48
121-14-2	**2,4-Dinitrotoluene**	**700**		240	4.41
606-20-2	**2,6-Dinitrotoluene**	**61 J**		240	38.8
91-58-7	2-Chloronaphthalene	240 U		240	3.22
95-57-8	2-Chlorophenol	240 U		240	2.81
91-57-6	2-Methylnaphthalene	240 U		240	3.84
95-48-7	2-Methylphenol	240 U		240	6.78
88-74-4	2-Nitroaniline	240 U		240	6.44
88-75-5	2-Nitrophenol	240 U		240	2.38
91-94-1	3,3'-Dichlorobenzidine	240 U		240	77.6
99-09-2	3-Nitroaniline	240 U		240	25.6
534-52-1	4,6-Dinitro-2-Methylphenol	240 U		240	6.31
101-55-3	4-Bromophenyl Phenylether	240 U		240	4.73
59-50-7	**4-Chloro-3-Methylphenol**	**18 J**		240	7.29
106-47-8	4-Chloroaniline	240 U		240	1.76
7005-72-3	4-Chlorophenylphenyl-Ether	240 U		240	4.58
106-44-5	4-Methylphenol	240 U		240	8.92
100-01-6	4-Nitroaniline	240 U		240	10.2
100-02-7	4-Nitrophenol	460 U		460	3.96
83-32-9	Acenaphthene	240 U		240	2.41
208-96-8	Acenaphthylene	240 U		240	2.10
98-86-2	Acetophenone	240 U		240	2.66

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 11:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB12B**	QC Batch:	90572 -114
Sample #:	**345887**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	71
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
120-12-7	Anthracene	240 U	240	6.47
1912-24-9	Atrazine	240 U	240	9.63
100-52-7	Benzaldehyde	240 U	240	5.67
56-55-3	Benzo (a) Anthracene	240 U	240	18.6
50-32-8	Benzo (a) Pyrene	240 U	240	7.99
205-99-2	Benzo (b) Fluoranthene	240 U	240	13.7
191-24-2	Benzo (g,h,i,) Perylene	240 U	240	12.2
207-08-9	Benzo (k) Fluoranthene	240 U	240	18.8
111-91-1	Bis (2-Chloroethoxy)-Methane	240 U	240	4.40
111-44-4	Bis (2-Chloroethyl) Ether	240 U	240	2.42
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**360**	240	2.90
85-68-7	Butyl Benzyl Phthalate	240 U	240	6.27
105-60-2	Caprolactam	460 U	460	8.93
86-74-8	Carbazole	240 U	240	8.54
218-01-9	Chrysene	240 U	240	14.3
53-70-3	Dibenzo (a,h) Anthracene	240 U	240	8.26
132-64-9	Dibenzofuran	240 U	240	4.42
~~84-66-2~~ *	~~**Diethylphthalate**~~	~~**2000 E**~~ J,Y	~~240~~	~~2.66~~ * JS 2/18/04
131-11-3	**Dimethylphthalate**	**32 J**	240	4.63
~~84-74-2~~ *	~~**Di-n-Butylphthalate**~~	~~**1200 E**~~ J,Y	~~240~~	~~5.35~~ * JS 2/18/04
117-84-0	Di-n-Octylphthalate	240 U	240	4.34
206-44-0	Fluoranthene	240 U	240	3.29
86-73-7	Fluorene	240 U	240	2.35
118-74-1	Hexachlorobenzene	240 U	240	3.51
87-68-3	Hexachlorobutadiene	240 U	240	5.42
77-47-4	Hexachlorocyclopentadiene	240 U	240	2.77
67-72-1	Hexachloroethane	240 U	240	3.27
193-39-5	Indeno (1,2,3-cd) Pyrene	240 U	240	5.49
78-59-1	Isophorone	240 U	240	2.42
91-20-3	Naphthalene	240 U	240	3.85
98-95-3	Nitrobenzene	240 U	240	4.48

* See Dilution for these results, JS 2/18/04

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 11:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB12B**	QC Batch:	90572 -114
Sample #:	**345887**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	71
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	240 U	240	4.61
86-30-6	**N-Nitroso-di-Phenylamine**	**900**	240	6.65
87-86-5	Pentachlorophenol	460 U	460	6.15
85-01-8	Phenanthrene	240 U	240	3.22
108-95-2	Phenol	240 U	240	5.54
129-00-0	Pyrene	240 U	240	2.07

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 11:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB12B**	QC Batch:	90572 -114
Sample #:	**345887**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	71
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	270	E	NJ,+
2-Ethyl-hexanoic Acid	149-57-5	180	E	NJ,+
7H-Dibenzo (a,g) carbazole	207-84-1	280	E	NJ,+
Benzene, 2-methyl-1,3,5-trinitro-	118-96-7	260	E	NJ,+
Benzeneamine, 2-nitro-N-phenyl-	119-75-5	900	E	NJ,+
Octacosane	630-02-4	180	E	NJ,+
Triacetin	102-76-1	1300	E	NJ,+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 11:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB12B**	QC Batch:	90572 -114
Sample #:	**345887DL**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	71
Unit:	ug/kg dry	Dilution Factor:	2.8

AK 2/13/04

Do not use, See undiluted results

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	480 U		480	6.89
95-94-3	1,2,4,5-Tetrachloro-benzene	480 U		480	80.4
108-60-1	Bis (2-Chloroisopropyl)-Ether	480 U		480	3.70
95-95-4	2,4,5-Trichlorophenol	480 U		480	9.35
88-06-2	2,4,6-Trichlorophenol	480 U		480	7.34
120-83-2	2,4-Dichlorophenol	480 U		480	9.86
105-67-9	2,4-Dimethylphenol	480 U		480	22.2
51-28-5	2,4-Dinitrophenol	930 U	UJC	930	8.96
121-14-2	**2,4-Dinitrotoluene**	**690**		480	8.82
606-20-2	2,6-Dinitrotoluene	480 U		480	77.6
91-58-7	2-Chloronaphthalene	480 U		480	6.44
95-57-8	2-Chlorophenol	480 U		480	5.63
91-57-6	2-Methylnaphthalene	480 U		480	7.67
95-48-7	2-Methylphenol	480 U		480	13.6
88-74-4	2-Nitroaniline	480 U		480	12.9
88-75-5	2-Nitrophenol	480 U		480	4.76
91-94-1	3,3'-Dichlorobenzidine	480 U		480	155
99-09-2	3-Nitroaniline	480 U		480	51.2
534-52-1	4,6-Dinitro-2-Methylphenol	480 U		480	12.6
101-55-3	4-Bromophenyl Phenylether	480 U		480	9.46
59-50-7	**4-Chloro-3-Methylphenol**	**17 J**		480	14.6
106-47-8	4-Chloroaniline	480 U		480	3.53
7005-72-3	4-Chlorophenylphenyl-Ether	480 U		480	9.16
106-44-5	4-Methylphenol	480 U		480	17.8
100-01-6	4-Nitroaniline	480 U		480	20.3
100-02-7	4-Nitrophenol	930 U		930	7.92
83-32-9	Acenaphthene	480 U		480	4.82
208-96-8	Acenaphthylene	480 U		480	4.20
98-86-2	Acetophenone	480 U		480	5.32

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 11:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB12B**	QC Batch:	90572 -114
Sample #:	**345887DL**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	71
Unit:	ug/kg dry	Dilution Factor:	2.8

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	480 U		480	12.9
1912-24-9	Atrazine	480 U		480	19.3
100-52-7	Benzaldehyde	480 U		480	11.3
56-55-3	Benzo (a) Anthracene	480 U		480	37.2
50-32-8	Benzo (a) Pyrene	480 U		480	16.0
205-99-2	Benzo (b) Fluoranthene	480 U		480	27.3
191-24-2	Benzo (g,h,i,) Perylene	480 U		480	24.4
207-08-9	Benzo (k) Fluoranthene	480 U		480	37.5
111-91-1	Bis (2-Chloroethoxy)-Methane	480 U		480	8.79
111-44-4	Bis (2-Chloroethyl) Ether	480 U		480	4.84
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**420 J**		480	5.80
85-68-7	Butyl Benzyl Phthalate	480 U		480	12.5
105-60-2	Caprolactam	930 U		930	17.9
86-74-8	Carbazole	480 U		480	17.1
218-01-9	Chrysene	480 U		480	28.6
53-70-3	Dibenzo (a,h) Anthracene	480 U		480	16.5
132-64-9	Dibenzofuran	480 U		480	8.85
84-66-2	**Diethylphthalate**	**2200**		480	5.32
131-11-3	**Dimethylphthalate**	**33 J**		480	9.27
84-74-2	**Di-n-Butylphthalate**	**1300**	J,f	480	10.7
117-84-0	Di-n-Octylphthalate	480 U		480	8.68
206-44-0	**Fluoranthene**	**7.0 J**		480	6.58
86-73-7	Fluorene	480 U		480	4.70
118-74-1	Hexachlorobenzene	480 U		480	7.03
87-68-3	Hexachlorobutadiene	480 U		480	10.8
77-47-4	Hexachlorocyclopentadiene	480 U	UJ,c	480	5.54
67-72-1	Hexachloroethane	480 U		480	6.54
193-39-5	Indeno (1,2,3-cd) Pyrene	480 U		480	11.0
78-59-1	Isophorone	480 U		480	4.84
91-20-3	Naphthalene	480 U		480	7.70
98-95-3	Nitrobenzene	480 U		480	8.96

KB 2-18-04

KB 2/18/04

* Use only these two results from this run
KB 2/18/04

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 11:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB12B**	QC Batch:	90572 -114
Sample #:	**345887DL**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	71
Unit:	ug/kg dry	Dilution Factor:	2.8

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	480 U	480	9.21
86-30-6	**N-Nitroso-di-Phenylamine**	**1200**	480	13.3
87-86-5	Pentachlorophenol	930 U	930	12.3
85-01-8	Phenanthrene	480 U	480	6.44
108-95-2	Phenol	480 U	480	11.1
129-00-0	**Pyrene**	**7.0 J**	480	4.14

Do not use, JS 2/18/04
See neat run.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**SBD8**	QC Batch:	90572 -114
Sample #:	**345888**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	67
Unit:	ug/kg dry	Dilution Factor:	1.5

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	250 U	250	3.69
95-94-3	1,2,4,5-Tetrachloro-benzene	250 U	250	43.1
108-60-1	Bis (2-Chloroisopropyl)-Ether	250 U	250	1.98
95-95-4	2,4,5-Trichlorophenol	250 U	250	5.01
88-06-2	2,4,6-Trichlorophenol	250 U	250	3.93
120-83-2	2,4-Dichlorophenol	250 U	250	5.28
105-67-9	2,4-Dimethylphenol	250 U	250	11.9
51-28-5	2,4-Dinitrophenol	490 U UJ,c	490	4.80
~~121-14-2~~	~~**2,4-Dinitrotoluene**~~	~~**1500 E** J,q~~	~~250~~	~~4.73~~ see dilutions 2/18/04
606-20-2	**2,6-Dinitrotoluene**	**56 J**	250	41.6
91-58-7	2-Chloronaphthalene	250 U	250	3.45
95-57-8	2-Chlorophenol	250 U	250	3.02
91-57-6	2-Methylnaphthalene	250 U	250	4.11
95-48-7	2-Methylphenol	250 U	250	7.26
88-74-4	2-Nitroaniline	250 U	250	6.90
88-75-5	2-Nitrophenol	250 U	250	2.55
91-94-1	3,3'-Dichlorobenzidine	250 U	250	83.1
99-09-2	3-Nitroaniline	250 U	250	27.5
534-52-1	4,6-Dinitro-2-Methylphenol	250 U	250	6.77
101-55-3	4-Bromophenyl Phenylether	250 U	250	5.07
59-50-7	**4-Chloro-3-Methylphenol**	**23 J**	250	7.82
106-47-8	4-Chloroaniline	250 U	250	1.89
7005-72-3	4-Chlorophenylphenyl-Ether	250 U	250	4.91
106-44-5	4-Methylphenol	250 U	250	9.56
100-01-6	4-Nitroaniline	250 U	250	10.9
100-02-7	4-Nitrophenol	490 U	490	4.25
83-32-9	Acenaphthene	250 U	250	2.58
208-96-8	Acenaphthylene	250 U	250	2.25
98-86-2	Acetophenone	250 U	250	2.85

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**SBD8**	QC Batch:	90572 -114
Sample #:	**345888**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	67
Unit:	ug/kg dry	Dilution Factor:	1.5

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL	
120-12-7	Anthracene	250 U	250	6.93	
1912-24-9	Atrazine	250 U	250	10.3	
100-52-7	Benzaldehyde	250 U	250	6.08	
56-55-3	Benzo (a) Anthracene	250 U	250	20.0	
50-32-8	Benzo (a) Pyrene	250 U	250	8.57	
205-99-2	Benzo (b) Fluoranthene	250 U	250	14.6	
191-24-2	Benzo (g,h,i,) Perylene	250 U	250	13.1	
207-08-9	Benzo (k) Fluoranthene	250 U	250	20.1	
111-91-1	Bis (2-Chloroethoxy)-Methane	250 U	250	4.71	
111-44-4	Bis (2-Chloroethyl) Ether	250 U	250	2.60	
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**300**	250	3.11	
85-68-7	Butyl Benzyl Phthalate	250 U	250	6.72	
105-60-2	Caprolactam	490 U	490	9.57	
86-74-8	Carbazole	250 U	250	9.15	
218-01-9	Chrysene	250 U	250	15.3	
53-70-3	Dibenzo (a,h) Anthracene	250 U	250	8.85	
132-64-9	Dibenzofuran	250 U	250	4.74	
~~84-66-2~~	~~**Diethylphthalate**~~	~~**2200 E**~~ J,q	250	2.85	see dilution 1, 2/18/04
131-11-3	Dimethylphthalate	250 U	250	4.97	
~~84-74-2~~	~~**Di-n-Butylphthalate**~~	~~**1800 E**~~ J,q	250	5.73	see dilution 1, 2/18/04
117-84-0	Di-n-Octylphthalate	250 U	250	4.65	
206-44-0	**Fluoranthene**	**21 J**	250	3.53	
86-73-7	Fluorene	250 U	250	2.52	
118-74-1	Hexachlorobenzene	250 U	250	3.77	
87-68-3	Hexachlorobutadiene	250 U	250	5.81	
77-47-4	Hexachlorocyclopentadiene	250 U	250	2.97	
67-72-1	Hexachloroethane	250 U	250	3.50	
193-39-5	Indeno (1,2,3-cd) Pyrene	250 U	250	5.88	
78-59-1	Isophorone	250 U	250	2.60	
91-20-3	Naphthalene	250 U	250	4.13	
98-95-3	Nitrobenzene	250 U	250	4.80	

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**SBD8**	QC Batch:	90572 -114
Sample #:	**345888**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	67
Unit:	ug/kg dry	Dilution Factor:	1.5

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	250 U	250	4.94
86-30-6	**N-Nitroso-di-Phenylamine**	**700**	250	7.13
87-86-5	Pentachlorophenol	490 U	490	6.59
85-01-8	**Phenanthrene**	**9.0 J**	250	3.45
108-95-2	Phenol	250 U	250	5.94
129-00-0	**Pyrene**	**16 J**	250	2.22

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**SBD8**	QC Batch:	90572 -114
Sample #:	**345888**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	67
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
1,1'-Biphenyl, bis(1-methylethyl)-	69009-90-1	66	E	NJ,+
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	400	E	NJ,+
2-Ethyl-hexanoic Acid	149-57-5	140	E	NJ,+
Benzene, 2-methyl-1,3,5-trinitro-	118-96-7	160	E	NJ,+
Benzeneamine, 2-nitro-N-phenyl-	119-75-5	600	E	NJ,+
Erucylamide	112-84-5	440	E	B,X
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~560~~	~~E~~	~~B,X~~ JB, 2/18/04
Triacetin	102-76-1	1000	E	NJ,+
Triphenyl Phosphate	115-86-6	200	E	NJ,+
Urea, N,N'-dimethyl-N,N'-diphenyl-	611-92-7	100	E	NJ,+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**SBD8**	QC Batch:	90572 -114
Sample #:	**345888DL**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	67
Unit:	ug/kg dry	Dilution Factor:	3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	510 U	510	7.38
95-94-3	1,2,4,5-Tetrachloro-benzene	510 U	510	86.1
108-60-1	Bis (2-Chloroisopropyl)-Ether	510 U	510	3.96
95-95-4	2,4,5-Trichlorophenol	510 U	510	10.0
88-06-2	2,4,6-Trichlorophenol	510 U	510	7.86
120-83-2	2,4-Dichlorophenol	510 U	510	10.6
105-67-9	2,4-Dimethylphenol	510 U	510	23.8
51-28-5	2,4-Dinitrophenol	980 U UJ,C	980	9.60
★ 121-14-2	**2,4-Dinitrotoluene**	**1500**	510	9.45
606-20-2	2,6-Dinitrotoluene	510 U	510	83.1
91-58-7	2-Chloronaphthalene	510 U	510	6.90
95-57-8	2-Chlorophenol	510 U	510	6.03
91-57-6	2-Methylnaphthalene	510 U	510	8.22
95-48-7	2-Methylphenol	510 U	510	14.5
88-74-4	2-Nitroaniline	510 U	510	13.8
88-75-5	2-Nitrophenol	510 U	510	5.10
91-94-1	3,3'-Dichlorobenzidine	510 U	510	166
99-09-2	3-Nitroaniline	510 U	510	54.9
534-52-1	4,6-Dinitro-2-Methylphenol	510 U	510	13.5
101-55-3	4-Bromophenyl Phenylether	510 U	510	10.1
59-50-7	**4-Chloro-3-Methylphenol**	**19 J**	510	15.6
106-47-8	4-Chloroaniline	510 U	510	3.78
7005-72-3	4-Chlorophenylphenyl-Ether	510 U	510	9.81
106-44-5	4-Methylphenol	510 U	510	19.1
100-01-6	4-Nitroaniline	510 U	510	21.8
100-02-7	4-Nitrophenol	980 U	980	8.49
83-32-9	Acenaphthene	510 U	510	5.16
208-96-8	Acenaphthylene	510 U	510	4.50
98-86-2	Acetophenone	510 U	510	5.70

★ Use only this result, ★ 2/18/04

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**SBD8**	QC Batch:	90572 -114
Sample #:	**345888DL**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	67
Unit:	ug/kg dry	Dilution Factor:	3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
120-12-7	Anthracene	510 U	510	13.9
1912-24-9	Atrazine	510 U	510	20.6
100-52-7	Benzaldehyde	510 U	510	12.2
56-55-3	Benzo (a) Anthracene	510 U	510	39.9
50-32-8	Benzo (a) Pyrene	510 U	510	17.1
205-99-2	Benzo (b) Fluoranthene	510 U	510	29.3
191-24-2	Benzo (g,h,i,) Perylene	510 U	510	26.2
207-08-9	Benzo (k) Fluoranthene	510 U	510	40.2
111-91-1	Bis (2-Chloroethoxy)-Methane	510 U	510	9.42
111-44-4	Bis (2-Chloroethyl) Ether	510 U	510	5.19
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**320 J**	510	6.21
85-68-7	Butyl Benzyl Phthalate	510 U	510	13.4
105-60-2	Caprolactam	980 U	980	19.1
86-74-8	Carbazole	510 U	510	18.3
218-01-9	Chrysene	510 U	510	30.6
53-70-3	Dibenzo (a,h) Anthracene	510 U	510	17.7
132-64-9	Dibenzofuran	510 U	510	9.48
84-66-2	**Diethylphthalate**	**2400**	510	5.70
131-11-3	Dimethylphthalate	510 U	510	9.93
84-74-2	**Di-n-Butylphthalate**	**1900** J,f	510	11.5
117-84-0	Di-n-Octylphthalate	510 U	510	9.30
206-44-0	**Fluoranthene**	**21 J**	510	7.05
86-73-7	Fluorene	510 U	510	5.04
118-74-1	Hexachlorobenzene	510 U	510	7.53
87-68-3	Hexachlorobutadiene	510 U	510	11.6
77-47-4	Hexachlorocyclopentadiene	510 U UJ,c	510	5.94
67-72-1	Hexachloroethane	510 U	510	7.00
193-39-5	Indeno (1,2,3-cd) Pyrene	510 U	510	11.8
78-59-1	Isophorone	510 U	510	5.19
91-20-3	Naphthalene	510 U	510	8.25
98-95-3	Nitrobenzene	510 U	510	9.60

★ Use only these results, ★s 2/18/04

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**SBD8**	QC Batch:	90572 -114
Sample #:	**345888DL**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	67
Unit:	ug/kg dry	Dilution Factor:	3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	510 U	510	9.87
86-30-6	**N-Nitroso-di-Phenylamine**	**820**	510	14.3
87-86-5	Pentachlorophenol	980 U	980	13.2
85-01-8	**Phenanthrene**	**8.0 J**	510	6.90
108-95-2	Phenol	510 U	510	11.9
129-00-0	**Pyrene**	**22 J**	510	4.44

Do not use See next analysis, ts 2/18/04

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 11:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB12C**	QC Batch:	90572 -114
Sample #:	**345889**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	62
Unit:	ug/kg dry	Dilution Factor:	1.6

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	270 U		270	3.94
95-94-3	1,2,4,5-Tetrachloro-benzene	270 U		270	45.9
108-60-1	Bis (2-Chloroisopropyl)-Ether	270 U		270	2.11
95-95-4	2,4,5-Trichlorophenol	270 U		270	5.34
88-06-2	2,4,6-Trichlorophenol	270 U		270	4.19
120-83-2	2,4-Dichlorophenol	270 U		270	5.63
105-67-9	2,4-Dimethylphenol	270 U		270	12.7
51-28-5	2,4-Dinitrophenol	530 U	VJ,C	530	5.12
121-14-2	**2,4-Dinitrotoluene**	**65 J**		270	5.04
606-20-2	2,6-Dinitrotoluene	270 U		270	44.3
91-58-7	2-Chloronaphthalene	270 U		270	3.68
95-57-8	2-Chlorophenol	270 U		270	3.22
91-57-6	2-Methylnaphthalene	270 U		270	4.38
95-48-7	2-Methylphenol	270 U		270	7.74
88-74-4	2-Nitroaniline	270 U		270	7.36
88-75-5	2-Nitrophenol	270 U		270	2.72
91-94-1	3,3'-Dichlorobenzidine	270 U		270	88.6
99-09-2	3-Nitroaniline	270 U		270	29.3
534-52-1	4,6-Dinitro-2-Methylphenol	270 U		270	7.22
101-55-3	4-Bromophenyl Phenylether	270 U		270	5.41
59-50-7	**4-Chloro-3-Methylphenol**	**24 J**		270	8.34
106-47-8	4-Chloroaniline	270 U		270	2.02
7005-72-3	4-Chlorophenylphenyl-Ether	270 U		270	5.23
106-44-5	4-Methylphenol	270 U		270	10.2
100-01-6	4-Nitroaniline	270 U		270	11.6
100-02-7	4-Nitrophenol	530 U		530	4.53
83-32-9	**Acenaphthene**	**3.0 J**		270	2.75
208-96-8	Acenaphthylene	270 U		270	2.40
98-86-2	Acetophenone	270 U		270	3.04

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 11:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB12C**	QC Batch:	90572 -114
Sample #:	**345889**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	62
Unit:	ug/kg dry	Dilution Factor:	1.6

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
120-12-7	Anthracene	270 U	270	7.39
1912-24-9	Atrazine	270 U	270	11.0
100-52-7	Benzaldehyde	270 U	270	6.48
56-55-3	**Benzo (a) Anthracene**	**25 J**	270	21.3
50-32-8	**Benzo (a) Pyrene**	**21 J**	270	9.14
205-99-2	**Benzo (b) Fluoranthene**	**40 J**	270	15.6
191-24-2	Benzo (g,h,i,) Perylene	270 U	270	14.0
207-08-9	**Benzo (k) Fluoranthene**	**22 J**	270	21.4
111-91-1	Bis (2-Chloroethoxy)-Methane	270 U	270	5.02
111-44-4	Bis (2-Chloroethyl) Ether	270 U	270	2.77
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**1000**	270	3.31
85-68-7	Butyl Benzyl Phthalate	270 U	270	7.17
105-60-2	Caprolactam	530 U	530	10.2
86-74-8	Carbazole	270 U	270	9.76
218-01-9	**Chrysene**	**24 J**	270	16.3
53-70-3	Dibenzo (a,h) Anthracene	270 U	270	9.44
132-64-9	Dibenzofuran	270 U	270	5.06
84-66-2	**Diethylphthalate**	**940**	270	3.04
131-11-3	Dimethylphthalate	270 U	270	5.30
84-74-2	**Di-n-Butylphthalate**	**650**	270	6.11
117-84-0	Di-n-Octylphthalate	270 U	270	4.96
206-44-0	**Fluoranthene**	**59 J**	270	3.76
86-73-7	**Fluorene**	**4.0 J**	270	2.69
118-74-1	Hexachlorobenzene	270 U	270	4.02
87-68-3	Hexachlorobutadiene	270 U	270	6.19
77-47-4	Hexachlorocyclopentadiene	270 U	270	3.17
67-72-1	Hexachloroethane	270 U	270	3.73
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**10 J**	270	6.27
78-59-1	Isophorone	270 U	270	2.77
91-20-3	**Naphthalene**	**15 J**	270	4.40
98-95-3	Nitrobenzene	270 U	270	5.12

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 11:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB12C**	QC Batch:	90572 -114
Sample #:	**345889**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	62
Unit:	ug/kg dry	Dilution Factor:	1.6

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	270 U	270	5.26
86-30-6	**N-Nitroso-di-Phenylamine**	**480**	270	7.60
87-86-5	Pentachlorophenol	530 U	530	7.02
85-01-8	**Phenanthrene**	**52 J**	270	3.68
108-95-2	Phenol	270 U	270	6.34
129-00-0	**Pyrene**	**54 J**	270	2.37

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 11:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB12C**	QC Batch:	90572 -114
Sample #:	**345889**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	62
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
1,1'-Biphenyl, (1,1-dimethylethoxy)-	72101-19-0	360	E	NJ,+
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	460	E	NJ,+
Benzeneamine, 2-nitro-N-phenyl-	119-75-5	250	E	NJ,+
Ether, bis(p-tert-butylphenyl)	24085-65-2	830	E	NJ,+
Triacetin	102-76-1	240	E	NJ,+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB11A**	QC Batch:	90572 -114
Sample #:	**345890**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	220 U		220	3.20
95-94-3	1,2,4,5-Tetrachloro-benzene	220 U		220	37.3
108-60-1	Bis (2-Chloroisopropyl)-Ether	220 U		220	1.72
95-95-4	2,4,5-Trichlorophenol	220 U		220	4.34
88-06-2	2,4,6-Trichlorophenol	220 U		220	3.41
120-83-2	2,4-Dichlorophenol	220 U		220	4.58
105-67-9	2,4-Dimethylphenol	220 U		220	10.3
51-28-5	2,4-Dinitrophenol	430 U	VJ,c	430	4.16
121-14-2	**2,4-Dinitrotoluene**	**35 J**		220	4.10
606-20-2	2,6-Dinitrotoluene	220 U		220	36.0
91-58-7	2-Chloronaphthalene	220 U		220	2.99
95-57-8	2-Chlorophenol	220 U		220	2.61
91-57-6	**2-Methylnaphthalene**	**5.0 J**		220	3.56
95-48-7	2-Methylphenol	220 U		220	6.29
88-74-4	2-Nitroaniline	220 U		220	5.98
88-75-5	2-Nitrophenol	220 U		220	2.21
91-94-1	3,3'-Dichlorobenzidine	220 U		220	72.0
99-09-2	3-Nitroaniline	220 U		220	23.8
534-52-1	4,6-Dinitro-2-Methylphenol	220 U		220	5.86
101-55-3	4-Bromophenyl Phenylether	220 U		220	4.39
59-50-7	**4-Chloro-3-Methylphenol**	**9.0 J**		220	6.77
106-47-8	4-Chloroaniline	220 U		220	1.64
7005-72-3	4-Chlorophenylphenyl-Ether	220 U		220	4.25
106-44-5	4-Methylphenol	220 U		220	8.28
100-01-6	4-Nitroaniline	220 U		220	9.43
100-02-7	4-Nitrophenol	430 U		430	3.68
83-32-9	**Acenaphthene**	**8.0 J**		220	2.24
208-96-8	**Acenaphthylene**	**2.0 J**		220	1.95
98-86-2	Acetophenone	220 U		220	2.47

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB11A**	QC Batch:	90572 -114
Sample #:	**345890**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
120-12-7	**Anthracene**	**15 J**	220	6.01
1912-24-9	Atrazine	220 U	220	8.94
100-52-7	Benzaldehyde	220 U	220	5.27
56-55-3	**Benzo (a) Anthracene**	**51 J**	220	17.3
50-32-8	**Benzo (a) Pyrene**	**44 J**	220	7.42
205-99-2	**Benzo (b) Fluoranthene**	**78 J**	220	12.7
191-24-2	**Benzo (g,h,i,) Perylene**	**25 J**	220	11.3
207-08-9	**Benzo (k) Fluoranthene**	**28 J**	220	17.4
111-91-1	Bis (2-Chloroethoxy)-Methane	220 U	220	4.08
111-44-4	Bis (2-Chloroethyl) Ether	220 U	220	2.25
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**59 J**	220	2.69
85-68-7	**Butyl Benzyl Phthalate**	**13 J**	220	5.82
105-60-2	Caprolactam	430 U	430	8.29
86-74-8	Carbazole	220 U	220	7.93
218-01-9	**Chrysene**	**57 J**	220	13.3
53-70-3	Dibenzo (a,h) Anthracene	220 U	220	7.67
132-64-9	Dibenzofuran	220 U	220	4.11
84-66-2	**Diethylphthalate**	**93 J**	220	2.47
131-11-3	Dimethylphthalate	220 U	220	4.30
84-74-2	**Di-n-Butylphthalate**	**360**	220	4.97
117-84-0	Di-n-Octylphthalate	220 U	220	4.03
206-44-0	**Fluoranthene**	**150 J**	220	3.06
86-73-7	**Fluorene**	**6.0 J**	220	2.18
118-74-1	Hexachlorobenzene	220 U	220	3.26
87-68-3	Hexachlorobutadiene	220 U	220	5.03
77-47-4	Hexachlorocyclopentadiene	220 U	220	2.57
67-72-1	Hexachloroethane	220 U	220	3.03
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**22 J**	220	5.10
78-59-1	Isophorone	220 U	220	2.25
91-20-3	**Naphthalene**	**4.0 J**	220	3.58
98-95-3	Nitrobenzene	220 U	220	4.16

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB11A**	QC Batch:	90572 -114
Sample #:	**345890**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	220 U	220	4.28
86-30-6	**N-Nitroso-di-Phenylamine**	**200 J**	220	6.18
87-86-5	Pentachlorophenol	430 U	430	5.71
85-01-8	**Phenanthrene**	**63 J**	220	2.99
108-95-2	Phenol	220 U	220	5.15
129-00-0	**Pyrene**	**110 J**	220	1.92

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB11A**	QC Batch:	90572 -114
Sample #:	**345890**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	77
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
.Gamma.-sitosterol	83-47-6	500	E	NJ,+
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	360	E	NJ,+
1-Heneicosanol	15594-90-8	220	E	NJ,+
Benzene, 2-methyl-1,3,5-trinitro-	118-96-7	280	E	NJ,+
Butyl Ester Octadecanioc	123-95-5	130	E	NJ,+
Erucylamide	112-84-5	140	E	B,X
Ethanol, 2-(hexadecyloxy)-	2136-71-2	390	E	NJ,+
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~2200~~	~~E~~	AS 2/18/04
Stigmast-4-en-3-one	1058-61-3	140	E	NJ,+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:30
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB11B**	QC Batch:	90572 -114
Sample #:	**345891**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	88
Unit:	ug/kg dry	Dilution Factor:	1.1

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	190 U		190	2.71
95-94-3	1,2,4,5-Tetrachloro-benzene	190 U		190	31.6
108-60-1	Bis (2-Chloroisopropyl)-Ether	190 U		190	1.45
95-95-4	2,4,5-Trichlorophenol	190 U		190	3.67
88-06-2	2,4,6-Trichlorophenol	190 U		190	2.88
120-83-2	2,4-Dichlorophenol	190 U		190	3.87
105-67-9	2,4-Dimethylphenol	190 U		190	8.73
51-28-5	2,4-Dinitrophenol	380 U	UJ,c	380	3.52
121-14-2	**2,4-Dinitrotoluene**	**87 J**		190	3.47
606-20-2	**2,6-Dinitrotoluene**	**32 J**		190	30.5
91-58-7	2-Chloronaphthalene	190 U		190	2.53
95-57-8	2-Chlorophenol	190 U		190	2.21
91-57-6	2-Methylnaphthalene	190 U		190	3.01
95-48-7	2-Methylphenol	190 U		190	5.32
88-74-4	2-Nitroaniline	190 U		190	5.06
88-75-5	2-Nitrophenol	190 U		190	1.87
91-94-1	3,3'-Dichlorobenzidine	190 U		190	60.9
99-09-2	3-Nitroaniline	190 U		190	20.1
534-52-1	4,6-Dinitro-2-Methylphenol	190 U		190	4.96
101-55-3	4-Bromophenyl Phenylether	190 U		190	3.72
59-50-7	**4-Chloro-3-Methylphenol**	**13 J**		190	5.73
106-47-8	4-Chloroaniline	190 U		190	1.39
7005-72-3	4-Chlorophenylphenyl-Ether	190 U		190	3.60
106-44-5	4-Methylphenol	190 U		190	7.01
100-01-6	4-Nitroaniline	190 U		190	7.98
100-02-7	4-Nitrophenol	380 U		380	3.11
83-32-9	Acenaphthene	190 U		190	1.89
208-96-8	**Acenaphthylene**	**2.0 J**		190	1.65
98-86-2	Acetophenone	190 U		190	2.09

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB11B**	QC Batch:	90572 -114
Sample #:	**345891**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	88
Unit:	ug/kg dry	Dilution Factor:	1.1

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
120-12-7	Anthracene	190 U	190	5.08
1912-24-9	Atrazine	190 U	190	7.57
100-52-7	Benzaldehyde	190 U	190	4.46
56-55-3	Benzo (a) Anthracene	190 U	190	14.6
50-32-8	**Benzo (a) Pyrene**	**7.0 J**	190	6.28
205-99-2	**Benzo (b) Fluoranthene**	**13 J**	190	10.7
191-24-2	Benzo (g,h,i,) Perylene	190 U	190	9.59
207-08-9	Benzo (k) Fluoranthene	190 U	190	14.7
111-91-1	Bis (2-Chloroethoxy)-Methane	190 U	190	3.45
111-44-4	Bis (2-Chloroethyl) Ether	190 U	190	1.90
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**380**	190	2.28
85-68-7	**Butyl Benzyl Phthalate**	**24 J**	190	4.93
105-60-2	Caprolactam	380 U	380	7.02
86-74-8	Carbazole	190 U	190	6.71
218-01-9	Chrysene	190 U	190	11.2
53-70-3	Dibenzo (a,h) Anthracene	190 U	190	6.49
132-64-9	Dibenzofuran	190 U	190	3.48
84-66-2	**Diethylphthalate**	**39 J**	190	2.09
131-11-3	**Dimethylphthalate**	**550**	190	3.64
84-74-2	**Di-n-Butylphthalate**	**600**	190	4.20
117-84-0	Di-n-Octylphthalate	190 U	190	3.41
206-44-0	**Fluoranthene**	**12 J**	190	2.59
86-73-7	Fluorene	190 U	190	1.85
118-74-1	Hexachlorobenzene	190 U	190	2.76
87-68-3	Hexachlorobutadiene	190 U	190	4.26
77-47-4	Hexachlorocyclopentadiene	190 U	190	2.18
67-72-1	Hexachloroethane	190 U	190	2.57
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**5.0 J**	190	4.31
78-59-1	Isophorone	190 U	190	1.90
91-20-3	Naphthalene	190 U	190	3.03
98-95-3	Nitrobenzene	190 U	190	3.52

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB11B**	QC Batch:	90572 -114
Sample #:	**345891**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	88
Unit:	ug/kg dry	Dilution Factor:	1.1

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	190 U	190	3.62
86-30-6	**N-Nitroso-di-Phenylamine**	**950**	190	5.23
87-86-5	Pentachlorophenol	380 U	380	4.83
85-01-8	**Phenanthrene**	**9.0 J**	190	2.53
108-95-2	Phenol	190 U	190	4.36
129-00-0	**Pyrene**	**11 J**	190	1.63

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB11B**	QC Batch:	90572 -114
Sample #:	**345891**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	88
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	430	E	NJ,+
Benzeneamine, 2-nitro-N-phenyl-	119-75-5	150	E	NJ,+
Bis(2-ethylhexyl)maleate	142-16-5	120	E	NJ,+
Erucylamide	112-84-5	510	E	NJ,+
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~4500~~	~~E~~	~~A~~ 2/19/04
Triphenyl Phosphate	115-86-6	110	E	NJ,+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB11C**	QC Batch:	90572 -114
Sample #:	**345892**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	220 U		220	3.20
95-94-3	1,2,4,5-Tetrachloro-benzene	220 U		220	37.3
108-60-1	Bis (2-Chloroisopropyl)-Ether	220 U		220	1.72
95-95-4	2,4,5-Trichlorophenol	220 U		220	4.34
88-06-2	2,4,6-Trichlorophenol	220 U		220	3.41
120-83-2	2,4-Dichlorophenol	220 U		220	4.58
105-67-9	2,4-Dimethylphenol	220 U		220	10.3
51-28-5	2,4-Dinitrophenol	430 U	UJ,c	430	4.16
121-14-2	2,4-Dinitrotoluene	220 U		220	4.10
606-20-2	2,6-Dinitrotoluene	220 U		220	36.0
91-58-7	2-Chloronaphthalene	220 U		220	2.99
95-57-8	2-Chlorophenol	220 U		220	2.61
91-57-6	2-Methylnaphthalene	220 U		220	3.56
95-48-7	2-Methylphenol	220 U		220	6.29
88-74-4	2-Nitroaniline	220 U		220	5.98
88-75-5	2-Nitrophenol	220 U		220	2.21
91-94-1	3,3'-Dichlorobenzidine	220 U		220	72.0
99-09-2	3-Nitroaniline	220 U		220	23.8
534-52-1	4,6-Dinitro-2-Methylphenol	220 U		220	5.86
101-55-3	4-Bromophenyl Phenylether	220 U		220	4.39
59-50-7	4-Chloro-3-Methylphenol	220 U		220	6.77
106-47-8	4-Chloroaniline	220 U		220	1.64
7005-72-3	4-Chlorophenylphenyl-Ether	220 U		220	4.25
106-44-5	4-Methylphenol	220 U		220	8.28
100-01-6	4-Nitroaniline	220 U		220	9.43
100-02-7	4-Nitrophenol	430 U		430	3.68
83-32-9	Acenaphthene	220 U		220	2.24
208-96-8	Acenaphthylene	220 U		220	1.95
98-86-2	Acetophenone	220 U		220	2.47

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB11C**	QC Batch:	90572 -114
Sample #:	**345892**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	220 U		220	6.01
1912-24-9	Atrazine	220 U		220	8.94
100-52-7	Benzaldehyde	220 U		220	5.27
56-55-3	Benzo (a) Anthracene	220 U		220	17.3
50-32-8	**Benzo (a) Pyrene**	**14 J**		220	7.42
205-99-2	**Benzo (b) Fluoranthene**	**24 J**		220	12.7
191-24-2	**Benzo (g,h,i,) Perylene**	**17 J**		220	11.3
207-08-9	Benzo (k) Fluoranthene	220 U		220	17.4
111-91-1	Bis (2-Chloroethoxy)-Methane	220 U		220	4.08
111-44-4	Bis (2-Chloroethyl) Ether	220 U		220	2.25
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**540**		220	2.69
85-68-7	**Butyl Benzyl Phthalate**	**40 J**		220	5.82
105-60-2	Caprolactam	430 U		430	8.29
86-74-8	Carbazole	220 U		220	7.93
218-01-9	**Chrysene**	**16 J**		220	13.3
53-70-3	Dibenzo (a,h) Anthracene	220 U		220	7.67
132-64-9	Dibenzofuran	220 U		220	4.11
84-66-2	**Diethylphthalate**	**6.0 J**		220	2.47
131-11-3	Dimethylphthalate	220 U		220	4.30
84-74-2	**Di-n-Butylphthalate**	**320**		220	4.97
117-84-0	Di-n-Octylphthalate	220 U		220	4.03
206-44-0	**Fluoranthene**	**16 J**		220	3.06
86-73-7	Fluorene	220 U		220	2.18
118-74-1	Hexachlorobenzene	220 U		220	3.26
87-68-3	Hexachlorobutadiene	220 U		220	5.03
77-47-4	Hexachlorocyclopentadiene	220 U	UJ,C	220	2.57
67-72-1	Hexachloroethane	220 U		220	3.03
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**16 J**		220	5.10
78-59-1	Isophorone	220 U		220	2.25
91-20-3	Naphthalene	220 U		220	3.58
98-95-3	Nitrobenzene	220 U		220	4.16

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB11C**	QC Batch:	90572 -114
Sample #:	**345892**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	220 U	220	4.28
86-30-6	N-Nitroso-di-Phenylamine	220 U	220	6.18
87-86-5	Pentachlorophenol	430 U	430	5.71
85-01-8	**Phenanthrene**	**7.0 J**	220	2.99
108-95-2	Phenol	220 U	220	5.15
129-00-0	**Pyrene**	**14 J**	220	1.92

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:45
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB11C**	QC Batch:	90572 -114
Sample #:	**345892**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	77
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
1,2-Benzenedicarboxylic acid, butyl cyclohexyl ester	84-64-0	310	E	NJ,+
Bis(2-ethylhexyl)maleate	142-16-5	140	E	NJ,+
Erucylamide	112-84-5	180	E	B, X
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~4900~~	~~E~~	~~B~~ 2/18/04

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB10A**	QC Batch:	90572 -114
Sample #:	**345893**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	71
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	240 U		240	3.44
95-94-3	1,2,4,5-Tetrachloro-benzene	240 U		240	40.2
108-60-1	Bis (2-Chloroisopropyl)-Ether	240 U		240	1.85
95-95-4	2,4,5-Trichlorophenol	240 U		240	4.68
88-06-2	2,4,6-Trichlorophenol	240 U		240	3.67
120-83-2	2,4-Dichlorophenol	240 U		240	4.93
105-67-9	2,4-Dimethylphenol	240 U		240	11.1
51-28-5	2,4-Dinitrophenol	460 U	UJc	460	4.48
121-14-2	2,4-Dinitrotoluene	240 U		240	4.41
606-20-2	2,6-Dinitrotoluene	240 U		240	38.8
91-58-7	2-Chloronaphthalene	240 U		240	3.22
95-57-8	2-Chlorophenol	240 U		240	2.81
91-57-6	**2-Methylnaphthalene**	**4.0 J**		240	3.84
95-48-7	2-Methylphenol	240 U		240	6.78
88-74-4	2-Nitroaniline	240 U		240	6.44
88-75-5	2-Nitrophenol	240 U		240	2.38
91-94-1	3,3'-Dichlorobenzidine	240 U		240	77.6
99-09-2	3-Nitroaniline	240 U		240	25.6
534-52-1	4,6-Dinitro-2-Methylphenol	240 U		240	6.31
101-55-3	4-Bromophenyl Phenylether	240 U		240	4.73
59-50-7	**4-Chloro-3-Methylphenol**	**15 J**		240	7.29
106-47-8	4-Chloroaniline	240 U		240	1.76
7005-72-3	4-Chlorophenylphenyl-Ether	240 U		240	4.58
106-44-5	4-Methylphenol	240 U		240	8.92
100-01-6	4-Nitroaniline	240 U		240	10.2
100-02-7	4-Nitrophenol	460 U		460	3.96
83-32-9	**Acenaphthene**	**9.0 J**		240	2.41
208-96-8	**Acenaphthylene**	**4.0 J**		240	2.10
98-86-2	Acetophenone	240 U		240	2.66

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB10A**	QC Batch:	90572 -114
Sample #:	**345893**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	71
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
120-12-7	**Anthracene**	**26 J**	240	6.47
1912-24-9	Atrazine	240 U	240	9.63
100-52-7	Benzaldehyde	240 U	240	5.67
56-55-3	**Benzo (a) Anthracene**	**89 J**	240	18.6
50-32-8	**Benzo (a) Pyrene**	**72 J**	240	7.99
205-99-2	**Benzo (b) Fluoranthene**	**120 J**	240	13.7
191-24-2	**Benzo (g,h,i,) Perylene**	**34 J**	240	12.2
207-08-9	**Benzo (k) Fluoranthene**	**49 J**	240	18.8
111-91-1	Bis (2-Chloroethoxy)-Methane	240 U	240	4.40
111-44-4	Bis (2-Chloroethyl) Ether	240 U	240	2.42
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**450**	240	2.90
85-68-7	**Butyl Benzyl Phthalate**	**38 J**	240	6.27
105-60-2	Caprolactam	460 U	460	8.93
86-74-8	Carbazole	240 U	240	8.54
218-01-9	**Chrysene**	**120 J**	240	14.3
53-70-3	Dibenzo (a,h) Anthracene	240 U	240	8.26
132-64-9	**Dibenzofuran**	**6.0 J**	240	4.42
84-66-2	**Diethylphthalate**	**110 J**	240	2.66
131-11-3	**Dimethylphthalate**	**140 J**	240	4.63
84-74-2	**Di-n-Butylphthalate**	**470**	240	5.35
117-84-0	Di-n-Octylphthalate	240 U	240	4.34
206-44-0	**Fluoranthene**	**350**	240	3.29
86-73-7	**Fluorene**	**12 J**	240	2.35
118-74-1	Hexachlorobenzene	240 U	240	3.51
87-68-3	Hexachlorobutadiene	240 U	240	5.42
77-47-4	Hexachlorocyclopentadiene	240 U	240	2.77
67-72-1	Hexachloroethane	240 U	240	3.27
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**32 J**	240	5.49
78-59-1	Isophorone	240 U	240	2.42
91-20-3	Naphthalene	240 U	240	3.85
98-95-3	Nitrobenzene	240 U	240	4.48

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Individual sample results relate only to the sample tested.

TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB10A**	QC Batch:	90572 -114
Sample #:	**345893**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	71
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	240 U	240	4.61
86-30-6	N-Nitroso-di-Phenylamine	240 U	240	6.65
87-86-5	Pentachlorophenol	460 U	460	6.15
85-01-8	**Phenanthrene**	**170 J**	240	3.22
108-95-2	Phenol	240 U	240	5.54
129-00-0	**Pyrene**	**260**	240	2.07

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB10A**	QC Batch:	90572 -114
Sample #:	**345893**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	71
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
.Gamma.-sitosterol	83-47-6	2400	E	NJ,+
1,2-Benzenedicarboxylic acid, butyl 2-methylpropyl ester	17851-53-5	530	E	NJ,+
4,4,6a,6b,8a,11,11,14b-Octamethyl-1,4,4a,5,6,6a,6b	1000194624 1000019-46-24	710	E	NJ,+
Cholesterol	57-88-5	470	E	NJ,+
Erucylamide	112-84-5	400	E	B,X
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~5000~~	~~E~~	~~dh 2/18/04~~
Vitamin E	10191-41-0	600	E	NJ,+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB10B**	QC Batch:	90572 -114
Sample #:	**345894**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	220 U	220	3.20
95-94-3	1,2,4,5-Tetrachloro-benzene	220 U	220	37.3
108-60-1	Bis (2-Chloroisopropyl)-Ether	220 U	220	1.72
95-95-4	2,4,5-Trichlorophenol	220 U	220	4.34
88-06-2	2,4,6-Trichlorophenol	220 U	220	3.41
120-83-2	2,4-Dichlorophenol	220 U	220	4.58
105-67-9	2,4-Dimethylphenol	220 U	220	10.3
51-28-5	2,4-Dinitrophenol	430 U UJ,c	430	4.16
121-14-2	**2,4-Dinitrotoluene**	**51 J**	220	4.10
606-20-2	2,6-Dinitrotoluene	220 U	220	36.0
91-58-7	2-Chloronaphthalene	220 U	220	2.99
95-57-8	2-Chlorophenol	220 U	220	2.61
91-57-6	**2-Methylnaphthalene**	**4.0 J**	220	3.56
95-48-7	2-Methylphenol	220 U	220	6.29
88-74-4	2-Nitroaniline	220 U	220	5.98
88-75-5	2-Nitrophenol	220 U	220	2.21
91-94-1	3,3'-Dichlorobenzidine	220 U	220	72.0
99-09-2	3-Nitroaniline	220 U	220	23.8
534-52-1	4,6-Dinitro-2-Methylphenol	220 U	220	5.86
101-55-3	4-Bromophenyl Phenylether	220 U	220	4.39
59-50-7	4-Chloro-3-Methylphenol	220 U	220	6.77
106-47-8	4-Chloroaniline	220 U	220	1.64
7005-72-3	4-Chlorophenylphenyl-Ether	220 U	220	4.25
106-44-5	4-Methylphenol	220 U	220	8.28
100-01-6	4-Nitroaniline	220 U	220	9.43
100-02-7	4-Nitrophenol	430 U	430	3.68
83-32-9	**Acenaphthene**	**4.0 J**	220	2.24
208-96-8	**Acenaphthylene**	**6.0 J**	220	1.95
98-86-2	Acetophenone	220 U	220	2.47

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB10B**	QC Batch:	90572 -114
Sample #:	**345894**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
120-12-7	**Anthracene**	**16 J**	220	6.01
1912-24-9	Atrazine	220 U	220	8.94
100-52-7	Benzaldehyde	220 U	220	5.27
56-55-3	**Benzo (a) Anthracene**	**73 J**	220	17.3
50-32-8	**Benzo (a) Pyrene**	**95 J**	220	7.42
205-99-2	**Benzo (b) Fluoranthene**	**150 J**	220	12.7
191-24-2	**Benzo (g,h,i,) Perylene**	**60 J**	220	11.3
207-08-9	**Benzo (k) Fluoranthene**	**64 J**	220	17.4
111-91-1	Bis (2-Chloroethoxy)-Methane	220 U	220	4.08
111-44-4	Bis (2-Chloroethyl) Ether	220 U	220	2.25
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**200 J**	220	2.69
85-68-7	Butyl Benzyl Phthalate	220 U	220	5.82
105-60-2	Caprolactam	430 U	430	8.29
86-74-8	Carbazole	220 U	220	7.93
218-01-9	**Chrysene**	**100 J**	220	13.3
53-70-3	**Dibenzo (a,h) Anthracene**	**16 J**	220	7.67
132-64-9	Dibenzofuran	220 U	220	4.11
84-66-2	**Diethylphthalate**	**240**	220	2.47
131-11-3	Dimethylphthalate	220 U	220	4.30
84-74-2	**Di-n-Butylphthalate**	**470**	220	4.97
117-84-0	Di-n-Octylphthalate	220 U	220	4.03
206-44-0	**Fluoranthene**	**90 J**	220	3.06
86-73-7	**Fluorene**	**4.0 J**	220	2.18
118-74-1	Hexachlorobenzene	220 U	220	3.26
87-68-3	Hexachlorobutadiene	220 U	220	5.03
77-47-4	Hexachlorocyclopentadiene	220 U	220	2.57
67-72-1	Hexachloroethane	220 U	220	3.03
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**54 J**	220	5.10
78-59-1	Isophorone	220 U	220	2.25
91-20-3	Naphthalene	220 U	220	3.58
98-95-3	Nitrobenzene	220 U	220	4.16

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB10B**	QC Batch:	90572 -114
Sample #:	**345894**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	220 U	220	4.28
86-30-6	**N-Nitroso-di-Phenylamine**	**120 J**	220	6.18
87-86-5	Pentachlorophenol	430 U	430	5.71
85-01-8	**Phenanthrene**	**43 J**	220	2.99
108-95-2	Phenol	220 U	220	5.15
129-00-0	**Pyrene**	**83 J**	220	1.92

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB10B**	QC Batch:	90572 -114
Sample #:	**345894**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	77
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
1,2-Benzenedicarboxylic acid, butyl 2-methylpropyl ester	17851-53-5	47	E	NJ,+
2,4,6-Triallyloxy-1,3,5-triazine	101-37-1	150	E	NJ,+
Benzeneamine, 2-nitro-N-phenyl-	119-75-5	71	E	NJ,+
Erucylamide	112-84-5	900	E	NJ,+
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~150~~	~~E~~	

2/18/04

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:30
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB10C**	QC Batch:	90572 -114
Sample #:	**345895**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	73
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	230 U		230	3.44
95-94-3	1,2,4,5-Tetrachloro-benzene	230 U		230	40.2
108-60-1	Bis (2-Chloroisopropyl)-Ether	230 U		230	1.85
95-95-4	2,4,5-Trichlorophenol	230 U		230	4.68
88-06-2	2,4,6-Trichlorophenol	230 U		230	3.67
120-83-2	2,4-Dichlorophenol	230 U		230	4.93
105-67-9	2,4-Dimethylphenol	230 U		230	11.1
51-28-5	2,4-Dinitrophenol	450 U	UJ,C	450	4.48
121-14-2	2,4-Dinitrotoluene	230 U		230	4.41
606-20-2	2,6-Dinitrotoluene	230 U		230	38.8
91-58-7	2-Chloronaphthalene	230 U		230	3.22
95-57-8	2-Chlorophenol	230 U		230	2.81
91-57-6	2-Methylnaphthalene	230 U		230	3.84
95-48-7	2-Methylphenol	230 U		230	6.78
88-74-4	2-Nitroaniline	230 U		230	6.44
88-75-5	2-Nitrophenol	230 U		230	2.38
91-94-1	3,3'-Dichlorobenzidine	230 U		230	77.6
99-09-2	3-Nitroaniline	230 U		230	25.6
534-52-1	4,6-Dinitro-2-Methylphenol	230 U		230	6.31
101-55-3	4-Bromophenyl Phenylether	230 U		230	4.73
59-50-7	4-Chloro-3-Methylphenol	230 U		230	7.29
106-47-8	4-Chloroaniline	230 U		230	1.76
7005-72-3	4-Chlorophenylphenyl-Ether	230 U		230	4.58
106-44-5	4-Methylphenol	230 U		230	8.92
100-01-6	4-Nitroaniline	230 U		230	10.2
100-02-7	4-Nitrophenol	450 U		450	3.96
83-32-9	Acenaphthene	230 U		230	2.41
208-96-8	**Acenaphthylene**	**6.0 J**		230	2.10
98-86-2	Acetophenone	230 U		230	2.66

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB10C**	QC Batch:	90572 -114
Sample #:	**345895**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	73
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
120-12-7	**Anthracene**	**22 J**	230	6.47
1912-24-9	Atrazine	230 U	230	9.63
100-52-7	Benzaldehyde	230 U	230	5.67
56-55-3	**Benzo (a) Anthracene**	**50 J**	230	18.6
50-32-8	**Benzo (a) Pyrene**	**82 J**	230	7.99
205-99-2	**Benzo (b) Fluoranthene**	**140 J**	230	13.7
191-24-2	**Benzo (g,h,i,) Perylene**	**46 J**	230	12.2
207-08-9	**Benzo (k) Fluoranthene**	**48 J**	230	18.8
111-91-1	Bis (2-Chloroethoxy)-Methane	230 U	230	4.40
111-44-4	Bis (2-Chloroethyl) Ether	230 U	230	2.42
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**31 J**	230	2.90
85-68-7	**Butyl Benzyl Phthalate**	**9.0 J**	230	6.27
105-60-2	Caprolactam	450 U	450	8.93
86-74-8	Carbazole	230 U	230	8.54
218-01-9	**Chrysene**	**83 J**	230	14.3
53-70-3	**Dibenzo (a,h) Anthracene**	**13 J**	230	8.26
132-64-9	Dibenzofuran	230 U	230	4.42
84-66-2	**Diethylphthalate**	**71 J**	230	2.66
131-11-3	Dimethylphthalate	230 U	230	4.63
84-74-2	**Di-n-Butylphthalate**	**450**	230	5.35
117-84-0	Di-n-Octylphthalate	230 U	230	4.34
206-44-0	**Fluoranthene**	**29 J**	230	3.29
86-73-7	Fluorene	230 U	230	2.35
118-74-1	Hexachlorobenzene	230 U	230	3.51
87-68-3	Hexachlorobutadiene	230 U	230	5.42
77-47-4	Hexachlorocyclopentadiene	230 U	230	2.77
67-72-1	Hexachloroethane	230 U	230	3.27
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**45 J**	230	5.49
78-59-1	Isophorone	230 U	230	2.42
91-20-3	Naphthalene	230 U	230	3.85
98-95-3	Nitrobenzene	230 U	230	4.48

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB10C**	QC Batch:	90572 -114
Sample #:	**345895**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	73
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	230 U	230	4.61
86-30-6	N-Nitroso-di-Phenylamine	230 U	230	6.65
87-86-5	Pentachlorophenol	450 U	450	6.15
85-01-8	**Phenanthrene**	**14 J**	230	3.22
108-95-2	Phenol	230 U	230	5.54
129-00-0	**Pyrene**	**29 J**	230	2.07

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB10C**	QC Batch:	90572 -114
Sample #:	**345895**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	73
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	530	E	NJ,+
Erucylamide	112-84-5	180	E	B,X
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~1800~~	~~E~~	

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB9A**	QC Batch:	90572 -114
Sample #:	**345896**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	220 U		220	3.20
95-94-3	1,2,4,5-Tetrachloro-benzene	220 U		220	37.3
108-60-1	Bis (2-Chloroisopropyl)-Ether	220 U		220	1.72
95-95-4	2,4,5-Trichlorophenol	220 U		220	4.34
88-06-2	2,4,6-Trichlorophenol	220 U		220	3.41
120-83-2	2,4-Dichlorophenol	220 U		220	4.58
105-67-9	2,4-Dimethylphenol	220 U		220	10.3
51-28-5	2,4-Dinitrophenol	420 U	UJ,C	420	4.16
121-14-2	**2,4-Dinitrotoluene**	**220**		220	4.10
606-20-2	2,6-Dinitrotoluene	220 U		220	36.0
91-58-7	2-Chloronaphthalene	220 U		220	2.99
95-57-8	2-Chlorophenol	220 U		220	2.61
91-57-6	2-Methylnaphthalene	220 U		220	3.56
95-48-7	2-Methylphenol	220 U		220	6.29
88-74-4	2-Nitroaniline	220 U		220	5.98
88-75-5	2-Nitrophenol	220 U		220	2.21
91-94-1	3,3'-Dichlorobenzidine	220 U		220	72.0
99-09-2	3-Nitroaniline	220 U		220	23.8
534-52-1	4,6-Dinitro-2-Methylphenol	220 U		220	5.86
101-55-3	4-Bromophenyl Phenylether	220 U		220	4.39
59-50-7	**4-Chloro-3-Methylphenol**	**25 J**		220	6.77
106-47-8	4-Chloroaniline	220 U		220	1.64
7005-72-3	4-Chlorophenylphenyl-Ether	220 U		220	4.25
106-44-5	4-Methylphenol	220 U		220	8.28
100-01-6	4-Nitroaniline	220 U		220	9.43
100-02-7	4-Nitrophenol	420 U		420	3.68
83-32-9	**Acenaphthene**	**10 J**		220	2.24
208-96-8	**Acenaphthylene**	**7.0 J**		220	1.95
98-86-2	Acetophenone	220 U		220	2.47

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB9A**	QC Batch:	90572 -114
Sample #:	**345896**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
120-12-7	**Anthracene**	**25 J**	220	6.01
1912-24-9	Atrazine	220 U	220	8.94
100-52-7	Benzaldehyde	220 U	220	5.27
56-55-3	**Benzo (a) Anthracene**	**200 J**	220	17.3
50-32-8	**Benzo (a) Pyrene**	**140 J**	220	7.42
205-99-2	**Benzo (b) Fluoranthene**	**240**	220	12.7
191-24-2	**Benzo (g,h,i,) Perylene**	**46 J**	220	11.3
207-08-9	**Benzo (k) Fluoranthene**	**93 J**	220	17.4
111-91-1	Bis (2-Chloroethoxy)-Methane	220 U	220	4.08
111-44-4	Bis (2-Chloroethyl) Ether	220 U	220	2.25
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**43 J**	220	2.69
85-68-7	Butyl Benzyl Phthalate	220 U	220	5.82
105-60-2	Caprolactam	420 U	420	8.29
86-74-8	Carbazole	220 U	220	7.93
218-01-9	**Chrysene**	**220**	220	13.3
53-70-3	**Dibenzo (a,h) Anthracene**	**13 J**	220	7.67
132-64-9	Dibenzofuran	220 U	220	4.11
84-66-2	**Diethylphthalate**	**230**	220	2.47
131-11-3	**Dimethylphthalate**	**18 J**	220	4.30
84-74-2	**Di-n-Butylphthalate**	**580**	220	4.97
117-84-0	Di-n-Octylphthalate	220 U	220	4.03
206-44-0	**Fluoranthene**	**260**	220	3.06
86-73-7	**Fluorene**	**6.0 J**	220	2.18
118-74-1	Hexachlorobenzene	220 U	220	3.26
87-68-3	Hexachlorobutadiene	220 U	220	5.03
77-47-4	Hexachlorocyclopentadiene	220 U	220	2.57
67-72-1	Hexachloroethane	220 U	220	3.03
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**43 J**	220	5.10
78-59-1	Isophorone	220 U	220	2.25
91-20-3	Naphthalene	220 U	220	3.58
98-95-3	Nitrobenzene	220 U	220	4.16

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB9A**	QC Batch:	90572 -114
Sample #:	**345896**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	220 U	220	4.28
86-30-6	**N-Nitroso-di-Phenylamine**	**25 J**	220	6.18
87-86-5	Pentachlorophenol	420 U	420	5.71
85-01-8	**Phenanthrene**	**79 J**	220	2.99
108-95-2	Phenol	220 U	220	5.15
129-00-0	**Pyrene**	**230**	220	1.92

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB9A**	QC Batch:	90572 -114
Sample #:	**345896**	Anal. Batch:	208911
Matrix:	Soil	Percent Solids:	78
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
.Gamma.-sitosterol	83-47-6	160	E	NJ,+
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	670	E	NJ,+
2,4,6-Triallyloxy-1,3,5-triazine	101-37-1	75	E	NJ,+
Erucylamide	112-84-5	570	E	NJ,+
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~780~~	~~E~~	

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**SBD9**	QC Batch:	90572 -114
Sample #:	**345897**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	210 U		210	2.95
95-94-3	1,2,4,5-Tetrachloro-benzene	210 U		210	34.4
108-60-1	Bis (2-Chloroisopropyl)-Ether	210 U		210	1.58
95-95-4	2,4,5-Trichlorophenol	210 U		210	4.01
88-06-2	2,4,6-Trichlorophenol	210 U		210	3.14
120-83-2	2,4-Dichlorophenol	210 U		210	4.22
105-67-9	2,4-Dimethylphenol	210 U		210	9.53
51-28-5	2,4-Dinitrophenol	410 U	UJ,C	410	3.84
121-14-2	**2,4-Dinitrotoluene**	**23 J**		210	3.78
606-20-2	2,6-Dinitrotoluene	210 U		210	33.2
91-58-7	2-Chloronaphthalene	210 U		210	2.76
95-57-8	2-Chlorophenol	210 U		210	2.41
91-57-6	2-Methylnaphthalene	210 U		210	3.29
95-48-7	2-Methylphenol	210 U		210	5.81
88-74-4	2-Nitroaniline	210 U		210	5.52
88-75-5	2-Nitrophenol	210 U		210	2.04
91-94-1	3,3'-Dichlorobenzidine	210 U		210	66.5
99-09-2	3-Nitroaniline	210 U		210	22.0
534-52-1	4,6-Dinitro-2-Methylphenol	210 U		210	5.41
101-55-3	4-Bromophenyl Phenylether	210 U		210	4.06
59-50-7	**4-Chloro-3-Methylphenol**	**8.0 J**		210	6.25
106-47-8	4-Chloroaniline	210 U		210	1.51
7005-72-3	4-Chlorophenylphenyl-Ether	210 U		210	3.92
106-44-5	4-Methylphenol	210 U		210	7.64
100-01-6	4-Nitroaniline	210 U		210	8.70
100-02-7	4-Nitrophenol	410 U		410	3.40
83-32-9	**Acenaphthene**	**7.0 J**		210	2.06
208-96-8	**Acenaphthylene**	**3.0 J**		210	1.80
98-86-2	Acetophenone	210 U		210	2.28

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**SBD9**	QC Batch:	90572 -114
Sample #:	**345897**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	**Anthracene**	**18 J**		210	5.54
1912-24-9	Atrazine	210 U		210	8.26
100-52-7	Benzaldehyde	210 U		210	4.86
56-55-3	**Benzo (a) Anthracene**	**140 J**		210	16.0
50-32-8	**Benzo (a) Pyrene**	**120 J**		210	6.85
205-99-2	**Benzo (b) Fluoranthene**	**170 J**		210	11.7
191-24-2	**Benzo (g,h,i,) Perylene**	**58 J**		210	10.5
207-08-9	**Benzo (k) Fluoranthene**	**85 J**		210	16.1
111-91-1	Bis (2-Chloroethoxy)-Methane	210 U		210	3.77
111-44-4	Bis (2-Chloroethyl) Ether	210 U		210	2.08
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**33 J**		210	2.48
85-68-7	Butyl Benzyl Phthalate	210 U		210	5.38
105-60-2	Caprolactam	410 U		410	7.66
86-74-8	**Carbazole**	**37 J**		210	7.32
218-01-9	**Chrysene**	**160 J**		210	12.2
53-70-3	**Dibenzo (a,h) Anthracene**	**18 J**		210	7.08
132-64-9	Dibenzofuran	210 U		210	3.79
84-66-2	**Diethylphthalate**	**44 J**		210	2.28
131-11-3	Dimethylphthalate	210 U		210	3.97
84-74-2	**Di-n-Butylphthalate**	**430**		210	4.58
117-84-0	Di-n-Octylphthalate	210 U		210	3.72
206-44-0	**Fluoranthene**	**190 J**		210	2.82
86-73-7	**Fluorene**	**4.0 J**		210	2.02
118-74-1	Hexachlorobenzene	210 U		210	3.01
87-68-3	Hexachlorobutadiene	210 U		210	4.64
77-47-4	Hexachlorocyclopentadiene	210 U	UJ,c	210	2.38
67-72-1	Hexachloroethane	210 U		210	2.80
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**52 J**		210	4.70
78-59-1	Isophorone	210 U		210	2.08
91-20-3	Naphthalene	210 U		210	3.30
98-95-3	Nitrobenzene	210 U		210	3.84

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**SBD9**	QC Batch:	90572 -114
Sample #:	**345897**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	210 U	210	3.95
86-30-6	**N-Nitroso-di-Phenylamine**	**46 J**	210	5.70
87-86-5	Pentachlorophenol	410 U	410	5.27
85-01-8	**Phenanthrene**	**60 J**	210	2.76
108-95-2	Phenol	210 U	210	4.75
129-00-0	**Pyrene**	**170 J**	210	1.78

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**SBD9**	QC Batch:	90572 -114
Sample #:	**345897**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	80
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
2,4,6-Triallyloxy-1,3,5-triazine	101-37-1	45	E	BX
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~820~~	~~E~~	
Stigmasterol, 22,23-dihydro-	1000214207 100021-42-07	160	E	NJ+
Urea, N,N'-dimethyl-N,N'-diphenyl-	611-92-7	48	E	NJ+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB9B**	QC Batch:	90572 -114
Sample #:	**345898**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	73
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	230 U		230	3.44
95-94-3	1,2,4,5-Tetrachloro-benzene	230 U		230	40.2
108-60-1	Bis (2-Chloroisopropyl)-Ether	230 U		230	1.85
95-95-4	2,4,5-Trichlorophenol	230 U		230	4.68
88-06-2	2,4,6-Trichlorophenol	230 U		230	3.67
120-83-2	2,4-Dichlorophenol	230 U		230	4.93
105-67-9	2,4-Dimethylphenol	230 U		230	11.1
51-28-5	2,4-Dinitrophenol	450 U	VJC	450	4.48
121-14-2	2,4-Dinitrotoluene	230 U		230	4.41
606-20-2	2,6-Dinitrotoluene	230 U		230	38.8
91-58-7	2-Chloronaphthalene	230 U		230	3.22
95-57-8	2-Chlorophenol	230 U		230	2.81
91-57-6	2-Methylnaphthalene	230 U		230	3.84
95-48-7	2-Methylphenol	230 U		230	6.78
88-74-4	2-Nitroaniline	230 U		230	6.44
88-75-5	2-Nitrophenol	230 U		230	2.38
91-94-1	3,3'-Dichlorobenzidine	230 U		230	77.6
99-09-2	3-Nitroaniline	230 U		230	25.6
534-52-1	4,6-Dinitro-2-Methylphenol	230 U		230	6.31
101-55-3	4-Bromophenyl Phenylether	230 U		230	4.73
59-50-7	4-Chloro-3-Methylphenol	230 U		230	7.29
106-47-8	4-Chloroaniline	230 U		230	1.76
7005-72-3	4-Chlorophenylphenyl-Ether	230 U		230	4.58
106-44-5	4-Methylphenol	230 U		230	8.92
100-01-6	4-Nitroaniline	230 U		230	10.2
100-02-7	4-Nitrophenol	450 U		450	3.96
83-32-9	Acenaphthene	230 U		230	2.41
208-96-8	Acenaphthylene	230 U		230	2.10
98-86-2	Acetophenone	230 U		230	2.66

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB9B**	QC Batch:	90572 -114
Sample #:	**345898**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	73
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	230 U		230	6.47
1912-24-9	Atrazine	230 U		230	9.63
100-52-7	Benzaldehyde	230 U		230	5.67
56-55-3	**Benzo (a) Anthracene**	**22 J**		230	18.6
50-32-8	**Benzo (a) Pyrene**	**22 J**		230	7.99
205-99-2	**Benzo (b) Fluoranthene**	**25 J**		230	13.7
191-24-2	**Benzo (g,h,i,) Perylene**	**15 J**		230	12.2
207-08-9	Benzo (k) Fluoranthene	230 U		230	18.8
111-91-1	Bis (2-Chloroethoxy)-Methane	230 U		230	4.40
111-44-4	Bis (2-Chloroethyl) Ether	230 U		230	2.42
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**24 J**		230	2.90
85-68-7	Butyl Benzyl Phthalate	230 U		230	6.27
105-60-2	Caprolactam	450 U		450	8.93
86-74-8	Carbazole	230 U		230	8.54
218-01-9	**Chrysene**	**30 J**		230	14.3
53-70-3	Dibenzo (a,h) Anthracene	230 U		230	8.26
132-64-9	Dibenzofuran	230 U		230	4.42
84-66-2	**Diethylphthalate**	**8.0 J**		230	2.66
131-11-3	Dimethylphthalate	230 U		230	4.63
84-74-2	**Di-n-Butylphthalate**	**270**		230	5.35
117-84-0	Di-n-Octylphthalate	230 U		230	4.34
206-44-0	**Fluoranthene**	**37 J**		230	3.29
86-73-7	Fluorene	230 U		230	2.35
118-74-1	Hexachlorobenzene	230 U		230	3.51
87-68-3	Hexachlorobutadiene	230 U		230	5.42
77-47-4	Hexachlorocyclopentadiene	230 U	UJ,c	230	2.77
67-72-1	Hexachloroethane	230 U		230	3.27
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**10 J**		230	5.49
78-59-1	Isophorone	230 U		230	2.42
91-20-3	Naphthalene	230 U		230	3.85
98-95-3	Nitrobenzene	230 U		230	4.48

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Individual sample results relate only to the sample tested.

TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB9B**	QC Batch:	90572 -114
Sample #:	**345898**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	73
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	230 U	230	4.61
86-30-6	N-Nitroso-di-Phenylamine	230 U	230	6.65
87-86-5	Pentachlorophenol	450 U	450	6.15
85-01-8	**Phenanthrene**	**17 J**	230	3.22
108-95-2	Phenol	230 U	230	5.54
129-00-0	**Pyrene**	**33 J**	230	2.07

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB9B**	QC Batch:	90572 -114
Sample #:	**345898**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	73
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
(Z)-9-Octadecenamide	301-02-0	83	E	NJ,+
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	420	E	NJ,+
2,4,6-Triallyloxy-1,3,5-triazine	101-37-1	45	E	NJ,+
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~1000~~	~~E~~	~~ds~~ 2/18/04

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB9C**	QC Batch:	90572 -114
Sample #:	**345899**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	220 U		220	3.20
95-94-3	1,2,4,5-Tetrachloro-benzene	220 U		220	37.3
108-60-1	Bis (2-Chloroisopropyl)-Ether	220 U		220	1.72
95-95-4	2,4,5-Trichlorophenol	220 U		220	4.34
88-06-2	2,4,6-Trichlorophenol	220 U		220	3.41
120-83-2	2,4-Dichlorophenol	220 U		220	4.58
105-67-9	2,4-Dimethylphenol	220 U		220	10.3
51-28-5	2,4-Dinitrophenol	420 U	UJ,c	420	4.16
121-14-2	2,4-Dinitrotoluene	220 U		220	4.10
606-20-2	2,6-Dinitrotoluene	220 U		220	36.0
91-58-7	2-Chloronaphthalene	220 U		220	2.99
95-57-8	2-Chlorophenol	220 U		220	2.61
91-57-6	2-Methylnaphthalene	220 U		220	3.56
95-48-7	2-Methylphenol	220 U		220	6.29
88-74-4	2-Nitroaniline	220 U		220	5.98
88-75-5	2-Nitrophenol	220 U		220	2.21
91-94-1	3,3'-Dichlorobenzidine	220 U		220	72.0
99-09-2	3-Nitroaniline	220 U		220	23.8
534-52-1	4,6-Dinitro-2-Methylphenol	220 U		220	5.86
101-55-3	4-Bromophenyl Phenylether	220 U		220	4.39
59-50-7	4-Chloro-3-Methylphenol	220 U		220	6.77
106-47-8	4-Chloroaniline	220 U		220	1.64
7005-72-3	4-Chlorophenylphenyl-Ether	220 U		220	4.25
106-44-5	4-Methylphenol	220 U		220	8.28
100-01-6	4-Nitroaniline	220 U		220	9.43
100-02-7	4-Nitrophenol	420 U		420	3.68
83-32-9	Acenaphthene	220 U		220	2.24
208-96-8	Acenaphthylene	220 U		220	1.95
98-86-2	Acetophenone	220 U		220	2.47

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB9C**	QC Batch:	90572 -114
Sample #:	**345899**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	220 U		220	6.01
1912-24-9	Atrazine	220 U		220	8.94
100-52-7	Benzaldehyde	220 U		220	5.27
56-55-3	Benzo (a) Anthracene	220 U		220	17.3
50-32-8	Benzo (a) Pyrene	220 U		220	7.42
205-99-2	Benzo (b) Fluoranthene	220 U		220	12.7
191-24-2	Benzo (g,h,i,) Perylene	220 U		220	11.3
207-08-9	Benzo (k) Fluoranthene	220 U		220	17.4
111-91-1	Bis (2-Chloroethoxy)-Methane	220 U		220	4.08
111-44-4	Bis (2-Chloroethyl) Ether	220 U		220	2.25
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**15 J**		220	2.69
85-68-7	Butyl Benzyl Phthalate	220 U		220	5.82
105-60-2	Caprolactam	420 U		420	8.29
86-74-8	Carbazole	220 U		220	7.93
218-01-9	Chrysene	220 U		220	13.3
53-70-3	Dibenzo (a,h) Anthracene	220 U		220	7.67
132-64-9	Dibenzofuran	220 U		220	4.11
84-66-2	**Diethylphthalate**	**3.0 J**		220	2.47
131-11-3	Dimethylphthalate	220 U		220	4.30
84-74-2	**Di-n-Butylphthalate**	**180 J**		220	4.97
117-84-0	Di-n-Octylphthalate	220 U		220	4.03
206-44-0	Fluoranthene	220 U		220	3.06
86-73-7	Fluorene	220 U		220	2.18
118-74-1	Hexachlorobenzene	220 U		220	3.26
87-68-3	Hexachlorobutadiene	220 U		220	5.03
77-47-4	Hexachlorocyclopentadiene	220 U	UJ,c	220	2.57
67-72-1	Hexachloroethane	220 U		220	3.03
193-39-5	Indeno (1,2,3-cd) Pyrene	220 U		220	5.10
78-59-1	Isophorone	220 U		220	2.25
91-20-3	Naphthalene	220 U		220	3.58
98-95-3	Nitrobenzene	220 U		220	4.16

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB9C**	QC Batch:	90572 -114
Sample #:	**345899**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	220 U	220	4.28
86-30-6	N-Nitroso-di-Phenylamine	220 U	220	6.18
87-86-5	Pentachlorophenol	420 U	420	5.71
85-01-8	Phenanthrene	220 U	220	2.99
108-95-2	Phenol	220 U	220	5.15
129-00-0	**Pyrene**	**3.0 J**	220	1.92

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB9C**	QC Batch:	90572 -114
Sample #:	**345899**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	78
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
1,2-Benzenedicarboxylic acid, butyl 2-methylpropyl ester	17851-53-5	350	E	NJ+
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~300~~	~~E~~	AS 2-18-04

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 15:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB8A**	QC Batch:	90572 -114
Sample #:	**345900**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	220 U		220	3.20
95-94-3	1,2,4,5-Tetrachloro-benzene	220 U		220	37.3
108-60-1	Bis (2-Chloroisopropyl)-Ether	220 U		220	1.72
95-95-4	2,4,5-Trichlorophenol	220 U		220	4.34
88-06-2	2,4,6-Trichlorophenol	220 U		220	3.41
120-83-2	2,4-Dichlorophenol	220 U		220	4.58
105-67-9	2,4-Dimethylphenol	220 U		220	10.3
51-28-5	2,4-Dinitrophenol	430 U	UJ,C	430	4.16
121-14-2	2,4-Dinitrotoluene	220 U		220	4.10
606-20-2	2,6-Dinitrotoluene	220 U		220	36.0
91-58-7	2-Chloronaphthalene	220 U		220	2.99
95-57-8	2-Chlorophenol	220 U		220	2.61
91-57-6	**2-Methylnaphthalene**	**22 J**		220	3.56
95-48-7	2-Methylphenol	220 U		220	6.29
88-74-4	2-Nitroaniline	220 U		220	5.98
88-75-5	2-Nitrophenol	220 U		220	2.21
91-94-1	3,3'-Dichlorobenzidine	220 U		220	72.0
99-09-2	3-Nitroaniline	220 U		220	23.8
534-52-1	4,6-Dinitro-2-Methylphenol	220 U		220	5.86
101-55-3	4-Bromophenyl Phenylether	220 U		220	4.39
59-50-7	4-Chloro-3-Methylphenol	220 U		220	6.77
106-47-8	4-Chloroaniline	220 U		220	1.64
7005-72-3	4-Chlorophenylphenyl-Ether	220 U		220	4.25
106-44-5	4-Methylphenol	220 U		220	8.28
100-01-6	4-Nitroaniline	220 U		220	9.43
100-02-7	4-Nitrophenol	430 U		430	3.68
83-32-9	**Acenaphthene**	**19 J**		220	2.24
208-96-8	**Acenaphthylene**	**2.0 J**		220	1.95
98-86-2	Acetophenone	220 U		220	2.47

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 15:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB8A**	QC Batch:	90572 -114
Sample #:	**345900**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	**Anthracene**	**37 J**		220	6.01
1912-24-9	Atrazine	220 U		220	8.94
100-52-7	Benzaldehyde	220 U		220	5.27
56-55-3	**Benzo (a) Anthracene**	**100 J**		220	17.3
50-32-8	**Benzo (a) Pyrene**	**120 J**		220	7.42
205-99-2	**Benzo (b) Fluoranthene**	**180 J**		220	12.7
191-24-2	**Benzo (g,h,i,) Perylene**	**72 J**		220	11.3
207-08-9	**Benzo (k) Fluoranthene**	**68 J**		220	17.4
111-91-1	Bis (2-Chloroethoxy)-Methane	220 U		220	4.08
111-44-4	Bis (2-Chloroethyl) Ether	220 U		220	2.25
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**35 J**		220	2.69
85-68-7	Butyl Benzyl Phthalate	220 U		220	5.82
105-60-2	Caprolactam	430 U		430	8.29
86-74-8	Carbazole	220 U		220	7.93
218-01-9	**Chrysene**	**140 J**		220	13.3
53-70-3	**Dibenzo (a,h) Anthracene**	**18 J**		220	7.67
132-64-9	**Dibenzofuran**	**13 J**		220	4.11
84-66-2	**Diethylphthalate**	**33 J**		220	2.47
131-11-3	Dimethylphthalate	220 U		220	4.30
84-74-2	**Di-n-Butylphthalate**	**62 J**		220	4.97
117-84-0	Di-n-Octylphthalate	220 U		220	4.03
206-44-0	**Fluoranthene**	**370**		220	3.06
86-73-7	**Fluorene**	**20 J**		220	2.18
118-74-1	Hexachlorobenzene	220 U		220	3.26
87-68-3	Hexachlorobutadiene	220 U		220	5.03
77-47-4	Hexachlorocyclopentadiene	220 U	UJ,C	220	2.57
67-72-1	Hexachloroethane	220 U		220	3.03
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**73 J**		220	5.10
78-59-1	Isophorone	220 U		220	2.25
91-20-3	**Naphthalene**	**10 J**		220	3.58
98-95-3	Nitrobenzene	220 U		220	4.16

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 15:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB8A**	QC Batch:	90572 -114
Sample #:	**345900**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	220 U	220	4.28
86-30-6	**N-Nitroso-di-Phenylamine**	**21 J**	220	6.18
87-86-5	Pentachlorophenol	430 U	430	5.71
85-01-8	**Phenanthrene**	**130 J**	220	2.99
108-95-2	Phenol	220 U	220	5.15
129-00-0	**Pyrene**	**260**	220	1.92

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 15:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB8A**	QC Batch:	90572 -114
Sample #:	**345900**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	77
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	CAS Number	Result (ug/kg dr	Qualifier	
.Gamma.-sitosterol	83-47-6	780	E	NJ,+
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	120	E	NJ,+
Cholesterol	57-88-5	120	E	NJ,+
Erucylamide	112-84-5	220	E	B,X
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~2600~~	~~E~~	* 2/18/04
Stigmast-4-en-3-one	1058-61-3	240	E	NJ,+
Taraxerol	127-22-0	290	E	NJ,+
Vitamin E	10191-41-0	160	E	NJ,+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 15:30
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB8B**	QC Batch:	90572 -114
Sample #:	**345901**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	220 U		220	3.20
95-94-3	1,2,4,5-Tetrachloro-benzene	220 U		220	37.3
108-60-1	Bis (2-Chloroisopropyl)-Ether	220 U		220	1.72
95-95-4	2,4,5-Trichlorophenol	220 U		220	4.34
88-06-2	2,4,6-Trichlorophenol	220 U		220	3.41
120-83-2	2,4-Dichlorophenol	220 U		220	4.58
105-67-9	2,4-Dimethylphenol	220 U		220	10.3
51-28-5	2,4-Dinitrophenol	420 U	UJ,c	420	4.16
121-14-2	2,4-Dinitrotoluene	220 U		220	4.10
606-20-2	2,6-Dinitrotoluene	220 U		220	36.0
91-58-7	2-Chloronaphthalene	220 U		220	2.99
95-57-8	2-Chlorophenol	220 U		220	2.61
91-57-6	2-Methylnaphthalene	220 U		220	3.56
95-48-7	2-Methylphenol	220 U		220	6.29
88-74-4	2-Nitroaniline	220 U		220	5.98
88-75-5	2-Nitrophenol	220 U		220	2.21
91-94-1	3,3'-Dichlorobenzidine	220 U		220	72.0
99-09-2	3-Nitroaniline	220 U		220	23.8
534-52-1	4,6-Dinitro-2-Methylphenol	220 U		220	5.86
101-55-3	4-Bromophenyl Phenylether	220 U		220	4.39
59-50-7	**4-Chloro-3-Methylphenol**	**24 J**		220	6.77
106-47-8	4-Chloroaniline	220 U		220	1.64
7005-72-3	4-Chlorophenylphenyl-Ether	220 U		220	4.25
106-44-5	4-Methylphenol	220 U		220	8.28
100-01-6	4-Nitroaniline	220 U		220	9.43
100-02-7	4-Nitrophenol	420 U		420	3.68
83-32-9	Acenaphthene	220 U		220	2.24
208-96-8	Acenaphthylene	220 U		220	1.95
98-86-2	Acetophenone	220 U		220	2.47

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 15:30
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB8B**	QC Batch:	90572 -114
Sample #:	**345901**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	220 U		220	6.01
1912-24-9	Atrazine	220 U		220	8.94
100-52-7	Benzaldehyde	220 U		220	5.27
56-55-3	Benzo (a) Anthracene	220 U		220	17.3
50-32-8	**Benzo (a) Pyrene**	**21 J**		220	7.42
205-99-2	**Benzo (b) Fluoranthene**	**36 J**		220	12.7
191-24-2	**Benzo (g,h,i,) Perylene**	**14 J**		220	11.3
207-08-9	Benzo (k) Fluoranthene	220 U		220	17.4
111-91-1	Bis (2-Chloroethoxy)-Methane	220 U		220	4.08
111-44-4	Bis (2-Chloroethyl) Ether	220 U		220	2.25
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**190 J**		220	2.69
85-68-7	**Butyl Benzyl Phthalate**	**6.0 J**		220	5.82
105-60-2	Caprolactam	420 U		420	8.29
86-74-8	Carbazole	220 U		220	7.93
218-01-9	**Chrysene**	**25 J**		220	13.3
53-70-3	Dibenzo (a,h) Anthracene	220 U		220	7.67
132-64-9	Dibenzofuran	220 U		220	4.11
84-66-2	**Diethylphthalate**	**40 J**		220	2.47
131-11-3	Dimethylphthalate	220 U		220	4.30
84-74-2	**Di-n-Butylphthalate**	**190 J**		220	4.97
117-84-0	Di-n-Octylphthalate	220 U		220	4.03
206-44-0	**Fluoranthene**	**35 J**		220	3.06
86-73-7	Fluorene	220 U		220	2.18
118-74-1	Hexachlorobenzene	220 U		220	3.26
87-68-3	Hexachlorobutadiene	220 U		220	5.03
77-47-4	Hexachlorocyclopentadiene	220 U	UJ/C	220	2.57
67-72-1	Hexachloroethane	220 U		220	3.03
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**12 J**		220	5.10
78-59-1	Isophorone	220 U		220	2.25
91-20-3	Naphthalene	220 U		220	3.58
98-95-3	Nitrobenzene	220 U		220	4.16

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 15:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SB8B**	QC Batch:	90572 -114
Sample #:	**345901**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	220 U	220	4.28
86-30-6	N-Nitroso-di-Phenylamine	220 U	220	6.18
87-86-5	Pentachlorophenol	420 U	420	5.71
85-01-8	**Phenanthrene**	**10 J**	220	2.99
108-95-2	Phenol	220 U	220	5.15
129-00-0	**Pyrene**	**32 J**	220	1.92

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 15:30
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SB8B**	QC Batch:	90572 -114
Sample #:	**345901**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	78
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
.Gamma.-sitosterol	83-47-6	76	E	NJ,+
1,2-Benzenedicarboxylic acid, butyl 2-methylpropyl ester	17851-53-5	320	E	NJ,+
9-Octadecenoic acid, (E)-	112-79-8	74	E	NJ,+
Erucylamide	112-84-5	890	E	NJ,+
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~990~~	~~E~~	
Tetradecanamide	638-58-4	60	E	NJ,+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	10/15/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/23/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**69SB2A**	QC Batch:	90834 -115
Sample #:	**345745**	Anal. Batch:	209212
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	120 U	120	11.3
208-96-8	Acenaphthylene	250 U	250	13.9
120-12-7	Anthracene	25 U	25	0.840
56-55-3	**Benzo (a) Anthracene**	**2.9 J**	25	0.960
50-32-8	Benzo (a) Pyrene	25 U	25	1.20
205-99-2	Benzo (b) Fluoranthene	25 U	25	1.56
191-24-2	Benzo (g,h,i,) Perylene	25 U	25	15.0
207-08-9	Benzo (k) Fluoranthene	25 U	25	1.20
218-01-9	**Chrysene**	**2.9 J**	25	1.44
53-70-3	Dibenzo (a,h) Anthracene	25 U	25	1.68
206-44-0	**Fluoranthene**	**18 J**	25	2.04
86-73-7	Fluorene	25 U	25	1.56
193-39-5	Indeno (1,2,3-cd) Pyrene	25 U	25	0.840
91-20-3	Naphthalene	120 U	120	9.48
85-01-8	**Phenanthrene**	**7.2 J**	25	0.720
129-00-0	**Pyrene**	**13 J**	25	1.08

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/09/03 @ 08:40
		Prepared:	10/15/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/23/03 by TAJ
		Anal. Method:	USEPA-8310
Sample ID:	**69SB2B**	QC Batch:	90834 -115
Sample #:	**345746**	Anal. Batch:	209212
Matrix:	Soil	Percent Solids:	79
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	130 U VLS	130	12.2
208-96-8	Acenaphthylene	270 U	270	15.1
120-12-7	Anthracene	27 U	27	0.910
56-55-3	Benzo (a) Anthracene	27 U	27	1.04
50-32-8	Benzo (a) Pyrene	27 U	27	1.30
205-99-2	Benzo (b) Fluoranthene	27 U	27	1.69
191-24-2	Benzo (g,h,i,) Perylene	27 U	27	16.3
207-08-9	Benzo (k) Fluoranthene	27 U	27	1.30
218-01-9	Chrysene	27 U	27	1.56
53-70-3	Dibenzo (a,h) Anthracene	27 U	27	1.82
206-44-0	Fluoranthene	27 U	27	2.21
86-73-7	Fluorene	27 U	27	1.69
193-39-5	Indeno (1,2,3-cd) Pyrene	27 U	27	0.910
91-20-3	Naphthalene	130 U	130	10.3
85-01-8	Phenanthrene	27 U	27	0.780
129-00-0	Pyrene	27 U	27	1.17

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:30
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/09/03 @ 08:40
		Prepared:	10/15/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/23/03 by TAJ
		Anal. Method:	USEPA-8310
Sample ID:	**69SB2C**	QC Batch:	90834 -115
Sample #:	**345747**	Anal. Batch:	209212
Matrix:	Soil	Percent Solids:	75
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	130 U VL,S	130	12.2
208-96-8	Acenaphthylene	280 U	280	15.1
120-12-7	Anthracene	28 U	28	0.910
56-55-3	Benzo (a) Anthracene	28 U	28	1.04
50-32-8	Benzo (a) Pyrene	28 U	28	1.30
205-99-2	Benzo (b) Fluoranthene	28 U	28	1.69
191-24-2	Benzo (g,h,i,) Perylene	28 U	28	16.3
207-08-9	Benzo (k) Fluoranthene	28 U	28	1.30
218-01-9	Chrysene	28 U	28	1.56
53-70-3	Dibenzo (a,h) Anthracene	28 U	28	1.82
206-44-0	Fluoranthene	28 U	28	2.21
86-73-7	Fluorene	28 U	28	1.69
193-39-5	Indeno (1,2,3-cd) Pyrene	28 U	28	0.910
91-20-3	Naphthalene	130 U	130	10.3
85-01-8	Phenanthrene	28 U	28	0.780
129-00-0	Pyrene	28 U	28	1.17

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 16:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	10/15/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/23/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**57SB4B**	QC Batch:	90834 -115
Sample #:	**345748**	Anal. Batch:	209212
Matrix:	Soil	Percent Solids:	74
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	140 U	140	13.2
208-96-8	Acenaphthylene	280 U	280	16.2
120-12-7	Anthracene	28 U	28	0.980
56-55-3	Benzo (a) Anthracene	28 U	28	1.12
50-32-8	Benzo (a) Pyrene	28 U	28	1.40
205-99-2	Benzo (b) Fluoranthene	28 U	28	1.82
191-24-2	Benzo (g,h,i,) Perylene	28 U	28	17.5
207-08-9	Benzo (k) Fluoranthene	28 U	28	1.40
218-01-9	Chrysene	28 U	28	1.68
53-70-3	Dibenzo (a,h) Anthracene	28 U	28	1.96
206-44-0	Fluoranthene	28 U	28	2.38
86-73-7	Fluorene	28 U	28	1.82
193-39-5	Indeno (1,2,3-cd) Pyrene	28 U	28	0.980
91-20-3	Naphthalene	140 U	140	11.1
85-01-8	Phenanthrene	28 U	28	0.840
129-00-0	Pyrene	28 U	28	1.26

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 09:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/15/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/23/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**13SB7A**	QC Batch:	90834 -115
Sample #:	**345883**	Anal. Batch:	209212
Matrix:	Soil	Percent Solids:	82
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	120 U	120	11.3
208-96-8	Acenaphthylene	260 U	260	13.9
120-12-7	Anthracene	26 U	26	0.840
56-55-3	**Benzo (a) Anthracene**	**2.1 J**	26	0.960
50-32-8	Benzo (a) Pyrene	26 U	26	1.20
205-99-2	Benzo (b) Fluoranthene	26 U	26	1.56
191-24-2	Benzo (g,h,i,) Perylene	26 U	26	15.0
207-08-9	Benzo (k) Fluoranthene	26 U	26	1.20
218-01-9	**Chrysene**	**2.6 J**	26	1.44
53-70-3	Dibenzo (a,h) Anthracene	26 U	26	1.68
206-44-0	**Fluoranthene**	**5.0 J**	26	2.04
86-73-7	Fluorene	26 U	26	1.56
193-39-5	Indeno (1,2,3-cd) Pyrene	26 U	26	0.840
91-20-3	Naphthalene	120 U	120	9.48
85-01-8	**Phenanthrene**	**2.1 J**	26	0.720
129-00-0	**Pyrene**	**3.6 J**	26	1.08

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/15/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/23/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**13SB7B**	QC Batch:	90834 -115
Sample #:	**345884**	Anal. Batch:	209212
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	130 U	130	12.2
208-96-8	Acenaphthylene	260 U	260	15.1
120-12-7	**Anthracene**	**1.0 J**	26	0.910
56-55-3	**Benzo (a) Anthracene**	**3.9 J**	26	1.04
50-32-8	Benzo (a) Pyrene	26 U	26	1.30
205-99-2	Benzo (b) Fluoranthene	26 U	26	1.69
191-24-2	Benzo (g,h,i,) Perylene	26 U	26	16.3
207-08-9	Benzo (k) Fluoranthene	26 U	26	1.30
218-01-9	**Chrysene**	**6.5 J**	26	1.56
53-70-3	Dibenzo (a,h) Anthracene	26 U	26	1.82
206-44-0	**Fluoranthene**	**3.3 J**	26	2.21
86-73-7	Fluorene	26 U	26	1.69
193-39-5	Indeno (1,2,3-cd) Pyrene	26 U	26	0.910
91-20-3	Naphthalene	130 U	130	10.3
85-01-8	**Phenanthrene**	**1.8 J**	26	0.780
129-00-0	**Pyrene**	**3.0 J**	26	1.17

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/23/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**13SB7C**	QC Batch:	91080 -118
Sample #:	**345885**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	79
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	130 U	130	12.2
208-96-8	Acenaphthylene	270 U	270	15.1
120-12-7	Anthracene	27 U	27	0.910
56-55-3	Benzo (a) Anthracene	27 U	27	1.04
50-32-8	Benzo (a) Pyrene	27 U	27	1.30
205-99-2	Benzo (b) Fluoranthene	27 U	27	1.69
191-24-2	Benzo (g,h,i,) Perylene	27 U	27	16.3
207-08-9	Benzo (k) Fluoranthene	27 U	27	1.30
218-01-9	Chrysene	27 U	27	1.56
53-70-3	Dibenzo (a,h) Anthracene	27 U	27	1.82
206-44-0	Fluoranthene	27 U	27	2.21
86-73-7	Fluorene	27 U	27	1.69
193-39-5	Indeno (1,2,3-cd) Pyrene	27 U	27	0.910
91-20-3	Naphthalene	130 U	130	10.3
85-01-8	Phenanthrene	27 U	27	0.780
129-00-0	Pyrene	27 U	27	1.17

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/23/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**13SB12A**	QC Batch:	91080 -118
Sample #:	**345886**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	130 U	130	12.2
208-96-8	Acenaphthylene	270 U	270	15.1
120-12-7	Anthracene	27 U	27	0.910
56-55-3	**Benzo (a) Anthracene**	**3.8 J**	27	1.04
50-32-8	**Benzo (a) Pyrene**	**6.5 J**	27	1.30
205-99-2	**Benzo (b) Fluoranthene**	**4.9 J**	27	1.69
191-24-2	Benzo (g,h,i,) Perylene	27 U	27	16.3
207-08-9	Benzo (k) Fluoranthene	27 U	27	1.30
218-01-9	**Chrysene**	**2.4 J**	27	1.56
53-70-3	Dibenzo (a,h) Anthracene	27 U	27	1.82
206-44-0	**Fluoranthene**	**9.2 J**	27	2.21
86-73-7	Fluorene	27 U	27	1.69
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**5.9 J**	27	0.910
91-20-3	Naphthalene	130 U	130	10.3
85-01-8	**Phenanthrene**	**2.5 J**	27	0.780
129-00-0	**Pyrene**	**6.4 J**	27	1.17

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 11:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/23/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**13SB12B**	QC Batch:	91080 -118
Sample #:	**345887**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	71
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	140 U	140	13.2
208-96-8	Acenaphthylene	300 U	300	16.2
120-12-7	Anthracene	30 U	30	0.980
56-55-3	**Benzo (a) Anthracene**	**1.7 J**	30	1.12
50-32-8	Benzo (a) Pyrene	30 U	30	1.40
205-99-2	Benzo (b) Fluoranthene	30 U	30	1.82
191-24-2	Benzo (g,h,i,) Perylene	30 U	30	17.5
207-08-9	Benzo (k) Fluoranthene	30 U	30	1.40
218-01-9	Chrysene	30 U	30	1.68
53-70-3	Dibenzo (a,h) Anthracene	30 U	30	1.96
206-44-0	**Fluoranthene**	**7.4 J**	30	2.38
86-73-7	Fluorene	30 U	30	1.82
193-39-5	Indeno (1,2,3-cd) Pyrene	30 U	30	0.980
91-20-3	Naphthalene	140 U	140	11.1
85-01-8	**Phenanthrene**	**2.2 J**	30	0.840
129-00-0	**Pyrene**	**3.9 J**	30	1.26

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**SBD8**	QC Batch:	91080 -118
Sample #:	**345888**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	67
Unit:	ug/kg dry	Dilution Factor:	1.5

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	150 U	150	14.1
208-96-8	Acenaphthylene	310 U	310	17.4
120-12-7	Anthracene	31 U	31	1.05
56-55-3	**Benzo (a) Anthracene**	**6.4 J**	31	1.20
50-32-8	**Benzo (a) Pyrene**	**8.0 J**	31	1.50
205-99-2	**Benzo (b) Fluoranthene**	**6.7 J**	31	1.95
191-24-2	**Benzo (g,h,i,) Perylene**	**21 J**	31	18.8
207-08-9	Benzo (k) Fluoranthene	31 U	31	1.50
218-01-9	**Chrysene**	**6.7 J**	31	1.80
53-70-3	Dibenzo (a,h) Anthracene	31 U	31	2.10
206-44-0	**Fluoranthene**	**16 J**	31	2.55
86-73-7	Fluorene	31 U	31	1.95
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**6.8 J**	31	1.05
91-20-3	Naphthalene	150 U	150	11.9
85-01-8	**Phenanthrene**	**2.7 J**	31	0.900
129-00-0	**Pyrene**	**10 J**	31	1.35

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 11:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**13SB12C**	QC Batch:	91080 -118
Sample #:	**345889**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	62
Unit:	ug/kg dry	Dilution Factor:	1.6

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	160 U	160	15.0
208-96-8	Acenaphthylene	340 U	340	18.6
120-12-7	**Anthracene**	**11 J**	34	1.12
56-55-3	**Benzo (a) Anthracene**	**32 J**	34	1.28
50-32-8	Benzo (a) Pyrene	34 U	34	1.60
205-99-2	Benzo (b) Fluoranthene	34 U	34	2.08
191-24-2	**Benzo (g,h,i,) Perylene**	**37**	34	20.0
207-08-9	Benzo (k) Fluoranthene	34 U	34	1.60
218-01-9	Chrysene	34 U	34	1.92
53-70-3	Dibenzo (a,h) Anthracene	34 U	34	2.24
206-44-0	**Fluoranthene**	**130**	34	2.72
86-73-7	Fluorene	34 U	34	2.08
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**17 J**	34	1.12
91-20-3	Naphthalene	160 U	160	12.6
85-01-8	**Phenanthrene**	**80**	34	0.960
129-00-0	**Pyrene**	**99**	34	1.44

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**13SB11A**	QC Batch:	91080 -118
Sample #:	**345890**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	130 U	130	12.2
208-96-8	Acenaphthylene	270 U	270	15.1
120-12-7	**Anthracene**	**6.6 J**	27	0.910
56-55-3	**Benzo (a) Anthracene**	**31**	27	1.04
50-32-8	**Benzo (a) Pyrene**	**45**	27	1.30
205-99-2	**Benzo (b) Fluoranthene**	**32**	27	1.69
191-24-2	**Benzo (g,h,i,) Perylene**	**82**	27	16.3
207-08-9	**Benzo (k) Fluoranthene**	**20 J**	27	1.30
218-01-9	**Chrysene**	**37**	27	1.56
53-70-3	Dibenzo (a,h) Anthracene	27 U	27	1.82
206-44-0	**Fluoranthene**	**73**	27	2.21
86-73-7	Fluorene	27 U	27	1.69
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**37**	27	0.910
91-20-3	Naphthalene	130 U	130	10.3
85-01-8	**Phenanthrene**	**26 J**	27	0.780
129-00-0	**Pyrene**	**59**	27	1.17

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**13SB11B**	QC Batch:	91080 -118
Sample #:	**345891**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	88
Unit:	ug/kg dry	Dilution Factor:	1.1

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result		Reporting Limit	MDL
83-32-9	Acenaphthene	110 U	UL,S	110	10.3
208-96-8	Acenaphthylene	240 U	↓	240	12.8
120-12-7	**Anthracene**	**8.7 J**	L,S	24	0.770
56-55-3	**Benzo (a) Anthracene**	**24**		24	0.880
50-32-8	**Benzo (a) Pyrene**	**33**		24	1.10
205-99-2	**Benzo (b) Fluoranthene**	**21 J**		24	1.43
191-24-2	**Benzo (g,h,i,) Perylene**	**77**		24	13.8
207-08-9	**Benzo (k) Fluoranthene**	**15 J**		24	1.10
218-01-9	**Chrysene**	**40**		24	1.32
53-70-3	Dibenzo (a,h) Anthracene	24 U	UL,S	24	1.54
206-44-0	Fluoranthene	24 U	↓	24	1.87
86-73-7	**Fluorene**	**12 J**	L,S	24	1.43
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**21 J**	↓	24	0.770
91-20-3	Naphthalene	110 U	UL,S	110	8.69
85-01-8	**Phenanthrene**	**110**	L,S	24	0.660
129-00-0	**Pyrene**	**79**	↓	24	0.990

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**13SB11C**	QC Batch:	91080 -118
Sample #:	**345892**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	130 U	130	12.2
208-96-8	Acenaphthylene	270 U	270	15.1
120-12-7	**Anthracene**	**1.1 J**	27	0.910
56-55-3	**Benzo (a) Anthracene**	**4.1 J**	27	1.04
50-32-8	**Benzo (a) Pyrene**	**13 J**	27	1.30
205-99-2	**Benzo (b) Fluoranthene**	**8.8 J**	27	1.69
191-24-2	**Benzo (g,h,i,) Perylene**	**46**	27	16.3
207-08-9	**Benzo (k) Fluoranthene**	**4.5 J**	27	1.30
218-01-9	**Chrysene**	**7.6 J**	27	1.56
53-70-3	Dibenzo (a,h) Anthracene	27 U	27	1.82
206-44-0	**Fluoranthene**	**6.5 J**	27	2.21
86-73-7	Fluorene	27 U	27	1.69
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**16 J**	27	0.910
91-20-3	Naphthalene	130 U	130	10.3
85-01-8	**Phenanthrene**	**3.4 J**	27	0.780
129-00-0	**Pyrene**	**5.6 J**	27	1.17

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**13SB10A**	QC Batch:	91080 -118
Sample #:	**345893**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	71
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	**Acenaphthene**	**14 J**	140	13.2
208-96-8	Acenaphthylene	300 U	300	16.2
120-12-7	**Anthracene**	**38**	30	0.980
56-55-3	**Benzo (a) Anthracene**	**140**	30	1.12
50-32-8	**Benzo (a) Pyrene**	**190**	30	1.40
205-99-2	**Benzo (b) Fluoranthene**	**140**	30	1.82
191-24-2	**Benzo (g,h,i,) Perylene**	**260**	30	17.5
207-08-9	**Benzo (k) Fluoranthene**	**80**	30	1.40
218-01-9	**Chrysene**	**150**	30	1.68
53-70-3	**Dibenzo (a,h) Anthracene**	**5.2 J**	30	1.96
206-44-0	**Fluoranthene**	**470**	30	2.38
86-73-7	**Fluorene**	**17 J**	30	1.82
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**130**	30	0.980
91-20-3	Naphthalene	140 U	140	11.1
85-01-8	**Phenanthrene**	**210**	30	0.840
129-00-0	**Pyrene**	**320**	30	1.26

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/24/03 by TAJ
		Anal. Method:	USEPA-8310
Sample ID:	**13SB10B**	QC Batch:	91080 -118
Sample #:	**345894**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	130 U	130	12.2
208-96-8	Acenaphthylene	270 U	270	15.1
120-12-7	**Anthracene**	**14 J**	27	0.910
56-55-3	**Benzo (a) Anthracene**	**56**	27	1.04
50-32-8	**Benzo (a) Pyrene**	**130**	27	1.30
205-99-2	**Benzo (b) Fluoranthene**	**91**	27	1.69
191-24-2	**Benzo (g,h,i,) Perylene**	**290**	27	16.3
207-08-9	**Benzo (k) Fluoranthene**	**52**	27	1.30
218-01-9	**Chrysene**	**80**	27	1.56
53-70-3	**Dibenzo (a,h) Anthracene**	**8.0 J**	27	1.82
206-44-0	**Fluoranthene**	**64**	27	2.21
86-73-7	Fluorene	27 U	27	1.69
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**110**	27	0.910
91-20-3	Naphthalene	130 U	130	10.3
85-01-8	**Phenanthrene**	**27**	27	0.780
129-00-0	**Pyrene**	**50**	27	1.17

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**13SB10C**	QC Batch:	91080 -118
Sample #:	**345895**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	73
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	140 U	140	13.2
208-96-8	Acenaphthylene	290 U	290	16.2
120-12-7	**Anthracene**	**6.1 J**	29	0.980
56-55-3	**Benzo (a) Anthracene**	**18 J**	29	1.12
50-32-8	**Benzo (a) Pyrene**	**59**	29	1.40
205-99-2	**Benzo (b) Fluoranthene**	**47**	29	1.82
191-24-2	**Benzo (g,h,i,) Perylene**	**140**	29	17.5
207-08-9	**Benzo (k) Fluoranthene**	**20 J**	29	1.40
218-01-9	**Chrysene**	**33**	29	1.68
53-70-3	**Dibenzo (a,h) Anthracene**	**5.3 J**	29	1.96
206-44-0	**Fluoranthene**	**12 J**	29	2.38
86-73-7	Fluorene	29 U	29	1.82
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**58**	29	0.980
91-20-3	Naphthalene	140 U	140	11.1
85-01-8	**Phenanthrene**	**7.0 J**	29	0.840
129-00-0	**Pyrene**	**9.5 J**	29	1.26

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**13SB9A**	QC Batch:	91080 -118
Sample #:	**345896**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result		Reporting Limit	MDL
83-32-9	**Acenaphthene**	**17**	**J**	130	12.2
208-96-8	Acenaphthylene	270	U	270	15.1
120-12-7	**Anthracene**	**38**		27	0.910
56-55-3	**Benzo (a) Anthracene**	**130**		27	1.04
50-32-8	**Benzo (a) Pyrene**	**170**		27	1.30
205-99-2	**Benzo (b) Fluoranthene**	**120**		27	1.69
191-24-2	**Benzo (g,h,i,) Perylene**	**540**	J,f	27	16.3
207-08-9	**Benzo (k) Fluoranthene**	**77**		27	1.30
218-01-9	**Chrysene**	**150**		27	1.56
53-70-3	Dibenzo (a,h) Anthracene	27	U	27	1.82
206-44-0	**Fluoranthene**	**290**	J,f	27	2.21
86-73-7	**Fluorene**	**11**	**J**	27	1.69
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**100**		27	0.910
91-20-3	Naphthalene	130	U	130	10.3
85-01-8	**Phenanthrene**	**130**		27	0.780
129-00-0	**Pyrene**	**240**	J,f	27	1.17

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**SBD9**	QC Batch:	91080 -118
Sample #:	**345897**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result		Reporting Limit	MDL
83-32-9	Acenaphthene	130 U		130	12.2
208-96-8	Acenaphthylene	260 U		260	15.1
120-12-7	**Anthracene**	**15 J**		26	0.910
56-55-3	**Benzo (a) Anthracene**	**61**		26	1.04
50-32-8	**Benzo (a) Pyrene**	**73**		26	1.30
205-99-2	**Benzo (b) Fluoranthene**	**56**		26	1.69
191-24-2	**Benzo (g,h,i,) Perylene**	**240**	J,f	26	16.3
207-08-9	**Benzo (k) Fluoranthene**	**36**		26	1.30
218-01-9	**Chrysene**	**74**		26	1.56
53-70-3	Dibenzo (a,h) Anthracene	26 U		26	1.82
206-44-0	**Fluoranthene**	**120**	J,f	26	2.21
86-73-7	Fluorene	26 U		26	1.69
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**46**		26	0.910
91-20-3	Naphthalene	130 U		130	10.3
85-01-8	**Phenanthrene**	**50**		26	0.780
129-00-0	**Pyrene**	**110**	J,f	26	1.17

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**13SB9B**	QC Batch:	91080 -118
Sample #:	**345898**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	73
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	140 U	140	13.2
208-96-8	Acenaphthylene	290 U	290	16.2
120-12-7	**Anthracene**	**4.2 J**	29	0.980
56-55-3	**Benzo (a) Anthracene**	**12 J**	29	1.12
50-32-8	**Benzo (a) Pyrene**	**15 J**	29	1.40
205-99-2	**Benzo (b) Fluoranthene**	**10 J**	29	1.82
191-24-2	Benzo (g,h,i,) Perylene	29 U	29	17.5
207-08-9	**Benzo (k) Fluoranthene**	**6.0 J**	29	1.40
218-01-9	**Chrysene**	**15 J**	29	1.68
53-70-3	Dibenzo (a,h) Anthracene	29 U	29	1.96
206-44-0	**Fluoranthene**	**30**	29	2.38
86-73-7	Fluorene	29 U	29	1.82
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**9.4 J**	29	0.980
91-20-3	Naphthalene	140 U	140	11.1
85-01-8	**Phenanthrene**	**14 J**	29	0.840
129-00-0	**Pyrene**	**27 J**	29	1.26

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**13SB9C**	QC Batch:	91080 -118
Sample #:	**345899**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	130 U	130	12.2
208-96-8	Acenaphthylene	270 U	270	15.1
120-12-7	Anthracene	27 U	27	0.910
56-55-3	**Benzo (a) Anthracene**	**1.4 J**	27	1.04
50-32-8	Benzo (a) Pyrene	27 U	27	1.30
205-99-2	Benzo (b) Fluoranthene	27 U	27	1.69
191-24-2	Benzo (g,h,i,) Perylene	27 U	27	16.3
207-08-9	Benzo (k) Fluoranthene	27 U	27	1.30
218-01-9	**Chrysene**	**1.7 J**	27	1.56
53-70-3	Dibenzo (a,h) Anthracene	27 U	27	1.82
206-44-0	**Fluoranthene**	**3.8 J**	27	2.21
86-73-7	Fluorene	27 U	27	1.69
193-39-5	Indeno (1,2,3-cd) Pyrene	27 U	27	0.910
91-20-3	Naphthalene	130 U	130	10.3
85-01-8	**Phenanthrene**	**1.8 J**	27	0.780
129-00-0	**Pyrene**	**5.1 J**	27	1.17

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 15:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**13SB8A**	QC Batch:	91080 -118
Sample #:	**345900**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	130 U	130	12.2
208-96-8	Acenaphthylene	270 U	270	15.1
120-12-7	**Anthracene**	**12 J**	27	0.910
56-55-3	**Benzo (a) Anthracene**	**49**	27	1.04
50-32-8	**Benzo (a) Pyrene**	**71**	27	1.30
205-99-2	**Benzo (b) Fluoranthene**	**54**	27	1.69
191-24-2	**Benzo (g,h,i,) Perylene**	**120**	27	16.3
207-08-9	**Benzo (k) Fluoranthene**	**32**	27	1.30
218-01-9	**Chrysene**	**57**	27	1.56
53-70-3	**Dibenzo (a,h) Anthracene**	**2.3 J**	27	1.82
206-44-0	**Fluoranthene**	**120**	27	2.21
86-73-7	Fluorene	27 U	27	1.69
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**53**	27	0.910
91-20-3	Naphthalene	130 U	130	10.3
85-01-8	**Phenanthrene**	**43**	27	0.780
129-00-0	**Pyrene**	**97**	27	1.17

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 15:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**13SB8B**	QC Batch:	91080 -118
Sample #:	**345901**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	130 U	130	12.2
208-96-8	Acenaphthylene	270 U	270	15.1
120-12-7	Anthracene	27 U	27	0.910
56-55-3	**Benzo (a) Anthracene**	**3.1 J**	27	1.04
50-32-8	Benzo (a) Pyrene	27 U	27	1.30
205-99-2	Benzo (b) Fluoranthene	27 U	27	1.69
191-24-2	Benzo (g,h,i,) Perylene	27 U	27	16.3
207-08-9	Benzo (k) Fluoranthene	27 U	27	1.30
218-01-9	**Chrysene**	**3.5 J**	27	1.56
53-70-3	Dibenzo (a,h) Anthracene	27 U	27	1.82
206-44-0	**Fluoranthene**	**7.9 J**	27	2.21
86-73-7	Fluorene	27 U	27	1.69
193-39-5	Indeno (1,2,3-cd) Pyrene	27 U	27	0.910
91-20-3	Naphthalene	130 U	130	10.3
85-01-8	**Phenanthrene**	**2.9 J**	27	0.780
129-00-0	**Pyrene**	**8.8 J**	27	1.17

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/09/03 @ 08:40
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/23/03 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**69SB2A**	QC Batch:	90508 -116
Sample #:	**345745**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	83
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U		0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U		0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	UJ,c	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U		1.0	0.229
98-95-3	Nitrobenzene	0.50 U		0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	UJ,c	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/09/03 @ 08:40
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/23/03 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**69SB2B**	QC Batch:	90508 -116
Sample #:	**345746**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	79
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U		0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U		0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	UJ,C	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U		1.0	0.229
98-95-3	Nitrobenzene	0.50 U		0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	UJ,C	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046	Analyzed:	10/23/03 by JMK1
	RAAP	Anal. Method:	USEPA-8330
Sample ID:	**69SB2C**	QC Batch:	90508 -116
Sample #:	**345747**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	75
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U		0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U		0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	VJ,C	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U		1.0	0.229
98-95-3	Nitrobenzene	0.50 U		0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	VJ,C	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 16:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046	Analyzed:	10/23/03 by JMK1
	RAAP	Anal. Method:	USEPA-8330
Sample ID:	**57SB4B**	QC Batch:	90508 -116
Sample #:	**345748**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	74
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U		0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U		0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	UJ,c	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U		1.0	0.229
98-95-3	Nitrobenzene	0.50 U		0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	UJ,c	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**
Project:	Richmond, VA
	RAAP
Submittal #:	**36440-5**
Submittal:	Delivery Order 0046
	RAAP
Sample ID:	**13SB7A**
Sample #:	**345883**
Matrix:	Soil
Unit:	mg/kg dry

Sampled:	10/09/03 @ 09:45
Sampler:	B.F. & J.S.
Received:	10/10/03 @ 08:40
Prepared:	10/16/03 by DJM
Prep. Method:	USEPA-8330
Analyzed:	10/23/03 by JMK1
Anal. Method:	USEPA-8330
QC Batch:	90508 -116
Anal. Batch:	208771
Percent Solids:	82
Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U		0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U		0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	UJ,C	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U		1.0	0.229
98-95-3	Nitrobenzene	0.50 U		0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	UJ,C	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/23/03 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**13SB7B**	QC Batch:	90508 -116
Sample #:	**345884**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	80
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U		0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U		0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	UJ,C	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U		1.0	0.229
98-95-3	Nitrobenzene	0.50 U		0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	UJ,C	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/21/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/23/03 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**13SB7C**	QC Batch:	90908 -121
Sample #:	**345885**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	79
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U		0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U		0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	UJ,C	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U		1.0	0.229
98-95-3	Nitrobenzene	0.50 U		0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	UJ,C	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.169

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:45
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/21/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/23/03 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**13SB12A**	QC Batch:	90908 -121
Sample #:	**345886**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	78
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U		0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.159
118-96-7	**2,4,6-Trinitrotoluene**	**0.27 J**		0.50	0.167
121-14-2	**2,4-Dinitrotoluene**	**0.39 J**		0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	UJ,C	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U		1.0	0.229
98-95-3	Nitrobenzene	0.50 U		0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	UJ,C	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 11:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/21/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/23/03 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**13SB12B**	QC Batch:	90908 -121
Sample #:	**345887**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	71
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U		0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.159
118-96-7	**2,4,6-Trinitrotoluene**	**0.55**		0.50	0.167
121-14-2	**2,4-Dinitrotoluene**	**0.19 J**		0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	VJ/C	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U		1.0	0.229
98-95-3	Nitrobenzene	0.50 U		0.50	0.102
121-82-4	**Hexahydro-1,3,5-trinitro-1,3,5-triazine**	**0.29 J**	J/C	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.169

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Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/21/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/23/03 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**SBD8**	QC Batch:	90908 -121
Sample #:	**345888**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	67
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U		0.50	0.140
99-65-0	**1,3-Dinitrobenzene**	**0.32 J**		0.50	0.159
118-96-7	**2,4,6-Trinitrotoluene**	**0.56**		0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	UJ,C	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U		1.0	0.229
98-95-3	Nitrobenzene	0.50 U		0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	UJ,C	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 11:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/21/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/23/03 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**13SB12C**	QC Batch:	90908 -121
Sample #:	**345889**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	62
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U		0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.159
118-96-7	**2,4,6-Trinitrotoluene**	**0.54**		0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	UJ,C	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U		1.0	0.229
98-95-3	Nitrobenzene	0.50 U		0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	UJ,C	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/21/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/23/03 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**13SB11A**	QC Batch:	90908 -121
Sample #:	**345890**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	77
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U		0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.159
118-96-7	**2,4,6-Trinitrotoluene**	**0.43 J**		0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	UJ,C	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U		1.0	0.229
98-95-3	Nitrobenzene	0.50 U		0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	UJ,C	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/21/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046	Analyzed:	10/23/03 by JMK1
	RAAP	Anal. Method:	USEPA-8330
Sample ID:	**13SB11B**	QC Batch:	90908 -121
Sample #:	**345891**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	88
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U		0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U		0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	UJ,C	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U		1.0	0.229
98-95-3	Nitrobenzene	0.50 U		0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	UJ,C	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:45
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/21/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/23/03 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**13SB11C**	QC Batch:	90908 -121
Sample #:	**345892**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	77
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U		0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U		0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	VJ,C	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U		1.0	0.229
98-95-3	Nitrobenzene	0.50 U		0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	VJ,C	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/21/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046	Analyzed:	10/23/03 by JMK1
	RAAP	Anal. Method:	USEPA-8330
Sample ID:	**13SB10A**	QC Batch:	90908 -121
Sample #:	**345893**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	71
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U		0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U		0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	UJ,C	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U		1.0	0.229
98-95-3	Nitrobenzene	0.50 U		0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	UJ,C	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/21/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/23/03 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**13SB10B**	QC Batch:	90908 -121
Sample #:	**345894**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	77
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U		0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U		0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	UJ,c	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U		1.0	0.229
98-95-3	Nitrobenzene	0.50 U		0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	UJ,c	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/21/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046	Analyzed:	10/23/03 by JMK1
	RAAP	Anal. Method:	USEPA-8330
Sample ID:	**13SB10C**	QC Batch:	90908 -121
Sample #:	**345895**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	73
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U		0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U		0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	UJ,C	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U		1.0	0.229
98-95-3	Nitrobenzene	0.50 U		0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	UJ,C	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/21/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046	Analyzed:	10/23/03 by JMK1
	RAAP	Anal. Method:	USEPA-8330
Sample ID:	**13SB9A**	QC Batch:	90908 -121
Sample #:	**345896**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	78
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U		0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U		0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	UJ,C	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U		1.0	0.229
98-95-3	Nitrobenzene	0.50 U		0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	UJ,C	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/21/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046	Analyzed:	10/23/03 by JMK1
	RAAP	Anal. Method:	USEPA-8330
Sample ID:	**SBD9**	QC Batch:	90908 -121
Sample #:	**345897**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	80
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U		0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U		0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	UJ,C	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U		1.0	0.229
98-95-3	Nitrobenzene	0.50 U		0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	UJ,C	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.169

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Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/21/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/24/03 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**13SB9B**	QC Batch:	90908 -121
Sample #:	**345898**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	73
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U		0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U		0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	UJ,C	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U		1.0	0.229
98-95-3	Nitrobenzene	0.50 U		0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	UJ,C	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/21/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by JMK1
	RAAP	Anal. Method:	USEPA-8330
Sample ID:	**13SB9C**	QC Batch:	90908 -121
Sample #:	**345899**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	78
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U		0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U		0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U		0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U		0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U		1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U		0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U		1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	UJ,c	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U		0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U		1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U		1.0	0.229
98-95-3	Nitrobenzene	0.50 U		0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	UJ,c	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U		1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 15:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/21/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/24/03 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**13SB8A**	QC Batch:	90908 -121
Sample #:	**345900**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	77
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U	0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.229
98-95-3	Nitrobenzene	0.50 U	0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 15:30
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/21/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/24/03 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**13SB8B**	QC Batch:	90908 -121
Sample #:	**345901**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	78
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U	0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.229
98-95-3	Nitrobenzene	0.50 U	0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	10/16/03 by JRR
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	10/31/03 by JLRM
	RAAP	Anal. Method:	USEPA-8081A
Sample ID:	**69SB2A**	QC Batch:	90181 -116
Sample #:	**345745**	Anal. Batch:	208635
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	24 U	24	0.286
72-55-9	4,4'-DDE	24 U	24	0.210
50-29-3	4,4'-DDT	24 U	24	0.216
309-00-2	**Aldrin**	**0.11 J**	24	0.365
319-84-6	Alpha-BHC	24 U	24	0.364
57-74-9	A-Chlordane	24 U	24	0.521
5103-74-2	G-Chlordane	24 U	24	0.844
319-85-7	Beta-BHC	24 U	24	1.36
319-86-8	**Delta-BHC**	**2.5 J**	24	0.982
60-57-1	Dieldrin	24 U	24	0.371
115-29-7	Endosulfan I	24 U	24	1.09
33213-65-9	Endosulfan II	24 U	24	0.257
1031-07-8	Endosulfan Sulfate	24 U	24	0.604
72-20-8	Endrin	24 U	24	0.358
7421-93-4	Endrin Aldehyde	24 U	24	1.33
53494-70-5	Endrin Ketone	24 U	24	0.330
58-89-9	Lindane	24 U	24	0.233
76-44-8	Heptachlor	24 U	24	0.846
1024-57-3	Heptachlor Epoxide	24 U	24	0.546
72-43-5	Methoxychlor	24 U	24	0.336
8001-35-2	Toxaphene	200 U	200	28.0

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/16/03 by JRR
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	10/31/03 by JLRM
	RAAP	Anal. Method:	USEPA-8081A
Sample ID:	**13SB9A**	QC Batch:	90181 -116
Sample #:	**345896**	Anal. Batch:	208635
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	26 U	26	0.309
72-55-9	4,4'-DDE	26 U	26	0.228
50-29-3	4,4'-DDT	26 U	26	0.234
309-00-2	Aldrin	26 U	26	0.395
319-84-6	Alpha-BHC	26 U	26	0.394
57-74-9	A-Chlordane	26 U	26	0.564
5103-74-2	G-Chlordane	26 U	26	0.914
319-85-7	Beta-BHC	26 U	26	1.47
319-86-8	Delta-BHC	26 U	26	1.06
60-57-1	Dieldrin	26 U	26	0.402
115-29-7	Endosulfan I	26 U	26	1.18
33213-65-9	Endosulfan II	26 U	26	0.278
1031-07-8	Endosulfan Sulfate	26 U	26	0.654
72-20-8	Endrin	26 U	26	0.387
7421-93-4	Endrin Aldehyde	26 U	26	1.44
53494-70-5	Endrin Ketone	26 U	26	0.358
58-89-9	Lindane	26 U	26	0.252
76-44-8	Heptachlor	26 U	26	0.917
1024-57-3	Heptachlor Epoxide	26 U	26	0.592
72-43-5	Methoxychlor	26 U	26	0.364
8001-35-2	Toxaphene	220 U	220	30.3

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/16/03 by JRR
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	10/31/03 by JLRM
	RAAP	Anal. Method:	USEPA-8081A
Sample ID:	**SBD9**	QC Batch:	90181 -116
Sample #:	**345897**	Anal. Batch:	208635
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	24 U	24	0.286
72-55-9	4,4'-DDE	24 U	24	0.210
50-29-3	4,4'-DDT	24 U	24	0.216
309-00-2	Aldrin	24 U	24	0.365
319-84-6	Alpha-BHC	24 U	24	0.364
57-74-9	A-Chlordane	24 U	24	0.521
5103-74-2	G-Chlordane	24 U	24	0.844
319-85-7	Beta-BHC	24 U	24	1.36
319-86-8	Delta-BHC	24 U	24	0.982
60-57-1	Dieldrin	24 U	24	0.371
115-29-7	Endosulfan I	24 U	24	1.09
33213-65-9	Endosulfan II	24 U	24	0.257
1031-07-8	Endosulfan Sulfate	24 U	24	0.604
72-20-8	Endrin	24 U	24	0.358
7421-93-4	Endrin Aldehyde	24 U	24	1.33
53494-70-5	Endrin Ketone	24 U	24	0.330
58-89-9	Lindane	24 U	24	0.233
76-44-8	Heptachlor	24 U	24	0.846
1024-57-3	Heptachlor Epoxide	24 U	24	0.546
72-43-5	Methoxychlor	24 U	24	0.336
8001-35-2	Toxaphene	200 U	200	28.0

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/09/03 @ 08:40
		Prepared:	10/16/03 by JRR
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/20/03 by JLRM
		Anal. Method:	USEPA-8082
Sample ID:	**69SB2A**	QC Batch:	89881 -116
Sample #:	**345745**	Anal. Batch:	207923
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	80 U	80	19.2
11104-28-2	PCB-1221	40 U	40	2.40
11141-16-5	PCB-1232	40 U	40	6.00
53469-21-9	PCB-1242	40 U	40	3.60
12672-29-6	PCB-1248	40 U	40	6.00
11097-69-1	**PCB-1254**	**220**	40	3.60
11096-82-5	PCB-1260	40 U	40	8.40

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/16/03 by JRR
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	10/17/03 by JLRM
	RAAP	Anal. Method:	USEPA-8082
Sample ID:	**13SB9A**	QC Batch:	89881 -116
Sample #:	**345896**	Anal. Batch:	207924
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polychlorinated Biphenyls OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	85 U	85	20.8
11104-28-2	PCB-1221	42 U	42	2.60
11141-16-5	PCB-1232	42 U	42	6.50
53469-21-9	PCB-1242	42 U	42	3.90
12672-29-6	PCB-1248	42 U	42	6.50
11097-69-1	PCB-1254	42 U	42	3.90
11096-82-5	PCB-1260	42 U	42	9.10

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/16/03 by JRR
Submittal #:	**36440-5**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	10/17/03 by JLRM
	RAAP	Anal. Method:	USEPA-8082
Sample ID:	**SBD9**	QC Batch:	89881 -116
Sample #:	**345897**	Anal. Batch:	207924
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	82 U	82	19.2
11104-28-2	PCB-1221	41 U	41	2.40
11141-16-5	PCB-1232	41 U	41	6.00
53469-21-9	PCB-1242	41 U	41	3.60
12672-29-6	PCB-1248	41 U	41	6.00
11097-69-1	PCB-1254	41 U	41	3.60
11096-82-5	PCB-1260	41 U	41	8.40

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
		Prepared:	10/10/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8151A
Submittal:	Delivery Order 0046	Analyzed:	10/14/03 by MSN
	RAAP	Anal. Method:	USEPA-8151A
Sample ID:	**69SB2A**	QC Batch:	90218 -110
Sample #:	**345745**	Anal. Batch:	208309
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Herbicides	Analytical Result	Reporting Limit	MDL
93-76-5	2,4,5-T	60 U	60	2.40
93-72-1	2,4,5-TP (Silvex)	60 U	60	4.80
94-75-7	2,4-D	240 U	240	19.2
94-82-6	2,4-DB	240 U	240	74.4
75-99-0	Dalapon	300 U	300	68.4
1918-00-9	Dicamba	240 U	240	2.40
120-36-5	Dichlorprop	240 U	240	20.4
~~88-85-7~~	~~* Dinoseb~~	~~240 R~~ R,1	~~240~~	~~25.2~~ AZ, 2/18/04
94-74-6	MCPA	24000 U	24000	1680
93-65-2	MCPP	24000 U	24000	6070

* See attached Statement of Data Qualifications.

See re-extraction, AZ 2/18/04

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ANALYTICAL REPORT

VALUE CHANGES

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/09/03 @ 08:40
		Prepared:	10/17/03 ~~10/10/03~~ by DJM ~~RS~~ 2/18/04
Submittal #:	**36440-5**	Prep. Method:	USEPA-8151A
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/28/03 by JLRM
		Anal. Method:	USEPA-8151A
Sample ID:	**69SB2A**	QC Batch:	90218 -110
Sample #:	**345745DL**	Anal. Batch:	208365
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Herbicides	Analytical Result	Reporting Limit	MDL
93-76-5	2,4,5-T	60 U	60	~~2.40~~
93-72-1	2,4,5-TP (Silvex)	60 U	60	4.80
94-75-7	2,4-D	~~240~~ U	240	19.2
94-82-6	2,4-DB	240 U	240	74.4
75-99-0	Dalapon	300 U	300	68.4
1918-00-9	Dicamba	240 U	240	2.40
~~120-36-5~~	Dichlorprop	240 U	240	20.4
88-85-7	Dinoseb	240 U	240	25.2
94-74-6	MCPA	~~24000~~ U	~~24000~~	~~1680~~
~~93-65-2~~	MCPP	24000 U	24000	6070

Use only Dinoseb, RS 2/18/04

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/10/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8151A
Submittal:	Delivery Order 0046	Analyzed:	10/14/03 by MSN
	RAAP	Anal. Method:	USEPA-8151A
Sample ID:	**13SB9A**	QC Batch:	90218 -110
Sample #:	**345896**	Anal. Batch:	208309
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Herbicides	Analytical Result	Reporting Limit	MDL
93-76-5	2,4,5-T	64 U	64	2.60
93-72-1	2,4,5-TP (Silvex)	64 U	64	5.20
94-75-7	2,4-D	260 U	260	20.8
94-82-6	2,4-DB	260 U	260	80.6
75-99-0	Dalapon	320 U	320	74.1
1918-00-9	Dicamba	260 U	260	2.60
120-36-5	Dichlorprop	260 U	260	22.1
~~88-85-7~~	~~* Dinoseb~~	~~260 R~~ R,1	~~260~~	~~27.3~~ * 2/18/04
94-74-6	MCPA	26000 U	26000	1810
93-65-2	MCPP	26000 U	26000	6570

* See attached Statement of Data Qualifications.

See re-extraction for Dinoseb * 2/18/04

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ANALYTICAL REPORT

VALUE CHANGES

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
		Prepared:	10/17/03 ~~10/10/03~~ by DJM ✱ 2/18/03
Submittal #:	**36440-5**	Prep. Method:	USEPA-8151A
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/27/03 by JLRM
		Anal. Method:	USEPA-8151A
Sample ID:	**13SB9A**	QC Batch:	90218 -110
Sample #:	**345896DL**	Anal. Batch:	208365
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Herbicides	Analytical Result	Reporting Limit	MDL
93-76-5	2,4,5-T	64 U	64	~~2.60~~
93-72-1	2,4,5-TP (Silvex)	64 U	~~64~~	5.20
94-75-7	2,4-D	~~260 U~~	260	20.8
94-82-6	2,4-DB	260 U	260	80.6
75-99-0	Dalapon	320 U	320	74.1
1918-00-9	Dicamba	260 U	260	2.60
~~120-36-5~~	Dichlorprop	~~260 U~~	260	22.1
88-85-7	Dinoseb	260 U	260	27.3
~~94-74-6~~	MCPA	~~26000 U~~	~~26000~~	~~1810~~
~~93-65-2~~	MCPP	26000 U	26000	6570

Use only Dinoseb, ✱ 2/18/04

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
		Prepared:	10/10/03 by DJM
Submittal #:	**36440-5**	Prep. Method:	USEPA-8151A
Submittal:	Delivery Order 0046	Analyzed:	10/14/03 by MSN
	RAAP	Anal. Method:	USEPA-8151A
Sample ID:	**SBD9**	QC Batch:	90218 -110
Sample #:	**345897**	Anal. Batch:	208309
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Herbicides	Analytical Result	Reporting Limit	MDL
93-76-5	2,4,5-T	62 U	62	2.40
93-72-1	2,4,5-TP (Silvex)	62 U	62	4.80
94-75-7	2,4-D	250 U	250	19.2
94-82-6	2,4-DB	250 U	250	74.4
75-99-0	Dalapon	310 U	310	68.4
1918-00-9	Dicamba	250 U	250	2.40
120-36-5	Dichlorprop	250 U	250	20.4
~~88-85-7~~	~~*Dinoseb~~	~~250 R~~ R,1	~~250~~	~~25.2~~ AS 2/18/04
94-74-6	MCPA	25000 U	25000	1680
93-65-2	MCPP	25000 U	25000	6070

* See attached Statement of Data Qualifications.

See re-extraction for dinoseb, AS 2/18/04

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ANALYTICAL REPORT

VALUE CHANGES

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
Submittal #:	**36440-5**	Prepared:	10/17/03 ~~10/10/03~~ by DJM AS 2/18/04
Submittal:	Delivery Order 0046 RAAP	Prep. Method:	USEPA-8151A
Sample ID:	**SBD9**	Analyzed:	10/27/03 by JLRM
Sample #:	**345897DL**	Anal. Method:	USEPA-8151A
Matrix:	Soil	QC Batch:	90218 -110
Unit:	ug/kg dry	Anal. Batch:	208365
		Percent Solids:	80
		Dilution Factor:	1.2

CAS Number	Herbicides	Analytical Result	Reporting Limit	MDL
93-76-5	2,4,5-T	62 U	62	~~2.40~~
93-72-1	2,4,5-TP (Silvex)	62 U	62	4.80
94-75-7	2,4-D	~~250~~ U	250	19.2
94-82-6	2,4-DB	250 U	250	74.4
75-99-0	Dalapon	310 U	310	68.4
1918-00-9	Dicamba	250 U	250	2.40
~~120-36-5~~	Dichlorprop	250 U	250	20.4
88-85-7	Dinoseb	250 U	250	25.2
94-74-6	MCPA	~~25000~~ U	~~25000~~	~~1680~~
~~93-65-2~~	MCPP	25000 U	25000	6070

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/08/03 @ 15:00
Sampler: B.F. & J.S.
Received: 10/09/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **69SB2A**
Sample #: **345745**
Matrix: Soil

Percent Solids: 83

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	24600	250	5.10	mg/kg dry	10/23/03	DSC	USEPA-6010B
Antimony, Total	9.5	0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	0.64	0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	65	5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	0.62 J	1.0	0.0333	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Cadmium, Total	0.57 J	1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	840 J,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	50 J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	16 J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	17 J,S	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	32700	1000	71.6	mg/kg dry	10/23/03	DSC	USEPA-6010B
Lead, Total	1.0 U	1.0	0.0218	mg/kg dry	10/23/03	DWJ	USEPA-6020
Magnesium, Total	2270 J,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	894	5.0	0.264	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Mercury, Total	0.091 J	0.10	0.0077	mg/kg dry	10/16/03	MSS	USEPA-7471A
Nickel, Total	0.50 U	0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1580	100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	1.0 U	1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.085 J	3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	114	100	8.92	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Thallium, Total	0.33 J B,X	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	54	1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	51	4.0	0.517	mg/kg dry	10/23/03	KLVM	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/08/03 @ 15:15
Sampler: B.F. & J.S.
Received: 10/09/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **69SB2B**
Sample #: **345746**
Matrix: Soil

Percent Solids: 79

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	34800		250	5.10	mg/kg dry	10/23/03	DSC	USEPA-6010B
Antimony, Total	8.8		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	6.5		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	70		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	0.91 J		1.0	0.0333	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Cadmium, Total	1.5		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	568	J,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	50	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	12	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	23	J,S	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	42400		1000	71.6	mg/kg dry	10/23/03	DSC	USEPA-6010B
Lead, Total	14		1.0	0.0218	mg/kg dry	10/23/03	DWJ	USEPA-6020
Magnesium, Total	6020	J,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	303		5.0	0.264	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Mercury, Total	0.070 J		0.10	0.0077	mg/kg dry	10/16/03	MSS	USEPA-7471A
Nickel, Total	30		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	3680		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.47 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.10 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	353		100	8.92	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Thallium, Total	0.37 J	B,X	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	71		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	54		4.0	0.517	mg/kg dry	10/23/03	KLVM	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/08/03 @ 15:30
Sampler: B.F. & J.S.
Received: 10/09/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **69SB2C**
Sample #: **345747**
Matrix: Soil

Percent Solids: 75

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	31400		250	5.10	mg/kg dry	10/23/03	DSC	USEPA-6010B
Antimony, Total	7.2		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	9.9		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	63		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	1.0		1.0	0.0333	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Cadmium, Total	0.90 J		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	483	J,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	41	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	16	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	24	J,S	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	41200		1000	71.6	mg/kg dry	10/23/03	DSC	USEPA-6010B
Lead, Total	15		1.0	0.0218	mg/kg dry	10/23/03	DWJ	USEPA-6020
Magnesium, Total	8790	J,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	585		5.0	0.264	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Mercury, Total	0.077 J		0.10	0.0077	mg/kg dry	10/16/03	MSS	USEPA-7471A
Nickel, Total	25		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	4720		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.45 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.11 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	434		100	8.92	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Thallium, Total	0.39 J	B,X	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	57		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	45		4.0	0.517	mg/kg dry	10/23/03	KLVM	USEPA-6010B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/08/03 @ 16:00
Sampler: B.F. & J.S.
Received: 10/09/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **57SB4B**
Sample #: **345748**
Matrix: Soil

Percent Solids: 74

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	33300		250	9.15	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Antimony, Total	9.7		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	2.0		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	51		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	0.45 J		1.0	0.0333	mg/kg dry	10/29/03	DSC	USEPA-6010B
Cadmium, Total	1.6		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	372	J,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	45	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	13	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	18	J,S	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	59000		200	42.4	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Lead, Total	18		1.0	0.0218	mg/kg dry	10/23/03	DWJ	USEPA-6020
Magnesium, Total	971	J,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	273		5.0	0.264	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Mercury, Total	0.041 J		0.10	0.0077	mg/kg dry	10/16/03	MSS	USEPA-7471A
Nickel, Total	12		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1080		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.40 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.063 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	497		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.18 J	B,X	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	66		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	88		4.0	0.517	mg/kg dry	10/23/03	KLVM	USEPA-6010B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 09:45
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SB7A**
Sample #: **345883**
Matrix: Soil

Percent Solids: 82

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	14000		50	1.83	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	2.5		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	170		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	1.0		1.0	0.167	mg/kg dry	11/03/03	KLVM	USEPA-6010B
Cadmium, Total	1.3		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	2290	J,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	28	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	9.0	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	13	J,S	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	31000		200	42.4	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Lead, Total	141		25	0.545	mg/kg dry	10/24/03	DWJ	USEPA-6020
Magnesium, Total	3370	J,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	1040		25	1.32	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Mercury, Total	0.027 J		0.10	0.0077	mg/kg dry	10/16/03	MSS	USEPA-7471A
Nickel, Total	14		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1670		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.57 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.084 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	58 J		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.52	B,X	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	24		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	471		40	5.17	mg/kg dry	10/27/03	KLVM	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 10:00
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SB7B**
Sample #: **345884**
Matrix: Soil

Percent Solids: 80

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	13900		50	1.83	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Antimony, Total	0.12 J	B,P	0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	3.5		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	199		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	0.98 J		1.0	0.167	mg/kg dry	11/03/03	KLVM	USEPA-6010B
Cadmium, Total	1.5		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	2650	J,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	30	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	13	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	16	J,S	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	41600		200	42.4	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Lead, Total	235		50	1.09	mg/kg dry	10/24/03	DWJ	USEPA-6020
Magnesium, Total	3140	J,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	1650		25	1.32	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Mercury, Total	0.038 J		0.10	0.0077	mg/kg dry	10/16/03	MSS	USEPA-7471A
Nickel, Total	13		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1320		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.70 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.096 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	46 J		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.69	B,X	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	24		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	688		40	5.17	mg/kg dry	10/27/03	KLVM	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 10:15
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SB7C**
Sample #: **345885**
Matrix: Soil

Percent Solids: 79

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	21400		50	1.83	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Antimony, Total	0.085 J	B,P	0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	2.4		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	208		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	1.3		1.0	0.167	mg/kg dry	11/03/03	KLVM	USEPA-6010B
Cadmium, Total	1.3		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
* Calcium, Total	2310	J,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
* Chromium, Total	37	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	13	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	19	J,S	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	41900		200	42.4	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Lead, Total	239		50	1.09	mg/kg dry	10/24/03	DWJ	USEPA-6020
* Magnesium, Total	3940	J,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	1380		25	1.32	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Mercury, Total	0.034 J		0.10	0.0077	mg/kg dry	10/16/03	MSS	USEPA-7471A
Nickel, Total	19		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1890		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.84 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.11 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	53 J		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.86	B,X	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	36		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	847		40	5.17	mg/kg dry	10/27/03	KLVM	USEPA-6010B

* See attached Statement of Data Qualifications.

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 10:45
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SB12A**
Sample #: **345886**
Matrix: Soil

Percent Solids: 78

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	6630		50	1.83	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Antimony, Total	1.1		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	1.6		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	78		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	1.0 U		1.0	0.0391	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cadmium, Total	1.1		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	12400	J,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	18	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	5.1	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	45	J,S	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	14800		100	21.2	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Lead, Total	176		25	0.545	mg/kg dry	10/24/03	DWJ	USEPA-6020
Magnesium, Total	5330	J,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	301		5.0	0.264	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Mercury, Total	0.016 J		0.10	0.0077	mg/kg dry	10/16/03	MSS	USEPA-7471A
Nickel, Total	8.3		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1050		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.32 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.059 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	102		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.13 J	B,X	0.50	0.0270	mg/kg dry	10/30/03	DWJ	USEPA-6020
Vanadium, Total	14		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	214		20	2.59	mg/kg dry	10/27/03	KLVM	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 11:00
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SB12B**
Sample #: **345887**
Matrix: Soil

Percent Solids: 71

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	9910		50	1.83	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Antimony, Total	1.1		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	1.2		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	106		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	1.0 U		1.0	0.0391	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cadmium, Total	1.4		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	4820	J,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	27	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	6.4	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	37	J,S	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	15000		100	21.2	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Lead, Total	325		50	1.09	mg/kg dry	10/24/03	DWJ	USEPA-6020
Magnesium, Total	3270	J,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	280		5.0	0.264	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Mercury, Total	0.041 J		0.10	0.0077	mg/kg dry	10/16/03	MSS	USEPA-7471A
Nickel, Total	11		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1420		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.39 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.027 J	B,P	3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	252		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.23 J	B,X	0.50	0.0270	mg/kg dry	10/30/03	DWJ	USEPA-6020
Vanadium, Total	17		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	377		40	5.17	mg/kg dry	10/27/03	KLVM	USEPA-6010B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 00:00
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **SBD8**
Sample #: **345888**
Matrix: Soil

Percent Solids: 67

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	8930		50	1.83	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Antimony, Total	1.3		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	1.2		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	102		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	1.0 U		1.0	0.0391	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cadmium, Total	1.6		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	4640	J,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	26	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	6.3	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	36	J,S	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	14700		100	21.2	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Lead, Total	318		50	1.09	mg/kg dry	10/24/03	DWJ	USEPA-6020
Magnesium, Total	3050	J,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	291		5.0	0.264	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Mercury, Total	0.035 J		0.10	0.0077	mg/kg dry	10/16/03	MSS	USEPA-7471A
Nickel, Total	9.6		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1290		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.41 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.030 J	B,P	3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	88 J		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.15 J	B,X	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	17		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	426		40	5.17	mg/kg dry	10/27/03	KLVM	USEPA-6010B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 11:15
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SB12C**
Sample #: **345889**
Matrix: Soil

Percent Solids: 62

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	15000		50	1.83	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Antimony, Total	1.5		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	2.2		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	161		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	1.0 U		1.0	0.0391	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cadmium, Total	2.3		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	3840	J,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	34	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	9.9	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	94	J,S	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	18700		100	21.2	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Lead, Total	1140		200	4.36	mg/kg dry	10/24/03	DWJ	USEPA-6020
Magnesium, Total	3980	J,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	272		5.0	0.264	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Mercury, Total	0.13		0.10	0.0077	mg/kg dry	10/16/03	MSS	USEPA-7471A
Nickel, Total	17		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	2150		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.67 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.063 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	95 J		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.29 J	B,X	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	26		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	476		40	5.17	mg/kg dry	10/27/03	KLVM	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 12:15
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SB11A**
Sample #: **345890**
Matrix: Soil

Percent Solids: 77

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	19800		50	1.83	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Antimony, Total	0.27 J	B,P	0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	2.2		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	171		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	1.0		1.0	0.167	mg/kg dry	11/03/03	KLVM	USEPA-6010B
Cadmium, Total	1.2		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	4020	J,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	38	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	13	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	26	J,S	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	32600		200	42.4	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Lead, Total	111		25	0.545	mg/kg dry	10/24/03	DWJ	USEPA-6020
Magnesium, Total	4650	J,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	1140		25	1.32	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Mercury, Total	0.052 J		0.10	0.0077	mg/kg dry	10/16/03	MSS	USEPA-7471A
Nickel, Total	17		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	2680		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.86 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.10 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	51 J		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.42 J	B,X	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	34		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	294		40	5.17	mg/kg dry	10/27/03	KLVM	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 12:30
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SB11B**
Sample #: **345891**
Matrix: Soil

Percent Solids: 88

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	10800		50	1.83	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Antimony, Total	4.7		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	2.8		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	143		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	0.65 J		1.0	0.0333	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Cadmium, Total	1.2		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	2120	J,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	29	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	9.4	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	98	J,S	5.0	1.84	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Iron, Total	33800		200	42.4	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Lead, Total	26500		5000	109	mg/kg dry	10/24/03	DWJ	USEPA-6020
Magnesium, Total	2520	J,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	942		5.0	0.264	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Mercury, Total	0.045 J		0.10	0.0077	mg/kg dry	10/16/03	MSS	USEPA-7471A
Nickel, Total	12		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1280		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.53 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.26 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	63 J		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.45 J	B,X	0.50	0.0270	mg/kg dry	10/30/03	DWJ	USEPA-6020
Vanadium, Total	18		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	502		40	5.17	mg/kg dry	10/27/03	KLVM	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 12:45
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SB11C**
Sample #: **345892**
Matrix: Soil

Percent Solids: 77

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	20900		50	1.83	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Antimony, Total	0.62		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	4.7		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	211		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	1.2		1.0	0.167	mg/kg dry	11/03/03	KLVM	USEPA-6010B
Cadmium, Total	2.7		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	2970	J,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	39	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	16	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	33	J,S	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	48600		200	42.4	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Lead, Total	295		50	1.09	mg/kg dry	10/24/03	DWJ	USEPA-6020
Magnesium, Total	3940	J,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	1700		125	6.60	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Mercury, Total	0.071 J		0.10	0.0077	mg/kg dry	10/16/03	MSS	USEPA-7471A
Nickel, Total	21		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1720		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	1.5		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.15 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	64 J		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.68	B,X	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	34		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	1070		100	12.9	mg/kg dry	10/27/03	KLVM	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 13:00
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SB10A**
Sample #: **345893**
Matrix: Soil

Percent Solids: 71

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	10900		50	1.83	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Antimony, Total	0.19 J	B,P	0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	2.5		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	111		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	0.85 J		1.0	0.167	mg/kg dry	11/03/03	KLVM	USEPA-6010B
Cadmium, Total	1.1		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	4570	J,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	27	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	11	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	16	J,S	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	25700		200	42.4	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Lead, Total	111		25	0.545	mg/kg dry	10/24/03	DWJ	USEPA-6020
Magnesium, Total	3850	J,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	853		5.0	0.264	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Mercury, Total	0.040 J		0.10	0.0077	mg/kg dry	10/16/03	MSS	USEPA-7471A
Nickel, Total	14		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1540		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.67 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.085 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	36 J		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.32 J	B,X	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	22		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	287		20	2.59	mg/kg dry	10/27/03	KLVM	USEPA-6010B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 13:15
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SB10B**
Sample #: **345894**
Matrix: Soil

Percent Solids: 77

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	14100		50	1.83	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Antimony, Total	3.0		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	3.9		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	160		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	0.97 J		1.0	0.167	mg/kg dry	11/03/03	KLVM	USEPA-6010B
Cadmium, Total	1.5		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	2240	J,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	35	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	12	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	44	J,S	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	37500		200	42.4	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Lead, Total	320		50	1.09	mg/kg dry	10/24/03	DWJ	USEPA-6020
Magnesium, Total	2890	J,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	1310		25	1.32	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Mercury, Total	0.089 J		0.10	0.0077	mg/kg dry	10/16/03	MSS	USEPA-7471A
Nickel, Total	16		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1200		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.77 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.18 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	52 J		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.45 J	B,X	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	25		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	578		40	5.17	mg/kg dry	10/27/03	KLVM	USEPA-6010B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 13:30
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SB10C**
Sample #: **345895**
Matrix: Soil

Percent Solids: 73

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	17500		50	1.83	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Antimony, Total	0.78		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	3.6		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	142		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	0.89 J		1.0	0.0333	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Cadmium, Total	1.0		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	1820	J,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	35	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	14	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	34	J,S	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	39600		200	42.4	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Lead, Total	204		25	0.545	mg/kg dry	10/24/03	DWJ	USEPA-6020
Magnesium, Total	3230	J,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	1150		25	1.32	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Mercury, Total	0.083 J		0.10	0.0077	mg/kg dry	10/16/03	MSS	USEPA-7471A
Nickel, Total	16		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1410		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.96 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.11 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	48 J		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.50	B,X	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	30		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	540		40	5.17	mg/kg dry	10/27/03	KLVM	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 14:00
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SB9A**
Sample #: **345896**
Matrix: Soil

Percent Solids: 78

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	20400		50	1.83	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Antimony, Total	0.095 J	B,P	0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	2.7		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	175		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	1.2		1.0	0.167	mg/kg dry	11/03/03	KLVM	USEPA-6010B
Cadmium, Total	2.2		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	1890	J,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	36	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	13	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	25	J,S	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	36500		200	42.4	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Lead, Total	434		50	1.09	mg/kg dry	10/24/03	DWJ	USEPA-6020
Magnesium, Total	3690	J,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	1240		25	1.32	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Mercury, Total	0.043 J		0.10	0.0077	mg/kg dry	10/16/03	MSS	USEPA-7471A
Nickel, Total	19		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1980		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.93 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.12 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	44 J		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.78	B,X	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	37		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	1010		100	12.9	mg/kg dry	10/27/03	KLVM	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 00:00
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **SBD9**
Sample #: **345897**
Matrix: Soil

Percent Solids: 80

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	18600		50	1.83	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Antimony, Total	0.10 J	B,P	0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	2.4		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	178		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	1.1		1.0	0.167	mg/kg dry	11/03/03	KLVM	USEPA-6010B
Cadmium, Total	2.4		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	2070	J,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	34	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	13	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	26	J,S	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	35900		200	42.4	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Lead, Total	396		50	1.09	mg/kg dry	10/24/03	DWJ	USEPA-6020
Magnesium, Total	3690	J,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	1390		25	1.32	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Mercury, Total	0.043 J		0.10	0.0077	mg/kg dry	10/16/03	MSS	USEPA-7471A
Nickel, Total	17		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1910		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.84 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.12 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	45 J		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.95	B,P	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	35		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	969		100	12.9	mg/kg dry	10/27/03	KLVM	USEPA-6010B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 14:15
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SB9B**
Sample #: **345898**
Matrix: Soil

Percent Solids: 73

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	16200		50	1.83	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	1.1		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	121		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	1.0 U		1.0	0.0391	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cadmium, Total	1.2		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	1490	J,m	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	31	J,m	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	9.8	J,s	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	13	J,s	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	20400		200	42.4	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Lead, Total	113		25	0.545	mg/kg dry	10/24/03	DWJ	USEPA-6020
Magnesium, Total	2970	J,m	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	689		5.0	0.264	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Mercury, Total	0.027 J		0.10	0.0077	mg/kg dry	10/16/03	MSS	USEPA-7471A
Nickel, Total	17		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1490		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.72 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.060 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	54 J		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.25 J	B,x	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	30		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	194		20	2.59	mg/kg dry	10/27/03	KLVM	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 14:30
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SB9C**
Sample #: **345899**
Matrix: Soil

Percent Solids: 78

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	4250	50	1.83	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Antimony, Total	0.50 U	0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	0.12 J	0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	29	5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	1.0 U	1.0	0.0391	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cadmium, Total	1.1	1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	1300 J,m	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	11 B,x	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	3.9 J,s	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	2.5 J,s	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	5330	20	4.24	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Lead, Total	12	1.0	0.0218	mg/kg dry	10/23/03	DWJ	USEPA-6020
Magnesium, Total	1210 J,m	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	59	5.0	0.264	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Mercury, Total	0.10 U	0.10	0.0077	mg/kg dry	10/16/03	MSS	USEPA-7471A
Nickel, Total	3.8	0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	548	100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.23 J	1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.023 J B,p	3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	69 J	100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.047 J B,x	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	11	1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	46	4.0	0.517	mg/kg dry	10/23/03	KLVM	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 15:15
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SB8A**
Sample #: **345900**
Matrix: Soil

Percent Solids: 77

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	12600		50	1.83	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Antimony, Total	0.069 J	B,P	0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	2.4		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	124		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	0.66 J		1.0	0.0333	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Cadmium, Total	0.91 J		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	3290	J,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	28	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	10	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	18	J,S	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	29200		200	42.4	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Lead, Total	8620		1000	21.8	mg/kg dry	10/24/03	DWJ	USEPA-6020
Magnesium, Total	3240	J,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	1160		25	1.32	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Mercury, Total	0.033 J		0.10	0.0077	mg/kg dry	10/16/03	MSS	USEPA-7471A
Nickel, Total	14		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1480		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.66 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.14 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	40 J		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.36 J	B,P	0.50	0.0270	mg/kg dry	10/30/03	DWJ	USEPA-6020
Vanadium, Total	23		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	363		20	2.59	mg/kg dry	10/27/03	KLVM	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 15:30
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SB8B**
Sample #: **345901**
Matrix: Soil

Percent Solids: 78

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	7650		50	1.83	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	0.65		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	66		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	1.0 U		1.0	0.0391	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cadmium, Total	0.72 J		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	1750	J,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	19	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	6.0	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	8.3	J,S	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	12400		100	21.2	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Lead, Total	46		1.0	0.0218	mg/kg dry	10/23/03	DWJ	USEPA-6020
Magnesium, Total	2160	J,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	270		5.0	0.264	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Mercury, Total	0.0087 J		0.10	0.0077	mg/kg dry	10/16/03	MSS	USEPA-7471A
Nickel, Total	7.8		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	939		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.35 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.45 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	63 J		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.14 J	B,Y	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	15		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	154		20	2.59	mg/kg dry	10/27/03	KLVM	USEPA-6010B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
Submittal #:	**36440-5**		
Submittal:	Delivery Order 0046		
	RAAP		
Sample ID:	**69SB2A**		
Sample #:	**345745**		
Matrix:	Soil	Percent Solids:	83

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	83	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.14 J	0.50	0.0356	mg/kg dry	10/16/03	JLB	USEPA-9012A

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
Submittal #:	**36440-5**		
Submittal:	Delivery Order 0046		
	RAAP		
Sample ID:	**69SB2B**		
Sample #:	**345746**		
Matrix:	Soil	Percent Solids:	79

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	79	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.50 U	0.50	0.0356	mg/kg dry	10/16/03	JLB	USEPA-9012A

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 15:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
Submittal #:	**36440-5**		
Submittal:	Delivery Order 0046		
	RAAP		
Sample ID:	**69SB2C**		
Sample #:	**345747**		
Matrix:	Soil	Percent Solids:	75

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	75	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.05 J	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/08/03 @ 16:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/09/03 @ 08:40
Submittal #:	**36440-5**		
Submittal:	Delivery Order 0046		
	RAAP		
Sample ID:	**57SB4B**		
Sample #:	**345748**		
Matrix:	Soil	Percent Solids:	74

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	74	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.50 U	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 09:45
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
Submittal #:	**36440-5**		
Submittal:	Delivery Order 0046 RAAP		
Sample ID:	**13SB7A**		
Sample #:	**345883**		
Matrix:	Soil	Percent Solids:	82

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	82	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.07 J	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
Submittal #:	**36440-5**		
Submittal:	Delivery Order 0046		
	RAAP		
Sample ID:	**13SB7B**		
Sample #:	**345884**		
Matrix:	Soil	Percent Solids:	80

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	80	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.18 J	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 10:15
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/10/03 @ 08:40
Submittal #:	**36440-5**		
Submittal:	Delivery Order 0046 RAAP		
Sample ID:	**13SB7C**		
Sample #:	**345885**		
Matrix:	Soil	Percent Solids:	79

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	79	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.50 U	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 10:45
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SB12A**
Sample #: **345886**
Matrix: Soil

Percent Solids: 78

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	78	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.18 J	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 11:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
Submittal #:	**36440-5**		
Submittal:	Delivery Order 0046		
	RAAP		
Sample ID:	**13SB12B**		
Sample #:	**345887**		
Matrix:	Soil	Percent Solids:	71

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	71	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.39 J	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
Submittal #:	**36440-5**		
Submittal:	Delivery Order 0046		
	RAAP		
Sample ID:	**SBD8**		
Sample #:	**345888**		
Matrix:	Soil	Percent Solids:	67

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	67	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.23 J	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 11:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
Submittal #:	**36440-5**		
Submittal:	Delivery Order 0046		
	RAAP		
Sample ID:	**13SB12C**		
Sample #:	**345889**		
Matrix:	Soil	Percent Solids:	62

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	62	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.11 J	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
Submittal #:	**36440-5**		
Submittal:	Delivery Order 0046		
	RAAP		
Sample ID:	**13SB11A**		
Sample #:	**345890**		
Matrix:	Soil	Percent Solids:	77

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	77	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.22 J	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 12:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
Submittal #:	**36440-5**		
Submittal:	Delivery Order 0046		
	RAAP		
Sample ID:	**13SB11B**		
Sample #:	**345891**		
Matrix:	Soil	Percent Solids:	88

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	88	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.35 J	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 12:45
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SB11C**
Sample #: **345892**
Matrix: Soil

Percent Solids: 77

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	77	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.25 J	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 13:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
Submittal #:	**36440-5**		
Submittal:	Delivery Order 0046		
	RAAP		
Sample ID:	**13SB10A**		
Sample #:	**345893**		
Matrix:	Soil	Percent Solids:	71

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	71	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.17 J	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 13:15
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SB10B**
Sample #: **345894**
Matrix: Soil

Percent Solids: 77

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	77	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.22 J	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 13:30
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SB10C**
Sample #: **345895**
Matrix: Soil

Percent Solids: 73

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	73	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.11 J	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
Submittal #:	**36440-5**		
Submittal:	Delivery Order 0046		
	RAAP		
Sample ID:	**13SB9A**		
Sample #:	**345896**		
Matrix:	Soil	Percent Solids:	78

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	78	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.35 J	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
Submittal #:	**36440-5**		
Submittal:	Delivery Order 0046		
	RAAP		
Sample ID:	**SBD9**		
Sample #:	**345897**		
Matrix:	Soil	Percent Solids:	80

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	80	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.26 J	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/09/03 @ 14:15
Sampler: B.F. & J.S.
Received: 10/10/03 @ 08:40

Submittal #: **36440-5**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SB9B**
Sample #: **345898**
Matrix: Soil

Percent Solids: 73

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	73	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.12 J	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 14:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
Submittal #:	**36440-5**		
Submittal:	Delivery Order 0046		
	RAAP		
Sample ID:	**13SB9C**		
Sample #:	**345899**		
Matrix:	Soil	Percent Solids:	78

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	78	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.50 U	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 15:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
Submittal #:	**36440-5**		
Submittal:	Delivery Order 0046		
	RAAP		
Sample ID:	**13SB8A**		
Sample #:	**345900**		
Matrix:	Soil	Percent Solids:	77

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	77	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.25 J	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/09/03 @ 15:30
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/10/03 @ 08:40
Submittal #:	**36440-5**		
Submittal:	Delivery Order 0046		
	RAAP		
Sample ID:	**13SB8B**		
Sample #:	**345901**		
Matrix:	Soil	Percent Solids:	78

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	78	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.50 U	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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DATA VALIDATION WORKSHEET

Volatile Organic Analysis by GC/MS

Reviewer:	AS	**Project Name:**	Radford SSP
Date:	February-04	**Project Number:**	15291974.30000
DV Level:	II III IV	**Laboratory:**	TriMatrix
Review Document:		**SDG No.:**	36440-5
X NFG - Region III Modifications		**Test Name:**	8260B
X Project QAPP/SAP		**Method No.:**	VOC

1.0 Laboratory Deliverables		**Yes**	**No**	**NA**
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	x		
1.4	Do sample preservation, collection and storage condition meet method requirement?	x		
	If the temperature of the cooler was elevated (> 10 °C) or bubble size in aqueous sample was too big (tiny bubble is OK.), then flag all positive results with a "L" and all non-detects "UL".			
1.5	Do any soil samples contain more than 50% water?		x	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV report.			

Notes: *four coolers @ 2.3C, 0.4C, 0.9C, & 0.8C*

2.0 Holding Times		**Yes**	**No**	**NA**
2.1	Were sample preserved as specified in the method or project QAPP?	see above		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, L(+)/UL(-). For aqueous unpreserved - 7 days for aromatic compounds All others - 14 days.		x	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .		x	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per GCMS, 20 samples, batch, matrix, and level)?	x		
3.2	Do any method blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to 5 times (or 10 times for the common volatile lab contaminants - methylene chloride, acetone, and 2-butanone) the amount in the associated blank.	x		
3.3	Do any field equipment blanks/trip blanks have positive results? If Yes, use same rules above.	x		
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, noted in the DV report.	x		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	x		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	x		
4.3	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	x		
4.4	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 15% and %D < ± 20%		x	
	For initial Calibration: for %RSD > ±15%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 20% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >20%, J(+).			
4.5	Do any SPCC compounds have an RRF < control limit? Control limits: >0.10 for chloromethane, 1,1-dichloroethane, & bromoform or >0.30 for chlorobenzene & 1,1,2,2-tetrachloroethane. If yes, L(+)/R(-).		x	

Notes: ***The second source for methyl acetate was analyzed after sample analyses, but passed at 89% - no action was taken.***

5.0 GC/MS Instrument Performance Check		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	x		
5.2	Are BFB enchanced bar graph spectrum and mass/charge (m/z) listing provided for each 12-hour shift?	x		
5.3	Have all samples been analyzed within twelve hours of the BFB tune?	x		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
5.4	Have ion abundance criteria for BFB been met for each instrument used?	x		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Notes:

6.0 Surrogate Recovery		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	x		
6.2	Are surrogate recoveries within acceptance criteria (not to exceed 50-150%) for all samples and method blanks?	x		
6.3	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?			x
	If any system monitoring compound(s) in the volatile fraction is out of specification, there should be a reanalysis to confirm that the non-compliance is because of sample matrix effects rather than laboratory deficiencies.			
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? DV report should indicate that extraction efficiency/ method accuracy cannot be verified.			x
	1 or more <10% / 1 high/low / 2 or 3 high/low / 2 or 3 all low / 2 or 3 all high Positives: L / J / J / L / K Non-detects: R / UJ / UJ / UL / NONE			
	Note: The B qualifier remains over surrogate flagging.			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	x		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
7.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 50-150%?	x		
7.4	Are there any RPD outside the QC limits not to exceed 50%?	x		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	x		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 50-150%?	x		
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 50%?			x
	If Yes, J(+) only.			

Notes:

9.0 Internal Standard		Yes	No	NA
9.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? If not, J(+)/UJ(-).		x	
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	x		
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.			

Notes: ***13SB12C***

10.0 Field Duplicate		Yes	No	NA
10.1	Was a field duplicate prepared and analyzed at the correct frequency (one per 20 samples, matrix, and level)?	x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
10.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	x		

Notes:

11.0 Tentatively Identified Compounds (TICs) and Detection Limit Verification		Yes	No	NA
11.1	Are any TICs detected in the field samples? If Yes, all TIC results should be flagged "NJ" (tentatively identified and approximate concentration).	x		
11.2	Do detection limits meet those required by the project QAPP and were they properly adjusted to reflect all sample dilutions and dry weight factors?	x		
11.3	Were sample concentrations above the highest standard run at a dilution? If not, for ion saturation flag "L", unsaturated results "J".			x

Notes:

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	x		
	Number of samples: 23			
	Number of target compounds in each analysis:50			
	Number of results rejected and not reported:0			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100.0%			

Notes:

DATA VALIDATION WORKSHEET

Semivolatile Organic Analysis

Reviewer: AS
Date: February-04
DV Level: II III IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: Radford SSP
Project Number: 15291974.30000
Laboratory: TriMatrix
SDG No.: 36440-5
Test Name: SVOC
Method No.: 8270C

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		x	
1.4	Do sample preservation, collection and storage condition meet method requirement?		x	
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 ^{O}C), then flag all positive results with a "L" and all non-detects "UL".			
1.5	Do any soil samples contain more than 50% water?		x	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV report.			

Notes: *four coolers @ 2.3C, 0.4C, 0.9C, & 0.8C*

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method or project QAPP?	x		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, L(+)/UL(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		x	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .		x	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	x		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentrationof the compound in the sample is less than or equal to 5 times (or 10 times for the common phthalate contaminants) the amount in the associated blank.	x		
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.	x		
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, noted in the Dv report.	x		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	x		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	x		
4.3	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	x		
4.4	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: $r \geq 0.99$, %RSD $\leq$ 15%, ICV %D < 30%, and CCV %D $\leq$ 20%.		x	
	For initial Calibration: for %RSD $\geq \pm$15%, but < $\pm$ 50%, J(+) only. for %RSD > $\pm$50%, but < $\pm$ 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 20% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >20%, J(+).			
4.5	Do any SPCC compounds have an RRF < 0.05? (n-nitroso-di-n-propylamine,hexachlorocyclopentadiene,2,4-dinitrophenol, & 4-nitrophenol) If yes, J(+)/R(-).		x	

Notes: ***1,2,4,5-tetrachlorobenzene was not in the ICV for the 10/31/03 calibration. It is found in the LCS, MS, and MSD from a second source.***

5.0 GC/MS Instrument Performance Check		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for decafluorotriphenylphosphine (DFTPP)?	x		
5.2	Are DFTPP enchanced bar graph spectrum and mass/charge (m/z) listing provided for each 12-hour shift?	x		
	If DFTPP was analyzed simultaneously with any calibration standard or blank, the instrument performance check (IPC) is rejected "R" as well as all associated data.			
5.3	Have all samples been analyzed within twelve hours of the DFTPP tune?	x		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
5.4	Have ion abundance criteria for DFTPP been met for each instrument used?	x		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Notes:

6.0 Surrogate Recovery		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	x		
6.2	Are surrogate recoveries within acceptance criteria not to exceed 10-150% for all samples and method blanks?	x		
6.3	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?			x
	If any two base/neutral or acid fraction are out of specification, or if any one base/neutral or acid extractable surrogate has a recovery of less than 10%, then there should be a reanalysis to confirm that the non-compliance is because of sample matrix effects rather than laboratory deficiencies.			
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			x
	1 or more <10% / 2 or 3 high/low / 2 or 3 all low / 2 or 3 all high Positives: L / J / L / K Non-detects: R / UJ / UL / NONE			
	Note: The B qualifier remains over surrogate flagging.			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	x		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
7.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 10-150%?	x		
7.4	Are there any RPDs outside the QC limits not to exceed 60%?	x		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	x		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 10-150%?	x		
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 50%?			x
	If Yes, J(+) only.			

Notes:

9.0 Internal Standard		Yes	No	NA
9.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? If not, J(+)/UJ(-).	x		
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	x		
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.			

Notes:

10.0 Field Duplicate		Yes	No	NA
10.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
10.2	Are all analyte duplicate results within control limits? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.		x	

Notes:

11.0 Tentatively Identified Compounds (TICs) and Detection Limit Verification		Yes	No	NA
11.1	Are any TICs detected in the field samples? If Yes, all TIC results should be flagged "NJ" (tentativelyidenified, and approximate concentration).	x		
11.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?	x		
11.3	Were sample concentrations above the highest standard run at a dilution? If not, for ion saturation flag "L", unsaturated results "J".	x		

Notes:

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	x		
	Number of samples: 23			
	Number of target compounds in each analysis:66			
	Number of results rejected and not reported:0			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100.0%			

Notes:

DATA VALIDATION WORKSHEET

Polyaromatic Hydrocarbons

Reviewer: AS
Date: February-04
DV Level: II III IV

Review Document:

__X__ Region III Modified for National Functional Guidelines
_____ NFG for organic Data review (February 1994)
__X__ Project QAPP/SAP

Project Name: Radford SSP
Project Number: 15291974.30000
Laboratory: TriMatrix
SDG No.: 36440-5
Test Name: PAH
Method No.: 8310-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	x		
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids		x	
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	x		

Notes: *four coolers @ 2.3C, 0.4C, 0.9C, & 0.8C*

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?		see above	
	Action: If the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyses, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		x	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		x	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	x		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		x	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		x	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	x		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	x		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	x		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	x		
	For initial Calibration: for %RSD > ±20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	x		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	x		
5.2	Are surrogate recoveries within acceptance criteria not to exceed 30-150% for all samples and method blanks?		x	
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			x
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			x
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	x		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
6.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 40-150%?		x	
	Are there any RPDs outside the QC limits not to exceed 60%?		x	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	x		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 40-150%?		x	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 60%?		x	
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.		x	

Notes:

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are all positive identifications confirmed on second column or detector? If not, reject or estimate this detection.	x		
9.2	For positive sample detections, is RPD <40% between first and second columns. If not, apply J.			x
9.3	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	x		

Notes:

10.0 Data Completeness			Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)		x		
	Number of samples:	23			
	Number of target compounds in each analysis:	16			
	Number of results rejected and not reported:	0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)				
	% Completeness =	100%			

Notes:

DATA VALIDATION WORKSHEET

Explosives

Reviewer: AS
Date: February-04
DV Level: II III IV
Review Document:
X Region III Modified for National Functional Guidelines
___ NFG for organic Data review (February 1994)
X Project QAPP/SAP

Project Name: Radford SSP
Project Number: 15291974.30000
Laboratory: TriMatrix
SDG No.: 36440-5
Test Name: Explosives
Method No.: 8330-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	x		
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids		x	
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	x		

Notes: *four coolers @ 2.3C, 0.4C, 0.9C, & 0.8C*

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?		see above	
	Action: If the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		x	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		x	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	x		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		x	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		x	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	x		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	x		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	x		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		x	
	For initial Calibration: for %RSD > ±20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	x		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	x		
5.2	Are surrogate recoveries within acceptance criteria not to exceed 30-150% for all samples and method blanks?	x		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			x
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			x
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	x		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
6.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 40-150%?		x	
6.4	Are there any RPDs outside the QC limits not to exceed 60%?		x	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	x		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 40-150%?		x	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 60%?			x
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	x		

Notes:

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are all positive identifications confirmed on second column or detector? If not, reject or estimate this detection.	x		
9.2	For positive sample detections, is RPD <40% between first and second columns. If not, apply J.	x		
9.3	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	x		

Notes:

10.0 Data Completeness			Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)		x		
	Number of samples:	23			
	Number of target compounds in each analysis:	14			
	Number of results rejected and not reported:	0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)				
	% Completeness =	100%			

Notes:

DATA VALIDATION WORKSHEET

Pesticides/PCBs

Reviewer: AS
Date: February-04
DV Level: II III IV

Review Document:
X SW-846 - 8081/8082
X NFG - Region III Modifications
___ CLP

Project Name: Radford SSP
Project Number: 15291974.30000
Laboratory: TriMatrix
SDG No.: 36440-5
Test Name: PEST/PCB
Method No.: 8081A/8082

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	x		
1.4	Do any soil samples contain more than 50% water?		x	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV report.			

Notes: *four coolers @ 2.3C, 0.4C, 0.9C, & 0.8C*

2.0 Preservation/ Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?		see above	
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		x	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		x	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix)?	x		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to five times the amount in the associated blank.		x	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		x	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note it in the DV report.	x		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? 1016 and 1260 need at least three peaks at five concentrations. The multi-component target compounds (the other Aroclors, Toxaphene, & Chlordane) must each be analyzed separately at a single concentration level during the initial calibration sequence.	x		
4.2	Has a continuing calibration standard been analyzed for every 12 hours or twenty samples?	x		
4.3	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r>0.99, %RSD < ± 20% and %D < ± 15%		x	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Do all standard retention times in the continuing calibration fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	x		

Notes:

5.0 GC/ECD Instrument Performance Check for Pesticides		Yes	No	NA
5.1	Is the 4,4'-DDT breakdown </= to 15%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	x		
5.2	Is the endrin breakdown </= to 15%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	x		

Notes:

6.0 Surrogate Recovery		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	x		
6.2	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	x		
6.3	Are surrogate recoveries within acceptance criteria not to exceed 30-150% for all samples and method blanks?	x		
6.4	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?			x
6.5	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)			x

	# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance
	1 out	high/low	No action	No action
	2 out	2 high same column	K	No action
		2 low same column	L, UL	No action
		mixed same column	J, UJ	No action
		2 high diff columns	J	Not applicable
		2 low diff columns	J, UJ	Not applicable
		mixed diff columns	Professional judgement	Not applicable
	3 out	All high	K	Not applicable
		All low	L, UL	Not applicable
		2 high, 1 low	K (2 high)	J (1 low 2nd column)
		2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)
		other mixed	J, UJ	Not applicable
	4 out	All high	K	Not applicable
		All low	L, UL	Not applicable
		Mixed	J, UJ	Not applicable
	If any recovery is >0% and <10% then L(+)/R(-).			
	If any recovery is 0% then R(+/-).			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	x		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
7.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 30-150%?	pest	pcb	
7.4	Are there any RPDs outside the QC limits not to exceed 60%?	pest	pcb	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: MS/MSD from SDG 36440-1

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	x		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 30-150%?		x	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 60%?			x
	If Yes, J(+) only.			

Notes:

9.0 Field Duplicate		Yes	No	NA
9.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
9.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	x		

Notes:

10.0 Compound Identification and Detection Limit Verification		Yes	No	NA
10.1	Is the percent difference calculated for the positive sample results on both columns < 40%? If No, J(+).	x		
10.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	x		

Notes:

11.0 Pesticide Cleanup Checks		Yes	No	NA
11.1	Is Form IX PEST-1 present and complete for each lot of Florisil Cartridges used? (Florisil Cleanup is required for all Pest/PCB extracts to reduce matrix interference caused by polar compounds.)			x
	Every lot number of Florisil cartridges used for sample cleanup must be checked by spiking with 2,4,5-trichlorophenol and the midpoint concentration of Individual Standard Mixture A.			
11.2	Are all samples listed on the Pesticide Florisil cartridge Check Form?			
11.3	Are percent recoveries of pesticide and surrogate compounds within control limit, 80-120%(if the recovery of 2,4,5-trichlorophenol < 5%), for the florisil cartridge check? If No, the raw data should be examined for the presence of polar interferences and professional judgement should be used in qualifying the data.			

Notes:

Florisil cleanup was performed, no laboratory submission for these CLP descriptors was provided.

12.0 Data Completeness				Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	Pest	PCB	x		
	Number of samples:	3	3			
	Number of target compounds in each analysis:	21	7			
	Number of results rejected and not reported:	0	0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)					
	% Completeness =	100%	100%			

Notes:

DATA VALIDATION WORKSHEET

Herbicides

Reviewer:	AS	**Project Name:**	Radford SSP
Date:	February-04	**Project Number:**	15291974.30000
DV Level:	**II III IV**	**Laboratory:**	TriMatrix
Review Document:		**SDG No.:**	36440-5
X Region III Modified for National Functional Guidelines		**Test Name:**	Herbicides
____ NFG for organic Data review (February 1994)		**Method No.:**	8151A
X Project QAPP/SAP			

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	x		
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids		x	
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	x		

Notes: *four coolers @ 2.3C, 0.4C, 0.9C, & 0.8C*

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?		see above	
	Action: If the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		x	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		x	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	x		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		x	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		x	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	x		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	x		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	x		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		x	
	For initial Calibration: for %RSD > ±20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	x		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	x		
5.2	Are surrogate recoveries within acceptance criteria not to exceed 25-150% for all samples and method blanks?		x	
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?		x	
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.		x	
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	x		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
6.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 25-150%?	x		
6.4	Are there any RPDs outside the QC limits not to exceed 60%?	x		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: MS/MSD see SDG 36440-1

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	x		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 25-150%?	x		
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 60%?		x	
	Action: If Yes, J(+) only.			

Notes: original extraction Dinoseb LCS recovery low, re-extraction passed.

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	x		

Notes:

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are all positive identifications confirmed on second column or detector? If not, reject or estimate this detection.			x
9.2	For positive sample detections, is RPD <40% between first and second columns. If not, apply J.			x
9.3	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	x		

Notes:

10.0 Data Completeness			Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)		x		
	Number of samples:	3			
	Number of target compounds in each analysis:	10			
	Number of results rejected and not reported:	0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)				
	% Completeness =	100%			

Notes:

DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: 36440-5
Project No.: 15291974.30000

Project Name: Radford SSP
Reviewer: AS
Date: February-04

1.0 Chain of Custody/Sample Condition/Raw Data		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	x			x			x			x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x			x			x			x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		x			x			x			x	
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 ^{o}C $\pm$ 2 ^{o}C)		x			x			x			x	
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	x			x			x			x		

Note: *four coolers @ 2.3C, 0.4C, 0.9C, & 0.8C*

2.0 Holding Time		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, CN: 14 days, other metals: 6 months) Action:L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		x			x			x			x	

Note:

3.0 Instrument Calibration		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? (ICP& ICPMS: blank + one standard & a RL standard OR 3 standards and a blank with one standard at the RL; CVAA: blank + five standards with one standard at the RL). If not, qualify with "R".	7 + BLK			4 + BLK			5 + BLK			6 + BLK		
3.2	Are the correlation coefficients > 0.99? Action: J(+)/UJ(-).	x			x			x			x		
3.3	Once per calibration, did a high and low distilled standard recovery within 85-115%? If no, follow 3.6.										x		
3.4	Was an initial calibration check standard (labelled LCS by TriMatrix) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	x			x			x			x		
3.5	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.	x			x			x			x		
3.6	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR ICP 90%-110%, FOR Hg 80-120%, FOR CN 85-115%.	x			x			x			x		
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury < 65% 65% - 79% > 120% Cyanide < 65% 65% - 84% > 115% Other Metals < 75% 75% - 89% > 110%												
3.7	For ICP & ICPMS, did the CRDL standard recover between 80-120%?	x					x	x			x		
	<50% 50%-79% >120% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K							passed within 70-130%			passed within 80-120%		

Note: ***A high point added to Al, Ba, Ca, Fe, Mg, Mn, & K curves and the RLs were elevated by 5.***

4.0 Blanks

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	x			x			x			x		
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	x			x			x			x		
4.3	Are there reported MB or ICB/CCBs values > RL?	x			x				x			x	
	Sample Results > RL												
	< 5X Blank Contamination B												
4.4	Are there negative blank results with the absolute value > RL?		x			x			x			x	
	Sample Results Non-detects > RL												
	< 5X absolute Blank Contamination UL L												
4.5	Are there reported field blank > ± RL?	x			x				x			x	
	Sample Results > RL												
	< 5X Blank Contamination B												

Note: _____

5.0 ICP Interference Check Sample (ICS)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning of each ICP run?	x			x								
5.2	Are the ICS AB recoveries within 80% - 120%?	x			x								
5.3	Are the results for unspiked analytes (in ICS A) < ± RL?	x			x								
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?			x			x						
	If not...												
	Action: Not Spiked Analytes: < -IDL L(+)/UL(-); > IDL K(+). Spiked analytes (ICS AB analytes): < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); >120% K(+)												

Note: _____

6.0 Laboratory Control Sample (LCS)		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	x			x			x			x		
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		x			x			x			x	
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)												

Note:

7.0 Laboratory Duplicates (MSD)		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.	x			x			x			x		
	For aqueous 6010B and Hg - RPD< 25%, aqueous CN - RPD < 20%, aqueous 6020 - RPD < 20%, and for soil - use laboratory generated limits for MS/MSD.												
7.2	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ(-) for the analyte with results that fall outside criteria.	x			x			x			x		

Note:

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.	x			x			x			x		
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125% for aqueous and lab limits for soil?												
	%R > 125% 30%< %R < 74% < 30%	x				x		x			x		
	Positive K L L												
	Non-detect None UL R												
8.3	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.	x			x			x					x

Note: ***13SB7C Ca 129%/133% (121%), Cr 114%/119% (112%), Mg 127%/142% (111%)***

9.0 Instrument Detection Limits (IDL)		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?	x			x			x			x		

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	x			x								
10.2	Was a five-fold dilution performed?	x			x								
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 5 X the RL for 6010 or > 20 X the RL for 6020 in the original sample? If no, J(+).	x				x							

Note: ***Serial Dilution: 13SB7C - Co 53.8% and Cu 21.1%; post digestion spike recovery passes for Co and Cu***

11.0 Field Duplicate Samples

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	x			x			x			x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.												
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report	x				x		x			x		

Note: _____

12.0 Result Verification/ Internal Standards/ Tune

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?	x			x			x			x		
12.2	Were all dilution reflected in the positive results and detection limits?	x			x			x			x		
12.3	Were the Internal Standard recoveries within 30-120%	x			x								
12.4	Were the tunes run at a minimum of four times with RSD < 5% for analytes in solution?	x											
12.5	Were the tune mass calibrations < 0.1 amu from the true value?	x											
12.6	Was the resolution check peak width < 0.9 amu at 10% peak height?	x											

Note: ***6010B: Several samples displayed yttrium out high. The samples were reanalyzed at DF5 elevating Be MDL but not RL as MDLx3 is still <RL.***

6020: high lead interfered with internal used to quantitate Th concentrations in samples 13SB11B and 13SB8A. Lab used a different internal.

New MDL could not be inserted into EDD.

13.0 Completeness Calculation

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	x			x			x			x		
13.1.1	Number of samples: 23												
13.1.2	Number of target compounds in each analysis: various												
13.1.3	Number of results rejected and not reported: 0												
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2)												
	% Completeness = 100%	**100%**			**100%**			**100%**			**100%**		

Note: _____

TM0301 Cart, 5 Volatile Soil

№ 1149

Radford Army Ammunition Plant
Chain Of Custody Record

Project Number	Project Name
09604317	RFAAP

Project Contact (Name and Phone Number): Darren Fenne (804)965-9060

Samplers: Brett Fisher / John Spangler

LAB: Tri-Matrix

AIRBILL No: 0000063

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330[redacted])	Dioxin/Furan(8290)	TAL Metals (Including Mercury) (ILM)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	[redacted] HERB	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
695B2A	10/8/03 1500	5		X	5	F	/	7	X	X	X	X	X	X		X						X	
695B2B	10/8/03 1515	5		X	5	F	/	5	X	X	X			X		X							
695B2C	10/8/03 1530	5		X	5	F	/	5	X	X	X			X		X							
SF [redacted]5784B	10/8/03 1600	5		X	5	F	/	5	X	X	X			X		X							

2222

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	10/8/03 1500				
Relinquished by:	Date/time	Received by: (for lab) [signature]	Date/Time 10/9/03 8:40	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

19-3

36440-5

TM0360 Cart 2 Volatile Soil

№ 1144

Radford Army Ammunition Plant
Chain Of Custody Record

Project Number	Project Name
09604317	RFAAP

Project Contact (Name and Phone Number): Darren Rowe (804) 765 9100

Samplers: Brett Fisher / John Spangler

LAB: Tri-Matrix

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, [redacted])	Dioxin/Furan(8290)	TAL Metals (Including Mercury) /Al	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	NETB	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
135B7A	10/9/03 945	5		X	S	F	/	5	X	X	X			X		X							
135B7B	10/9/03 1000	5		X	S	F	/	5	X	X	X			X		X							
135B7C	10/9/03 1015	5		X	S	F	/	5	X	X	X			X		X							
135B7CMS	10/9/03 1015	5		X	S	F	/	5	X	X	X			X		X							—
135B7CMSD	10/9/03 1015	5		X	S	F	/	5	X	X	X			X		X							—
135B12A	10/9/03 1045	5		X	S	F	/	5	X	X	X			X		X							
135B12B	10/9/03 1100	5		X	S	F	/	5	X	X	X			X		X							
DBDP	10/9/03	5		X	S	F	/	5	X	X	X			X		X							
135B12C	10/9/03 1115	5		X	S	F	/	5	X	X	X			X		X							
135B11A	10/9/03 1215	5		X	S	F	/	5	X	X	X			X		X							
135B11B	10/9/03 1230	5		X	S	F	/	5	X	X	X			X		X							
135B11C	10/9/03 1245	5		X	S	F	/	5	X	X	X			X		X							

TC 21-2 21-1

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Brett Fisher	10/9/03 1800				
Relinquished by:	Date/time	Received by: (for lab) John Parker	Date/Time 10/10/03 8:40	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

36440-5

21-4

Volatile Cart 4
Soil TMO 341
№ 1147

Radford Army Ammunition Plant
Chain Of Custody Record

Project Number	Project Name
09604317	RFAAP

Project Contact (Name and Phone Number): Darren Rayne (804) 965 7000

Samplers: Brett Fisher / John Spangler

LAB: Tri-Matrix

AIRBILL No: 000068

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330)	Dioxin/Furan(8290)	TAL Metals (Including Mercury) /CN	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	[redacted] NERB	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
135B10A	10/9/03 1300	5		X	5	F	/	5	X	X	X			X		X							
135B10B	10/9/03 1315	5		X	5	F	/	5	X	X	X			X		X							
135B10C	10/9/03 1330	5		X	5	F	/	5	X	X	X			X		X							
135B9A	10/9/03 1400	5		X	5	F	/	7	X	X	X	X	X	X		X						X	
[redacted]5BD9	10/9/03 —	5		X	5	F	/	7	X	X	X	X	X	X		X						X	
135B9B	10/9/03 1415	5		X	5	F	/	5	X	X	X			X		X							
135B9C	10/9/03 1430	5		X	5	F	/	5	X	X	X			X		X							
135B8A	10/9/03 1515	5		X	5	F	/	5	X	X	X			X		X							
135B8B	10/9/03 1530	5		X	5	F	/	5	X	X	X			X		X							
~~135B8C~~	~~10/9/03 1545~~	~~5~~		X	5	F	/	6	X	X	X			X		X							
																	BT						

N/C for 135B8

TC 2 ↓ 2 2 2 2 2 ↓

Box #1			Box #2			Box #3	Box #4	
1. Surface Water	6. Trip Blank		A. HCl + Ice	F. Ice Only		F. Filtered	R. Rush - 3 Day	
2. Ground Water	7. Oil		B. HNO3 + Ice	G. Other _____		U. Unfiltered	S. Standard 28 Day	
3. Leachate	8. Waste		C. NaOH + Ice	H. NaHSO4 + Ice			T. Timely 14 Day	
4. Rinsate	9. Other _____		D. H2SO4 + Ice	I. ZnAc + NaOH + Ice			O. Other _____	
5. Soil Sediment/Sludge			E. Unpreserved					

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	10/9/03 1800				
Relinquished by:	Date/time	Received by: (for lab) [signature]	Date/Time 10/10/03 8:40	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

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36440-5

DATA VALIDATION REPORT - Level III Review

SDG No.: 36440-6 **Fraction:** VOCs, SVOCs, PAHs, Explosives, Pesticides, PCBs, Herbicides, Metals, & Cyanide

Lab: TriMatrix **Project Name:** Radford_SSP

Reviewer: AS **Date:** January_20,_2004

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific Quality Assurance Project Plan (QAPP).

Major Anomalies: None.

Minor Anomalies: For the VOC analyses, the method blank for batch 89888-115 contained acetone at 13.0 ug/L and methylene chloride at 0.410 ug/L. The method blank for batch 89888-122 contained methylene chloride at 0.540 ug/L. The method blank for batch 90257-121 contained acetone at 10 ug/Kg. The method blank for batch 90601-122 contained acetone at 9.7 ug/Kg. The method blank for batch 90601-123 contained acetone at 14 ug/Kg and methylene chloride at 3.9 ug/Kg. Positive results less than ten times the blank concentrations were flagged "B,z" in the associated samples.

The equipment blank EQB5 displayed positive detections for acetone at 1.6 ug/L and methylene chloride at 0.60 ug/L. The associated trip blank displayed positive detections for methylene chloride at 1.2 ug/L and toluene at 0.24 ug/L. The equipment blank EQB6 displayed positive detections for acetone at 1.4 ug/L and methylene chloride at 0.68 ug/L. The associated trip blank displayed a positive detection for methylene chloride at 1.1 ug/L. The trip blank associated with the investigative field samples contained methylene chloride at 0.96 ug/L. The field blank detections for methylene chloride were previously qualified due to method blank detections. Since EQB5 was non-detect for toluene, no data qualifying action was required based on the associated trip blank detection for toluene. Positive associated soil boring sample results for acetone were previously flagged for method blank detections. No further data qualifying action was taken.

The continuing calibration analyzed on 10/15/03 at 0919 displayed a percent difference greater than the control limit (i.e., 20%) with a negative bias for carbon disulfide at 27.5%. All associated field sample results were non-detect and were flagged "UJ,c".

The continuing calibration analyzed on 10/22/03 at 1151 displayed percent differences greater than the control limit with a negative bias for acetone at 28.4%, 4-methyl-2-pentanone at 26.8%, and 2-hexanone at 27.7% and with a positive bias for carbon disulfide at 22.5%. Positive associated field sample results for acetone, 4-methyl-2-pentanone, and 2-hexanone were flagged "J,c" while non-detects were flagged "UJ,c". All associated field sample results for carbon disulfide were non-detect while the continuing calibration displayed a positive bias; thus, no data qualifying action was required.

The continuing calibration analyzed on 10/21/03 at 0901 displayed percent differences greater than the control limit with a negative bias for chloroethane at 24.1% and with a positive bias for trans-1,3-dichloropropene at 23.1%, dibromochloromethane at 24.8%, bromoform at 20.7%, and 1,2-dibromo-3-chloropropane at 31.6%. The associated field sample results for chloroethane were non-detect and were flagged "UJ,c". All associated field sample results for trans-1,3-dichloropropene, dibromochloromethane, bromoform, and 1,2-dibromo-3-chloropropane were non-detect while the continuing calibration displayed a positive bias; thus, no data qualifying action was required.

The continuing calibration analyzed on 10/22/03 at 1203 displayed percent differences greater than the control limit with a negative bias for chloroethane at 25.3% and acetone at 21.8% and with a positive bias for dibromochloromethane at 22.9%. The associated field sample results for chloroethane were non-detect and were flagged "UJ,c". All associated field sample results for acetone were positive and were previously flagged for a method blank detection; thus, no further data qualifying action was taken. All associated field sample results for dibromochloro-methane were non-detect while the continuing calibration displayed a positive bias; thus, no data qualifying action was required.

The continuing calibration analyzed on 10/23/03 at 1121 displayed percent differences greater than the control limit with a negative bias for carbon disulfide at 20.8% and methyl acetate at 20.7% and with a positive bias for methyl-tert-butyl ether at 27.3%, bromochloromethane at 25.8%, and trans-1,3-dichloropropene at 24.5%. The associated field sample results for carbon disulfide and methyl acetate were non-detect and were flagged "UJ,c". All associated field sample results for methyl-tert-butyl ether, bromochloromethane, and trans-1,3-dichloropropene were non-detect while the continuing calibration displayed a positive bias; thus, no data qualifying action was required.

The laboratory control spike analyzed for batch 90257-121 displayed percent recoveries greater than the laboratory generated upper control limits for 1,2-dibromo3-chloropropane at 132% and methyl acetate at 131%. Since the associated field sample results were non-detect while the laboratory control spike displayed a positive bias, no data qualifying action was required.

The matrix spike pair for sample 13SD2 displayed several percent recoveries less than the laboratory generated lower control limits or relative percent differences greater than the laboratory generated control limits. Positive associated parent sample results were flagged "J,m" while non-detect parent sample results were flagged "UJ,m", except for the result for chloroethane that was previously flagged for a low continuing calibration percent difference. The matrix spike pair for sample 13SW2 displayed acceptable recoveries. The matrix spike for sample ASB2C displayed percent recoveries less than the lower control limits for 1,1,2-trichloro-1,2,2-trifluoroethane at 69% and trans-1,3-dichloroethene at 73%. The matrix spike duplicate displayed a percent recovery less than the laboratory generated lower control limit (i.e., 49%) for acetone at 49%. This matrix spike pair displayed relative percent differences greater than the laboratory generated control limits for carbon tetrachloride at 20%, methyl-cyclohexane at 22%, and vinyl chloride at 26%. Since one of the matrix spikes displayed an acceptable recovery and the parent sample was non-detect for the compounds that displayed imprecision anomalies, no data qualifying action was taken.

For the SVOC analyses, the method blank for extraction batch 90165-116 displayed positive detections for bis(2-ethylhexyl)phthalate at 0.700 ug/L, butyl benzyl phthalate at 0.350 ug/L,

and diethylphthalate at 0.080 ug/L. Positive associated field sample results less than ten times the blank concentrations were flagged "B,z".

The equipment blank EQB5 contained bis(2-ethylhexyl)phthalate at 0.35 ug/L, butyl benzyl phthalate at 0.060 ug/L, and several tentatively identified compounds (TICs). The equipment blank EQB6 contained bis(2-ethylhexyl)phthalate at 0.29 ug/L, butyl benzyl phthalate at 0.050 ug/L, and several TICs. The equipment blank detections for these phthalates were previously flagged due to method blank detections and no further data qualifying action was taken. Positive results less than five times the blank concentration of the TICs were flagged "B,x" in the associated soil boring field samples.

The continuing calibration analyzed on 11/02/03 at 1249 displayed percent differences greater than the control limit (i.e., 20%) with a negative bias for hexachlorocyclopentadiene at 28.0% and 2,4-dinitrophenol at 22.4%. The continuing calibration analyzed on 11/03/03 at 1053 displayed percent differences greater than the control limit with a negative bias for carbazole at 31.6% and 2,4-dinitrophenol at 20.1%. The continuing calibration analyzed on 11/04/03 at 0845 displayed percent differences greater than the control limit with a negative bias for 4-chloroaniline at 32.1%, caprolactam at 26.4%, 3-nitroaniline at 54.6%, 4-nitrophenol at 37.9%, carbazole at 43.9%, and 2,4-dinitrophenol at 32.9%. The continuing calibration analyzed on 11/05/03 at 1252 displayed a percent difference greater than the control limit with a negative bias for caprolactam at 22.5%. The associated field sample results were non-detect for these anomalous compounds and were flagged "UJ,c".

The laboratory control spike for batch 89985-118 displayed recoveries less than the laboratory generated lower control limits but greater than the QAPP lower control limit (i.e., 10%) for 2,4-dimethylphenol (17%) and 4-chloroaniline (11%). The laboratory control spike for batch 90165-116 displayed recoveries less than the laboratory generated lower control limits but greater than the QAPP lower control limit for 2,4-dinitrophenol (23%), caprolactam (20%), and hexachlorocyclopentadiene (18%). The associated field sample results were non-detect and were flagged "UJ,l", unless previously flagged for a negative bias in the continuing calibration.

The laboratory control spike for batch 89985-118 displayed recoveries greater than the laboratory generated upper control limits for benzo(b)fluoranthene at 119% and benzo(k) fluoranthene at 129%. The laboratory control spike for batch 90165-116 displayed recoveries greater than the laboratory generated upper control limits for benzo(a)pyrene at 129%, benzo(k)fluoranthene at 136%, dibenzo(a,h)anthracene at 132%, and indeno(1,2,3-cd)pyrene at 131%. The laboratory control spike for batch 90572-114 displayed a recovery greater than the laboratory generated upper control limit for 3,3'-dichlorobenzidine at 120%. Sample ASB1A displayed a positive detection for benzo(b)fluoranthene that was flagged "J,l". All other associated field sample results were non-detect while the laboratory control spike displayed a positive bias. No further data qualifying action was taken.

The matrix spike pair for sample 13SD2 displayed percent recoveries outside the laboratory generated control limits for 4-chloroaniline (13%/11%), anthracene (60%/64%), atrazine (118%/120%), bis(2-ethylhexyl)phthalate (125%/125%), fluoranthene (133%/136%), and hexachlorocyclopentadiene (20%/21%). The positive associated parent sample results for bis(2-ethylhexyl)phthalate and fluoranthene were flagged "J,m". The non-detect parent sample results for 4-chloroaniline, anthracene, and hexachlorocyclopentadiene were flagged "UJ,m". The parent sample result for atrazine was non-detect while the matrix spike recoveries displayed a positive bias; thus, no data qualifying action was required. This matrix spike pair

also displayed relative percent differences greater than the laboratory generated control limits for 4-methylphenol at 12%, diethylphthalate at 18%, and isophorone at 15%. The positive parent sample result for diethylphthalate was flagged "J,d". The parent sample results for 4-methylphenol and isophorone were non-detect while the matrix spikes displayed imprecision; thus, no data qualifying action was required.

The matrix spike pair for sample 13SW2 displayed percent recoveries less than the laboratory generated lower control limits for 2,4-dimethylphenol (42%), 2,4-dinitrophenol (20%/23%), 4,6-dinitro-2-methylphenol (24%/16%), 4-nitrophenol (19%/14%), caprolactam (18%/18%), hexachlorocyclopentadiene (14%/21%), and pentachlorophenol (16%). The associated parent sample results were non-detect and were flagged "UJ,m", unless previously flagged for low bias anomalies for the continuing calibration or laboratory control spike. This matrix spike pair displayed percent recoveries greater than the laboratory generated upper control limits for benzo(a)pyrene at 124%, benzo(k)fluoranthene at 130%, and n-nitroso-diphenylamine at 96%. This matrix spike pair also displayed relative percent differences greater than the laboratory generated control limits for 2-nitrophenol at 25%, 4,6-dinitro-2-methylphenol at 40%, and hexachlorocyclopentadiene at 35%. The parent sample result was non-detect while the matrix spikes displayed a high bias or imprecision; thus, no data qualifying action was required.

The matrix spike pair for sample ASB2C displayed percent recoveries less than the laboratory generated lower control limits for 2,4-dimethylphenol (21%/29%), 2,4-dinitrophenol (26%/25%), 3,3'-dichlorobenzidine (24%), 4-chloroaniline (10%/10%), 4-nitroaniline (53%), and hexachlorocyclopentadiene (43%). The associated parent sample results were non-detect and were flagged "UJ,m", unless previously flagged for low bias anomalies for the continuing calibration or laboratory control spike. This matrix spike pair displayed a percent recovery greater than the laboratory generated upper control limit for benzo(k)fluoranthene at 129%. The parent sample results were non-detect while the matrix spikes displayed a high bias; thus, no data qualifying action was required.

Sample ASB3A displayed an internal standard area count marginally less than the lower control limit (i.e., -50%) for perylene-d_{10} at -57.8%. Positive associated field sample results were flagged "J,i" while non-detects were flagged "UJ,i".

The acid fraction surrogate 2,4,6-tribromophenol displayed percent recoveries less than the laboratory generated lower control limit (i.e., 26%) for samples 13SW2 at 22% and SBD10 at 18%. Since these samples only displayed one acid fraction surrogate recovery less than the lower control limits, no data qualifying action was required.

Sample ASB1A displayed positive concentrations that exceeded the linear range of the instrument initial calibration. These detections were flagged "J,q". This sample was re-analyzed at a dilution factor of five with acceptable results that should be used for data interpretation. Sample ASB3A displayed positive concentrations that exceeded the linear range of the instrument initial calibration. These detections were flagged "J,q". This sample was re-analyzed at a dilution factor of two hundred and fifty with acceptable results for 2,4-dinitrotoluene, di-n-butylphthalate, and n-nitroso-diphenylamine that should be used for data interpretation. Sample ASB2A displayed a positive concentration for di-n-butylphthalate that exceeded the linear range of the instrument initial calibration. This detection was flagged "J,q". This sample was re-analyzed at a dilution factor of five with an acceptable result that should be used for data interpretation.

The field duplicate pair (13SD3/SDD1) displayed a difference greater than the control limit (i.e., 1080 ug/Kg) for dimethylphthalate at 1130 ug/Kg. The positive dimethylphthalate result for sample 13SD3 was flagged "J,f" while the non-detect dimethylphthalate result for sample SDD1 was flagged "UJ,f".

For the PAH analyses, the opening continuing calibration analyzed on 11/25/2003 at 1207 displayed percent differences greater than the control limit (i.e., 15%) with a negative bias for benzo(a)pyrene at 21.03% and with a positive bias for indeno(1,2,3-cd)pyrene at 17.02%. The closing continuing calibration analyzed on 11/25/2003 at 1531 displayed percent differences greater than the control limit with a negative bias for benzo(a)pyrene at 17.92% and with a positive bias for fluoranthene at 17.10%, benzo(k)fluoranthene at 16.82%, and indeno(1,2,3-cd)pyrene at 19.10%. The associated field sample ASB1A was non-detect for benzo(a)pyrene and was flagged "UJ,c". The associated field sample result for fluoranthene was positive and was flagged "J,c". This associated field sample was non-detect for benzo(k)fluoranthene and indeno(1,2,3-cd)pyrene while the continuing calibration displayed a positive bias; thus, no data qualifying action was required.

Sample ASB3B displayed a surrogate percent recovery less than the laboratory lower control limit (i.e., 49%) for 2-fluorobiphenyl at 46%. All associated field sample results were non-detect and were flagged "UL,s".

The matrix spike pair for sample 13SW2 displayed several percent recoveries greater than the laboratory generated upper control limits. The parent sample was non-detect for all target compounds. Based on professional judgement, no data qualifying action was taken based on these matrix spike anomalies.

For the explosive analyses, the opening continuing calibration analyzed on 10/24/03 at 0146 displayed a percent difference greater than the control limit (i.e., 15%) with a positive bias for 2,6-dinitrotoluene at 16.0%. The closing continuing calibration analyzed on 10/24/03 at 0646 displayed a percent difference greater than the control limit with a positive bias for 2,6-dinitrotoluene at 15.2%. The associated field sample results for 2,6-dinitrotoluene were non-detect while the continuing calibration displayed a positive bias; thus, no data qualifying action was required. The closing continuing calibration analyzed on 10/28/03 at 1126 displayed a percent difference greater than the control limit with a positive bias for HMX at 16.7%. The associated field sample results for HMX were non-detect while the continuing calibration displayed a positive bias; thus, no data qualifying action was required.

The matrix spike pair for sample 13SD2 displayed relative percent differences greater than the laboratory generated control limits (i.e., 40%) for 1,3,5-trinitrobenzene at 44% and 4-amino-2,6-dinitrotoluene at 41%. The matrix spike pair for sample ASB2C displayed relative percent differences greater than the laboratory generated control limits for 2,4-dinitrotoluene at 41%, 4-nitrotoluene at 45%, nitrobenzene at 45%, and RDX at 56%. The parent sample results were non-detect while the matrix spike results displayed imprecision; thus, no data qualifying action was taken. The matrix spike pair for sample 13SW2 displayed percent recoveries less than the laboratory generated lower control limit (i.e., 50%) for tetryl (42%/40%). The parent sample result for tetryl was non-detect and was flagged "UJ,m".

Sample ASB3A displayed a positive concentration for 2,4-dinitrotoluene that exceeded the linear range of the instrument initial calibration. This detection was flagged "J,q". This sample was re-analyzed at a dilution factor of five with an acceptable result that should be used for data interpretation.

For the pesticide analyses, closing continuing calibration analyzed on 10/18/03 displayed percent differences greater than the control limit (i.e., 15%) with a positive bias on column one for delta BHC at 16.89%, 4,4'-DDD at 33.20%, 4,4'-DDT at 18.77%, methoxychlor at 28.37%, and endosulfan sulfate at 15.85%. This closing continuing calibration displayed percent differences greater than the control limit with a positive bias on column two for 4,4'-DDD at 17.38% and methoxychlor at 20.16%. The associated field sample results were non-detect on one or both columns while the continuing calibration displayed a positive bias. No data qualifying action was taken based on these anomalies.

The opening continuing calibration analyzed on 10/31/03 at 0958 displayed percent differences greater than the control limit with a positive bias on column one for endrin at 25.43% and 4,4'-DDD at 19.19%. This opening continuing calibration displayed percent differences greater than the control limit with a negative bias on column two for heptachlor at 15.75% and endosulfan II at 15.25%. The closing continuing calibration analyzed on 10/31/03 at 1342 displayed percent differences greater than the control limit with a positive bias on column one for endrin at 26.81% and 4,4'-DDD at 23.02%. This closing continuing calibration displayed a percent difference greater than the control limit with a negative bias on column two for endosulfan II at 21.50%. Only one column is required to pass to report valid non-detects. Since the associated field sample results were non-detects, no data qualifying action was taken based on these anomalies.

For the PCB analyses, the closing continuing calibration displayed a percent difference greater than the control limit (i.e., 15%) with a positive bias for arochlor 1016 at 16.70%. The associated field sample results were non-detect while the continuing calibration displayed a positive bias; thus, no data qualifying action was required.

For the herbicide analyses, the opening continuing calibration analyzed on 10/27/03 at 2225 displayed percent differences greater than the control limit (i.e., 15%) with a positive bias on column one for 2,4-D at 49.0% and with a negative bias for 2,4,5-T at 17.17% and silvex at 22.6%. This opening continuing calibration displayed percent differences greater than the control limit with a negative bias on column two for dicamba at 21.0% and 2,4-D at 19.9%. The closing continuing calibration analyzed on 10/28/03 at 0339 displayed acceptable percent differences on column one. This closing continuing calibration displayed a percent difference greater than the control limit with a negative bias on column two for 2,4-D at 16.8% and with a positive bias for dalapon at 15.1%. Only one column is required to pass to report valid non-detects. Since the associated field sample results were non-detects, no data qualifying action was taken based on these anomalies.

The laboratory control spikes displayed several recoveries greater than the laboratory generated upper control limits. The associated field samples were non-detect while the laboratory control spike displayed a positive bias. No data qualifying action was taken.

All samples displayed surrogate percent recoveries greater than the laboratory generated upper control limits. Since the associated field samples results were non-detect, no data qualifying action was required.

For the metal analyses by 6020, the method blank for batch 89969-115 contained total chromium at 0.69 ug/L and total lead at 0.43 ug/L. The associated positive field sample results less than five times the blank concentration were flagged "B,p". The method blank for batch 89970-113 contained lead at 0.098 mg/Kg. The associated field sample results for lead were

greater than five times the blank concentration and no data qualifying action was required. The equipment blank EQB5 contained chromium at 4.5 ug/L and thallium at 0.5 ug/L. The equipment blank EQB6 contained chromium at 0.9 ug/L and thallium at 0.4 ug/L. The chromium detection in EQB6 was previously flagged due to a method blank detection and no further data qualifying action was required. The associated positive field sample results less than five times the equipment blank concentrations were flagged "B,x".

The field duplicate pair (ASB2B and SBD10) displayed relative percent differences greater than the control limit (i.e., 35%) for lead at 38.5% and nickel at 52.6%. The results for lead and nickel were positive in these two field samples and were flagged "J,f".

For the metal analyses by 6010B, the method blank for batch 89968-115 contained total beryllium at 0.31 ug/L, total iron at 6.2 ug/L, and total sodium at 200 ug/L. Positive results less than five times the blank concentrations were flagged "B,p" in the associated field samples. The method blank for batch 90177-120 contained total cobalt at 0.374 mg/Kg. The associated field sample results were greater than five times the blank concentration and no data qualifying action was required. The equipment blank EQB5 contained beryllium at 0.3 ug/L, iron at 7.6 ug/L, and sodium at 280 ug/L. The equipment blank EQB6 contained iron at 4.8 ug/L, sodium at 180 ug/L, and zinc at 4.6 ug/L. The equipment blank results for beryllium, iron, and sodium were previously qualified due to method blank detections. The associated field sample results were greater than five times the blank concentration for zinc. No data qualifying action was required.

The serial dilution performed on sample 13SW2 displayed a percent difference greater than the control limit (i.e., 10%) for total sodium at 15.7%. All associated field surface water sample results were positive and were flagged "J,s".

The matrix spike performed on sample 13SD2 displayed percent recoveries greater than the laboratory generated upper control limits for calcium at 134% and magnesium at 121%. All associated positive field sediment sample results were flagged "K,m". The serial dilution performed on sample 13SD2 displayed a percent difference greater than the control limit for calcium at 12.6%. All associated field sediment sample results were previously qualified for matrix spike recovery anomalies and no further data qualifying action was taken.

The matrix spike pair performed on sample ASB2C displayed percent recoveries outside the laboratory generated control limits for chromium (61%/114%) and a recovery less than the lower control limit (i.e., 64%) for vanadium at 60%. All associated field soil boring sample results were positive for chromium and were flagged "J,m". All associated field sample results were positive for vanadium and were flagged "L,m". The serial dilution performed on sample ASB2C displayed a percent difference greater than the control limit for cobalt at 30.0%. All associated field soil boring sample results were positive and were flagged "J,s".

The field duplicate pair (ASB2B and SBD10) displayed relative percent differences greater than the control limit (i.e., 35%) for cobalt at 44.4%, magnesium at 60.3%, and potassium at 55.2%. The associated field sample results for cobalt were previously flagged for a matrix spike anomaly and no further data qualifying action was taken. The results for magnesium and potassium were positive in these two field samples and were flagged "J,f".

Several samples displayed internal standard recoveries greater than the laboratory upper control limit (i.e., 120%) for yttrium. This internal standard is used to quantitate beryllium. The affected samples were reanalyzed at a dilution factor of five and displayed acceptable

internal standard responses. The affected sample results were reported from the diluted analyses and the method detection limits were elevated by a factor of five. The reporting limit was not raised because the project specified reporting limit was still greater than three times the elevated method detection limit.

Correctable Anomalies: For the sample receipt at the laboratory on 10/14/2003, two unlabelled jars were assigned to ASB1C and two unlabelled 250ml jars were assigned to ASB3A based on a logical deduction of required number of sample container types.

Comments: All samples from Area A were collected on a Saturday and could not be shipped until the following Monday. Samples were received at laboratory that Tuesday. The encore aliquots could not be used since the holding time to preservation had expired. All sample aliquots for VOC analyses were taken from bulk. Cooler TM0436 was received at the laboratory with internal temperatures greater than the upper control limit (i.e., 6°C) at 9.8 °C. This cooler contained the sample aliquots for field sample EQB5. Based on professional judgement no data qualifying action was required since this temperature did not exceed 10°C.

It should be noted that TIC results were flagged "NJ,t" in the associated samples. TIC results that were identified as unknown were manually lined out by the reviewer. Due to the abundance of target compounds, most of the samples were analyzed at dilutions for the metals analyses. Therefore, the reporting limits for these constituents were elevated.

No anomalies were encountered if a given fraction was not mentioned. Except for data flagged "R", all data are usable, as qualified, for their intended purpose based on the data reviewed.

Signed: Andrea Sansom

Andrea Sansom

Radford SSP

Submittal No.	Lab Sample ID	Field Sample ID	Matrix (Code)	Sample Date
36440-6	346012	37SB1B	SO	10/10/03
36440-6	346013	EQB5	WQ	10/10/03
36440-6	346014	Trip Blank	WQ	10/10/03
36440-6	346015	EQB6	WQ	10/10/03
36440-6	346016	Trip Blank	WQ	10/10/03
36440-6	346017	13SD3	SO	10/10/03
36440-6	346018	SDD1	SO	10/10/03
36440-6	346019	13SD2	SO	10/10/03
36440-6	346020	13SW3	WS	10/10/03
36440-6	346021	SWD1	WS	10/10/03
36440-6	346022	13SW2	WS	10/10/03
36440-6	346082	Trip Blank	WQ	10/10/03
36440-6	346248	ASB1A	SO	10/11/03
36440-6	346249	ASB1B	SO	10/11/03
36440-6	346250	ASB1C	SO	10/11/03
36440-6	346251	ASB3A	SO	10/11/03
36440-6	346252	ASB3B	SO	10/11/03
36440-6	346253	ASB3C	SO	10/11/03
36440-6	346254	ASB2A	SO	10/11/03
36440-6	346255	ASB2B	SO	10/11/03
36440-6	346256	SBD-10	SO	10/11/03
36440-6	346257	ASB2C	SO	10/11/03

Radford SSP
Duplicate Statistics
ASB2B and SBD10

	Units	RL	5xRL	Sample Conc		Duplicate Conc		%RPD	Delta	4xRL	Pass/ Fail
Volatiles											
acetone	ug/Kg	26	130	23	B	24	B	4.3%	1	104	N/A
methylene chloride	ug/Kg	26	130	7.7	J	7.0	J	9.5%	0.7	104	N/A
Semi-Volatiles											
bis(2-ethylhexyl)phthalate	ug/Kg	220	1100	22	J	16	J	31.6%	6	880	N/A
diethylphthalate	ug/Kg	220	1100	10	J	220	U	182.6%	210	880	N/A
di-n-butylphthalate	ug/Kg	220	1100	590		640		8.1%	50	880	Pass
Polyaromatic Hydrocarbons											
BDL											
Explosives											
BDL											
Metals											
aluminum	mg/Kg	250	1250	32300		34800		7.5%	2500	1000	Pass
antimony	mg/Kg	0.5	2.5	0.50	U	0.068	J	152.1%	0.432	2	N/A
arsenic	mg/Kg	0.40	2.0	3.4		4.7		32.1%	1.3	1.6	Pass
barium	mg/Kg	5.0	25	77		98		24.0%	21	20	Pass
beryllium	mg/Kg	1.0	5.0	1.3		0.86	J	40.7%	0.44	4	N/A
cadmium	mg/Kg	1.0	5.0	0.36	J	1.0	U	94.1%	0.64	4	N/A
calcium	mg/Kg	250	1250	867		380		78.1%	487	1000	Pass
chromium	mg/Kg	5.0	25	39		41		5.0%	2	20	Pass
cobalt	mg/Kg	1.0	5.0	14		22		**44.4%**	8	4	**Fail**
copper	mg/Kg	2.0	10	19		23		19.0%	4	8	Pass
iron	mg/Kg	1000	5000	40300		38000		5.9%	2300	4000	Pass
lead	mg/Kg	1.0	5.0	8.8		13		**38.5%**	4.2	4	**Fail**
magnesium	mg/Kg	250	1250	5220		2800		**60.3%**	2420	1000	**Fail**
manganese	mg/Kg	5.0	25	648		859		28.0%	211	20	Pass
mercury	mg/Kg	0.10	0.50	0.014	J	0.022	J	44.4%	0.008	0.4	N/A
nickel	mg/Kg	0.50	2.5	36		21		**52.6%**	15	2	**Fail**
potassium	mg/Kg	100	500	2750		1560		**55.2%**	1190	400	**Fail**
selenium	mg/Kg	1.0	5.0	0.60	J	0.50	J	18.2%	0.1	4	N/A
silver	mg/Kg	3.0	15	0.093	J	0.094	J	1.1%	0.001	12	N/A
sodium	mg/Kg	100	500	77	J	50	J	42.5%	27	400	N/A
thallium	mg/Kg	0.50	2.5	0.23	J	0.22	J	4.4%	0.01	2	N/A
vanadium	mg/Kg	1.0	5.0	55		49		11.5%	6	4	Pass
zinc	mg/Kg	4.0	20	45		37		19.5%	8	16	Pass
Cyanide											
zinc	mg/Kg	0.50	2.5	0.18	J	0.14	J	25.0%	0.04	2.0	N/A

Soil Control Limits

[sample] > 5 x RL, use 35%
[sample] < 5 x RL, use 4 x RL

Radford SSP
Duplicate Statistics

13SD3 and SDD1

	Units	RL	5xRL	Sample Conc		Duplicate Conc		%RPD	Delta	4xRL	Pass/ Fail
Volatiles											
cis-1,2-dichloroethene	ug/Kg	7.4	37	11		8		31.6%	3	30	Pass
methyl ethyl ketone	ug/Kg	29	145	31		30		3.3%	1	116	Pass
acetone	ug/Kg	29	145	80	B	59	B	30.2%	21	116	Pass
methylene chloride	ug/Kg	29	145	29		6.6	J	125.8%	22.4	116	N/A
tetrachloroethene	ug/Kg	7.4	37	5	J	2.1	J	81.7%	2.9	30	N/A
toluene	ug/Kg	7.4	37	1.8	J	1	J	57.1%	0.8	30	N/A
trichloroethene	ug/Kg	7.4	37	64		38		51.0%	26	30	Pass
Semi-Volatiles											
2-methylnaphalene	ug/Kg	270	1350	7.0	J	270	U	189.9%	263	1080	N/A
acenaphthylene	ug/Kg	270	1350	9.0	J	3.0	J	100.0%	6	1080	N/A
anthracene	ug/Kg	270	1350	44	J	12	J	114.3%	32	1080	N/A
benzo(a)anthracene	ug/Kg	270	1350	86	J	30	J	96.6%	56	1080	N/A
benzo(a)pyrene	ug/Kg	270	1350	140	J	53	J	90.2%	87	1080	N/A
benzo(b)fluoranthene	ug/Kg	270	1350	190	J	86	J	75.4%	104	1080	N/A
benzo(g,h,i)perylene	ug/Kg	270	1350	110	J	27	J	121.2%	83	1080	N/A
benzo(k)fluoranthene	ug/Kg	270	1350	92	J	36	J	87.5%	56	1080	N/A
bis(2-ethylhexyl)phthalate	ug/Kg	270	1350	41	J	35	J	15.8%	6	1080	N/A
chrysene	ug/Kg	270	1350	220	J	64	J	109.9%	156	1080	N/A
dibenzo(a,h)anthracene	ug/Kg	270	1350	42.0	J	270	U	146.2%	228	1080	N/A
diethylphthalate	ug/Kg	270	1350	18	J	22	J	20.0%	4	1080	N/A
dimethylphthalate	ug/Kg	270	1350	1400		270	U	135.3%	1130	1080	Fail
di-n-butylphthalate	ug/Kg	270	1350	130	J	110	J	16.7%	20	1080	N/A
fluoranthene	ug/Kg	270	1350	34	J	26	J	26.7%	8	1080	N/A
fluorene	ug/Kg	270	1350	4.0	J	270	U	194.2%	266	1080	N/A
indeno(1,2,3-cd)pyrene	ug/Kg	270	1350	100	J	30	J	107.7%	70	1080	N/A
naphthalene	ug/Kg	270	1350	5.0	J	270	U	192.7%	265	1080	N/A
phenanthrene	ug/Kg	270	1350	29	J	14	J	69.8%	15	1080	N/A
pyrene	ug/Kg	270	1350	37	J	23	J	46.7%	14	1080	N/A
Polyaromatic Hydrocarbons											
anthracene	ug/Kg	33	165	9	J	33	U	111.3%	23.6	132	N/A
benzo(a)anthracene	ug/Kg	33	165	30	J	33	U	9.5%	3	132	N/A
benzo(a)pyrene	ug/Kg	33	165	49		33	U	39.0%	16	132	N/A
benzo(b)fluoranthene	ug/Kg	33	165	36		33	U	8.7%	3	132	N/A
benzo(g,h,i)perylene	ug/Kg	33	165	88		33	U	90.9%	55	132	N/A
benzo(k)fluoranthene	ug/Kg	33	165	24	J	33	U	31.6%	9	132	N/A
chrysene	ug/Kg	33	165	84		2.6	J	188.0%	81.4	132	N/A
dibenzo(a,h)anthracene	ug/Kg	33	165	6.2	J	33	U	136.7%	26.8	132	N/A
fluoranthene	ug/Kg	33	165	19	J	33	U	53.8%	14	132	N/A
indeno(1,2,3-cd)pyrene	ug/Kg	33	165	45		33	U	30.8%	12	132	N/A
phenanthrene	ug/Kg	33	165	5	J	33	U	145.5%	27.8	132	N/A
pyrene	ug/Kg	33	165	14	J	33	U	80.9%	19	132	N/A
Explosives											
BDL											
Metals											
aluminum	mg/Kg	500	2500	23400		19600		17.7%	3800	2000	Pass
antimony	mg/Kg	0.5	2.5	3.5		1.9		59.3%	1.6	2.0	Pass
arsenic	mg/Kg	0.4	2.0	3.4		3.7		8.5%	0.3	1.6	Pass
barium	mg/Kg	5	25	169		131		25.3%	38	20	Pass
beryllium	mg/Kg	1	5	1.3		1.3		0.0%	0.0	4.0	Pass
cadmium	mg/Kg	1	5	1.0		0.94	J	6.2%	0.06	4.0	N/A
calcium	mg/Kg	250	1250	2080		1620		24.9%	460	1000	Pass
chromium	mg/Kg	5	25	40		31		25.4%	9.0	20	Pass
cobalt	mg/Kg	1	5	13		12		8.0%	1.0	4.0	Pass
copper	mg/Kg	2	10	36		31		14.9%	5.0	8.0	Pass
iron	mg/Kg	1000	5000	37100		32000		14.8%	5100	4000	Pass
lead	mg/Kg	50	250	247		271		9.3%	24	200	Pass
magnesium	mg/Kg	250	1250	3870		3030		24.3%	840	1000	Pass
manganese	mg/Kg	5	25	544		644		16.8%	100	20	Pass
mercury	mg/Kg	0.1	0.50	0.13		0.11		16.7%	0.02	0.40	Pass
nickel	mg/Kg	0.5	2.5	19		18		5.4%	1.0	2.0	Pass
potassium	mg/Kg	100	500	1950		1520		24.8%	430	400	Pass
selenium	mg/Kg	1	5	1.2		1.2		0.0%	0.0	4.0	Pass
silver	mg/Kg	3	15	0.12	J	0.14	J	15.4%	0.02	12	N/A
sodium	mg/Kg	100	500	52	J	38	J	31.1%	14	400	N/A
thallium	mg/Kg	0.5	2.5	0.52		0.49	J	5.9%	0.03	2.0	N/A
vanadium	mg/Kg	1	5	44		32		31.6%	12	4.0	Pass
zinc	mg/Kg	40	200	541		541		0.0%	0.0	160	Pass
Cyanide											
total cyanide	mg/Kg	0.10	0.50	0.20	J	0.39	J	64.4%	0.19	0.40	N/A

Soil Control Limits

[sample] > 5 x RL, use 35%
[sample] < 5 x RL, use 4 x RL

URS
Measurement Systems DV Service

Radford SSP
Duplicate Statistics
13SW3 and SWD1

	Units	RL	5xRL	Sample Conc		Duplicate Conc		%RPD	Delta	4xRL	Pass/ Fail
Volatiles											
BDL											
Semi-Volatiles											
bis(2-ethylhexyl)phthalate	ug/L	5.0	25	0.31	J	0.33	J	6.3%	0.02	20	N/A
butyl benzyl phthalate	ug/L	5.0	25	0.11	J	0.11	J	0.0%	0.0	20	N/A
Polyaromatic Hydrocarbons											
BDL											
Explosives											
BDL											
Metals											
total aluminum	ug/L	100	500	66	J	53	J	21.8%	13	400	N/A
total antimony	ug/L	1.0	5	0.7	J	1.0	U	35.3%	0.3	4.0	N/A
dissolved antimony	ug/L	2.0	10	0.8	J	2.0	U	85.7%	1.2	8.0	N/A
total barium	ug/L	10	50	21		21		0.0%	0.0	40.0	Pass
dissolved barium	ug/L	10	50	18		17		5.7%	1.0	40	Pass
total calcium	ug/L	2500	12500	13000		13000		0.0%	0.0	10000	Pass
dissolved calcium	ug/L	2500	12500	13000		13000		0.0%	0.0	10000	Pass
total chromium	ug/L	1.0	5	0.8	J	0.6	J	28.6%	0.2	4	N/A
dissolved chromium	ug/L	2.0	10	0.6	J	0.8	J	28.6%	0.2	8	N/A
total iron	ug/L	100	500	180		170		5.7%	10.0	400.0	Pass
dissolved iron	ug/L	100	500	38	J	36	J	5.4%	2.0	400.0	N/A
total lead	ug/L	1.0	5	0.9	J	0.9	J	0.0%	0	4	N/A
total magnesium	ug/L	500	2500	5400		5300		1.9%	100	2000	Pass
dissloved magnesium	ug/L	500	2500	5500		5400		1.8%	100	2000	Pass
total manganese	ug/L	10	50	30		24		22.2%	6	40	Pass
dissolved manganese	ug/L	10	50	7.9	J	4.3	J	59.0%	3.6	40.00	N/A
total nickel	ug/L	1.0	5.0	0.8	J	0.8	J	0.0%	0.0	4.0	N/A
dissolved nickel	ug/L	2.0	10	1.0	J	0.8	J	22.2%	0.2	8	N/A
total potassium	ug/L	200	1000	1900		1800		5.4%	100.0	800.0	Pass
dissolved potassium	ug/L	200	1000	1600		1700		6.1%	100	800	Pass
total sodium	ug/L	500	2500	5100		5000		2.0%	100	2000	Pass
dissolved sodium	ug/L	500	2500	5100		5000		2.0%	100	2000.0	Pass
total thallium	ug/L	1.0	5	0.30	J	0.24	J	22.2%	0.06	4.0	N/A
Cyanide											
BDL											

Aqueous Control Limits

[sample] > 5 x RL, use 25%
[sample] < 5 x RL, use 2 x RL

URS
Measurement Systems DV Service

TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 09:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/21/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**37SB1B**	QC Batch:	90257 -121
Sample #:	**346012**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	83
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.0 U		6.0	0.511
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.0 U		6.0	0.911
79-34-5	1,1,2,2-Tetrachloroethane	6.0 U		6.0	0.784
79-00-5	1,1,2-Trichloroethane	6.0 U		6.0	0.712
75-34-3	1,1-Dichloroethane	6.0 U		6.0	0.869
75-35-4	1,1-Dichloroethylene	6.0 U		6.0	0.880
106-93-4	1,2-Dibromoethane	6.0 U		6.0	0.822
96-12-8	1,2-Dibromo-3-chloropropane	12 U		12	2.50
95-50-1	1,2-Dichlorobenzene	6.0 U		6.0	0.581
107-06-2	1,2-Dichloroethane	6.0 U		6.0	0.517
156-59-2	cis-1,2-Dichloroethene	6.0 U		6.0	0.852
156-60-5	trans-1,2-Dichloroethene	6.0 U		6.0	0.844
78-87-5	1,2-Dichloropropane	6.0 U		6.0	0.703
87-61-6	1,2,3-Trichlorobenzene	6.0 U		6.0	0.653
120-82-1	1,2,4-Trichlorobenzene	6.0 U		6.0	0.492
541-73-1	1,3-Dichlorobenzene	6.0 U		6.0	0.322
106-46-7	1,4-Dichlorobenzene	6.0 U		6.0	0.852
78-93-3	**Methyl Ethyl Ketone**	**24**		24	6.00
591-78-6	2-Hexanone	12 U		12	2.71
108-10-1	4-Methyl-2-Pentanone	12 U		12	1.75
67-64-1	**Acetone**	**48**	B,Z	24	6.00
71-43-2	Benzene	6.0 U		6.0	0.632
74-97-5	Bromochloromethane	6.0 U		6.0	0.913
75-27-4	Dichlorobromomethane	6.0 U		6.0	0.601
75-25-2	Bromoform	6.0 U		6.0	0.694
74-83-9	Bromomethane	6.0 U		6.0	1.80
75-15-0	Carbon Disulfide	6.0 U		6.0	1.74
56-23-5	Carbon Tetrachloride	6.0 U		6.0	0.559
108-90-7	Chlorobenzene	6.0 U		6.0	0.793
75-00-3	Chloroethane	6.0 U	UJ,C	6.0	1.62
67-66-3	Chloroform	6.0 U		6.0	0.535

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**
Project:	Richmond, VA
	RAAP
Submittal #:	**36440-6**
Submittal:	Delivery Order 0046
	RAAP
Sample ID:	**37SB1B**
Sample #:	**346012**
Matrix:	Soil
Unit:	ug/kg dry

Sampled:	10/10/03 @ 09:15
Sampler:	B.F. & J.S.
Received:	10/11/03 @ 08:45
Prepared:	n/a
Prep. Method:	n/a
Analyzed:	10/21/03 by JDM
Anal. Method:	USEPA-8260B
QC Batch:	90257 -121
Anal. Batch:	208351
Percent Solids:	83
Dilution Factor:	1.2

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
74-87-3	Chloromethane	6.0 U	6.0	1.00
110-82-7	Cyclohexane	12 U	12	0.379
10061-01-5	cis-1,3-Dichloropropene	6.0 U	6.0	0.589
10061-02-6	trans-1,3-Dichloropropene	6.0 U	6.0	0.625
75-71-8	Dichlorodifluoromethane	6.0 U	6.0	0.802
124-48-1	Chlorodibromomethane	6.0 U	6.0	0.620
100-41-4	Ethylbenzene	6.0 U	6.0	0.508
98-82-8	Isopropylbenzene	6.0 U	6.0	0.655
79-20-9	Methyl Acetate	24 U	24	4.16
108-87-2	Methylcyclohexane	12 U	12	1.01
1634-04-4	Methyl(tert)butyl Ether	6.0 U	6.0	0.769
75-09-2	**Methylene Chloride**	**4.6 J**	24	3.37
100-42-5	Styrene	6.0 U	6.0	0.530
127-18-4	Tetrachloroethene	6.0 U	6.0	0.736
108-88-3	Toluene	6.0 U	6.0	0.557
79-01-6	Trichloroethene	6.0 U	6.0	0.812
75-69-4	Trichlorofluoromethane	6.0 U	6.0	0.892
75-01-4	Vinyl Chloride	6.0 U	6.0	0.444
1330-20-7	Xylene (Total)	6.0 U	6.0	0.505

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 09:15
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/21/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**37SB1B**	QC Batch:	90257 -121
Sample #:	**346012**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	83
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**
No compound was detected.			

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 09:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 by DLVV
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**EQB5**	QC Batch:	89888 -122
Sample #:	**346013**	Anal. Batch:	208078
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Volatile Organics OLM4.2+ TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	1.0 U		1.0	0.142
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U		1.0	0.179
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U		1.0	0.148
79-00-5	1,1,2-Trichloroethane	1.0 U		1.0	0.142
75-34-3	1,1-Dichloroethane	1.0 U		1.0	0.057
75-35-4	1,1-Dichloroethylene	1.0 U		1.0	0.133
106-93-4	1,2-Dibromoethane	1.0 U		1.0	0.171
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U		5.0	0.270
95-50-1	1,2-Dichlorobenzene	1.0 U		1.0	0.164
107-06-2	1,2-Dichloroethane	1.0 U		1.0	0.111
156-59-2	cis-1,2-Dichloroethene	1.0 U		1.0	0.139
156-60-5	trans-1,2-Dichloroethene	1.0 U		1.0	0.143
78-87-5	1,2-Dichloropropane	1.0 U		1.0	0.255
87-61-6	1,2,3-Trichlorobenzene	1.0 U		1.0	0.228
120-82-1	1,2,4-Trichlorobenzene	1.0 U		1.0	0.189
541-73-1	1,3-Dichlorobenzene	1.0 U		1.0	0.160
106-46-7	1,4-Dichlorobenzene	1.0 U		1.0	0.124
78-93-3	Methyl Ethyl Ketone	20 U		20	0.417
591-78-6	2-Hexanone	20 U	UJ,c	20	0.455
108-10-1	4-Methyl-2-Pentanone	20 U	UJ,c	20	0.364
67-64-1	**Acetone**	**1.6 J**	J,c	20	1.07
71-43-2	Benzene	1.0 U		1.0	0.022
74-97-5	Bromochloromethane	1.0 U		1.0	0.076
75-27-4	Dichlorobromomethane	2.0 U		2.0	0.431
75-25-2	Bromoform	1.0 U		1.0	0.110
74-83-9	Bromomethane	1.0 U		1.0	0.267
75-15-0	Carbon Disulfide	5.0 U		5.0	0.059
56-23-5	Carbon Tetrachloride	1.0 U		1.0	0.115
108-90-7	Chlorobenzene	1.0 U		1.0	0.157
75-00-3	Chloroethane	1.0 U		1.0	0.180
67-66-3	Chloroform	1.0 U		1.0	0.101

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 09:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 by DLVV
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**EQB5**	QC Batch:	89888 -122
Sample #:	**346013**	Anal. Batch:	208078
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Volatile Organics OLM4.2+ TCL	Analytical Result		Reporting Limit	MDL
74-87-3	Chloromethane	1.0 U		1.0	0.103
110-82-7	Cyclohexane	5.0 U		5.0	0.215
10061-01-5	cis-1,3-Dichloropropene	1.0 U		1.0	0.189
10061-02-6	trans-1,3-Dichloropropene	1.0 U		1.0	0.117
75-71-8	Dichlorodifluoromethane	1.0 U		1.0	0.120
124-48-1	Chlorodibromomethane	1.0 U		1.0	0.108
100-41-4	Ethylbenzene	1.0 U		1.0	0.195
98-82-8	Isopropylbenzene	1.0 U		1.0	0.090
79-20-9	Methyl Acetate	10 U		10	0.231
108-87-2	Methylcyclohexane	5.0 U		5.0	0.168
1634-04-4	Methyl(tert)butyl Ether	1.0 U		1.0	0.077
75-09-2	**Methylene Chloride**	**0.60 J**	B,Z	4.0	0.117
100-42-5	Styrene	1.0 U		1.0	0.137
127-18-4	Tetrachloroethene	1.0 U		1.0	0.193
108-88-3	Toluene	1.0 U		1.0	0.214
79-01-6	Trichloroethene	1.0 U		1.0	0.211
75-69-4	Trichlorofluoromethane	1.0 U		1.0	0.051
75-01-4	Vinyl Chloride	1.0 U		1.0	0.119
1330-20-7	Xylene (Total)	3.0 U		3.0	0.160

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 09:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 DLVV
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**EQB5**	QC Batch:	89888 -122
Sample #:	**346013**	Anal. Batch:	208078
Matrix:	QC Water	Percent Solids:	n/a
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/L)**	**Qualifier**

No compound was detected.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 09:45
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/22/03 by DLVV
		Anal. Method:	USEPA-8260B
Sample ID:	**Trip Blank**	QC Batch:	89888 -122
Sample #:	**346014**	Anal. Batch:	208078
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Volatile Organics OLM4.2+ TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	1.0 U		1.0	0.142
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U		1.0	0.179
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U		1.0	0.148
79-00-5	1,1,2-Trichloroethane	1.0 U		1.0	0.142
75-34-3	1,1-Dichloroethane	1.0 U		1.0	0.057
75-35-4	1,1-Dichloroethylene	1.0 U		1.0	0.133
106-93-4	1,2-Dibromoethane	1.0 U		1.0	0.171
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U		5.0	0.270
95-50-1	1,2-Dichlorobenzene	1.0 U		1.0	0.164
107-06-2	1,2-Dichloroethane	1.0 U		1.0	0.111
156-59-2	cis-1,2-Dichloroethene	1.0 U		1.0	0.139
156-60-5	trans-1,2-Dichloroethene	1.0 U		1.0	0.143
78-87-5	1,2-Dichloropropane	1.0 U		1.0	0.255
87-61-6	1,2,3-Trichlorobenzene	1.0 U		1.0	0.228
120-82-1	1,2,4-Trichlorobenzene	1.0 U		1.0	0.189
541-73-1	1,3-Dichlorobenzene	1.0 U		1.0	0.160
106-46-7	1,4-Dichlorobenzene	1.0 U		1.0	0.124
78-93-3	Methyl Ethyl Ketone	20 U		20	0.417
591-78-6	2-Hexanone	20 U	UJ,C	20	0.455
108-10-1	4-Methyl-2-Pentanone	20 U	UJ,C	20	0.364
67-64-1	Acetone	20 U	UJ,C	20	1.07
71-43-2	Benzene	1.0 U		1.0	0.022
74-97-5	Bromochloromethane	1.0 U		1.0	0.076
75-27-4	Dichlorobromomethane	2.0 U		2.0	0.431
75-25-2	Bromoform	1.0 U		1.0	0.110
74-83-9	Bromomethane	1.0 U		1.0	0.267
75-15-0	Carbon Disulfide	5.0 U		5.0	0.059
56-23-5	Carbon Tetrachloride	1.0 U		1.0	0.115
108-90-7	Chlorobenzene	1.0 U		1.0	0.157
75-00-3	Chloroethane	1.0 U		1.0	0.180
67-66-3	Chloroform	1.0 U		1.0	0.101

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 09:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 by DLVV
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**Trip Blank**	QC Batch:	89888 -122
Sample #:	**346014**	Anal. Batch:	208078
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Volatile Organics OLM4.2+ TCL	Analytical Result		Reporting Limit	MDL
74-87-3	Chloromethane	1.0 U		1.0	0.103
110-82-7	Cyclohexane	5.0 U		5.0	0.215
10061-01-5	cis-1,3-Dichloropropene	1.0 U		1.0	0.189
10061-02-6	trans-1,3-Dichloropropene	1.0 U		1.0	0.117
75-71-8	Dichlorodifluoromethane	1.0 U		1.0	0.120
124-48-1	Chlorodibromomethane	1.0 U		1.0	0.108
100-41-4	Ethylbenzene	1.0 U		1.0	0.195
98-82-8	Isopropylbenzene	1.0 U		1.0	0.090
79-20-9	Methyl Acetate	10 U		10	0.231
108-87-2	Methylcyclohexane	5.0 U		5.0	0.168
1634-04-4	Methyl(tert)butyl Ether	1.0 U		1.0	0.077
75-09-2	**Methylene Chloride**	**1.2 J**	B,Z	4.0	0.117
100-42-5	Styrene	1.0 U		1.0	0.137
127-18-4	Tetrachloroethene	1.0 U		1.0	0.193
108-88-3	**Toluene**	**0.24 J**		1.0	0.214
79-01-6	Trichloroethene	1.0 U		1.0	0.211
75-69-4	Trichlorofluoromethane	1.0 U		1.0	0.051
75-01-4	Vinyl Chloride	1.0 U		1.0	0.119
1330-20-7	Xylene (Total)	3.0 U		3.0	0.160

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 09:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 DLVV
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**Trip Blank**	QC Batch:	89888 -122
Sample #:	**346014**	Anal. Batch:	208078
Matrix:	QC Water	Percent Solids:	n/a
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/L)**	**Qualifier**

No compound was detected.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 11:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/22/03 by DLVV
		Anal. Method:	USEPA-8260B
Sample ID:	**EQB6**	QC Batch:	89888 -122
Sample #:	**346015**	Anal. Batch:	208078
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Volatile Organics OLM4.2+ TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	1.0 U		1.0	0.142
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U		1.0	0.179
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U		1.0	0.148
79-00-5	1,1,2-Trichloroethane	1.0 U		1.0	0.142
75-34-3	1,1-Dichloroethane	1.0 U		1.0	0.057
75-35-4	1,1-Dichloroethylene	1.0 U		1.0	0.133
106-93-4	1,2-Dibromoethane	1.0 U		1.0	0.171
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U		5.0	0.270
95-50-1	1,2-Dichlorobenzene	1.0 U		1.0	0.164
107-06-2	1,2-Dichloroethane	1.0 U		1.0	0.111
156-59-2	cis-1,2-Dichloroethene	1.0 U		1.0	0.139
156-60-5	trans-1,2-Dichloroethene	1.0 U		1.0	0.143
78-87-5	1,2-Dichloropropane	1.0 U		1.0	0.255
87-61-6	1,2,3-Trichlorobenzene	1.0 U		1.0	0.228
120-82-1	1,2,4-Trichlorobenzene	1.0 U		1.0	0.189
541-73-1	1,3-Dichlorobenzene	1.0 U		1.0	0.160
106-46-7	1,4-Dichlorobenzene	1.0 U		1.0	0.124
78-93-3	Methyl Ethyl Ketone	20 U		20	0.417
591-78-6	2-Hexanone	20 U	UJ,C	20	0.455
108-10-1	4-Methyl-2-Pentanone	20 U	UJ,C	20	0.364
67-64-1	**Acetone**	**1.4 J**	J,C	20	1.07
71-43-2	Benzene	1.0 U		1.0	0.022
74-97-5	Bromochloromethane	1.0 U		1.0	0.076
75-27-4	Dichlorobromomethane	2.0 U		2.0	0.431
75-25-2	Bromoform	1.0 U		1.0	0.110
74-83-9	Bromomethane	1.0 U		1.0	0.267
75-15-0	Carbon Disulfide	5.0 U		5.0	0.059
56-23-5	Carbon Tetrachloride	1.0 U		1.0	0.115
108-90-7	Chlorobenzene	1.0 U		1.0	0.157
75-00-3	Chloroethane	1.0 U		1.0	0.180
67-66-3	Chloroform	1.0 U		1.0	0.101

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 11:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 by DLVV
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**EQB6**	QC Batch:	89888 -122
Sample #:	**346015**	Anal. Batch:	208078
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Volatile Organics OLM4.2+ TCL	Analytical Result		Reporting Limit	MDL
74-87-3	Chloromethane	1.0 U		1.0	0.103
110-82-7	Cyclohexane	5.0 U		5.0	0.215
10061-01-5	cis-1,3-Dichloropropene	1.0 U		1.0	0.189
10061-02-6	trans-1,3-Dichloropropene	1.0 U		1.0	0.117
75-71-8	Dichlorodifluoromethane	1.0 U		1.0	0.120
124-48-1	Chlorodibromomethane	1.0 U		1.0	0.108
100-41-4	Ethylbenzene	1.0 U		1.0	0.195
98-82-8	Isopropylbenzene	1.0 U		1.0	0.090
79-20-9	Methyl Acetate	10 U		10	0.231
108-87-2	Methylcyclohexane	5.0 U		5.0	0.168
1634-04-4	Methyl(tert)butyl Ether	1.0 U		1.0	0.077
75-09-2	**Methylene Chloride**	**0.68 J**	B,Z	4.0	0.117
100-42-5	Styrene	1.0 U		1.0	0.137
127-18-4	Tetrachloroethene	1.0 U		1.0	0.193
108-88-3	Toluene	1.0 U		1.0	0.214
79-01-6	Trichloroethene	1.0 U		1.0	0.211
75-69-4	Trichlorofluoromethane	1.0 U		1.0	0.051
75-01-4	Vinyl Chloride	1.0 U		1.0	0.119
1330-20-7	Xylene (Total)	3.0 U		3.0	0.160

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 11:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 DLVV
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**EQB6**	QC Batch:	89888 -122
Sample #:	**346015**	Anal. Batch:	208078
Matrix:	QC Water	Percent Solids:	n/a
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/L)**	**Qualifier**

No compound was detected.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 11:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 by DLVV
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**Trip Blank**	QC Batch:	89888 -122
Sample #:	**346016**	Anal. Batch:	208078
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Volatile Organics OLM4.2+ TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	1.0 U		1.0	0.142
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U		1.0	0.179
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U		1.0	0.148
79-00-5	1,1,2-Trichloroethane	1.0 U		1.0	0.142
75-34-3	1,1-Dichloroethane	1.0 U		1.0	0.057
75-35-4	1,1-Dichloroethylene	1.0 U		1.0	0.133
106-93-4	1,2-Dibromoethane	1.0 U		1.0	0.171
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U		5.0	0.270
95-50-1	1,2-Dichlorobenzene	1.0 U		1.0	0.164
107-06-2	1,2-Dichloroethane	1.0 U		1.0	0.111
156-59-2	cis-1,2-Dichloroethene	1.0 U		1.0	0.139
156-60-5	trans-1,2-Dichloroethene	1.0 U		1.0	0.143
78-87-5	1,2-Dichloropropane	1.0 U		1.0	0.255
87-61-6	1,2,3-Trichlorobenzene	1.0 U		1.0	0.228
120-82-1	1,2,4-Trichlorobenzene	1.0 U		1.0	0.189
541-73-1	1,3-Dichlorobenzene	1.0 U		1.0	0.160
106-46-7	1,4-Dichlorobenzene	1.0 U		1.0	0.124
78-93-3	Methyl Ethyl Ketone	20 U		20	0.417
591-78-6	2-Hexanone	20 U	UJ,C	20	0.455
108-10-1	4-Methyl-2-Pentanone	20 U	UJ,C	20	0.364
67-64-1	Acetone	20 U	UJ,C	20	1.07
71-43-2	Benzene	1.0 U		1.0	0.022
74-97-5	Bromochloromethane	1.0 U		1.0	0.076
75-27-4	Dichlorobromomethane	2.0 U		2.0	0.431
75-25-2	Bromoform	1.0 U		1.0	0.110
74-83-9	Bromomethane	1.0 U		1.0	0.267
75-15-0	Carbon Disulfide	5.0 U		5.0	0.059
56-23-5	Carbon Tetrachloride	1.0 U		1.0	0.115
108-90-7	Chlorobenzene	1.0 U		1.0	0.157
75-00-3	Chloroethane	1.0 U		1.0	0.180
67-66-3	Chloroform	1.0 U		1.0	0.101

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 11:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 by DLVV
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**Trip Blank**	QC Batch:	89888 -122
Sample #:	**346016**	Anal. Batch:	208078
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Volatile Organics OLM4.2+ TCL	Analytical Result		Reporting Limit	MDL
74-87-3	Chloromethane	1.0 U		1.0	0.103
110-82-7	Cyclohexane	5.0 U		5.0	0.215
10061-01-5	cis-1,3-Dichloropropene	1.0 U		1.0	0.189
10061-02-6	trans-1,3-Dichloropropene	1.0 U		1.0	0.117
75-71-8	Dichlorodifluoromethane	1.0 U		1.0	0.120
124-48-1	Chlorodibromomethane	1.0 U		1.0	0.108
100-41-4	Ethylbenzene	1.0 U		1.0	0.195
98-82-8	Isopropylbenzene	1.0 U		1.0	0.090
79-20-9	Methyl Acetate	10 U		10	0.231
108-87-2	Methylcyclohexane	5.0 U		5.0	0.168
1634-04-4	Methyl(tert)butyl Ether	1.0 U		1.0	0.077
75-09-2	**Methylene Chloride**	**1.1 J**	B,Z	4.0	0.117
100-42-5	Styrene	1.0 U		1.0	0.137
127-18-4	Tetrachloroethene	1.0 U		1.0	0.193
108-88-3	Toluene	1.0 U		1.0	0.214
79-01-6	Trichloroethene	1.0 U		1.0	0.211
75-69-4	Trichlorofluoromethane	1.0 U		1.0	0.051
75-01-4	Vinyl Chloride	1.0 U		1.0	0.119
1330-20-7	Xylene (Total)	3.0 U		3.0	0.160

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 11:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 DLVV
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**Trip Blank**	QC Batch:	89888 -122
Sample #:	**346016**	Anal. Batch:	208078
Matrix:	QC Water	Percent Solids:	n/a
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/L)**	**Qualifier**

No compound was detected.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 13:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/21/03 by JDM
		Anal. Method:	USEPA-8260B
Sample ID:	**13SD3**	QC Batch:	90257 -121
Sample #:	**346017**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	68
Unit:	ug/kg dry	Dilution Factor:	1.5

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	7.4 U		7.4	0.639
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	7.4 U		7.4	1.14
79-34-5	1,1,2,2-Tetrachloroethane	7.4 U		7.4	0.980
79-00-5	1,1,2-Trichloroethane	7.4 U		7.4	0.890
75-34-3	1,1-Dichloroethane	7.4 U		7.4	1.09
75-35-4	1,1-Dichloroethylene	7.4 U		7.4	1.10
106-93-4	1,2-Dibromoethane	7.4 U		7.4	1.03
96-12-8	1,2-Dibromo-3-chloropropane	15 U		15	3.12
95-50-1	1,2-Dichlorobenzene	7.4 U		7.4	0.726
107-06-2	1,2-Dichloroethane	7.4 U		7.4	0.647
156-59-2	**cis-1,2-Dichloroethene**	**11**		7.4	1.07
156-60-5	trans-1,2-Dichloroethene	7.4 U		7.4	1.05
78-87-5	1,2-Dichloropropane	7.4 U		7.4	0.879
87-61-6	1,2,3-Trichlorobenzene	7.4 U		7.4	0.816
120-82-1	1,2,4-Trichlorobenzene	7.4 U		7.4	0.615
541-73-1	1,3-Dichlorobenzene	7.4 U		7.4	0.402
106-46-7	1,4-Dichlorobenzene	7.4 U		7.4	1.07
78-93-3	**Methyl Ethyl Ketone**	**31**		29	7.50
591-78-6	2-Hexanone	15 U		15	3.39
108-10-1	4-Methyl-2-Pentanone	15 U		15	2.19
67-64-1	**Acetone**	**80**	B,Z	29	7.50
71-43-2	Benzene	7.4 U		7.4	0.791
74-97-5	Bromochloromethane	7.4 U		7.4	1.14
75-27-4	Dichlorobromomethane	7.4 U		7.4	0.752
75-25-2	Bromoform	7.4 U		7.4	0.867
74-83-9	Bromomethane	7.4 U		7.4	2.25
75-15-0	Carbon Disulfide	7.4 U		7.4	2.18
56-23-5	Carbon Tetrachloride	7.4 U		7.4	0.699
108-90-7	Chlorobenzene	7.4 U		7.4	0.992
75-00-3	Chloroethane	7.4 U	UJ,C	7.4	2.03
67-66-3	Chloroform	7.4 U		7.4	0.669

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 13:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/21/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SD3**	QC Batch:	90257 -121
Sample #:	**346017**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	68
Unit:	ug/kg dry	Dilution Factor:	1.5

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
74-87-3	Chloromethane	7.4 U	7.4	1.25
110-82-7	Cyclohexane	15 U	15	0.474
10061-01-5	cis-1,3-Dichloropropene	7.4 U	7.4	0.737
10061-02-6	trans-1,3-Dichloropropene	7.4 U	7.4	0.782
75-71-8	Dichlorodifluoromethane	7.4 U	7.4	1.00
124-48-1	Chlorodibromomethane	7.4 U	7.4	0.776
100-41-4	Ethylbenzene	7.4 U	7.4	0.635
98-82-8	Isopropylbenzene	7.4 U	7.4	0.819
79-20-9	Methyl Acetate	29 U	29	5.21
108-87-2	Methylcyclohexane	15 U	15	1.27
1634-04-4	Methyl(tert)butyl Ether	7.4 U	7.4	0.962
75-09-2	Methylene Chloride	29 U	29	4.22
100-42-5	Styrene	7.4 U	7.4	0.663
127-18-4	**Tetrachloroethene**	**5.0 J**	7.4	0.920
108-88-3	**Toluene**	**1.8 J**	7.4	0.696
79-01-6	**Trichloroethene**	**64**	7.4	1.02
75-69-4	Trichlorofluoromethane	7.4 U	7.4	1.11
75-01-4	Vinyl Chloride	7.4 U	7.4	0.555
1330-20-7	Xylene (Total)	7.4 U	7.4	0.632

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ANALYTICAL REPORT

Client:	**URS Corporation**
Project:	Richmond, VA
	RAAP
Submittal #:	**36440-6**
Submittal:	Delivery Order 0046
	RAAP
Sample ID:	**13SD3**
Sample #:	**346017**
Matrix:	Soil

Sampled:	10/10/03 @ 13:00
Sampler:	B.F. & J.S.
Received:	10/11/03 @ 08:45
Prepared:	n/a
Prep. Method:	n/a
Analyzed:	10/21/03 JDM
Anal. Method:	USEPA-8260B
QC Batch:	90257 -121
Anal. Batch:	208351
Percent Solids:	68
Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**

No compound was detected.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/21/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**SDD1**	QC Batch:	90257 -121
Sample #:	**346018**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	63
Unit:	ug/kg dry	Dilution Factor:	1.6

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	7.9 U		7.9	0.682
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	7.9 U		7.9	1.21
79-34-5	1,1,2,2-Tetrachloroethane	7.9 U		7.9	1.04
79-00-5	1,1,2-Trichloroethane	7.9 U		7.9	0.949
75-34-3	1,1-Dichloroethane	7.9 U		7.9	1.16
75-35-4	1,1-Dichloroethylene	7.9 U		7.9	1.17
106-93-4	1,2-Dibromoethane	7.9 U		7.9	1.10
96-12-8	1,2-Dibromo-3-chloropropane	16 U		16	3.33
95-50-1	1,2-Dichlorobenzene	7.9 U		7.9	0.774
107-06-2	1,2-Dichloroethane	7.9 U		7.9	0.690
156-59-2	**cis-1,2-Dichloroethene**	**8.0**		7.9	1.14
156-60-5	trans-1,2-Dichloroethene	7.9 U		7.9	1.12
78-87-5	1,2-Dichloropropane	7.9 U		7.9	0.938
87-61-6	1,2,3-Trichlorobenzene	7.9 U		7.9	0.870
120-82-1	1,2,4-Trichlorobenzene	7.9 U		7.9	0.656
541-73-1	1,3-Dichlorobenzene	7.9 U		7.9	0.429
106-46-7	1,4-Dichlorobenzene	7.9 U		7.9	1.14
78-93-3	**Methyl Ethyl Ketone**	**30 J**		32	8.00
591-78-6	2-Hexanone	16 U		16	3.62
108-10-1	4-Methyl-2-Pentanone	16 U		16	2.34
67-64-1	**Acetone**	**59**	B,Z	32	8.00
71-43-2	Benzene	7.9 U		7.9	0.843
74-97-5	Bromochloromethane	7.9 U		7.9	1.22
75-27-4	Dichlorobromomethane	7.9 U		7.9	0.802
75-25-2	Bromoform	7.9 U		7.9	0.925
74-83-9	Bromomethane	7.9 U		7.9	2.40
75-15-0	Carbon Disulfide	7.9 U		7.9	2.32
56-23-5	Carbon Tetrachloride	7.9 U		7.9	0.746
108-90-7	Chlorobenzene	7.9 U		7.9	1.06
75-00-3	Chloroethane	7.9 U	UJ,C	7.9	2.16
67-66-3	Chloroform	7.9 U		7.9	0.714

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/21/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**SDD1**	QC Batch:	90257 -121
Sample #:	**346018**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	63
Unit:	ug/kg dry	Dilution Factor:	1.6

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
74-87-3	Chloromethane	7.9 U	7.9	1.33
110-82-7	Cyclohexane	16 U	16	0.506
10061-01-5	cis-1,3-Dichloropropene	7.9 U	7.9	0.786
10061-02-6	trans-1,3-Dichloropropene	7.9 U	7.9	0.834
75-71-8	Dichlorodifluoromethane	7.9 U	7.9	1.07
124-48-1	Chlorodibromomethane	7.9 U	7.9	0.827
100-41-4	Ethylbenzene	7.9 U	7.9	0.677
98-82-8	Isopropylbenzene	7.9 U	7.9	0.874
79-20-9	Methyl Acetate	32 U	32	5.55
108-87-2	Methylcyclohexane	16 U	16	1.35
1634-04-4	Methyl(tert)butyl Ether	7.9 U	7.9	1.03
75-09-2	**Methylene Chloride**	**6.6 J**	32	4.50
100-42-5	Styrene	7.9 U	7.9	0.707
127-18-4	**Tetrachloroethene**	**2.1 J**	7.9	0.981
108-88-3	**Toluene**	**1.0 J**	7.9	0.742
79-01-6	**Trichloroethene**	**38**	7.9	1.08
75-69-4	Trichlorofluoromethane	7.9 U	7.9	1.19
75-01-4	Vinyl Chloride	7.9 U	7.9	0.592
1330-20-7	Xylene (Total)	7.9 U	7.9	0.674

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/21/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**SDD1**	QC Batch:	90257 -121
Sample #:	**346018**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	63
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**

No compound was detected.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/21/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SD2**	QC Batch:	90257 -121
Sample #:	**346019**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	65
Unit:	ug/kg dry	Dilution Factor:	1.5

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	*1,1,1-Trichloroethane	7.7 U	UJ,M	7.7	0.639
76-13-1	*1,1,2-Trichloro-1,2,2-trifluoroethane	7.7 U	↓	7.7	1.14
79-34-5	1,1,2,2-Tetrachloroethane	7.7 U		7.7	0.980
79-00-5	*1,1,2-Trichloroethane	7.7 U	UJ,M	7.7	0.890
75-34-3	*1,1-Dichloroethane	7.7 U		7.7	1.09
75-35-4	*1,1-Dichloroethylene	7.7 U		7.7	1.10
106-93-4	*1,2-Dibromoethane	7.7 U		7.7	1.03
96-12-8	*1,2-Dibromo-3-chloropropane	15 U		15	3.12
95-50-1	*1,2-Dichlorobenzene	7.7 U		7.7	0.726
107-06-2	*1,2-Dichloroethane	7.7 U		7.7	0.647
156-59-2	*cis-1,2-Dichloroethene	7.7 U		7.7	1.07
156-60-5	*trans-1,2-Dichloroethene	7.7 U		7.7	1.05
78-87-5	*1,2-Dichloropropane	7.7 U		7.7	0.879
87-61-6	*1,2,3-Trichlorobenzene	7.7 U		7.7	0.816
120-82-1	*1,2,4-Trichlorobenzene	7.7 U		7.7	0.615
541-73-1	*1,3-Dichlorobenzene	7.7 U		7.7	0.402
106-46-7	*1,4-Dichlorobenzene	7.7 U	↓	7.7	1.07
78-93-3	**Methyl Ethyl Ketone**	**42**		31	7.50
591-78-6	2-Hexanone	15 U		15	3.39
108-10-1	4-Methyl-2-Pentanone	15 U		15	2.19
67-64-1	***Acetone**	**180**	J,M	31	7.50
71-43-2	*Benzene	7.7 U	UJ,M	7.7	0.791
74-97-5	*Bromochloromethane	7.7 U		7.7	1.14
75-27-4	*Dichlorobromomethane	7.7 U		7.7	0.752
75-25-2	*Bromoform	7.7 U		7.7	0.867
74-83-9	Bromomethane	7.7 U		7.7	2.25
75-15-0	*Carbon Disulfide	7.7 U		7.7	2.18
56-23-5	*Carbon Tetrachloride	7.7 U		7.7	0.699
108-90-7	*Chlorobenzene	7.7 U		7.7	0.992
75-00-3	*Chloroethane	7.7 U	UJ,C	7.7	2.03
67-66-3	*Chloroform	7.7 U	UJ,M	7.7	0.669

* See attached Statement of Data Qualifications.

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Individual sample results relate only to the sample tested.

TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/21/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SD2**	QC Batch:	90257 -121
Sample #:	**346019**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	65
Unit:	ug/kg dry	Dilution Factor:	1.5

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
74-87-3	*Chloromethane	7.7 U	UJ,M	7.7	1.25
110-82-7	*Cyclohexane	15 U		15	0.474
10061-01-5	*cis-1,3-Dichloropropene	7.7 U		7.7	0.737
10061-02-6	*trans-1,3-Dichloropropene	7.7 U		7.7	0.782
75-71-8	*Dichlorodifluoromethane	7.7 U		7.7	1.00
124-48-1	*Chlorodibromomethane	7.7 U		7.7	0.776
100-41-4	*Ethylbenzene	7.7 U		7.7	0.635
98-82-8	*Isopropylbenzene	7.7 U		7.7	0.819
79-20-9	Methyl Acetate	31 U		31	5.21
108-87-2	Methylcyclohexane	15 U		15	1.27
1634-04-4	*Methyl(tert)butyl Ether	7.7 U	UJ,M	7.7	0.962
75-09-2	*Methylene Chloride	31 U		31	4.22
100-42-5	*Styrene	7.7 U		7.7	0.663
127-18-4	*Tetrachloroethene	7.7 U		7.7	0.920
108-88-3	***Toluene**	**1.1 J**	J,M	7.7	0.696
79-01-6	*Trichloroethene	7.7 U	UJ,M	7.7	1.02
75-69-4	*Trichlorofluoromethane	7.7 U		7.7	1.11
75-01-4	*Vinyl Chloride	7.7 U		7.7	0.555
1330-20-7	*Xylene (Total)	7.7 U		7.7	0.632

* See attached Statement of Data Qualifications.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/21/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SD2**	QC Batch:	90257 -121
Sample #:	**346019**	Anal. Batch:	208351
Matrix:	Soil	Percent Solids:	65
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**
No compound was detected.			

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 13:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/15/03 by DLVV
		Anal. Method:	USEPA-8260B
Sample ID:	**13SW3**	QC Batch:	89888 -115
Sample #:	**346020**	Anal. Batch:	207752
Matrix:	Surface Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Volatile Organics OLM4.2+ TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	1.0 U		1.0	0.142
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U		1.0	0.179
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U		1.0	0.148
79-00-5	1,1,2-Trichloroethane	1.0 U		1.0	0.142
75-34-3	1,1-Dichloroethane	1.0 U		1.0	0.057
75-35-4	1,1-Dichloroethylene	1.0 U		1.0	0.133
106-93-4	1,2-Dibromoethane	1.0 U		1.0	0.171
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U		5.0	0.270
95-50-1	1,2-Dichlorobenzene	1.0 U		1.0	0.164
107-06-2	1,2-Dichloroethane	1.0 U		1.0	0.111
156-59-2	cis-1,2-Dichloroethene	1.0 U		1.0	0.139
156-60-5	trans-1,2-Dichloroethene	1.0 U		1.0	0.143
78-87-5	1,2-Dichloropropane	1.0 U		1.0	0.255
87-61-6	1,2,3-Trichlorobenzene	1.0 U		1.0	0.228
120-82-1	1,2,4-Trichlorobenzene	1.0 U		1.0	0.189
541-73-1	1,3-Dichlorobenzene	1.0 U		1.0	0.160
106-46-7	1,4-Dichlorobenzene	1.0 U		1.0	0.124
78-93-3	Methyl Ethyl Ketone	20 U		20	0.417
591-78-6	2-Hexanone	20 U		20	0.455
108-10-1	4-Methyl-2-Pentanone	20 U		20	0.364
67-64-1	Acetone	20 U		20	1.07
71-43-2	Benzene	1.0 U		1.0	0.022
74-97-5	Bromochloromethane	1.0 U		1.0	0.076
75-27-4	Dichlorobromomethane	2.0 U		2.0	0.431
75-25-2	Bromoform	1.0 U		1.0	0.110
74-83-9	Bromomethane	1.0 U		1.0	0.267
75-15-0	Carbon Disulfide	5.0 U	UJ,C	5.0	0.059
56-23-5	Carbon Tetrachloride	1.0 U		1.0	0.115
108-90-7	Chlorobenzene	1.0 U		1.0	0.157
75-00-3	Chloroethane	1.0 U		1.0	0.180
67-66-3	Chloroform	1.0 U		1.0	0.101

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 13:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/15/03 by DLVV
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SW3**	QC Batch:	89888 -115
Sample #:	**346020**	Anal. Batch:	207752
Matrix:	Surface Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Volatile Organics OLM4.2+ TCL	Analytical Result	Reporting Limit	MDL
74-87-3	Chloromethane	1.0 U	1.0	0.103
110-82-7	Cyclohexane	5.0 U	5.0	0.215
10061-01-5	cis-1,3-Dichloropropene	1.0 U	1.0	0.189
10061-02-6	trans-1,3-Dichloropropene	1.0 U	1.0	0.117
75-71-8	Dichlorodifluoromethane	1.0 U	1.0	0.120
124-48-1	Chlorodibromomethane	1.0 U	1.0	0.108
100-41-4	Ethylbenzene	1.0 U	1.0	0.195
98-82-8	Isopropylbenzene	1.0 U	1.0	0.090
79-20-9	Methyl Acetate	10 U	10	0.231
108-87-2	Methylcyclohexane	5.0 U	5.0	0.168
1634-04-4	Methyl(tert)butyl Ether	1.0 U	1.0	0.077
75-09-2	Methylene Chloride	4.0 U	4.0	0.117
100-42-5	Styrene	1.0 U	1.0	0.137
127-18-4	Tetrachloroethene	1.0 U	1.0	0.193
108-88-3	Toluene	1.0 U	1.0	0.214
79-01-6	Trichloroethene	1.0 U	1.0	0.211
75-69-4	Trichlorofluoromethane	1.0 U	1.0	0.051
75-01-4	Vinyl Chloride	1.0 U	1.0	0.119
1330-20-7	Xylene (Total)	3.0 U	3.0	0.160

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Individual sample results relate only to the sample tested.

TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 13:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/15/03 DLVV
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SW3**	QC Batch:	89888 -115
Sample #:	**346020**	Anal. Batch:	207752
Matrix:	Surface Water	Percent Solids:	n/a
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/L)**	**Qualifier**

No compound was detected.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 00:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/15/03 by DLVV
		Anal. Method:	USEPA-8260B
Sample ID:	**SWD1**	QC Batch:	89888 -115
Sample #:	**346021**	Anal. Batch:	207752
Matrix:	Surface Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Volatile Organics OLM4.2+ TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	1.0 U		1.0	0.142
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U		1.0	0.179
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U		1.0	0.148
79-00-5	1,1,2-Trichloroethane	1.0 U		1.0	0.142
75-34-3	1,1-Dichloroethane	1.0 U		1.0	0.057
75-35-4	1,1-Dichloroethylene	1.0 U		1.0	0.133
106-93-4	1,2-Dibromoethane	1.0 U		1.0	0.171
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U		5.0	0.270
95-50-1	1,2-Dichlorobenzene	1.0 U		1.0	0.164
107-06-2	1,2-Dichloroethane	1.0 U		1.0	0.111
156-59-2	cis-1,2-Dichloroethene	1.0 U		1.0	0.139
156-60-5	trans-1,2-Dichloroethene	1.0 U		1.0	0.143
78-87-5	1,2-Dichloropropane	1.0 U		1.0	0.255
87-61-6	1,2,3-Trichlorobenzene	1.0 U		1.0	0.228
120-82-1	1,2,4-Trichlorobenzene	1.0 U		1.0	0.189
541-73-1	1,3-Dichlorobenzene	1.0 U		1.0	0.160
106-46-7	1,4-Dichlorobenzene	1.0 U		1.0	0.124
78-93-3	Methyl Ethyl Ketone	20 U		20	0.417
591-78-6	2-Hexanone	20 U		20	0.455
108-10-1	4-Methyl-2-Pentanone	20 U		20	0.364
67-64-1	Acetone	20 U		20	1.07
71-43-2	Benzene	1.0 U		1.0	0.022
74-97-5	Bromochloromethane	1.0 U		1.0	0.076
75-27-4	Dichlorobromomethane	2.0 U		2.0	0.431
75-25-2	Bromoform	1.0 U		1.0	0.110
74-83-9	Bromomethane	1.0 U		1.0	0.267
75-15-0	Carbon Disulfide	5.0 U	UJ,C	5.0	0.059
56-23-5	Carbon Tetrachloride	1.0 U		1.0	0.115
108-90-7	Chlorobenzene	1.0 U		1.0	0.157
75-00-3	Chloroethane	1.0 U		1.0	0.180
67-66-3	Chloroform	1.0 U		1.0	0.101

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/15/03 by DLVV
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**SWD1**	QC Batch:	89888 -115
Sample #:	**346021**	Anal. Batch:	207752
Matrix:	Surface Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Volatile Organics OLM4.2+ TCL	Analytical Result	Reporting Limit	MDL
74-87-3	Chloromethane	1.0 U	1.0	0.103
110-82-7	Cyclohexane	5.0 U	5.0	0.215
10061-01-5	cis-1,3-Dichloropropene	1.0 U	1.0	0.189
10061-02-6	trans-1,3-Dichloropropene	1.0 U	1.0	0.117
75-71-8	Dichlorodifluoromethane	1.0 U	1.0	0.120
124-48-1	Chlorodibromomethane	1.0 U	1.0	0.108
100-41-4	Ethylbenzene	1.0 U	1.0	0.195
98-82-8	Isopropylbenzene	1.0 U	1.0	0.090
79-20-9	Methyl Acetate	10 U	10	0.231
108-87-2	Methylcyclohexane	5.0 U	5.0	0.168
1634-04-4	Methyl(tert)butyl Ether	1.0 U	1.0	0.077
75-09-2	Methylene Chloride	4.0 U	4.0	0.117
100-42-5	Styrene	1.0 U	1.0	0.137
127-18-4	Tetrachloroethene	1.0 U	1.0	0.193
108-88-3	Toluene	1.0 U	1.0	0.214
79-01-6	Trichloroethene	1.0 U	1.0	0.211
75-69-4	Trichlorofluoromethane	1.0 U	1.0	0.051
75-01-4	Vinyl Chloride	1.0 U	1.0	0.119
1330-20-7	Xylene (Total)	3.0 U	3.0	0.160

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/15/03 DLVV
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**SWD1**	QC Batch:	89888 -115
Sample #:	**346021**	Anal. Batch:	207752
Matrix:	Surface Water	Percent Solids:	n/a
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/L)**	**Qualifier**

No compound was detected.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 14:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/15/03 by DLVV
		Anal. Method:	USEPA-8260B
Sample ID:	**13SW2**	QC Batch:	89888 -115
Sample #:	**346022**	Anal. Batch:	207752
Matrix:	Surface Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Volatile Organics OLM4.2+ TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	1.0 U		1.0	0.142
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U		1.0	0.179
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U		1.0	0.148
79-00-5	1,1,2-Trichloroethane	1.0 U		1.0	0.142
75-34-3	1,1-Dichloroethane	1.0 U		1.0	0.057
75-35-4	1,1-Dichloroethylene	1.0 U		1.0	0.133
106-93-4	1,2-Dibromoethane	1.0 U		1.0	0.171
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U		5.0	0.270
95-50-1	1,2-Dichlorobenzene	1.0 U		1.0	0.164
107-06-2	1,2-Dichloroethane	1.0 U		1.0	0.111
156-59-2	cis-1,2-Dichloroethene	1.0 U		1.0	0.139
156-60-5	trans-1,2-Dichloroethene	1.0 U		1.0	0.143
78-87-5	1,2-Dichloropropane	1.0 U		1.0	0.255
87-61-6	1,2,3-Trichlorobenzene	1.0 U		1.0	0.228
120-82-1	1,2,4-Trichlorobenzene	1.0 U		1.0	0.189
541-73-1	1,3-Dichlorobenzene	1.0 U		1.0	0.160
106-46-7	1,4-Dichlorobenzene	1.0 U		1.0	0.124
78-93-3	Methyl Ethyl Ketone	20 U		20	0.417
591-78-6	2-Hexanone	20 U		20	0.455
108-10-1	4-Methyl-2-Pentanone	20 U		20	0.364
67-64-1	Acetone	20 U		20	1.07
71-43-2	Benzene	1.0 U		1.0	0.022
74-97-5	Bromochloromethane	1.0 U		1.0	0.076
75-27-4	Dichlorobromomethane	2.0 U		2.0	0.431
75-25-2	Bromoform	1.0 U		1.0	0.110
74-83-9	Bromomethane	1.0 U		1.0	0.267
75-15-0	Carbon Disulfide	5.0 U	VJ,c	5.0	0.059
56-23-5	Carbon Tetrachloride	1.0 U		1.0	0.115
108-90-7	Chlorobenzene	1.0 U		1.0	0.157
75-00-3	Chloroethane	1.0 U		1.0	0.180
67-66-3	Chloroform	1.0 U		1.0	0.101

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/15/03 by DLVV
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SW2**	QC Batch:	89888 -115
Sample #:	**346022**	Anal. Batch:	207752
Matrix:	Surface Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Volatile Organics OLM4.2+ TCL	Analytical Result	Reporting Limit	MDL
74-87-3	Chloromethane	1.0 U	1.0	0.103
110-82-7	Cyclohexane	5.0 U	5.0	0.215
10061-01-5	cis-1,3-Dichloropropene	1.0 U	1.0	0.189
10061-02-6	trans-1,3-Dichloropropene	1.0 U	1.0	0.117
75-71-8	Dichlorodifluoromethane	1.0 U	1.0	0.120
124-48-1	Chlorodibromomethane	1.0 U	1.0	0.108
100-41-4	Ethylbenzene	1.0 U	1.0	0.195
98-82-8	Isopropylbenzene	1.0 U	1.0	0.090
79-20-9	Methyl Acetate	10 U	10	0.231
108-87-2	Methylcyclohexane	5.0 U	5.0	0.168
1634-04-4	Methyl(tert)butyl Ether	1.0 U	1.0	0.077
75-09-2	Methylene Chloride	4.0 U	4.0	0.117
100-42-5	Styrene	1.0 U	1.0	0.137
127-18-4	Tetrachloroethene	1.0 U	1.0	0.193
108-88-3	Toluene	1.0 U	1.0	0.214
79-01-6	Trichloroethene	1.0 U	1.0	0.211
75-69-4	Trichlorofluoromethane	1.0 U	1.0	0.051
75-01-4	Vinyl Chloride	1.0 U	1.0	0.119
1330-20-7	Xylene (Total)	3.0 U	3.0	0.160

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/15/03 DLVV
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**13SW2**	QC Batch:	89888 -115
Sample #:	**346022**	Anal. Batch:	207752
Matrix:	Surface Water	Percent Solids:	n/a
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/L)**	**Qualifier**

No compound was detected.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 14:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/15/03 by DLVV
		Anal. Method:	USEPA-8260B
Sample ID:	**Trip Blank**	QC Batch:	89888 -115
Sample #:	**346082**	Anal. Batch:	207752
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Volatile Organics OLM4.2+ TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	1.0 U		1.0	0.142
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	1.0 U		1.0	0.179
79-34-5	1,1,2,2-Tetrachloroethane	1.0 U		1.0	0.148
79-00-5	1,1,2-Trichloroethane	1.0 U		1.0	0.142
75-34-3	1,1-Dichloroethane	1.0 U		1.0	0.057
75-35-4	1,1-Dichloroethylene	1.0 U		1.0	0.133
106-93-4	1,2-Dibromoethane	1.0 U		1.0	0.171
96-12-8	1,2-Dibromo-3-chloropropane	5.0 U		5.0	0.270
95-50-1	1,2-Dichlorobenzene	1.0 U		1.0	0.164
107-06-2	1,2-Dichloroethane	1.0 U		1.0	0.111
156-59-2	cis-1,2-Dichloroethene	1.0 U		1.0	0.139
156-60-5	trans-1,2-Dichloroethene	1.0 U		1.0	0.143
78-87-5	1,2-Dichloropropane	1.0 U		1.0	0.255
87-61-6	1,2,3-Trichlorobenzene	1.0 U		1.0	0.228
120-82-1	1,2,4-Trichlorobenzene	1.0 U		1.0	0.189
541-73-1	1,3-Dichlorobenzene	1.0 U		1.0	0.160
106-46-7	1,4-Dichlorobenzene	1.0 U		1.0	0.124
78-93-3	Methyl Ethyl Ketone	20 U		20	0.417
591-78-6	2-Hexanone	20 U		20	0.455
108-10-1	4-Methyl-2-Pentanone	20 U		20	0.364
67-64-1	Acetone	20 U		20	1.07
71-43-2	Benzene	1.0 U		1.0	0.022
74-97-5	Bromochloromethane	1.0 U		1.0	0.076
75-27-4	Dichlorobromomethane	2.0 U		2.0	0.431
75-25-2	Bromoform	1.0 U		1.0	0.110
74-83-9	Bromomethane	1.0 U		1.0	0.267
75-15-0	Carbon Disulfide	5.0 U	UJ,c	5.0	0.059
56-23-5	Carbon Tetrachloride	1.0 U		1.0	0.115
108-90-7	Chlorobenzene	1.0 U		1.0	0.157
75-00-3	Chloroethane	1.0 U		1.0	0.180
67-66-3	Chloroform	1.0 U		1.0	0.101

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 14:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/15/03 by DLVV
		Anal. Method:	USEPA-8260B
Sample ID:	**Trip Blank**	QC Batch:	89888 -115
Sample #:	**346082**	Anal. Batch:	207752
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Volatile Organics OLM4.2+ TCL	Analytical Result		Reporting Limit	MDL
74-87-3	Chloromethane	1.0 U		1.0	0.103
110-82-7	Cyclohexane	5.0 U		5.0	0.215
10061-01-5	cis-1,3-Dichloropropene	1.0 U		1.0	0.189
10061-02-6	trans-1,3-Dichloropropene	1.0 U		1.0	0.117
75-71-8	Dichlorodifluoromethane	1.0 U		1.0	0.120
124-48-1	Chlorodibromomethane	1.0 U		1.0	0.108
100-41-4	Ethylbenzene	1.0 U		1.0	0.195
98-82-8	Isopropylbenzene	1.0 U		1.0	0.090
79-20-9	Methyl Acetate	10 U		10	0.231
108-87-2	Methylcyclohexane	5.0 U		5.0	0.168
1634-04-4	Methyl(tert)butyl Ether	1.0 U		1.0	0.077
75-09-2	**Methylene Chloride**	**0.96 J**	B,Z	4.0	0.117
100-42-5	Styrene	1.0 U		1.0	0.137
127-18-4	Tetrachloroethene	1.0 U		1.0	0.193
108-88-3	Toluene	1.0 U		1.0	0.214
79-01-6	Trichloroethene	1.0 U		1.0	0.211
75-69-4	Trichlorofluoromethane	1.0 U		1.0	0.051
75-01-4	Vinyl Chloride	1.0 U		1.0	0.119
1330-20-7	Xylene (Total)	3.0 U		3.0	0.160

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/15/03 DLVV
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**Trip Blank**	QC Batch:	89888 -115
Sample #:	**346082**	Anal. Batch:	207752
Matrix:	QC Water	Percent Solids:	n/a
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/L)**	**Qualifier**

No compound was detected.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 08:45
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/22/03 by JDM
		Anal. Method:	USEPA-8260B
Sample ID:	**ASB1A**	QC Batch:	90601 -122
Sample #:	**346248**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	82
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.1 U		6.1	1.93
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.1 U		6.1	0.775
79-34-5	1,1,2,2-Tetrachloroethane	6.1 U		6.1	1.80
79-00-5	1,1,2-Trichloroethane	6.1 U		6.1	1.54
75-34-3	1,1-Dichloroethane	6.1 U		6.1	1.62
75-35-4	1,1-Dichloroethylene	6.1 U		6.1	3.47
106-93-4	1,2-Dibromoethane	6.1 U		6.1	2.24
96-12-8	1,2-Dibromo-3-chloropropane	12 U		12	3.28
95-50-1	1,2-Dichlorobenzene	6.1 U		6.1	1.72
107-06-2	1,2-Dichloroethane	6.1 U		6.1	1.56
156-59-2	cis-1,2-Dichloroethene	6.1 U		6.1	2.05
156-60-5	trans-1,2-Dichloroethene	6.1 U		6.1	2.12
78-87-5	1,2-Dichloropropane	6.1 U		6.1	1.90
87-61-6	1,2,3-Trichlorobenzene	6.1 U		6.1	1.13
120-82-1	1,2,4-Trichlorobenzene	6.1 U		6.1	2.11
541-73-1	1,3-Dichlorobenzene	6.1 U		6.1	2.16
106-46-7	1,4-Dichlorobenzene	6.1 U		6.1	0.833
78-93-3	Methyl Ethyl Ketone	24 U		24	5.40
591-78-6	2-Hexanone	12 U		12	2.27
108-10-1	4-Methyl-2-Pentanone	12 U		12	1.22
67-64-1	**Acetone**	**15 J**	B,Z	24	11.2
71-43-2	Benzene	6.1 U		6.1	0.805
74-97-5	Bromochloromethane	6.1 U		6.1	1.48
75-27-4	Dichlorobromomethane	6.1 U		6.1	0.569
75-25-2	Bromoform	6.1 U		6.1	1.63
74-83-9	Bromomethane	6.1 U		6.1	5.50
75-15-0	Carbon Disulfide	6.1 U		6.1	1.84
56-23-5	Carbon Tetrachloride	6.1 U		6.1	1.70
108-90-7	Chlorobenzene	6.1 U		6.1	0.545
75-00-3	Chloroethane	6.1 U	UJ,C	6.1	2.92
67-66-3	Chloroform	6.1 U		6.1	0.869

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 08:45
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**ASB1A**	QC Batch:	90601 -122
Sample #:	**346248**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	82
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
74-87-3	Chloromethane	6.1 U	6.1	0.679
110-82-7	Cyclohexane	12 U	12	1.58
10061-01-5	cis-1,3-Dichloropropene	6.1 U	6.1	1.30
10061-02-6	trans-1,3-Dichloropropene	6.1 U	6.1	1.94
75-71-8	Dichlorodifluoromethane	6.1 U	6.1	0.840
124-48-1	Chlorodibromomethane	6.1 U	6.1	0.673
100-41-4	Ethylbenzene	6.1 U	6.1	1.92
98-82-8	Isopropylbenzene	6.1 U	6.1	1.44
79-20-9	Methyl Acetate	24 U	24	4.50
108-87-2	Methylcyclohexane	12 U	12	1.94
1634-04-4	Methyl(tert)butyl Ether	6.1 U	6.1	1.55
75-09-2	**Methylene Chloride**	**4.9 J**	24	1.44
100-42-5	Styrene	6.1 U	6.1	1.49
127-18-4	Tetrachloroethene	6.1 U	6.1	1.54
108-88-3	Toluene	6.1 U	6.1	1.38
79-01-6	Trichloroethene	6.1 U	6.1	2.23
75-69-4	Trichlorofluoromethane	6.1 U	6.1	0.841
75-01-4	Vinyl Chloride	6.1 U	6.1	1.49
1330-20-7	Xylene (Total)	6.1 U	6.1	1.82

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 08:45
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**ASB1A**	QC Batch:	90601 -122
Sample #:	**346248**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	82
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**
No compound was detected.			

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 09:00
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**ASB1B**	QC Batch:	90601 -122
Sample #:	**346249**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.4 U		6.4	2.09
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.4 U		6.4	0.840
79-34-5	1,1,2,2-Tetrachloroethane	6.4 U		6.4	1.95
79-00-5	1,1,2-Trichloroethane	6.4 U		6.4	1.66
75-34-3	1,1-Dichloroethane	6.4 U		6.4	1.76
75-35-4	1,1-Dichloroethylene	6.4 U		6.4	3.76
106-93-4	1,2-Dibromoethane	6.4 U		6.4	2.43
96-12-8	1,2-Dibromo-3-chloropropane	13 U		13	3.55
95-50-1	1,2-Dichlorobenzene	6.4 U		6.4	1.86
107-06-2	1,2-Dichloroethane	6.4 U		6.4	1.69
156-59-2	cis-1,2-Dichloroethene	6.4 U		6.4	2.22
156-60-5	trans-1,2-Dichloroethene	6.4 U		6.4	2.30
78-87-5	1,2-Dichloropropane	6.4 U		6.4	2.05
87-61-6	1,2,3-Trichlorobenzene	6.4 U		6.4	1.23
120-82-1	1,2,4-Trichlorobenzene	6.4 U		6.4	2.29
541-73-1	1,3-Dichlorobenzene	6.4 U		6.4	2.34
106-46-7	1,4-Dichlorobenzene	6.4 U		6.4	0.902
78-93-3	Methyl Ethyl Ketone	26 U		26	5.85
591-78-6	2-Hexanone	13 U		13	2.46
108-10-1	4-Methyl-2-Pentanone	13 U		13	1.33
67-64-1	**Acetone**	**19 J**	B,Z	26	12.1
71-43-2	Benzene	6.4 U		6.4	0.872
74-97-5	Bromochloromethane	6.4 U		6.4	1.60
75-27-4	Dichlorobromomethane	6.4 U		6.4	0.616
75-25-2	Bromoform	6.4 U		6.4	1.77
74-83-9	Bromomethane	6.4 U		6.4	5.95
75-15-0	Carbon Disulfide	6.4 U		6.4	1.99
56-23-5	Carbon Tetrachloride	6.4 U		6.4	1.85
108-90-7	Chlorobenzene	6.4 U		6.4	0.590
75-00-3	Chloroethane	6.4 U	UJ,C	6.4	3.16
67-66-3	Chloroform	6.4 U		6.4	0.941

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 09:00
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**ASB1B**	QC Batch:	90601 -122
Sample #:	**346249**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
74-87-3	Chloromethane	6.4 U	6.4	0.736
110-82-7	Cyclohexane	13 U	13	1.72
10061-01-5	cis-1,3-Dichloropropene	6.4 U	6.4	1.40
10061-02-6	trans-1,3-Dichloropropene	6.4 U	6.4	2.11
75-71-8	Dichlorodifluoromethane	6.4 U	6.4	0.910
124-48-1	Chlorodibromomethane	6.4 U	6.4	0.729
100-41-4	Ethylbenzene	6.4 U	6.4	2.08
98-82-8	Isopropylbenzene	6.4 U	6.4	1.56
79-20-9	Methyl Acetate	26 U	26	4.88
108-87-2	Methylcyclohexane	13 U	13	2.11
1634-04-4	Methyl(tert)butyl Ether	6.4 U	6.4	1.68
75-09-2	**Methylene Chloride**	**5.9 J**	26	1.56
100-42-5	Styrene	6.4 U	6.4	1.61
127-18-4	Tetrachloroethene	6.4 U	6.4	1.66
108-88-3	Toluene	6.4 U	6.4	1.50
79-01-6	Trichloroethene	6.4 U	6.4	2.42
75-69-4	Trichlorofluoromethane	6.4 U	6.4	0.911
75-01-4	Vinyl Chloride	6.4 U	6.4	1.61
1330-20-7	Xylene (Total)	6.4 U	6.4	1.98

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 09:00
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**ASB1B**	QC Batch:	90601 -122
Sample #:	**346249**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	78
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**
No compound was detected.			

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 09:15
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/22/03 by JDM
		Anal. Method:	USEPA-8260B
Sample ID:	**ASB1C**	QC Batch:	90601 -122
Sample #:	**346250**	Anal. Batch:	208508
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.5 U		6.5	2.09
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.5 U		6.5	0.840
79-34-5	1,1,2,2-Tetrachloroethane	6.5 U		6.5	1.95
79-00-5	1,1,2-Trichloroethane	6.5 U		6.5	1.66
75-34-3	1,1-Dichloroethane	6.5 U		6.5	1.76
75-35-4	1,1-Dichloroethylene	6.5 U		6.5	3.76
106-93-4	1,2-Dibromoethane	6.5 U		6.5	2.43
96-12-8	1,2-Dibromo-3-chloropropane	13 U		13	3.55
95-50-1	1,2-Dichlorobenzene	6.5 U		6.5	1.86
107-06-2	1,2-Dichloroethane	6.5 U		6.5	1.69
156-59-2	cis-1,2-Dichloroethene	6.5 U		6.5	2.22
156-60-5	trans-1,2-Dichloroethene	6.5 U		6.5	2.30
78-87-5	1,2-Dichloropropane	6.5 U		6.5	2.05
87-61-6	1,2,3-Trichlorobenzene	6.5 U		6.5	1.23
120-82-1	1,2,4-Trichlorobenzene	6.5 U		6.5	2.29
541-73-1	1,3-Dichlorobenzene	6.5 U		6.5	2.34
106-46-7	1,4-Dichlorobenzene	6.5 U		6.5	0.902
78-93-3	Methyl Ethyl Ketone	26 U		26	5.85
591-78-6	2-Hexanone	13 U		13	2.46
108-10-1	4-Methyl-2-Pentanone	13 U		13	1.33
67-64-1	**Acetone**	**29**	B,Z	26	12.1
71-43-2	Benzene	6.5 U		6.5	0.872
74-97-5	Bromochloromethane	6.5 U		6.5	1.60
75-27-4	Dichlorobromomethane	6.5 U		6.5	0.616
75-25-2	Bromoform	6.5 U		6.5	1.77
74-83-9	Bromomethane	6.5 U		6.5	5.95
75-15-0	Carbon Disulfide	6.5 U	UJ,C	6.5	1.99
56-23-5	Carbon Tetrachloride	6.5 U		6.5	1.85
108-90-7	Chlorobenzene	6.5 U		6.5	0.590
75-00-3	Chloroethane	6.5 U		6.5	3.16
67-66-3	Chloroform	6.5 U		6.5	0.941

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 09:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**ASB1C**	QC Batch:	90601 -122
Sample #:	**346250**	Anal. Batch:	208508
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
74-87-3	Chloromethane	6.5 U		6.5	0.736
110-82-7	Cyclohexane	13 U		13	1.72
10061-01-5	cis-1,3-Dichloropropene	6.5 U		6.5	1.40
10061-02-6	trans-1,3-Dichloropropene	6.5 U		6.5	2.11
75-71-8	Dichlorodifluoromethane	6.5 U		6.5	0.910
124-48-1	Chlorodibromomethane	6.5 U		6.5	0.729
100-41-4	Ethylbenzene	6.5 U		6.5	2.08
98-82-8	Isopropylbenzene	6.5 U		6.5	1.56
79-20-9	Methyl Acetate	26 U	UJ,c	26	4.88
108-87-2	Methylcyclohexane	13 U		13	2.11
1634-04-4	Methyl(tert)butyl Ether	6.5 U		6.5	1.68
75-09-2	**Methylene Chloride**	**6.6 J**	B,2	26	1.56
100-42-5	Styrene	6.5 U		6.5	1.61
127-18-4	Tetrachloroethene	6.5 U		6.5	1.66
108-88-3	Toluene	6.5 U		6.5	1.50
79-01-6	Trichloroethene	6.5 U		6.5	2.42
75-69-4	Trichlorofluoromethane	6.5 U		6.5	0.911
75-01-4	Vinyl Chloride	6.5 U		6.5	1.61
1330-20-7	Xylene (Total)	6.5 U		6.5	1.98

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**
Project:	Richmond, VA
	RAAP
Submittal #:	**36440-6**
Submittal:	Delivery Order 0046
	RAAP
Sample ID:	**ASB1C**
Sample #:	**346250**
Matrix:	Soil

Sampled:	10/11/03 @ 09:15
Sampler:	B.F.& J.S.
Received:	10/14/03 @ 09:30
Prepared:	n/a
Prep. Method:	n/a
Analyzed:	10/22/03 JDM
Anal. Method:	USEPA-8260B
QC Batch:	90601 -122
Anal. Batch:	208854
Percent Solids:	77
Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**

No compound was detected.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:00
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/22/03 by JDM
		Anal. Method:	USEPA-8260B
Sample ID:	**ASB3A**	QC Batch:	90601 -122
Sample #:	**346251**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.2 U		6.2	1.93
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.2 U		6.2	0.775
79-34-5	1,1,2,2-Tetrachloroethane	6.2 U		6.2	1.80
79-00-5	1,1,2-Trichloroethane	6.2 U		6.2	1.54
75-34-3	1,1-Dichloroethane	6.2 U		6.2	1.62
75-35-4	1,1-Dichloroethylene	6.2 U		6.2	3.47
106-93-4	1,2-Dibromoethane	6.2 U		6.2	2.24
96-12-8	1,2-Dibromo-3-chloropropane	12 U		12	3.28
95-50-1	1,2-Dichlorobenzene	6.2 U		6.2	1.72
107-06-2	1,2-Dichloroethane	6.2 U		6.2	1.56
156-59-2	cis-1,2-Dichloroethene	6.2 U		6.2	2.05
156-60-5	trans-1,2-Dichloroethene	6.2 U		6.2	2.12
78-87-5	1,2-Dichloropropane	6.2 U		6.2	1.90
87-61-6	1,2,3-Trichlorobenzene	6.2 U		6.2	1.13
120-82-1	1,2,4-Trichlorobenzene	6.2 U		6.2	2.11
541-73-1	1,3-Dichlorobenzene	6.2 U		6.2	2.16
106-46-7	1,4-Dichlorobenzene	6.2 U		6.2	0.833
78-93-3	Methyl Ethyl Ketone	25 U		25	5.40
591-78-6	2-Hexanone	12 U		12	2.27
108-10-1	4-Methyl-2-Pentanone	12 U		12	1.22
67-64-1	**Acetone**	**12 J**	B,Z	25	11.2
71-43-2	Benzene	6.2 U		6.2	0.805
74-97-5	Bromochloromethane	6.2 U		6.2	1.48
75-27-4	Dichlorobromomethane	6.2 U		6.2	0.569
75-25-2	Bromoform	6.2 U		6.2	1.63
74-83-9	Bromomethane	6.2 U		6.2	5.50
75-15-0	Carbon Disulfide	6.2 U		6.2	1.84
56-23-5	Carbon Tetrachloride	6.2 U		6.2	1.70
108-90-7	Chlorobenzene	6.2 U		6.2	0.545
75-00-3	Chloroethane	6.2 U	UJ,C	6.2	2.92
67-66-3	Chloroform	6.2 U		6.2	0.869

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:00
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/22/03 by JDM
		Anal. Method:	USEPA-8260B
Sample ID:	**ASB3A**	QC Batch:	90601 -122
Sample #:	**346251**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
74-87-3	Chloromethane	6.2 U	6.2	0.679
110-82-7	Cyclohexane	12 U	12	1.58
10061-01-5	cis-1,3-Dichloropropene	6.2 U	6.2	1.30
10061-02-6	trans-1,3-Dichloropropene	6.2 U	6.2	1.94
75-71-8	Dichlorodifluoromethane	6.2 U	6.2	0.840
124-48-1	Chlorodibromomethane	6.2 U	6.2	0.673
100-41-4	Ethylbenzene	6.2 U	6.2	1.92
98-82-8	Isopropylbenzene	6.2 U	6.2	1.44
79-20-9	Methyl Acetate	25 U	25	4.50
108-87-2	Methylcyclohexane	12 U	12	1.94
1634-04-4	Methyl(tert)butyl Ether	6.2 U	6.2	1.55
75-09-2	**Methylene Chloride**	**5.3 J**	25	1.44
100-42-5	Styrene	6.2 U	6.2	1.49
127-18-4	Tetrachloroethene	6.2 U	6.2	1.54
108-88-3	Toluene	6.2 U	6.2	1.38
79-01-6	Trichloroethene	6.2 U	6.2	2.23
75-69-4	Trichlorofluoromethane	6.2 U	6.2	0.841
75-01-4	Vinyl Chloride	6.2 U	6.2	1.49
1330-20-7	Xylene (Total)	6.2 U	6.2	1.82

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:00
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**ASB3A**	QC Batch:	90601 -122
Sample #:	**346251**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	80
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**
No compound was detected.			

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:15
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/22/03 by JDM
		Anal. Method:	USEPA-8260B
Sample ID:	**ASB3B**	QC Batch:	90601 -122
Sample #:	**346252**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.2 U		6.2	1.93
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.2 U		6.2	0.775
79-34-5	1,1,2,2-Tetrachloroethane	6.2 U		6.2	1.80
79-00-5	1,1,2-Trichloroethane	6.2 U		6.2	1.54
75-34-3	1,1-Dichloroethane	6.2 U		6.2	1.62
75-35-4	1,1-Dichloroethylene	6.2 U		6.2	3.47
106-93-4	1,2-Dibromoethane	6.2 U		6.2	2.24
96-12-8	1,2-Dibromo-3-chloropropane	12 U		12	3.28
95-50-1	1,2-Dichlorobenzene	6.2 U		6.2	1.72
107-06-2	1,2-Dichloroethane	6.2 U		6.2	1.56
156-59-2	cis-1,2-Dichloroethene	6.2 U		6.2	2.05
156-60-5	trans-1,2-Dichloroethene	6.2 U		6.2	2.12
78-87-5	1,2-Dichloropropane	6.2 U		6.2	1.90
87-61-6	1,2,3-Trichlorobenzene	6.2 U		6.2	1.13
120-82-1	1,2,4-Trichlorobenzene	6.2 U		6.2	2.11
541-73-1	1,3-Dichlorobenzene	6.2 U		6.2	2.16
106-46-7	1,4-Dichlorobenzene	6.2 U		6.2	0.833
78-93-3	Methyl Ethyl Ketone	25 U		25	5.40
591-78-6	2-Hexanone	12 U		12	2.27
108-10-1	4-Methyl-2-Pentanone	12 U		12	1.22
67-64-1	**Acetone**	**19 J**	B,z	25	11.2
71-43-2	Benzene	6.2 U		6.2	0.805
74-97-5	Bromochloromethane	6.2 U		6.2	1.48
75-27-4	Dichlorobromomethane	6.2 U		6.2	0.569
75-25-2	Bromoform	6.2 U		6.2	1.63
74-83-9	Bromomethane	6.2 U		6.2	5.50
75-15-0	Carbon Disulfide	6.2 U		6.2	1.84
56-23-5	Carbon Tetrachloride	6.2 U		6.2	1.70
108-90-7	Chlorobenzene	6.2 U		6.2	0.545
75-00-3	Chloroethane	6.2 U	UJ,c	6.2	2.92
67-66-3	Chloroform	6.2 U		6.2	0.869

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**ASB3B**	QC Batch:	90601 -122
Sample #:	**346252**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
74-87-3	Chloromethane	6.2 U	6.2	0.679
110-82-7	Cyclohexane	12 U	12	1.58
10061-01-5	cis-1,3-Dichloropropene	6.2 U	6.2	1.30
10061-02-6	trans-1,3-Dichloropropene	6.2 U	6.2	1.94
75-71-8	Dichlorodifluoromethane	6.2 U	6.2	0.840
124-48-1	Chlorodibromomethane	6.2 U	6.2	0.673
100-41-4	Ethylbenzene	6.2 U	6.2	1.92
98-82-8	Isopropylbenzene	6.2 U	6.2	1.44
79-20-9	Methyl Acetate	25 U	25	4.50
108-87-2	Methylcyclohexane	12 U	12	1.94
1634-04-4	Methyl(tert)butyl Ether	6.2 U	6.2	1.55
75-09-2	**Methylene Chloride**	**6.6 J**	25	1.44
100-42-5	Styrene	6.2 U	6.2	1.49
127-18-4	Tetrachloroethene	6.2 U	6.2	1.54
108-88-3	Toluene	6.2 U	6.2	1.38
79-01-6	Trichloroethene	6.2 U	6.2	2.23
75-69-4	Trichlorofluoromethane	6.2 U	6.2	0.841
75-01-4	Vinyl Chloride	6.2 U	6.2	1.49
1330-20-7	Xylene (Total)	6.2 U	6.2	1.82

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**ASB3B**	QC Batch:	90601 -122
Sample #:	**346252**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	80
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**
No compound was detected.			

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:30
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/22/03 by JDM
		Anal. Method:	USEPA-8260B
Sample ID:	**ASB3C**	QC Batch:	90601 -122
Sample #:	**346253**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	84
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.0 U		6.0	1.93
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.0 U		6.0	0.775
79-34-5	1,1,2,2-Tetrachloroethane	6.0 U		6.0	1.80
79-00-5	1,1,2-Trichloroethane	6.0 U		6.0	1.54
75-34-3	1,1-Dichloroethane	6.0 U		6.0	1.62
75-35-4	1,1-Dichloroethylene	6.0 U		6.0	3.47
106-93-4	1,2-Dibromoethane	6.0 U		6.0	2.24
96-12-8	1,2-Dibromo-3-chloropropane	12 U		12	3.28
95-50-1	1,2-Dichlorobenzene	6.0 U		6.0	1.72
107-06-2	1,2-Dichloroethane	6.0 U		6.0	1.56
156-59-2	cis-1,2-Dichloroethene	6.0 U		6.0	2.05
156-60-5	trans-1,2-Dichloroethene	6.0 U		6.0	2.12
78-87-5	1,2-Dichloropropane	6.0 U		6.0	1.90
87-61-6	1,2,3-Trichlorobenzene	6.0 U		6.0	1.13
120-82-1	1,2,4-Trichlorobenzene	6.0 U		6.0	2.11
541-73-1	1,3-Dichlorobenzene	6.0 U		6.0	2.16
106-46-7	1,4-Dichlorobenzene	6.0 U		6.0	0.833
78-93-3	Methyl Ethyl Ketone	24 U		24	5.40
591-78-6	2-Hexanone	12 U		12	2.27
108-10-1	4-Methyl-2-Pentanone	12 U		12	1.22
67-64-1	**Acetone**	**18 J**	B,Z	24	11.2
71-43-2	Benzene	6.0 U		6.0	0.805
74-97-5	Bromochloromethane	6.0 U		6.0	1.48
75-27-4	Dichlorobromomethane	6.0 U		6.0	0.569
75-25-2	Bromoform	6.0 U		6.0	1.63
74-83-9	Bromomethane	6.0 U		6.0	5.50
75-15-0	Carbon Disulfide	6.0 U		6.0	1.84
56-23-5	Carbon Tetrachloride	6.0 U		6.0	1.70
108-90-7	Chlorobenzene	6.0 U		6.0	0.545
75-00-3	Chloroethane	6.0 U	UJ,C	6.0	2.92
67-66-3	Chloroform	6.0 U		6.0	0.869

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:30
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**ASB3C**	QC Batch:	90601 -122
Sample #:	**346253**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	84
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
74-87-3	Chloromethane	6.0 U	6.0	0.679
110-82-7	Cyclohexane	12 U	12	1.58
10061-01-5	cis-1,3-Dichloropropene	6.0 U	6.0	1.30
10061-02-6	trans-1,3-Dichloropropene	6.0 U	6.0	1.94
75-71-8	Dichlorodifluoromethane	6.0 U	6.0	0.840
124-48-1	Chlorodibromomethane	6.0 U	6.0	0.673
100-41-4	Ethylbenzene	6.0 U	6.0	1.92
98-82-8	Isopropylbenzene	6.0 U	6.0	1.44
79-20-9	Methyl Acetate	24 U	24	4.50
108-87-2	Methylcyclohexane	12 U	12	1.94
1634-04-4	Methyl(tert)butyl Ether	6.0 U	6.0	1.55
75-09-2	**Methylene Chloride**	**3.7 J**	24	1.44
100-42-5	Styrene	6.0 U	6.0	1.49
127-18-4	Tetrachloroethene	6.0 U	6.0	1.54
108-88-3	Toluene	6.0 U	6.0	1.38
79-01-6	Trichloroethene	6.0 U	6.0	2.23
75-69-4	Trichlorofluoromethane	6.0 U	6.0	0.841
75-01-4	Vinyl Chloride	6.0 U	6.0	1.49
1330-20-7	Xylene (Total)	6.0 U	6.0	1.82

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:30
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**ASB3C**	QC Batch:	90601 -122
Sample #:	**346253**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	84
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**
No compound was detected.			

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:15
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/22/03 by JDM
		Anal. Method:	USEPA-8260B
Sample ID:	**ASB2A**	QC Batch:	90601 -122
Sample #:	**346254**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.2 U		6.2	1.93
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.2 U		6.2	0.775
79-34-5	1,1,2,2-Tetrachloroethane	6.2 U		6.2	1.80
79-00-5	1,1,2-Trichloroethane	6.2 U		6.2	1.54
75-34-3	1,1-Dichloroethane	6.2 U		6.2	1.62
75-35-4	1,1-Dichloroethylene	6.2 U		6.2	3.47
106-93-4	1,2-Dibromoethane	6.2 U		6.2	2.24
96-12-8	1,2-Dibromo-3-chloropropane	12 U		12	3.28
95-50-1	1,2-Dichlorobenzene	6.2 U		6.2	1.72
107-06-2	1,2-Dichloroethane	6.2 U		6.2	1.56
156-59-2	cis-1,2-Dichloroethene	6.2 U		6.2	2.05
156-60-5	trans-1,2-Dichloroethene	6.2 U		6.2	2.12
78-87-5	1,2-Dichloropropane	6.2 U		6.2	1.90
87-61-6	1,2,3-Trichlorobenzene	6.2 U		6.2	1.13
120-82-1	1,2,4-Trichlorobenzene	6.2 U		6.2	2.11
541-73-1	1,3-Dichlorobenzene	6.2 U		6.2	2.16
106-46-7	1,4-Dichlorobenzene	6.2 U		6.2	0.833
78-93-3	Methyl Ethyl Ketone	25 U		25	5.40
591-78-6	2-Hexanone	12 U		12	2.27
108-10-1	4-Methyl-2-Pentanone	12 U		12	1.22
67-64-1	**Acetone**	**16 J**	B,Z	25	11.2
71-43-2	Benzene	6.2 U		6.2	0.805
74-97-5	Bromochloromethane	6.2 U		6.2	1.48
75-27-4	Dichlorobromomethane	6.2 U		6.2	0.569
75-25-2	Bromoform	6.2 U		6.2	1.63
74-83-9	Bromomethane	6.2 U		6.2	5.50
75-15-0	Carbon Disulfide	6.2 U		6.2	1.84
56-23-5	Carbon Tetrachloride	6.2 U		6.2	1.70
108-90-7	Chlorobenzene	6.2 U		6.2	0.545
75-00-3	Chloroethane	6.2 U	VJ,C	6.2	2.92
67-66-3	Chloroform	6.2 U		6.2	0.869

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**ASB2A**	QC Batch:	90601 -122
Sample #:	**346254**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
74-87-3	Chloromethane	6.2 U	6.2	0.679
110-82-7	Cyclohexane	12 U	12	1.58
10061-01-5	cis-1,3-Dichloropropene	6.2 U	6.2	1.30
10061-02-6	trans-1,3-Dichloropropene	6.2 U	6.2	1.94
75-71-8	Dichlorodifluoromethane	6.2 U	6.2	0.840
124-48-1	Chlorodibromomethane	6.2 U	6.2	0.673
100-41-4	Ethylbenzene	6.2 U	6.2	1.92
98-82-8	Isopropylbenzene	6.2 U	6.2	1.44
79-20-9	Methyl Acetate	25 U	25	4.50
108-87-2	Methylcyclohexane	12 U	12	1.94
1634-04-4	Methyl(tert)butyl Ether	6.2 U	6.2	1.55
75-09-2	**Methylene Chloride**	**4.5 J**	25	1.44
100-42-5	Styrene	6.2 U	6.2	1.49
127-18-4	Tetrachloroethene	6.2 U	6.2	1.54
108-88-3	Toluene	6.2 U	6.2	1.38
79-01-6	Trichloroethene	6.2 U	6.2	2.23
75-69-4	Trichlorofluoromethane	6.2 U	6.2	0.841
75-01-4	Vinyl Chloride	6.2 U	6.2	1.49
1330-20-7	Xylene (Total)	6.2 U	6.2	1.82

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**ASB2A**	QC Batch:	90601 -122
Sample #:	**346254**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	80
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**
No compound was detected.			

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:10
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
Submittal #:	**36440-6**	Prepared:	n/a
Submittal:	Delivery Order 0046 RAAP	Prep. Method:	n/a
		Analyzed:	10/22/03 by JDM
Sample ID:	**ASB2B**	Anal. Method:	USEPA-8260B
Sample #:	**346255**	QC Batch:	90601 -122
Matrix:	Soil	Anal. Batch:	208854
Unit:	ug/kg dry	Percent Solids:	76
		Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.6 U		6.6	2.09
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.6 U		6.6	0.840
79-34-5	1,1,2,2-Tetrachloroethane	6.6 U		6.6	1.95
79-00-5	1,1,2-Trichloroethane	6.6 U		6.6	1.66
75-34-3	1,1-Dichloroethane	6.6 U		6.6	1.76
75-35-4	1,1-Dichloroethylene	6.6 U		6.6	3.76
106-93-4	1,2-Dibromoethane	6.6 U		6.6	2.43
96-12-8	1,2-Dibromo-3-chloropropane	13 U		13	3.55
95-50-1	1,2-Dichlorobenzene	6.6 U		6.6	1.86
107-06-2	1,2-Dichloroethane	6.6 U		6.6	1.69
156-59-2	cis-1,2-Dichloroethene	6.6 U		6.6	2.22
156-60-5	trans-1,2-Dichloroethene	6.6 U		6.6	2.30
78-87-5	1,2-Dichloropropane	6.6 U		6.6	2.05
87-61-6	1,2,3-Trichlorobenzene	6.6 U		6.6	1.23
120-82-1	1,2,4-Trichlorobenzene	6.6 U		6.6	2.29
541-73-1	1,3-Dichlorobenzene	6.6 U		6.6	2.34
106-46-7	1,4-Dichlorobenzene	6.6 U		6.6	0.902
78-93-3	Methyl Ethyl Ketone	26 U		26	5.85
591-78-6	2-Hexanone	13 U		13	2.46
108-10-1	4-Methyl-2-Pentanone	13 U		13	1.33
67-64-1	**Acetone**	**23 J**	B,Z	26	12.1
71-43-2	Benzene	6.6 U		6.6	0.872
74-97-5	Bromochloromethane	6.6 U		6.6	1.60
75-27-4	Dichlorobromomethane	6.6 U		6.6	0.616
75-25-2	Bromoform	6.6 U		6.6	1.77
74-83-9	Bromomethane	6.6 U		6.6	5.95
75-15-0	Carbon Disulfide	6.6 U		6.6	1.99
56-23-5	Carbon Tetrachloride	6.6 U		6.6	1.85
108-90-7	Chlorobenzene	6.6 U		6.6	0.590
75-00-3	Chloroethane	6.6 U	UJ,C	6.6	3.16
67-66-3	Chloroform	6.6 U		6.6	0.941

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:10
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**ASB2B**	QC Batch:	90601 -122
Sample #:	**346255**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	76
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
74-87-3	Chloromethane	6.6 U	6.6	0.736
110-82-7	Cyclohexane	13 U	13	1.72
10061-01-5	cis-1,3-Dichloropropene	6.6 U	6.6	1.40
10061-02-6	trans-1,3-Dichloropropene	6.6 U	6.6	2.11
75-71-8	Dichlorodifluoromethane	6.6 U	6.6	0.910
124-48-1	Chlorodibromomethane	6.6 U	6.6	0.729
100-41-4	Ethylbenzene	6.6 U	6.6	2.08
98-82-8	Isopropylbenzene	6.6 U	6.6	1.56
79-20-9	Methyl Acetate	26 U	26	4.88
108-87-2	Methylcyclohexane	13 U	13	2.11
1634-04-4	Methyl(tert)butyl Ether	6.6 U	6.6	1.68
75-09-2	**Methylene Chloride**	**7.7 J**	26	1.56
100-42-5	Styrene	6.6 U	6.6	1.61
127-18-4	Tetrachloroethene	6.6 U	6.6	1.66
108-88-3	Toluene	6.6 U	6.6	1.50
79-01-6	Trichloroethene	6.6 U	6.6	2.42
75-69-4	Trichlorofluoromethane	6.6 U	6.6	0.911
75-01-4	Vinyl Chloride	6.6 U	6.6	1.61
1330-20-7	Xylene (Total)	6.6 U	6.6	1.98

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:10
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**ASB2B**	QC Batch:	90601 -122
Sample #:	**346255**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	76
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**
No compound was detected.			

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 00:00
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/22/03 by JDM
		Anal. Method:	USEPA-8260B
Sample ID:	**SBD-10**	QC Batch:	90601 -122
Sample #:	**346256**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	72
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.9 U		6.9	2.25
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	6.9 U		6.9	0.904
79-34-5	1,1,2,2-Tetrachloroethane	6.9 U		6.9	2.10
79-00-5	1,1,2-Trichloroethane	6.9 U		6.9	1.79
75-34-3	1,1-Dichloroethane	6.9 U		6.9	1.89
75-35-4	1,1-Dichloroethylene	6.9 U		6.9	4.05
106-93-4	1,2-Dibromoethane	6.9 U		6.9	2.62
96-12-8	1,2-Dibromo-3-chloropropane	14 U		14	3.82
95-50-1	1,2-Dichlorobenzene	6.9 U		6.9	2.00
107-06-2	1,2-Dichloroethane	6.9 U		6.9	1.82
156-59-2	cis-1,2-Dichloroethene	6.9 U		6.9	2.39
156-60-5	trans-1,2-Dichloroethene	6.9 U		6.9	2.48
78-87-5	1,2-Dichloropropane	6.9 U		6.9	2.21
87-61-6	1,2,3-Trichlorobenzene	6.9 U		6.9	1.32
120-82-1	1,2,4-Trichlorobenzene	6.9 U		6.9	2.46
541-73-1	1,3-Dichlorobenzene	6.9 U		6.9	2.52
106-46-7	1,4-Dichlorobenzene	6.9 U		6.9	0.972
78-93-3	Methyl Ethyl Ketone	28 U		28	6.30
591-78-6	2-Hexanone	14 U		14	2.65
108-10-1	4-Methyl-2-Pentanone	14 U		14	1.43
67-64-1	**Acetone**	**24 J**	B,Z	28	13.1
71-43-2	Benzene	6.9 U		6.9	0.939
74-97-5	Bromochloromethane	6.9 U		6.9	1.72
75-27-4	Dichlorobromomethane	6.9 U		6.9	0.664
75-25-2	Bromoform	6.9 U		6.9	1.90
74-83-9	Bromomethane	6.9 U		6.9	6.41
75-15-0	Carbon Disulfide	6.9 U		6.9	2.14
56-23-5	Carbon Tetrachloride	6.9 U		6.9	1.99
108-90-7	Chlorobenzene	6.9 U		6.9	0.636
75-00-3	Chloroethane	6.9 U	UJ,C	6.9	3.40
67-66-3	Chloroform	6.9 U		6.9	1.01

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**SBD-10**	QC Batch:	90601 -122
Sample #:	**346256**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	72
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
74-87-3	Chloromethane	6.9 U	6.9	0.792
110-82-7	Cyclohexane	14 U	14	1.85
10061-01-5	cis-1,3-Dichloropropene	6.9 U	6.9	1.51
10061-02-6	trans-1,3-Dichloropropene	6.9 U	6.9	2.27
75-71-8	Dichlorodifluoromethane	6.9 U	6.9	0.980
124-48-1	Chlorodibromomethane	6.9 U	6.9	0.785
100-41-4	Ethylbenzene	6.9 U	6.9	2.24
98-82-8	Isopropylbenzene	6.9 U	6.9	1.68
79-20-9	Methyl Acetate	28 U	28	5.25
108-87-2	Methylcyclohexane	14 U	14	2.27
1634-04-4	Methyl(tert)butyl Ether	6.9 U	6.9	1.81
75-09-2	**Methylene Chloride**	**7.0 J**	28	1.68
100-42-5	Styrene	6.9 U	6.9	1.74
127-18-4	Tetrachloroethene	6.9 U	6.9	1.79
108-88-3	Toluene	6.9 U	6.9	1.61
79-01-6	Trichloroethene	6.9 U	6.9	2.60
75-69-4	Trichlorofluoromethane	6.9 U	6.9	0.981
75-01-4	Vinyl Chloride	6.9 U	6.9	1.74
1330-20-7	Xylene (Total)	6.9 U	6.9	2.13

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 00:00
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
Submittal #:	**36440-6**	Prepared:	n/a
Submittal:	Delivery Order 0046 RAAP	Prep. Method:	n/a
		Analyzed:	10/22/03 JDM
Sample ID:	**SBD-10**	Anal. Method:	USEPA-8260B
Sample #:	**346256**	QC Batch:	90601 -122
Matrix:	Soil	Anal. Batch:	208854
		Percent Solids:	72
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**

No compound was detected.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 11:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**ASB2C**	QC Batch:	90601 -122
Sample #:	**346257**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	73
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
71-55-6	1,1,1-Trichloroethane	6.8 U		6.8	2.25
76-13-1	*1,1,2-Trichloro-1,2,2-trifluoroethane	6.8 U		6.8	0.904
79-34-5	1,1,2,2-Tetrachloroethane	6.8 U		6.8	2.10
79-00-5	1,1,2-Trichloroethane	6.8 U		6.8	1.79
75-34-3	1,1-Dichloroethane	6.8 U		6.8	1.89
75-35-4	1,1-Dichloroethylene	6.8 U		6.8	4.05
106-93-4	1,2-Dibromoethane	6.8 U		6.8	2.62
96-12-8	1,2-Dibromo-3-chloropropane	14 U		14	3.82
95-50-1	1,2-Dichlorobenzene	6.8 U		6.8	2.00
107-06-2	1,2-Dichloroethane	6.8 U		6.8	1.82
156-59-2	cis-1,2-Dichloroethene	6.8 U		6.8	2.39
156-60-5	*trans-1,2-Dichloroethene	6.8 U		6.8	2.48
78-87-5	1,2-Dichloropropane	6.8 U		6.8	2.21
87-61-6	1,2,3-Trichlorobenzene	6.8 U		6.8	1.32
120-82-1	1,2,4-Trichlorobenzene	6.8 U		6.8	2.46
541-73-1	1,3-Dichlorobenzene	6.8 U		6.8	2.52
106-46-7	1,4-Dichlorobenzene	6.8 U		6.8	0.972
78-93-3	Methyl Ethyl Ketone	27 U		27	6.30
591-78-6	2-Hexanone	14 U		14	2.65
108-10-1	4-Methyl-2-Pentanone	14 U		14	1.43
67-64-1	***Acetone**	**23 J**	B,Z	27	13.1
71-43-2	Benzene	6.8 U		6.8	0.939
74-97-5	Bromochloromethane	6.8 U		6.8	1.72
75-27-4	Dichlorobromomethane	6.8 U		6.8	0.664
75-25-2	Bromoform	6.8 U		6.8	1.90
74-83-9	Bromomethane	6.8 U		6.8	6.41
75-15-0	Carbon Disulfide	6.8 U		6.8	2.14
56-23-5	*Carbon Tetrachloride	6.8 U		6.8	1.99
108-90-7	Chlorobenzene	6.8 U		6.8	0.636
75-00-3	Chloroethane	6.8 U	UJ,C	6.8	3.40
67-66-3	Chloroform	6.8 U		6.8	1.01

* See attached Statement of Data Qualifications.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 11:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 by JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**ASB2C**	QC Batch:	90601 -122
Sample #:	**346257**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	73
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Volatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
74-87-3	Chloromethane	6.8 U	6.8	0.792
110-82-7	Cyclohexane	14 U	14	1.85
10061-01-5	cis-1,3-Dichloropropene	6.8 U	6.8	1.51
10061-02-6	trans-1,3-Dichloropropene	6.8 U	6.8	2.27
75-71-8	Dichlorodifluoromethane	6.8 U	6.8	0.980
124-48-1	Chlorodibromomethane	6.8 U	6.8	0.785
100-41-4	Ethylbenzene	6.8 U	6.8	2.24
98-82-8	Isopropylbenzene	6.8 U	6.8	1.68
79-20-9	Methyl Acetate	27 U	27	5.25
108-87-2	*Methylcyclohexane	14 U	14	2.27
1634-04-4	Methyl(tert)butyl Ether	6.8 U	6.8	1.81
75-09-2	**Methylene Chloride**	**11 J**	27	1.68
100-42-5	Styrene	6.8 U	6.8	1.74
127-18-4	Tetrachloroethene	6.8 U	6.8	1.79
108-88-3	Toluene	6.8 U	6.8	1.61
79-01-6	Trichloroethene	6.8 U	6.8	2.60
75-69-4	Trichlorofluoromethane	6.8 U	6.8	0.981
75-01-4	*Vinyl Chloride	6.8 U	6.8	1.74
1330-20-7	Xylene (Total)	6.8 U	6.8	2.13

* See attached Statement of Data Qualifications.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 11:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	n/a
Submittal #:	**36440-6**	Prep. Method:	n/a
Submittal:	Delivery Order 0046	Analyzed:	10/22/03 JDM
	RAAP	Anal. Method:	USEPA-8260B
Sample ID:	**ASB2C**	QC Batch:	90601 -122
Sample #:	**346257**	Anal. Batch:	208854
Matrix:	Soil	Percent Solids:	73
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8260B	**CAS Number**	**Result (ug/kg dr**	**Qualifier**
No compound was detected.			

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 09:45
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3510C
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/03/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**EQB5**	QC Batch:	90165 -116
Sample #:	**346013**	Anal. Batch:	209010
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	5.0 U		5.0	0.013
95-94-3	1,2,4,5-Tetrachloro-benzene	5.0 U		5.0	0.775
108-60-1	Bis (2-Chloroisopropyl)-Ether	5.0 U		5.0	0.014
95-95-4	2,4,5-Trichlorophenol	5.0 U		5.0	0.014
88-06-2	2,4,6-Trichlorophenol	5.0 U		5.0	0.015
120-83-2	2,4-Dichlorophenol	5.0 U		5.0	0.018
105-67-9	2,4-Dimethylphenol	5.0 U		5.0	0.198
51-28-5	2,4-Dinitrophenol	10 U	VJ,C	10	1.24
121-14-2	2,4-Dinitrotoluene	5.0 U		5.0	0.007
606-20-2	2,6-Dinitrotoluene	5.0 U		5.0	0.052
91-58-7	2-Chloronaphthalene	5.0 U		5.0	0.005
95-57-8	2-Chlorophenol	5.0 U		5.0	0.011
91-57-6	2-Methylnaphthalene	5.0 U		5.0	0.084
95-48-7	2-Methylphenol	5.0 U		5.0	0.007
88-74-4	2-Nitroaniline	5.0 U		5.0	0.010
88-75-5	2-Nitrophenol	5.0 U		5.0	0.011
91-94-1	3,3'-Dichlorobenzidine	5.0 U		5.0	0.058
99-09-2	3-Nitroaniline	5.0 U		5.0	0.032
534-52-1	4,6-Dinitro-2-Methylphenol	5.0 U		5.0	0.054
101-55-3	4-Bromophenyl Phenylether	5.0 U		5.0	0.019
59-50-7	4-Chloro-3-Methylphenol	5.0 U		5.0	0.018
106-47-8	4-Chloroaniline	5.0 U		5.0	0.011
7005-72-3	4-Chlorophenylphenyl-Ether	5.0 U		5.0	0.015
106-44-5	4-Methylphenol	5.0 U		5.0	0.014
100-01-6	4-Nitroaniline	5.0 U		5.0	0.070
100-02-7	4-Nitrophenol	10 U		10	0.134
83-32-9	Acenaphthene	5.0 U		5.0	0.008
208-96-8	Acenaphthylene	5.0 U		5.0	0.007
98-86-2	Acetophenone	5.0 U		5.0	0.011

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 09:45
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3510C
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/03/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**EQB5**	QC Batch:	90165 -116
Sample #:	**346013**	Anal. Batch:	209010
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	5.0 U		5.0	0.014
1912-24-9	Atrazine	5.0 U		5.0	0.018
100-52-7	Benzaldehyde	5.0 U		5.0	0.616
56-55-3	Benzo (a) Anthracene	5.0 U		5.0	0.022
50-32-8	Benzo (a) Pyrene	5.0 U		5.0	0.025
205-99-2	Benzo (b) Fluoranthene	5.0 U		5.0	0.019
191-24-2	Benzo (g,h,i,) Perylene	5.0 U		5.0	0.046
207-08-9	Benzo (k) Fluoranthene	5.0 U		5.0	0.064
111-91-1	Bis (2-Chloroethoxy)-Methane	5.0 U		5.0	0.013
111-44-4	Bis (2-Chloroethyl) Ether	5.0 U		5.0	0.012
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**0.35 J**	B,Z	5.0	0.149
85-68-7	**Butyl Benzyl Phthalate**	**0.060 J**	B,Z	5.0	0.015
105-60-2	Caprolactam	5.0 U	UJ,I	5.0	0.024
86-74-8	Carbazole	5.0 U	UJ,C	5.0	0.015
218-01-9	Chrysene	5.0 U		5.0	0.025
53-70-3	Dibenzo (a,h) Anthracene	5.0 U		5.0	0.025
132-64-9	Dibenzofuran	5.0 U		5.0	0.014
84-66-2	Diethylphthalate	5.0 U		5.0	0.074
131-11-3	Dimethylphthalate	5.0 U		5.0	0.013
84-74-2	Di-n-Butylphthalate	5.0 U		5.0	1.60
117-84-0	Di-n-Octylphthalate	5.0 U		5.0	0.162
206-44-0	Fluoranthene	5.0 U		5.0	0.024
86-73-7	Fluorene	5.0 U		5.0	0.012
118-74-1	Hexachlorobenzene	5.0 U		5.0	0.011
87-68-3	Hexachlorobutadiene	5.0 U		5.0	0.019
77-47-4	Hexachlorocyclopentadiene	5.0 U	UJ,I	5.0	0.016
67-72-1	Hexachloroethane	5.0 U		5.0	0.023
193-39-5	Indeno (1,2,3-cd) Pyrene	5.0 U		5.0	0.033
78-59-1	Isophorone	5.0 U		5.0	0.017
91-20-3	Naphthalene	5.0 U		5.0	0.006
98-95-3	Nitrobenzene	5.0 U		5.0	0.012

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 09:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3510C
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**EQB5**	QC Batch:	90165 -116
Sample #:	**346013**	Anal. Batch:	209010
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	5.0 U	5.0	0.017
86-30-6	N-Nitroso-di-Phenylamine	5.0 U	5.0	0.019
87-86-5	Pentachlorophenol	10 U	10	0.075
85-01-8	Phenanthrene	5.0 U	5.0	0.016
108-95-2	Phenol	5.0 U	5.0	0.006
129-00-0	Pyrene	5.0 U	5.0	0.033

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 09:45
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/03/03 JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**EQB5**	QC Batch:	90165 -116
Sample #:	**346013**	Anal. Batch:	209010
Matrix:	QC Water	Percent Solids:	n/a
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/L)**	**Qualifier**	
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	0.57	E	NJ,+
1-HEXACOSANOL	506-52-5	0.64	E	NJ,+
2,4,6-Triallyloxy-1,3,5-triazine	101-37-1	1.22	E	NJ,+
Erucylamide	112-84-5	9.63	E	NJ,+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 11:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3510C
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**EQB6**	QC Batch:	90165 -116
Sample #:	**346015**	Anal. Batch:	209010
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	5.0 U	5.0	0.013
95-94-3	1,2,4,5-Tetrachloro-benzene	5.0 U	5.0	0.775
108-60-1	Bis (2-Chloroisopropyl)-Ether	5.0 U	5.0	0.014
95-95-4	2,4,5-Trichlorophenol	5.0 U	5.0	0.014
88-06-2	2,4,6-Trichlorophenol	5.0 U	5.0	0.015
120-83-2	2,4-Dichlorophenol	5.0 U	5.0	0.018
105-67-9	2,4-Dimethylphenol	5.0 U	5.0	0.198
51-28-5	2,4-Dinitrophenol	10 U UJ,C	10	1.24
121-14-2	2,4-Dinitrotoluene	5.0 U	5.0	0.007
606-20-2	2,6-Dinitrotoluene	5.0 U	5.0	0.052
91-58-7	2-Chloronaphthalene	5.0 U	5.0	0.005
95-57-8	2-Chlorophenol	5.0 U	5.0	0.011
91-57-6	2-Methylnaphthalene	5.0 U	5.0	0.084
95-48-7	2-Methylphenol	5.0 U	5.0	0.007
88-74-4	2-Nitroaniline	5.0 U	5.0	0.010
88-75-5	2-Nitrophenol	5.0 U	5.0	0.011
91-94-1	3,3'-Dichlorobenzidine	5.0 U	5.0	0.058
99-09-2	3-Nitroaniline	5.0 U	5.0	0.032
534-52-1	4,6-Dinitro-2-Methylphenol	5.0 U	5.0	0.054
101-55-3	4-Bromophenyl Phenylether	5.0 U	5.0	0.019
59-50-7	4-Chloro-3-Methylphenol	5.0 U	5.0	0.018
106-47-8	4-Chloroaniline	5.0 U	5.0	0.011
7005-72-3	4-Chlorophenylphenyl-Ether	5.0 U	5.0	0.015
106-44-5	4-Methylphenol	5.0 U	5.0	0.014
100-01-6	4-Nitroaniline	5.0 U	5.0	0.070
100-02-7	4-Nitrophenol	10 U	10	0.134
83-32-9	Acenaphthene	5.0 U	5.0	0.008
208-96-8	Acenaphthylene	5.0 U	5.0	0.007
98-86-2	Acetophenone	5.0 U	5.0	0.011

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 11:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3510C
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/03/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**EQB6**	QC Batch:	90165 -116
Sample #:	**346015**	Anal. Batch:	209010
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	5.0 U		5.0	0.014
1912-24-9	Atrazine	5.0 U		5.0	0.018
100-52-7	Benzaldehyde	5.0 U		5.0	0.616
56-55-3	Benzo (a) Anthracene	5.0 U		5.0	0.022
50-32-8	Benzo (a) Pyrene	5.0 U		5.0	0.025
205-99-2	Benzo (b) Fluoranthene	5.0 U		5.0	0.019
191-24-2	Benzo (g,h,i,) Perylene	5.0 U		5.0	0.046
207-08-9	Benzo (k) Fluoranthene	5.0 U		5.0	0.064
111-91-1	Bis (2-Chloroethoxy)-Methane	5.0 U		5.0	0.013
111-44-4	Bis (2-Chloroethyl) Ether	5.0 U		5.0	0.012
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**0.29 J**	B,Z	5.0	0.149
85-68-7	**Butyl Benzyl Phthalate**	**0.050 J**	B,Z	5.0	0.015
105-60-2	Caprolactam	5.0 U	UJ,I	5.0	0.024
86-74-8	Carbazole	5.0 U	UJ,C	5.0	0.015
218-01-9	Chrysene	5.0 U		5.0	0.025
53-70-3	Dibenzo (a,h) Anthracene	5.0 U		5.0	0.025
132-64-9	Dibenzofuran	5.0 U		5.0	0.014
84-66-2	Diethylphthalate	5.0 U		5.0	0.074
131-11-3	Dimethylphthalate	5.0 U		5.0	0.013
84-74-2	Di-n-Butylphthalate	5.0 U		5.0	1.60
117-84-0	Di-n-Octylphthalate	5.0 U		5.0	0.162
206-44-0	Fluoranthene	5.0 U		5.0	0.024
86-73-7	Fluorene	5.0 U		5.0	0.012
118-74-1	Hexachlorobenzene	5.0 U		5.0	0.011
87-68-3	Hexachlorobutadiene	5.0 U		5.0	0.019
77-47-4	Hexachlorocyclopentadiene	5.0 U	UJ,I	5.0	0.016
67-72-1	Hexachloroethane	5.0 U		5.0	0.023
193-39-5	Indeno (1,2,3-cd) Pyrene	5.0 U		5.0	0.033
78-59-1	Isophorone	5.0 U		5.0	0.017
91-20-3	Naphthalene	5.0 U		5.0	0.006
98-95-3	Nitrobenzene	5.0 U		5.0	0.012

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 11:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3510C
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**EQB6**	QC Batch:	90165 -116
Sample #:	**346015**	Anal. Batch:	209010
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	5.0 U	5.0	0.017
86-30-6	N-Nitroso-di-Phenylamine	5.0 U	5.0	0.019
87-86-5	Pentachlorophenol	10 U	10	0.075
85-01-8	Phenanthrene	5.0 U	5.0	0.016
108-95-2	Phenol	5.0 U	5.0	0.006
129-00-0	Pyrene	5.0 U	5.0	0.033

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 11:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**EQB6**	QC Batch:	90165 -116
Sample #:	**346015**	Anal. Batch:	209010
Matrix:	QC Water	Percent Solids:	n/a
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/L)**	**Qualifier**	
1-HEXACOSANOL	506-52-5	0.65	E	NJ,+
2,4,6-Triallyloxy-1,3,5-triazine	101-37-1	0.75	E	NJ,+
Erucylamide	112-84-5	6.94	E	NJ,+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 13:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SD3**	QC Batch:	90572 -114
Sample #:	**346017**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	68
Unit:	ug/kg dry	Dilution Factor:	1.5

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	250 U		250	3.69
95-94-3	1,2,4,5-Tetrachloro-benzene	250 U		250	43.1
108-60-1	Bis (2-Chloroisopropyl)-Ether	250 U		250	1.98
95-95-4	2,4,5-Trichlorophenol	250 U		250	5.01
88-06-2	2,4,6-Trichlorophenol	250 U		250	3.93
120-83-2	2,4-Dichlorophenol	250 U		250	5.28
105-67-9	2,4-Dimethylphenol	250 U		250	11.9
51-28-5	2,4-Dinitrophenol	480 U	UJ,C	480	4.80
121-14-2	2,4-Dinitrotoluene	250 U		250	4.73
606-20-2	2,6-Dinitrotoluene	250 U		250	41.6
91-58-7	2-Chloronaphthalene	250 U		250	3.45
95-57-8	2-Chlorophenol	250 U		250	3.02
91-57-6	**2-Methylnaphthalene**	**7.0 J**		250	4.11
95-48-7	2-Methylphenol	250 U		250	7.26
88-74-4	2-Nitroaniline	250 U		250	6.90
88-75-5	2-Nitrophenol	250 U		250	2.55
91-94-1	3,3'-Dichlorobenzidine	250 U		250	83.1
99-09-2	3-Nitroaniline	250 U		250	27.5
534-52-1	4,6-Dinitro-2-Methylphenol	250 U		250	6.77
101-55-3	4-Bromophenyl Phenylether	250 U		250	5.07
59-50-7	4-Chloro-3-Methylphenol	250 U		250	7.82
106-47-8	4-Chloroaniline	250 U		250	1.89
7005-72-3	4-Chlorophenylphenyl-Ether	250 U		250	4.91
106-44-5	4-Methylphenol	250 U		250	9.56
100-01-6	4-Nitroaniline	250 U		250	10.9
100-02-7	4-Nitrophenol	480 U		480	4.25
83-32-9	Acenaphthene	250 U		250	2.58
208-96-8	**Acenaphthylene**	**9.0 J**		250	2.25
98-86-2	Acetophenone	250 U		250	2.85

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 13:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SD3**	QC Batch:	90572 -114
Sample #:	**346017**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	68
Unit:	ug/kg dry	Dilution Factor:	1.5

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	**Anthracene**	**44 J**		250	6.93
1912-24-9	Atrazine	250 U		250	10.3
100-52-7	Benzaldehyde	250 U		250	6.08
56-55-3	**Benzo (a) Anthracene**	**86 J**		250	20.0
50-32-8	**Benzo (a) Pyrene**	**140 J**		250	8.57
205-99-2	**Benzo (b) Fluoranthene**	**190 J**		250	14.6
191-24-2	**Benzo (g,h,i,) Perylene**	**110 J**		250	13.1
207-08-9	**Benzo (k) Fluoranthene**	**92 J**		250	20.1
111-91-1	Bis (2-Chloroethoxy)-Methane	250 U		250	4.71
111-44-4	Bis (2-Chloroethyl) Ether	250 U		250	2.60
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**41 J**		250	3.11
85-68-7	Butyl Benzyl Phthalate	250 U		250	6.72
105-60-2	Caprolactam	480 U		480	9.57
86-74-8	Carbazole	250 U		250	9.15
218-01-9	**Chrysene**	**220 J**		250	15.3
53-70-3	**Dibenzo (a,h) Anthracene**	**42 J**		250	8.85
132-64-9	Dibenzofuran	250 U		250	4.74
84-66-2	**Diethylphthalate**	**18 J**		250	2.85
131-11-3	**Dimethylphthalate**	**1400**	J,f	250	4.97
84-74-2	**Di-n-Butylphthalate**	**130 J**		250	5.73
117-84-0	Di-n-Octylphthalate	250 U		250	4.65
206-44-0	**Fluoranthene**	**34 J**		250	3.53
86-73-7	**Fluorene**	**4.0 J**		250	2.52
118-74-1	Hexachlorobenzene	250 U		250	3.77
87-68-3	Hexachlorobutadiene	250 U		250	5.81
77-47-4	Hexachlorocyclopentadiene	250 U	UJ,c	250	2.97
67-72-1	Hexachloroethane	250 U		250	3.50
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**100 J**		250	5.88
78-59-1	Isophorone	250 U		250	2.60
91-20-3	**Naphthalene**	**5.0 J**		250	4.13
98-95-3	Nitrobenzene	250 U		250	4.80

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 13:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SD3**	QC Batch:	90572 -114
Sample #:	**346017**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	68
Unit:	ug/kg dry	Dilution Factor:	1.5

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	250 U	250	4.94
86-30-6	N-Nitroso-di-Phenylamine	250 U	250	7.13
87-86-5	Pentachlorophenol	480 U	480	6.59
85-01-8	**Phenanthrene**	**29 J**	250	3.45
108-95-2	Phenol	250 U	250	5.94
129-00-0	**Pyrene**	**37 J**	250	2.22

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 13:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SD3**	QC Batch:	90572 -114
Sample #:	**346017**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	68
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	300	E	NJ,+
Benzeneamine, 2-nitro-N-phenyl-	119-75-5	350	E	NJ,+
Erucylamide	112-84-5	400	E	NJ,+
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~150~~	~~E~~	
Perylene	198-55-0	170	E	NJ,+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**SDD1**	QC Batch:	90572 -114
Sample #:	**346018**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	63
Unit:	ug/kg dry	Dilution Factor:	1.6

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	270 U		270	3.94
95-94-3	1,2,4,5-Tetrachloro-benzene	270 U		270	45.9
108-60-1	Bis (2-Chloroisopropyl)-Ether	270 U		270	2.11
95-95-4	2,4,5-Trichlorophenol	270 U		270	5.34
88-06-2	2,4,6-Trichlorophenol	270 U		270	4.19
120-83-2	2,4-Dichlorophenol	270 U		270	5.63
105-67-9	2,4-Dimethylphenol	270 U		270	12.7
51-28-5	2,4-Dinitrophenol	520 U	UJ,C	520	5.12
121-14-2	2,4-Dinitrotoluene	270 U		270	5.04
606-20-2	2,6-Dinitrotoluene	270 U		270	44.3
91-58-7	2-Chloronaphthalene	270 U		270	3.68
95-57-8	2-Chlorophenol	270 U		270	3.22
91-57-6	2-Methylnaphthalene	270 U		270	4.38
95-48-7	2-Methylphenol	270 U		270	7.74
88-74-4	2-Nitroaniline	270 U		270	7.36
88-75-5	2-Nitrophenol	270 U		270	2.72
91-94-1	3,3'-Dichlorobenzidine	270 U		270	88.6
99-09-2	3-Nitroaniline	270 U		270	29.3
534-52-1	4,6-Dinitro-2-Methylphenol	270 U		270	7.22
101-55-3	4-Bromophenyl Phenylether	270 U		270	5.41
59-50-7	4-Chloro-3-Methylphenol	270 U		270	8.34
106-47-8	4-Chloroaniline	270 U		270	2.02
7005-72-3	4-Chlorophenylphenyl-Ether	270 U		270	5.23
106-44-5	4-Methylphenol	270 U		270	10.2
100-01-6	4-Nitroaniline	270 U		270	11.6
100-02-7	4-Nitrophenol	520 U		520	4.53
83-32-9	Acenaphthene	270 U		270	2.75
208-96-8	**Acenaphthylene**	**3.0 J**		270	2.40
98-86-2	Acetophenone	270 U		270	3.04

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 00:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/02/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**SDD1**	QC Batch:	90572 -114
Sample #:	**346018**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	63
Unit:	ug/kg dry	Dilution Factor:	1.6

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	**Anthracene**	**12 J**		270	7.39
1912-24-9	Atrazine	270 U		270	11.0
100-52-7	Benzaldehyde	270 U		270	6.48
56-55-3	**Benzo (a) Anthracene**	**30 J**		270	21.3
50-32-8	**Benzo (a) Pyrene**	**53 J**		270	9.14
205-99-2	**Benzo (b) Fluoranthene**	**86 J**		270	15.6
191-24-2	**Benzo (g,h,i,) Perylene**	**27 J**		270	14.0
207-08-9	**Benzo (k) Fluoranthene**	**36 J**		270	21.4
111-91-1	Bis (2-Chloroethoxy)-Methane	270 U		270	5.02
111-44-4	Bis (2-Chloroethyl) Ether	270 U		270	2.77
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**35 J**		270	3.31
85-68-7	Butyl Benzyl Phthalate	270 U		270	7.17
105-60-2	Caprolactam	520 U		520	10.2
86-74-8	Carbazole	270 U		270	9.76
218-01-9	**Chrysene**	**64 J**		270	16.3
53-70-3	Dibenzo (a,h) Anthracene	270 U		270	9.44
132-64-9	Dibenzofuran	270 U		270	5.06
84-66-2	**Diethylphthalate**	**22 J**		270	3.04
131-11-3	Dimethylphthalate	270 U	UJ,f	270	5.30
84-74-2	**Di-n-Butylphthalate**	**110 J**		270	6.11
117-84-0	Di-n-Octylphthalate	270 U		270	4.96
206-44-0	**Fluoranthene**	**26 J**		270	3.76
86-73-7	Fluorene	270 U		270	2.69
118-74-1	Hexachlorobenzene	270 U		270	4.02
87-68-3	Hexachlorobutadiene	270 U		270	6.19
77-47-4	Hexachlorocyclopentadiene	270 U	UJ,c	270	3.17
67-72-1	Hexachloroethane	270 U		270	3.73
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**30 J**		270	6.27
78-59-1	Isophorone	270 U		270	2.77
91-20-3	Naphthalene	270 U		270	4.40
98-95-3	Nitrobenzene	270 U		270	5.12

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**SDD1**	QC Batch:	90572 -114
Sample #:	**346018**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	63
Unit:	ug/kg dry	Dilution Factor:	1.6

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	270 U	270	5.26
86-30-6	N-Nitroso-di-Phenylamine	270 U	270	7.60
87-86-5	Pentachlorophenol	520 U	520	7.02
85-01-8	**Phenanthrene**	**14 J**	270	3.68
108-95-2	Phenol	270 U	270	6.34
129-00-0	**Pyrene**	**23 J**	270	2.37

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/02/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**SDD1**	QC Batch:	90572 -114
Sample #:	**346018**	Anal. Batch:	208711
Matrix:	Soil	Percent Solids:	63
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	170	E	NJ,+
Benzeneamine, 2-nitro-N-phenyl-	119-75-5	60	E	NJ,+
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~680~~	~~E~~	~~4~~ 1/20/2004
Perylene	198-55-0	57	E	NJ,+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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Individual sample results relate only to the sample tested.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 14:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/03/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SD2**	QC Batch:	90572 -114
Sample #:	**346019**	Anal. Batch:	209010
Matrix:	Soil	Percent Solids:	65
Unit:	ug/kg dry	Dilution Factor:	1.5

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	260 U		260	3.69
95-94-3	1,2,4,5-Tetrachloro-benzene	260 U		260	43.1
108-60-1	Bis (2-Chloroisopropyl)-Ether	260 U		260	1.98
95-95-4	2,4,5-Trichlorophenol	260 U		260	5.01
88-06-2	2,4,6-Trichlorophenol	260 U		260	3.93
120-83-2	2,4-Dichlorophenol	260 U		260	5.28
105-67-9	2,4-Dimethylphenol	260 U		260	11.9
51-28-5	2,4-Dinitrophenol	510 U	UJ,C	510	4.80
121-14-2	2,4-Dinitrotoluene	260 U		260	4.73
606-20-2	2,6-Dinitrotoluene	260 U		260	41.6
91-58-7	2-Chloronaphthalene	260 U		260	3.45
95-57-8	2-Chlorophenol	260 U		260	3.02
91-57-6	**2-Methylnaphthalene**	**12 J**		260	4.11
95-48-7	2-Methylphenol	260 U		260	7.26
88-74-4	2-Nitroaniline	260 U		260	6.90
88-75-5	2-Nitrophenol	260 U		260	2.55
91-94-1	3,3'-Dichlorobenzidine	260 U		260	83.1
99-09-2	3-Nitroaniline	260 U		260	27.5
534-52-1	4,6-Dinitro-2-Methylphenol	260 U		260	6.77
101-55-3	4-Bromophenyl Phenylether	260 U		260	5.07
59-50-7	4-Chloro-3-Methylphenol	260 U		260	7.82
106-47-8	4-Chloroaniline	260 U	UJ,M	260	1.89
7005-72-3	4-Chlorophenylphenyl-Ether	260 U		260	4.91
106-44-5	4-Methylphenol	260 U		260	9.56
100-01-6	4-Nitroaniline	260 U		260	10.9
100-02-7	4-Nitrophenol	510 U		510	4.25
83-32-9	**Acenaphthene**	**5.0 J**		260	2.58
208-96-8	Acenaphthylene	260 U		260	2.25
98-86-2	Acetophenone	260 U		260	2.85

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 14:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/03/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SD2**	QC Batch:	90572 -114
Sample #:	**346019**	Anal. Batch:	209010
Matrix:	Soil	Percent Solids:	65
Unit:	ug/kg dry	Dilution Factor:	1.5

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	260 U	UJ,M	260	6.93
1912-24-9	Atrazine	260 U		260	10.3
100-52-7	Benzaldehyde	260 U		260	6.08
56-55-3	**Benzo (a) Anthracene**	**33 J**		260	20.0
50-32-8	**Benzo (a) Pyrene**	**42 J**		260	8.57
205-99-2	**Benzo (b) Fluoranthene**	**64 J**		260	14.6
191-24-2	**Benzo (g,h,i,) Perylene**	**35 J**		260	13.1
207-08-9	**Benzo (k) Fluoranthene**	**27 J**		260	20.1
111-91-1	Bis (2-Chloroethoxy)-Methane	260 U		260	4.71
111-44-4	Bis (2-Chloroethyl) Ether	260 U		260	2.60
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**28 J**	J,M	260	3.11
85-68-7	Butyl Benzyl Phthalate	260 U		260	6.72
105-60-2	Caprolactam	510 U		510	9.57
86-74-8	Carbazole	260 U	UJ,C	260	9.15
218-01-9	**Chrysene**	**37 J**		260	15.3
53-70-3	**Dibenzo (a,h) Anthracene**	**15 J**		260	8.85
132-64-9	Dibenzofuran	260 U		260	4.74
84-66-2	**Diethylphthalate**	**14 J**	J,d	260	2.85
131-11-3	Dimethylphthalate	260 U		260	4.97
84-74-2	**Di-n-Butylphthalate**	**69 J**		260	5.73
117-84-0	Di-n-Octylphthalate	260 U		260	4.65
206-44-0	**Fluoranthene**	**56 J**	J,M	260	3.53
86-73-7	**Fluorene**	**5.0 J**		260	2.52
118-74-1	Hexachlorobenzene	260 U		260	3.77
87-68-3	Hexachlorobutadiene	260 U		260	5.81
77-47-4	Hexachlorocyclopentadiene	260 U	UJ,M	260	2.97
67-72-1	Hexachloroethane	260 U		260	3.50
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**31 J**		260	5.88
78-59-1	Isophorone	260 U		260	2.60
91-20-3	Naphthalene	260 U		260	4.13
98-95-3	Nitrobenzene	260 U		260	4.80

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SD2**	QC Batch:	90572 -114
Sample #:	**346019**	Anal. Batch:	209010
Matrix:	Soil	Percent Solids:	65
Unit:	ug/kg dry	Dilution Factor:	1.5

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	260 U	260	4.94
86-30-6	N-Nitroso-di-Phenylamine	260 U	260	7.13
87-86-5	Pentachlorophenol	510 U	510	6.59
85-01-8	**Phenanthrene**	**34 J**	260	3.45
108-95-2	Phenol	260 U	260	5.94
129-00-0	**Pyrene**	**51 J**	260	2.22

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SD2**	QC Batch:	90572 -114
Sample #:	**346019**	Anal. Batch:	209010
Matrix:	Soil	Percent Solids:	65
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
(Z)-9-Octadecenamide	301-02-0	66	E	NJ,+
1,2-Benzenedicarboxylic acid, butyl 2-methylpropyl ester	17851-53-5	91	E	NJ,+
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~430~~	~~E~~	~~AS~~ 1/20/2004

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 13:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3510C
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SW3**	QC Batch:	90165 -116
Sample #:	**346020**	Anal. Batch:	209010
Matrix:	Surface Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	5.0 U		5.0	0.013
95-94-3	1,2,4,5-Tetrachloro-benzene	5.0 U		5.0	0.775
108-60-1	Bis (2-Chloroisopropyl)-Ether	5.0 U		5.0	0.014
95-95-4	2,4,5-Trichlorophenol	5.0 U		5.0	0.014
88-06-2	2,4,6-Trichlorophenol	5.0 U		5.0	0.015
120-83-2	2,4-Dichlorophenol	5.0 U		5.0	0.018
105-67-9	2,4-Dimethylphenol	5.0 U		5.0	0.198
51-28-5	2,4-Dinitrophenol	10 U	UJ,C	10	1.24
121-14-2	2,4-Dinitrotoluene	5.0 U		5.0	0.007
606-20-2	2,6-Dinitrotoluene	5.0 U		5.0	0.052
91-58-7	2-Chloronaphthalene	5.0 U		5.0	0.005
95-57-8	2-Chlorophenol	5.0 U		5.0	0.011
91-57-6	2-Methylnaphthalene	5.0 U		5.0	0.084
95-48-7	2-Methylphenol	5.0 U		5.0	0.007
88-74-4	2-Nitroaniline	5.0 U		5.0	0.010
88-75-5	2-Nitrophenol	5.0 U		5.0	0.011
91-94-1	3,3'-Dichlorobenzidine	5.0 U		5.0	0.058
99-09-2	3-Nitroaniline	5.0 U		5.0	0.032
534-52-1	4,6-Dinitro-2-Methylphenol	5.0 U		5.0	0.054
101-55-3	4-Bromophenyl Phenylether	5.0 U		5.0	0.019
59-50-7	4-Chloro-3-Methylphenol	5.0 U		5.0	0.018
106-47-8	4-Chloroaniline	5.0 U		5.0	0.011
7005-72-3	4-Chlorophenylphenyl-Ether	5.0 U		5.0	0.015
106-44-5	4-Methylphenol	5.0 U		5.0	0.014
100-01-6	4-Nitroaniline	5.0 U		5.0	0.070
100-02-7	4-Nitrophenol	10 U		10	0.134
83-32-9	Acenaphthene	5.0 U		5.0	0.008
208-96-8	Acenaphthylene	5.0 U		5.0	0.007
98-86-2	Acetophenone	5.0 U		5.0	0.011

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 13:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3510C
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SW3**	QC Batch:	90165 -116
Sample #:	**346020**	Anal. Batch:	209010
Matrix:	Surface Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	5.0 U		5.0	0.014
1912-24-9	Atrazine	5.0 U		5.0	0.018
100-52-7	Benzaldehyde	5.0 U		5.0	0.616
56-55-3	Benzo (a) Anthracene	5.0 U		5.0	0.022
50-32-8	Benzo (a) Pyrene	5.0 U		5.0	0.025
205-99-2	Benzo (b) Fluoranthene	5.0 U		5.0	0.019
191-24-2	Benzo (g,h,i,) Perylene	5.0 U		5.0	0.046
207-08-9	Benzo (k) Fluoranthene	5.0 U		5.0	0.064
111-91-1	Bis (2-Chloroethoxy)-Methane	5.0 U		5.0	0.013
111-44-4	Bis (2-Chloroethyl) Ether	5.0 U		5.0	0.012
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**0.31 J**	B,Z	5.0	0.149
85-68-7	**Butyl Benzyl Phthalate**	**0.11 J**	B,Z	5.0	0.015
105-60-2	Caprolactam	5.0 U	UJ,I	5.0	0.024
86-74-8	Carbazole	5.0 U	UJ,C	5.0	0.015
218-01-9	Chrysene	5.0 U		5.0	0.025
53-70-3	Dibenzo (a,h) Anthracene	5.0 U		5.0	0.025
132-64-9	Dibenzofuran	5.0 U		5.0	0.014
84-66-2	Diethylphthalate	5.0 U		5.0	0.074
131-11-3	Dimethylphthalate	5.0 U		5.0	0.013
84-74-2	Di-n-Butylphthalate	5.0 U		5.0	1.60
117-84-0	Di-n-Octylphthalate	5.0 U		5.0	0.162
206-44-0	Fluoranthene	5.0 U		5.0	0.024
86-73-7	Fluorene	5.0 U		5.0	0.012
118-74-1	Hexachlorobenzene	5.0 U		5.0	0.011
87-68-3	Hexachlorobutadiene	5.0 U		5.0	0.019
77-47-4	Hexachlorocyclopentadiene	5.0 U	UJ,I	5.0	0.016
67-72-1	Hexachloroethane	5.0 U		5.0	0.023
193-39-5	Indeno (1,2,3-cd) Pyrene	5.0 U		5.0	0.033
78-59-1	Isophorone	5.0 U		5.0	0.017
91-20-3	Naphthalene	5.0 U		5.0	0.006
98-95-3	Nitrobenzene	5.0 U		5.0	0.012

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 13:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3510C
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SW3**	QC Batch:	90165 -116
Sample #:	**346020**	Anal. Batch:	209010
Matrix:	Surface Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	5.0 U	5.0	0.017
86-30-6	N-Nitroso-di-Phenylamine	5.0 U	5.0	0.019
87-86-5	Pentachlorophenol	10 U	10	0.075
85-01-8	Phenanthrene	5.0 U	5.0	0.016
108-95-2	Phenol	5.0 U	5.0	0.006
129-00-0	Pyrene	5.0 U	5.0	0.033

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 13:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SW3**	QC Batch:	90165 -116
Sample #:	**346020**	Anal. Batch:	209010
Matrix:	Surface Water	Percent Solids:	n/a
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/L)**	**Qualifier**	
(M) 1-Eicosanol	629-96-9	0.89	E	NJ,+
1,2-Benzenedicarboxylic acid, butyl 2-methylpropyl ester	17851-53-5	0.51	E	NJ,+
2,4,6-Triallyloxy-1,3,5-triazine	101-37-1	1.20	E	NJ,+
Docosane, 11-butyl-	13475-76-8	0.49	E	NJ,+
Erucylamide	112-84-5	9.63	E	NJ,+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3510C
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**SWD1**	QC Batch:	90165 -116
Sample #:	**346021**	Anal. Batch:	209010
Matrix:	Surface Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	5.0 U	5.0	0.013
95-94-3	1,2,4,5-Tetrachloro-benzene	5.0 U	5.0	0.775
108-60-1	Bis (2-Chloroisopropyl)-Ether	5.0 U	5.0	0.014
95-95-4	2,4,5-Trichlorophenol	5.0 U	5.0	0.014
88-06-2	2,4,6-Trichlorophenol	5.0 U	5.0	0.015
120-83-2	2,4-Dichlorophenol	5.0 U	5.0	0.018
105-67-9	2,4-Dimethylphenol	5.0 U	5.0	0.198
51-28-5	2,4-Dinitrophenol	10 U	UJ,c 10	1.24
121-14-2	2,4-Dinitrotoluene	5.0 U	5.0	0.007
606-20-2	2,6-Dinitrotoluene	5.0 U	5.0	0.052
91-58-7	2-Chloronaphthalene	5.0 U	5.0	0.005
95-57-8	2-Chlorophenol	5.0 U	5.0	0.011
91-57-6	2-Methylnaphthalene	5.0 U	5.0	0.084
95-48-7	2-Methylphenol	5.0 U	5.0	0.007
88-74-4	2-Nitroaniline	5.0 U	5.0	0.010
88-75-5	2-Nitrophenol	5.0 U	5.0	0.011
91-94-1	3,3'-Dichlorobenzidine	5.0 U	5.0	0.058
99-09-2	3-Nitroaniline	5.0 U	5.0	0.032
534-52-1	4,6-Dinitro-2-Methylphenol	5.0 U	5.0	0.054
101-55-3	4-Bromophenyl Phenylether	5.0 U	5.0	0.019
59-50-7	4-Chloro-3-Methylphenol	5.0 U	5.0	0.018
106-47-8	4-Chloroaniline	5.0 U	5.0	0.011
7005-72-3	4-Chlorophenylphenyl-Ether	5.0 U	5.0	0.015
106-44-5	4-Methylphenol	5.0 U	5.0	0.014
100-01-6	4-Nitroaniline	5.0 U	5.0	0.070
100-02-7	4-Nitrophenol	10 U	10	0.134
83-32-9	Acenaphthene	5.0 U	5.0	0.008
208-96-8	Acenaphthylene	5.0 U	5.0	0.007
98-86-2	Acetophenone	5.0 U	5.0	0.011

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 00:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3510C
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/03/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**SWD1**	QC Batch:	90165 -116
Sample #:	**346021**	Anal. Batch:	209010
Matrix:	Surface Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	5.0 U		5.0	0.014
1912-24-9	Atrazine	5.0 U		5.0	0.018
100-52-7	Benzaldehyde	5.0 U		5.0	0.616
56-55-3	Benzo (a) Anthracene	5.0 U		5.0	0.022
50-32-8	Benzo (a) Pyrene	5.0 U		5.0	0.025
205-99-2	Benzo (b) Fluoranthene	5.0 U		5.0	0.019
191-24-2	Benzo (g,h,i,) Perylene	5.0 U		5.0	0.046
207-08-9	Benzo (k) Fluoranthene	5.0 U		5.0	0.064
111-91-1	Bis (2-Chloroethoxy)-Methane	5.0 U		5.0	0.013
111-44-4	Bis (2-Chloroethyl) Ether	5.0 U		5.0	0.012
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**0.33 J**	B,Z	5.0	0.149
85-68-7	**Butyl Benzyl Phthalate**	**0.11 J**	B,Z	5.0	0.015
105-60-2	Caprolactam	5.0 U	UJ,I	5.0	0.024
86-74-8	Carbazole	5.0 U	UJ,C	5.0	0.015
218-01-9	Chrysene	5.0 U		5.0	0.025
53-70-3	Dibenzo (a,h) Anthracene	5.0 U		5.0	0.025
132-64-9	Dibenzofuran	5.0 U		5.0	0.014
84-66-2	Diethylphthalate	5.0 U		5.0	0.074
131-11-3	Dimethylphthalate	5.0 U		5.0	0.013
84-74-2	Di-n-Butylphthalate	5.0 U		5.0	1.60
117-84-0	Di-n-Octylphthalate	5.0 U		5.0	0.162
206-44-0	Fluoranthene	5.0 U		5.0	0.024
86-73-7	Fluorene	5.0 U		5.0	0.012
118-74-1	Hexachlorobenzene	5.0 U		5.0	0.011
87-68-3	Hexachlorobutadiene	5.0 U		5.0	0.019
77-47-4	Hexachlorocyclopentadiene	5.0 U	UJ,I	5.0	0.016
67-72-1	Hexachloroethane	5.0 U		5.0	0.023
193-39-5	Indeno (1,2,3-cd) Pyrene	5.0 U		5.0	0.033
78-59-1	Isophorone	5.0 U		5.0	0.017
91-20-3	Naphthalene	5.0 U		5.0	0.006
98-95-3	Nitrobenzene	5.0 U		5.0	0.012

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3510C
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**SWD1**	QC Batch:	90165 -116
Sample #:	**346021**	Anal. Batch:	209010
Matrix:	Surface Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	5.0 U	5.0	0.017
86-30-6	N-Nitroso-di-Phenylamine	5.0 U	5.0	0.019
87-86-5	Pentachlorophenol	10 U	10	0.075
85-01-8	Phenanthrene	5.0 U	5.0	0.016
108-95-2	Phenol	5.0 U	5.0	0.006
129-00-0	Pyrene	5.0 U	5.0	0.033

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**SWD1**	QC Batch:	90165 -116
Sample #:	**346021**	Anal. Batch:	209010
Matrix:	Surface Water	Percent Solids:	n/a
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/L)**	**Qualifier**	
(M) 1-Eicosanol	629-96-9	0.78	E	NJ,+
(Z)-9-Octadecenamide	301-02-0	10.37	E	NJ,+
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	0.52	E	NJ,+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 14:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3510C
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/03/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**13SW2**	QC Batch:	90165 -116
Sample #:	**346022**	Anal. Batch:	209010
Matrix:	Surface Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	5.0 U		5.0	0.013
95-94-3	1,2,4,5-Tetrachloro-benzene	5.0 U		5.0	0.775
108-60-1	Bis (2-Chloroisopropyl)-Ether	5.0 U		5.0	0.014
95-95-4	2,4,5-Trichlorophenol	5.0 U		5.0	0.014
88-06-2	2,4,6-Trichlorophenol	5.0 U		5.0	0.015
120-83-2	2,4-Dichlorophenol	5.0 U		5.0	0.018
105-67-9	2,4-Dimethylphenol	5.0 U	UJ,M	5.0	0.198
51-28-5	2,4-Dinitrophenol	10 U	UJ,C	10	1.24
121-14-2	2,4-Dinitrotoluene	5.0 U		5.0	0.007
606-20-2	2,6-Dinitrotoluene	5.0 U		5.0	0.052
91-58-7	2-Chloronaphthalene	5.0 U		5.0	0.005
95-57-8	2-Chlorophenol	5.0 U		5.0	0.011
91-57-6	2-Methylnaphthalene	5.0 U		5.0	0.084
95-48-7	2-Methylphenol	5.0 U		5.0	0.007
88-74-4	2-Nitroaniline	5.0 U		5.0	0.010
88-75-5	2-Nitrophenol	5.0 U		5.0	0.011
91-94-1	3,3'-Dichlorobenzidine	5.0 U		5.0	0.058
99-09-2	3-Nitroaniline	5.0 U		5.0	0.032
534-52-1	4,6-Dinitro-2-Methylphenol	5.0 U	UJ,M	5.0	0.054
101-55-3	4-Bromophenyl Phenylether	5.0 U		5.0	0.019
59-50-7	4-Chloro-3-Methylphenol	5.0 U		5.0	0.018
106-47-8	4-Chloroaniline	5.0 U		5.0	0.011
7005-72-3	4-Chlorophenylphenyl-Ether	5.0 U		5.0	0.015
106-44-5	4-Methylphenol	5.0 U		5.0	0.014
100-01-6	4-Nitroaniline	5.0 U		5.0	0.070
100-02-7	4-Nitrophenol	10 U	UJ,M	10	0.134
83-32-9	Acenaphthene	5.0 U		5.0	0.008
208-96-8	Acenaphthylene	5.0 U		5.0	0.007
98-86-2	Acetophenone	5.0 U		5.0	0.011

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3510C
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SW2**	QC Batch:	90165 -116
Sample #:	**346022**	Anal. Batch:	209010
Matrix:	Surface Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	5.0 U		5.0	0.014
1912-24-9	Atrazine	5.0 U		5.0	0.018
100-52-7	Benzaldehyde	5.0 U		5.0	0.616
56-55-3	Benzo (a) Anthracene	5.0 U		5.0	0.022
50-32-8	Benzo (a) Pyrene	5.0 U		5.0	0.025
205-99-2	Benzo (b) Fluoranthene	5.0 U		5.0	0.019
191-24-2	Benzo (g,h,i,) Perylene	5.0 U		5.0	0.046
207-08-9	Benzo (k) Fluoranthene	5.0 U		5.0	0.064
111-91-1	Bis (2-Chloroethoxy)-Methane	5.0 U		5.0	0.013
111-44-4	Bis (2-Chloroethyl) Ether	5.0 U		5.0	0.012
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**0.34 J**	B,Z	5.0	0.149
85-68-7	**Butyl Benzyl Phthalate**	**0.11 J**	B,Z	5.0	0.015
105-60-2	Caprolactam	5.0 U	UJ,I	5.0	0.024
86-74-8	Carbazole	5.0 U	UJ,C	5.0	0.015
218-01-9	Chrysene	5.0 U		5.0	0.025
53-70-3	Dibenzo (a,h) Anthracene	5.0 U		5.0	0.025
132-64-9	Dibenzofuran	5.0 U		5.0	0.014
84-66-2	**Diethylphthalate**	**0.11 J**	B,Z	5.0	0.074
131-11-3	Dimethylphthalate	5.0 U		5.0	0.013
84-74-2	Di-n-Butylphthalate	5.0 U		5.0	1.60
117-84-0	Di-n-Octylphthalate	5.0 U		5.0	0.162
206-44-0	Fluoranthene	5.0 U		5.0	0.024
86-73-7	Fluorene	5.0 U		5.0	0.012
118-74-1	Hexachlorobenzene	5.0 U		5.0	0.011
87-68-3	Hexachlorobutadiene	5.0 U		5.0	0.019
77-47-4	Hexachlorocyclopentadiene	5.0 U	UJ,I	5.0	0.016
67-72-1	Hexachloroethane	5.0 U		5.0	0.023
193-39-5	Indeno (1,2,3-cd) Pyrene	5.0 U		5.0	0.033
78-59-1	Isophorone	5.0 U		5.0	0.017
91-20-3	Naphthalene	5.0 U		5.0	0.006
98-95-3	Nitrobenzene	5.0 U		5.0	0.012

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3510C
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SW2**	QC Batch:	90165 -116
Sample #:	**346022**	Anal. Batch:	209010
Matrix:	Surface Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	5.0 U		5.0	0.017
86-30-6	N-Nitroso-di-Phenylamine	5.0 U		5.0	0.019
87-86-5	Pentachlorophenol	10 U	UJM	10	0.075
85-01-8	Phenanthrene	5.0 U		5.0	0.016
108-95-2	Phenol	5.0 U		5.0	0.006
129-00-0	Pyrene	5.0 U		5.0	0.033

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/16/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**13SW2**	QC Batch:	90165 -116
Sample #:	**346022**	Anal. Batch:	209010
Matrix:	Surface Water	Percent Solids:	n/a
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/L)**	**Qualifier**	
(M) 1-Eicosanol	629-96-9	0.91	E	NJ,+
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	0.84	E	NJ,+
1-Hexadecanol	36653-82-4	0.51	E	NJ,+
2,4,6-Triallyloxy-1,3,5-triazine	101-37-1	1.63	E	NJ,+
Eicosane	112-95-8	0.54	E	NJ,+
Erucylamide	112-84-5	20.79	E	NJ,+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 08:45
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB1A**	QC Batch:	89985 -118
Sample #:	**346248**	Anal. Batch:	209010
Matrix:	Soil	Percent Solids:	82
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	210 U		210	2.95
95-94-3	1,2,4,5-Tetrachloro-benzene	210 U		210	34.4
108-60-1	Bis (2-Chloroisopropyl)-Ether	210 U		210	1.58
95-95-4	2,4,5-Trichlorophenol	210 U		210	4.01
88-06-2	2,4,6-Trichlorophenol	210 U		210	3.14
120-83-2	2,4-Dichlorophenol	210 U		210	4.22
105-67-9	2,4-Dimethylphenol	210 U	UJ,I	210	9.53
51-28-5	2,4-Dinitrophenol	400 U	UJ,C	400	3.84
~~121-14-2~~	~~2,4-Dinitrotoluene~~	~~1200 E~~	~~J,V~~	~~210~~	~~3.78~~
606-20-2	**2,6-Dinitrotoluene**	**82 J**		210	33.2
91-58-7	2-Chloronaphthalene	210 U		210	2.76
95-57-8	2-Chlorophenol	210 U		210	2.41
91-57-6	2-Methylnaphthalene	210 U		210	3.29
95-48-7	2-Methylphenol	210 U		210	5.81
88-74-4	2-Nitroaniline	210 U		210	5.52
88-75-5	2-Nitrophenol	210 U		210	2.04
91-94-1	3,3'-Dichlorobenzidine	210 U		210	66.5
99-09-2	3-Nitroaniline	210 U		210	22.0
534-52-1	4,6-Dinitro-2-Methylphenol	210 U		210	5.41
101-55-3	4-Bromophenyl Phenylether	210 U		210	4.06
59-50-7	4-Chloro-3-Methylphenol	210 U		210	6.25
106-47-8	4-Chloroaniline	210 U	UJ,I	210	1.51
7005-72-3	4-Chlorophenylphenyl-Ether	210 U		210	3.92
106-44-5	4-Methylphenol	210 U		210	7.64
100-01-6	4-Nitroaniline	210 U		210	8.70
100-02-7	4-Nitrophenol	400 U		400	3.40
83-32-9	Acenaphthene	210 U		210	2.06
208-96-8	Acenaphthylene	210 U		210	1.80
98-86-2	Acetophenone	210 U		210	2.28

~~121-14-2~~ ~~2,4-Dinitrotoluene~~ ~~1200 E~~ ~~J,V~~ ~~210~~ ~~3.78~~ *R, 1/20/2004

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 08:45
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB1A**	QC Batch:	89985 -118
Sample #:	**346248**	Anal. Batch:	209010
Matrix:	Soil	Percent Solids:	82
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	210 U		210	5.54
1912-24-9	Atrazine	210 U		210	8.26
100-52-7	Benzaldehyde	210 U		210	4.86
56-55-3	Benzo (a) Anthracene	210 U		210	16.0
50-32-8	**Benzo (a) Pyrene**	**9.0 J**		210	6.85
205-99-2	**Benzo (b) Fluoranthene**	**16 J**	J,1	210	11.7
191-24-2	Benzo (g,h,i,) Perylene	210 U		210	10.5
207-08-9	Benzo (k) Fluoranthene	210 U		210	16.1
111-91-1	Bis (2-Chloroethoxy)-Methane	210 U		210	3.77
111-44-4	Bis (2-Chloroethyl) Ether	210 U		210	2.08
~~117-81-7~~	~~**Bis (2-ethylhexyl)-Phthalate**~~	~~**1500 E**~~	J,q	~~210~~	~~2.48~~ KS 1/20/2004
85-68-7	Butyl Benzyl Phthalate	210 U		210	5.38
105-60-2	Caprolactam	400 U		400	7.66
86-74-8	Carbazole	210 U	UJ,c	210	7.32
218-01-9	**Chrysene**	**15 J**		210	12.2
53-70-3	Dibenzo (a,h) Anthracene	210 U		210	7.08
132-64-9	Dibenzofuran	210 U		210	3.79
84-66-2	**Diethylphthalate**	**14 J**		210	2.28
131-11-3	**Dimethylphthalate**	**210**		210	3.97
~~84-74-2~~	~~**Di-n-Butylphthalate**~~	~~**3900 E**~~	J,q	~~210~~	~~4.58~~ KS 1/20/2004
117-84-0	Di-n-Octylphthalate	210 U		210	3.72
206-44-0	**Fluoranthene**	**30 J**		210	2.82
86-73-7	Fluorene	210 U		210	2.02
118-74-1	Hexachlorobenzene	210 U		210	3.01
87-68-3	Hexachlorobutadiene	210 U		210	4.64
77-47-4	Hexachlorocyclopentadiene	210 U		210	2.38
67-72-1	Hexachloroethane	210 U		210	2.80
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**6.0 J**		210	4.70
78-59-1	Isophorone	210 U		210	2.08
91-20-3	Naphthalene	210 U		210	3.30
98-95-3	Nitrobenzene	210 U		210	3.84

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 08:45
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB1A**	QC Batch:	89985 -118
Sample #:	**346248**	Anal. Batch:	209010
Matrix:	Soil	Percent Solids:	82
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	210 U	210	3.95
~~86-30-6~~	~~**N-Nitroso-di-Phenylamine**~~	~~**1200 E**~~	210	~~5.70~~
87-86-5	Pentachlorophenol	400 U	400	5.27
85-01-8	**Phenanthrene**	**11 J**	210	2.76
108-95-2	Phenol	210 U	210	4.75
129-00-0	**Pyrene**	**26 J**	210	1.78

J, V

12/20/04

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 08:45
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB1A**	QC Batch:	89985 -118
Sample #:	**346248**	Anal. Batch:	209010
Matrix:	Soil	Percent Solids:	82
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
1,2-Benzenedicarboxylic acid, butyl 2-methylpropyl ester	17851-53-5	60	E	NJ,t
Benzeneamine, 2-nitro-N-phenyl-	119-75-5	140	E	NJ,t
Erucylamide	112-84-5	1500	E	B,X
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~130~~	~~E~~	AS 1/20/2004

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 08:45
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/04/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**ASB1A**	QC Batch:	89985 -118
Sample #:	**346248DL**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	82
Unit:	ug/kg dry	Dilution Factor:	6

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	1000 U		1000	14.8
95-94-3	1,2,4,5-Tetrachloro-benzene	1000 U		1000	172
108-60-1	Bis (2-Chloroisopropyl)-Ether	1000 U		1000	7.92
95-95-4	2,4,5-Trichlorophenol	1000 U		1000	20.0
88-06-2	2,4,6-Trichlorophenol	1000 U		1000	15.7
120-83-2	2,4-Dichlorophenol	1000 U		1000	21.1
105-67-9	2,4-Dimethylphenol	1000 U	UJ,I	1000	47.6
51-28-5	2,4-Dinitrophenol	2000 U	UJ,C	2000	19.2
121-14-2	√ **2,4-Dinitrotoluene**	**850 J**		1000	18.9
606-20-2	2,6-Dinitrotoluene	1000 U		1000	166
91-58-7	2-Chloronaphthalene	1000 U		1000	13.8
95-57-8	2-Chlorophenol	1000 U		1000	12.1
91-57-6	2-Methylnaphthalene	1000 U		1000	16.4
95-48-7	2-Methylphenol	1000 U		1000	29.0
88-74-4	2-Nitroaniline	1000 U		1000	27.6
88-75-5	2-Nitrophenol	1000 U		1000	10.2
91-94-1	3,3'-Dichlorobenzidine	1000 U		1000	332
99-09-2	3-Nitroaniline	1000 U	UJ,C	1000	110
534-52-1	4,6-Dinitro-2-Methylphenol	1000 U		1000	27.1
101-55-3	4-Bromophenyl Phenylether	1000 U		1000	20.3
59-50-7	4-Chloro-3-Methylphenol	1000 U		1000	31.3
106-47-8	4-Chloroaniline	1000 U	UJ,C	1000	7.56
7005-72-3	4-Chlorophenylphenyl-Ether	1000 U		1000	19.6
106-44-5	4-Methylphenol	1000 U		1000	38.2
100-01-6	4-Nitroaniline	1000 U		1000	43.5
100-02-7	4-Nitrophenol	2000 U	UJ,C	2000	17.0
83-32-9	Acenaphthene	1000 U		1000	10.3
208-96-8	Acenaphthylene	1000 U		1000	9.00
98-86-2	Acetophenone	1000 U		1000	11.4

Use only 2,4-DNT, see neat analysis - 1/20/2004

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 08:45
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/04/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**ASB1A**	QC Batch:	89985 -118
Sample #:	**346248DL**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	82
Unit:	ug/kg dry	Dilution Factor:	6

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
120-12-7	Anthracene	1000 U	1000	27.7
1912-24-9	Atrazine	1000 U	1000	41.3
100-52-7	Benzaldehyde	1000 U	1000	24.3
56-55-3	Benzo (a) Anthracene	1000 U	1000	79.8
50-32-8	Benzo (a) Pyrene	1000 U	1000	34.3
205-99-2	Benzo (b) Fluoranthene	1000 U	1000	58.6
191-24-2	Benzo (g,h,i,) Perylene	1000 U	1000	52.3
207-08-9	Benzo (k) Fluoranthene	1000 U	1000	80.4
111-91-1	Bis (2-Chloroethoxy)-Methane	1000 U	1000	18.8
111-44-4	Bis (2-Chloroethyl) Ether	1000 U	1000	10.4
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**1400**	1000	12.4
85-68-7	Butyl Benzyl Phthalate	1000 U	1000	26.9
105-60-2	Caprolactam	2000 U UJ,c	2000	38.3
86-74-8	Carbazole	1000 U UJ,c	1000	36.6
218-01-9	Chrysene	1000 U	1000	61.2
53-70-3	Dibenzo (a,h) Anthracene	1000 U	1000	35.4
132-64-9	Dibenzofuran	1000 U	1000	19.0
84-66-2	Diethylphthalate	1000 U	1000	11.4
131-11-3	**Dimethylphthalate**	**160 J**	1000	19.9
84-74-2	**Di-n-Butylphthalate**	**5100**	1000	22.9
117-84-0	Di-n-Octylphthalate	1000 U	1000	18.6
206-44-0	**Fluoranthene**	**30 J**	1000	14.1
86-73-7	Fluorene	1000 U	1000	10.1
118-74-1	Hexachlorobenzene	1000 U	1000	15.1
87-68-3	Hexachlorobutadiene	1000 U	1000	23.2
77-47-4	Hexachlorocyclopentadiene	1000 U	1000	11.9
67-72-1	Hexachloroethane	1000 U	1000	14.0
193-39-5	Indeno (1,2,3-cd) Pyrene	1000 U	1000	23.5
78-59-1	Isophorone	1000 U	1000	10.4
91-20-3	Naphthalene	1000 U	1000	16.5
98-95-3	Nitrobenzene	1000 U	1000	19.2

Use only bis(2ethylhexyl)phthalate and di-n-butylphthalate, see neat analysis - AS 1/20/2004

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 08:45
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/04/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB1A**	QC Batch:	89985 -118
Sample #:	**346248DL**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	82
Unit:	ug/kg dry	Dilution Factor:	6

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
~~621-64-7~~	~~N-Nitrosodi-n-Propylamine~~	~~1000 U~~	~~1000~~	~~19.7~~
86-30-6	**N-Nitroso-di-Phenylamine**	**1000**	1000	28.5
87-86-5	Pentachlorophenol	2000 U	2000	26.3
85-01-8	Phenanthrene	1000 U	1000	13.8
108-95-2	Phenol	1000 U	1000	23.8
~~129-00-0~~	**Pyrene**	**20 J**	1000	8.88

Use only n-nitroso-di-Phenylamine, see next analysis - ✱ 1/20/04

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 09:00
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/03/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**ASB1B**	QC Batch:	89985 -118
Sample #:	**346249**	Anal. Batch:	209010
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	220 U		220	3.20
95-94-3	1,2,4,5-Tetrachloro-benzene	220 U		220	37.3
108-60-1	Bis (2-Chloroisopropyl)-Ether	220 U		220	1.72
95-95-4	2,4,5-Trichlorophenol	220 U		220	4.34
88-06-2	2,4,6-Trichlorophenol	220 U		220	3.41
120-83-2	2,4-Dichlorophenol	220 U		220	4.58
105-67-9	2,4-Dimethylphenol	220 U	UJ,I	220	10.3
51-28-5	2,4-Dinitrophenol	420 U	UJ,C	420	4.16
121-14-2	2,4-Dinitrotoluene	220 U		220	4.10
606-20-2	2,6-Dinitrotoluene	220 U		220	36.0
91-58-7	2-Chloronaphthalene	220 U		220	2.99
95-57-8	2-Chlorophenol	220 U		220	2.61
91-57-6	2-Methylnaphthalene	220 U		220	3.56
95-48-7	2-Methylphenol	220 U		220	6.29
88-74-4	2-Nitroaniline	220 U		220	5.98
88-75-5	2-Nitrophenol	220 U		220	2.21
91-94-1	3,3'-Dichlorobenzidine	220 U		220	72.0
99-09-2	3-Nitroaniline	220 U		220	23.8
534-52-1	4,6-Dinitro-2-Methylphenol	220 U		220	5.86
101-55-3	4-Bromophenyl Phenylether	220 U		220	4.39
59-50-7	4-Chloro-3-Methylphenol	220 U		220	6.77
106-47-8	4-Chloroaniline	220 U	UJ,I	220	1.64
7005-72-3	4-Chlorophenylphenyl-Ether	220 U		220	4.25
106-44-5	4-Methylphenol	220 U		220	8.28
100-01-6	4-Nitroaniline	220 U		220	9.43
100-02-7	4-Nitrophenol	420 U		420	3.68
83-32-9	Acenaphthene	220 U		220	2.24
208-96-8	Acenaphthylene	220 U		220	1.95
98-86-2	Acetophenone	220 U		220	2.47

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 09:00
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/03/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**ASB1B**	QC Batch:	89985 -118
Sample #:	**346249**	Anal. Batch:	209010
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	220 U		220	6.01
1912-24-9	Atrazine	220 U		220	8.94
100-52-7	Benzaldehyde	220 U		220	5.27
56-55-3	Benzo (a) Anthracene	220 U		220	17.3
50-32-8	Benzo (a) Pyrene	220 U		220	7.42
205-99-2	Benzo (b) Fluoranthene	220 U		220	12.7
191-24-2	Benzo (g,h,i,) Perylene	220 U		220	11.3
207-08-9	Benzo (k) Fluoranthene	220 U		220	17.4
111-91-1	Bis (2-Chloroethoxy)-Methane	220 U		220	4.08
111-44-4	Bis (2-Chloroethyl) Ether	220 U		220	2.25
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**22 J**		220	2.69
85-68-7	Butyl Benzyl Phthalate	220 U		220	5.82
105-60-2	Caprolactam	420 U		420	8.29
86-74-8	Carbazole	220 U	VJ, C	220	7.93
218-01-9	Chrysene	220 U		220	13.3
53-70-3	Dibenzo (a,h) Anthracene	220 U		220	7.67
132-64-9	Dibenzofuran	220 U		220	4.11
84-66-2	**Diethylphthalate**	**8.0 J**		220	2.47
131-11-3	Dimethylphthalate	220 U		220	4.30
84-74-2	**Di-n-Butylphthalate**	**93 J**		220	4.97
117-84-0	Di-n-Octylphthalate	220 U		220	4.03
206-44-0	Fluoranthene	220 U		220	3.06
86-73-7	Fluorene	220 U		220	2.18
118-74-1	Hexachlorobenzene	220 U		220	3.26
87-68-3	Hexachlorobutadiene	220 U		220	5.03
77-47-4	Hexachlorocyclopentadiene	220 U		220	2.57
67-72-1	Hexachloroethane	220 U		220	3.03
193-39-5	Indeno (1,2,3-cd) Pyrene	220 U		220	5.10
78-59-1	Isophorone	220 U		220	2.25
91-20-3	Naphthalene	220 U		220	3.58
98-95-3	Nitrobenzene	220 U		220	4.16

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 09:00
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB1B**	QC Batch:	89985 -118
Sample #:	**346249**	Anal. Batch:	209010
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	220 U	220	4.28
86-30-6	N-Nitroso-di-Phenylamine	220 U	220	6.18
87-86-5	Pentachlorophenol	420 U	420	5.71
85-01-8	Phenanthrene	220 U	220	2.99
108-95-2	Phenol	220 U	220	5.15
129-00-0	Pyrene	220 U	220	1.92

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 09:00
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB1B**	QC Batch:	89985 -118
Sample #:	**346249**	Anal. Batch:	209010
Matrix:	Soil	Percent Solids:	78
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
(Z)-9-Octadecenamide	301-02-0	1600	E	NJ,+
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	110	E	B,X
2-Ethyl-1-Hexanol	104-76-7	33	E	NJ,+
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~77~~	~~E~~	~~NJ,+~~ 1/20/2004
Phosphonic acid, dioctadecyl ester	19047-85-9	24	E	NJ,+

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 09:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB1C**	QC Batch:	89985 -118
Sample #:	**346250**	Anal. Batch:	209010
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	220 U		220	3.20
95-94-3	1,2,4,5-Tetrachloro-benzene	220 U		220	37.3
108-60-1	Bis (2-Chloroisopropyl)-Ether	220 U		220	1.72
95-95-4	2,4,5-Trichlorophenol	220 U		220	4.34
88-06-2	2,4,6-Trichlorophenol	220 U		220	3.41
120-83-2	2,4-Dichlorophenol	220 U		220	4.58
105-67-9	2,4-Dimethylphenol	220 U	UJ,1	220	10.3
51-28-5	2,4-Dinitrophenol	430 U	UJ,c	430	4.16
121-14-2	2,4-Dinitrotoluene	220 U		220	4.10
606-20-2	2,6-Dinitrotoluene	220 U		220	36.0
91-58-7	2-Chloronaphthalene	220 U		220	2.99
95-57-8	2-Chlorophenol	220 U		220	2.61
91-57-6	2-Methylnaphthalene	220 U		220	3.56
95-48-7	2-Methylphenol	220 U		220	6.29
88-74-4	2-Nitroaniline	220 U		220	5.98
88-75-5	2-Nitrophenol	220 U		220	2.21
91-94-1	3,3'-Dichlorobenzidine	220 U		220	72.0
99-09-2	3-Nitroaniline	220 U		220	23.8
534-52-1	4,6-Dinitro-2-Methylphenol	220 U		220	5.86
101-55-3	4-Bromophenyl Phenylether	220 U		220	4.39
59-50-7	4-Chloro-3-Methylphenol	220 U		220	6.77
106-47-8	4-Chloroaniline	220 U	UJ,1	220	1.64
7005-72-3	4-Chlorophenylphenyl-Ether	220 U		220	4.25
106-44-5	4-Methylphenol	220 U		220	8.28
100-01-6	4-Nitroaniline	220 U		220	9.43
100-02-7	4-Nitrophenol	430 U		430	3.68
83-32-9	Acenaphthene	220 U		220	2.24
208-96-8	Acenaphthylene	220 U		220	1.95
98-86-2	Acetophenone	220 U		220	2.47

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 09:15
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/03/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**ASB1C**	QC Batch:	89985 -118
Sample #:	**346250**	Anal. Batch:	209010
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	220 U		220	6.01
1912-24-9	Atrazine	220 U		220	8.94
100-52-7	Benzaldehyde	220 U		220	5.27
56-55-3	Benzo (a) Anthracene	220 U		220	17.3
50-32-8	Benzo (a) Pyrene	220 U		220	7.42
205-99-2	Benzo (b) Fluoranthene	220 U		220	12.7
191-24-2	Benzo (g,h,i,) Perylene	220 U		220	11.3
207-08-9	Benzo (k) Fluoranthene	220 U		220	17.4
111-91-1	Bis (2-Chloroethoxy)-Methane	220 U		220	4.08
111-44-4	Bis (2-Chloroethyl) Ether	220 U		220	2.25
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**17 J**		220	2.69
85-68-7	Butyl Benzyl Phthalate	220 U		220	5.82
105-60-2	Caprolactam	430 U		430	8.29
86-74-8	Carbazole	220 U	UJ,c	220	7.93
218-01-9	Chrysene	220 U		220	13.3
53-70-3	Dibenzo (a,h) Anthracene	220 U		220	7.67
132-64-9	Dibenzofuran	220 U		220	4.11
84-66-2	**Diethylphthalate**	**10 J**		220	2.47
131-11-3	Dimethylphthalate	220 U		220	4.30
84-74-2	**Di-n-Butylphthalate**	**130 J**		220	4.97
117-84-0	Di-n-Octylphthalate	220 U		220	4.03
206-44-0	Fluoranthene	220 U		220	3.06
86-73-7	Fluorene	220 U		220	2.18
118-74-1	Hexachlorobenzene	220 U		220	3.26
87-68-3	Hexachlorobutadiene	220 U		220	5.03
77-47-4	Hexachlorocyclopentadiene	220 U		220	2.57
67-72-1	Hexachloroethane	220 U		220	3.03
193-39-5	Indeno (1,2,3-cd) Pyrene	220 U		220	5.10
78-59-1	Isophorone	220 U		220	2.25
91-20-3	Naphthalene	220 U		220	3.58
98-95-3	Nitrobenzene	220 U		220	4.16

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 09:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB1C**	QC Batch:	89985 -118
Sample #:	**346250**	Anal. Batch:	209010
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	220 U	220	4.28
86-30-6	N-Nitroso-di-Phenylamine	220 U	220	6.18
87-86-5	Pentachlorophenol	430 U	430	5.71
85-01-8	Phenanthrene	220 U	220	2.99
108-95-2	Phenol	220 U	220	5.15
129-00-0	Pyrene	220 U	220	1.92

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 09:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/03/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB1C**	QC Batch:	89985 -118
Sample #:	**346250**	Anal. Batch:	209010
Matrix:	Soil	Percent Solids:	77
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	200	E	NJ,+
2(5H)-Furanone, 5,5-dimethyl-	20019-64-1	49	E	NJ,+
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~530~~	~~E~~	AS 1/20/2004

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:00
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/04/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB3A**	QC Batch:	89985 -118
Sample #:	**346251**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	210 U		210	2.95
95-94-3	1,2,4,5-Tetrachloro-benzene	210 U		210	34.4
108-60-1	Bis (2-Chloroisopropyl)-Ether	210 U		210	1.58
95-95-4	2,4,5-Trichlorophenol	210 U		210	4.01
88-06-2	2,4,6-Trichlorophenol	210 U		210	3.14
120-83-2	2,4-Dichlorophenol	210 U		210	4.22
105-67-9	2,4-Dimethylphenol	210 U	UJ,I	210	9.53
51-28-5	2,4-Dinitrophenol	410 U	UJ,C	410	3.84
~~121-14-2~~	~~2,4-Dinitrotoluene~~	~~32000 E~~	~~J,Q~~	~~210~~	~~3.78~~ KS 1/15/04
606-20-2	**2,6-Dinitrotoluene**	**3300 E**	J,Q	210	33.2
91-58-7	2-Chloronaphthalene	210 U		210	2.76
95-57-8	2-Chlorophenol	210 U		210	2.41
91-57-6	2-Methylnaphthalene	210 U		210	3.29
95-48-7	2-Methylphenol	210 U		210	5.81
88-74-4	2-Nitroaniline	210 U		210	5.52
88-75-5	2-Nitrophenol	210 U		210	2.04
91-94-1	3,3'-Dichlorobenzidine	210 U		210	66.5
99-09-2	3-Nitroaniline	210 U	UJ,C	210	22.0
534-52-1	4,6-Dinitro-2-Methylphenol	210 U		210	5.41
101-55-3	4-Bromophenyl Phenylether	210 U		210	4.06
59-50-7	4-Chloro-3-Methylphenol	210 U		210	6.25
106-47-8	4-Chloroaniline	210 U	UJ,C	210	1.51
7005-72-3	4-Chlorophenylphenyl-Ether	210 U		210	3.92
106-44-5	4-Methylphenol	210 U		210	7.64
100-01-6	4-Nitroaniline	210 U		210	8.70
100-02-7	4-Nitrophenol	410 U	UJ,C	410	3.40
83-32-9	Acenaphthene	210 U		210	2.06
208-96-8	Acenaphthylene	210 U		210	1.80
98-86-2	Acetophenone	210 U		210	2.28

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:00
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/04/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB3A**	QC Batch:	89985 -118
Sample #:	**346251**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	210 U		210	5.54
1912-24-9	Atrazine	210 U		210	8.26
100-52-7	Benzaldehyde	210 U		210	4.86
56-55-3	Benzo (a) Anthracene	210 U		210	16.0
50-32-8	***Benzo (a) Pyrene**	**10 JJ**	J,i	210	6.85
205-99-2	*Benzo (b) Fluoranthene	210 UJ	UJ,i	210	11.7
191-24-2	*Benzo (g,h,i,) Perylene	210 UJ	UJ,i	210	10.5
207-08-9	*Benzo (k) Fluoranthene	210 UJ	UJ,i	210	16.1
111-91-1	Bis (2-Chloroethoxy)-Methane	210 U		210	3.77
111-44-4	Bis (2-Chloroethyl) Ether	210 U		210	2.08
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**1200 E**	J,q	210	2.48
85-68-7	**Butyl Benzyl Phthalate**	**240**		210	5.38
105-60-2	Caprolactam	410 U	UJ,c	410	7.66
86-74-8	Carbazole	210 U	UJ,c	210	7.32
218-01-9	Chrysene	210 U		210	12.2
53-70-3	*Dibenzo (a,h) Anthracene	210 UJ	UJ,i	210	7.08
132-64-9	Dibenzofuran	210 U		210	3.79
84-66-2	**Diethylphthalate**	**14 J**		210	2.28
131-11-3	Dimethylphthalate	210 U		210	3.97
~~84-74-2~~	~~**Di-n-Butylphthalate**~~	~~**30000 E**~~	~~J,q~~	~~210~~	~~4.58~~
117-84-0	**Di-n-Octylphthalate**	**38 J**		210	3.72
206-44-0	**Fluoranthene**	**8.8 J**		210	2.82
86-73-7	Fluorene	210 U		210	2.02
118-74-1	Hexachlorobenzene	210 U		210	3.01
87-68-3	Hexachlorobutadiene	210 U		210	4.64
77-47-4	Hexachlorocyclopentadiene	210 U		210	2.38
67-72-1	Hexachloroethane	210 U		210	2.80
193-39-5	*Indeno (1,2,3-cd) Pyrene	210 UJ	UJ,i	210	4.70
78-59-1	Isophorone	210 U		210	2.08
91-20-3	Naphthalene	210 U		210	3.30
98-95-3	Nitrobenzene	210 U		210	3.84

~~R~~ 1/14/04

* See attached Statement of Data Qualifications.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:00
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/04/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB3A**	QC Batch:	89985 -118
Sample #:	**346251**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	210 U	210	3.95
~~86-30-6~~	~~**N-Nitroso-di-Phenylamine**~~	~~**3700 E**~~ J,Q	~~210~~	~~5.70~~ 11/15/04
87-86-5	Pentachlorophenol	410 U	410	5.27
85-01-8	**Phenanthrene**	**3.8 J**	210	2.76
108-95-2	Phenol	210 U	210	4.75
129-00-0	**Pyrene**	**6.7 J**	210	1.78

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:00
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/04/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB3A**	QC Batch:	89985 -118
Sample #:	**346251**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	80
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	170	E	NJ,t
1,2-Benzenedicarboxylic acid, butyl 2-ethylhexyl ester	85-69-8	560	E	NJ,t
Benzenamine, 4-nitro-N-phenyl-	836-30-6	310	E	NJ,t
Benzeneamine, 2-nitro-N-phenyl-	119-75-5	520	E	NJ,t

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:00
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/05/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**ASB3A**	QC Batch:	89985 -118
Sample #:	**346251DL**	Anal. Batch:	209001
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	310

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	53000 U		53000	763
95-94-3	1,2,4,5-Tetrachloro-benzene	53000 U		53000	8900
108-60-1	Bis (2-Chloroisopropyl)-Ether	53000 U		53000	409
95-95-4	2,4,5-Trichlorophenol	53000 U		53000	1040
88-06-2	2,4,6-Trichlorophenol	53000 U		53000	812
120-83-2	2,4-Dichlorophenol	53000 U		53000	1090
105-67-9	2,4-Dimethylphenol	53000 U	UJ,I	53000	2460
51-28-5	2,4-Dinitrophenol	100000 U		100000	992
121-14-2	✓**2,4-Dinitrotoluene**	**28000 J**		53000	977
606-20-2	2,6-Dinitrotoluene	53000 U		53000	8590
91-58-7	2-Chloronaphthalene	53000 U		53000	713
95-57-8	2-Chlorophenol	53000 U		53000	623
91-57-6	2-Methylnaphthalene	53000 U		53000	849
95-48-7	2-Methylphenol	53000 U		53000	1500
88-74-4	2-Nitroaniline	53000 U		53000	1430
88-75-5	2-Nitrophenol	53000 U		53000	527
91-94-1	3,3'-Dichlorobenzidine	53000 U		53000	17200
99-09-2	3-Nitroaniline	53000 U		53000	5670
534-52-1	4,6-Dinitro-2-Methylphenol	53000 U		53000	1400
101-55-3	4-Bromophenyl Phenylether	53000 U		53000	1050
59-50-7	4-Chloro-3-Methylphenol	53000 U		53000	1620
106-47-8	4-Chloroaniline	53000 U	UJ,I	53000	391
7005-72-3	4-Chlorophenylphenyl-Ether	53000 U		53000	1010
106-44-5	4-Methylphenol	53000 U		53000	1970
100-01-6	4-Nitroaniline	53000 U		53000	2250
100-02-7	4-Nitrophenol	100000 U		100000	877
83-32-9	Acenaphthene	53000 U		53000	533
208-96-8	Acenaphthylene	53000 U		53000	465
98-86-2	Acetophenone	53000 U		53000	589

Use only 2,4 DNT, see neat analysis ~~A~~ 1/19/04

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:00
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/05/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**ASB3A**	QC Batch:	89985 -118
Sample #:	**346251DL**	Anal. Batch:	209001
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	310

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	53000 U		53000	1430
1912-24-9	Atrazine	53000 U		53000	2130
100-52-7	Benzaldehyde	53000 U		53000	1260
56-55-3	Benzo (a) Anthracene	53000 U		53000	4120
50-32-8	Benzo (a) Pyrene	53000 U		53000	1770
205-99-2	Benzo (b) Fluoranthene	53000 U		53000	3030
191-24-2	Benzo (g,h,i,) Perylene	53000 U		53000	2700
207-08-9	Benzo (k) Fluoranthene	53000 U		53000	4150
111-91-1	Bis (2-Chloroethoxy)-Methane	53000 U		53000	973
111-44-4	Bis (2-Chloroethyl) Ether	53000 U		53000	536
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**1200 J**		53000	642
85-68-7	Butyl Benzyl Phthalate	53000 U		53000	1390
105-60-2	Caprolactam	100000 U	VJ,c	100000	1980
86-74-8	Carbazole	53000 U		53000	1890
218-01-9	Chrysene	53000 U		53000	3160
53-70-3	Dibenzo (a,h) Anthracene	53000 U		53000	1830
132-64-9	Dibenzofuran	53000 U		53000	980
84-66-2	**Diethylphthalate**	**1400 J**		53000	589
131-11-3	Dimethylphthalate	53000 U		53000	1030
84-74-2	√ **Di-n-Butylphthalate**	**130000**		53000	1180
117-84-0	Di-n-Octylphthalate	53000 U		53000	961
206-44-0	Fluoranthene	53000 U		53000	729
86-73-7	Fluorene	53000 U		53000	521
118-74-1	Hexachlorobenzene	53000 U		53000	778
87-68-3	Hexachlorobutadiene	53000 U		53000	1200
77-47-4	Hexachlorocyclopentadiene	53000 U		53000	614
67-72-1	Hexachloroethane	53000 U		53000	724
193-39-5	Indeno (1,2,3-cd) Pyrene	53000 U		53000	1220
78-59-1	Isophorone	53000 U		53000	536
91-20-3	Naphthalene	53000 U		53000	853
98-95-3	Nitrobenzene	53000 U		53000	992

Use only Di-n-butylphthalate, see neat analysis ✱5 1/19/04

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:00
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/05/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB3A**	QC Batch:	89985 -118
Sample #:	**346251DL**	Anal. Batch:	209001
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	310

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
~~621-64-7~~	~~N-Nitrosodi-n-Propylamine~~	~~53000 U~~	~~53000~~	~~1020~~
86-30-6	✓ **N-Nitroso-di-Phenylamine**	**4700 J**	53000	1470
87-86-5	Pentachlorophenol	100000 U	100000	~~1360~~
85-01-8	Phenanthrene	~~53000 U~~	53000	713
108-95-2	Phenol	53000 U	53000	1230
~~129-00-0~~	Pyrene	53000 U	53000	459

Use only n-nitroso-di-phenylamine, see neat run # 1/19/04

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/04/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB3B**	QC Batch:	89985 -118
Sample #:	**346252**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	210 U		210	2.95
95-94-3	1,2,4,5-Tetrachloro-benzene	210 U		210	34.4
108-60-1	Bis (2-Chloroisopropyl)-Ether	210 U		210	1.58
95-95-4	2,4,5-Trichlorophenol	210 U		210	4.01
88-06-2	2,4,6-Trichlorophenol	210 U		210	3.14
120-83-2	2,4-Dichlorophenol	210 U		210	4.22
105-67-9	2,4-Dimethylphenol	210 U	UJ,l	210	9.53
51-28-5	2,4-Dinitrophenol	410 U	UJ,c	410	3.84
121-14-2	**2,4-Dinitrotoluene**	**23 J**		210	3.78
606-20-2	2,6-Dinitrotoluene	210 U		210	33.2
91-58-7	2-Chloronaphthalene	210 U		210	2.76
95-57-8	2-Chlorophenol	210 U		210	2.41
91-57-6	2-Methylnaphthalene	210 U		210	3.29
95-48-7	2-Methylphenol	210 U		210	5.81
88-74-4	2-Nitroaniline	210 U		210	5.52
88-75-5	2-Nitrophenol	210 U		210	2.04
91-94-1	3,3'-Dichlorobenzidine	210 U		210	66.5
99-09-2	3-Nitroaniline	210 U	UJ,c	210	22.0
534-52-1	4,6-Dinitro-2-Methylphenol	210 U		210	5.41
101-55-3	4-Bromophenyl Phenylether	210 U		210	4.06
59-50-7	4-Chloro-3-Methylphenol	210 U		210	6.25
106-47-8	4-Chloroaniline	210 U	UJ,c	210	1.51
7005-72-3	4-Chlorophenylphenyl-Ether	210 U		210	3.92
106-44-5	4-Methylphenol	210 U		210	7.64
100-01-6	4-Nitroaniline	210 U		210	8.70
100-02-7	4-Nitrophenol	410 U	UJ,c	410	3.40
83-32-9	Acenaphthene	210 U		210	2.06
208-96-8	Acenaphthylene	210 U		210	1.80
98-86-2	Acetophenone	210 U		210	2.28

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:15
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/04/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**ASB3B**	QC Batch:	89985 -118
Sample #:	**346252**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	210 U		210	5.54
1912-24-9	Atrazine	210 U		210	8.26
100-52-7	Benzaldehyde	210 U		210	4.86
56-55-3	Benzo (a) Anthracene	210 U		210	16.0
50-32-8	Benzo (a) Pyrene	210 U		210	6.85
205-99-2	Benzo (b) Fluoranthene	210 U		210	11.7
191-24-2	Benzo (g,h,i,) Perylene	210 U		210	10.5
207-08-9	Benzo (k) Fluoranthene	210 U		210	16.1
111-91-1	Bis (2-Chloroethoxy)-Methane	210 U		210	3.77
111-44-4	Bis (2-Chloroethyl) Ether	210 U		210	2.08
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**20 J**		210	2.48
85-68-7	Butyl Benzyl Phthalate	210 U		210	5.38
105-60-2	Caprolactam	410 U	UJ,c	410	7.66
86-74-8	Carbazole	210 U	UJ,c	210	7.32
218-01-9	Chrysene	210 U		210	12.2
53-70-3	Dibenzo (a,h) Anthracene	210 U		210	7.08
132-64-9	Dibenzofuran	210 U		210	3.79
84-66-2	**Diethylphthalate**	**10 J**		210	2.28
131-11-3	Dimethylphthalate	210 U		210	3.97
84-74-2	**Di-n-Butylphthalate**	**320**		210	4.58
117-84-0	Di-n-Octylphthalate	210 U		210	3.72
206-44-0	Fluoranthene	210 U		210	2.82
86-73-7	Fluorene	210 U		210	2.02
118-74-1	Hexachlorobenzene	210 U		210	3.01
87-68-3	Hexachlorobutadiene	210 U		210	4.64
77-47-4	Hexachlorocyclopentadiene	210 U		210	2.38
67-72-1	Hexachloroethane	210 U		210	2.80
193-39-5	Indeno (1,2,3-cd) Pyrene	210 U		210	4.70
78-59-1	Isophorone	210 U		210	2.08
91-20-3	Naphthalene	210 U		210	3.30
98-95-3	Nitrobenzene	210 U		210	3.84

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/04/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB3B**	QC Batch:	89985 -118
Sample #:	**346252**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	210 U	210	3.95
86-30-6	**N-Nitroso-di-Phenylamine**	**8.0 J**	210	5.70
87-86-5	Pentachlorophenol	410 U	410	5.27
85-01-8	Phenanthrene	210 U	210	2.76
108-95-2	Phenol	210 U	210	4.75
129-00-0	Pyrene	210 U	210	1.78

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/04/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB3B**	QC Batch:	89985 -118
Sample #:	**346252**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	80
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
1,2-Benzenedicarboxylic acid, butyl 2-methylpropyl ester	17851-53-5	420	E	NJ,t
1-Dodecanol	112-53-8	47	E	NJ,t
1-Pentadecanol	629-76-5	40	E	NJ,t
2,4,6-Triallyloxy-1,3,5-triazine	101-37-1	94	E	B,X
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~370~~	~~E~~	~~1/20/2004~~

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:30
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/04/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**ASB3C**	QC Batch:	89985 -118
Sample #:	**346253**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	84
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	200 U		200	2.95
95-94-3	1,2,4,5-Tetrachloro-benzene	200 U		200	34.4
108-60-1	Bis (2-Chloroisopropyl)-Ether	200 U		200	1.58
95-95-4	2,4,5-Trichlorophenol	200 U		200	4.01
88-06-2	2,4,6-Trichlorophenol	200 U		200	3.14
120-83-2	2,4-Dichlorophenol	200 U		200	4.22
105-67-9	2,4-Dimethylphenol	200 U	UJ,I	200	9.53
51-28-5	2,4-Dinitrophenol	390 U	UJ,C	390	3.84
121-14-2	2,4-Dinitrotoluene	200 U		200	3.78
606-20-2	2,6-Dinitrotoluene	200 U		200	33.2
91-58-7	2-Chloronaphthalene	200 U		200	2.76
95-57-8	2-Chlorophenol	200 U		200	2.41
91-57-6	2-Methylnaphthalene	200 U		200	3.29
95-48-7	2-Methylphenol	200 U		200	5.81
88-74-4	2-Nitroaniline	200 U		200	5.52
88-75-5	2-Nitrophenol	200 U		200	2.04
91-94-1	3,3'-Dichlorobenzidine	200 U		200	66.5
99-09-2	3-Nitroaniline	200 U	UJ,C	200	22.0
534-52-1	4,6-Dinitro-2-Methylphenol	200 U		200	5.41
101-55-3	4-Bromophenyl Phenylether	200 U		200	4.06
59-50-7	4-Chloro-3-Methylphenol	200 U		200	6.25
106-47-8	4-Chloroaniline	200 U	UJ,C	200	1.51
7005-72-3	4-Chlorophenylphenyl-Ether	200 U		200	3.92
106-44-5	4-Methylphenol	200 U		200	7.64
100-01-6	4-Nitroaniline	200 U		200	8.70
100-02-7	4-Nitrophenol	390 U	UJ,C	390	3.40
83-32-9	Acenaphthene	200 U		200	2.06
208-96-8	Acenaphthylene	200 U		200	1.80
98-86-2	Acetophenone	200 U		200	2.28

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:30
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/04/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**ASB3C**	QC Batch:	89985 -118
Sample #:	**346253**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	84
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	200 U		200	5.54
1912-24-9	Atrazine	200 U		200	8.26
100-52-7	Benzaldehyde	200 U		200	4.86
56-55-3	Benzo (a) Anthracene	200 U		200	16.0
50-32-8	Benzo (a) Pyrene	200 U		200	6.85
205-99-2	Benzo (b) Fluoranthene	200 U		200	11.7
191-24-2	Benzo (g,h,i,) Perylene	200 U		200	10.5
207-08-9	Benzo (k) Fluoranthene	200 U		200	16.1
111-91-1	Bis (2-Chloroethoxy)-Methane	200 U		200	3.77
111-44-4	Bis (2-Chloroethyl) Ether	200 U		200	2.08
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**22 J**		200	2.48
85-68-7	Butyl Benzyl Phthalate	200 U		200	5.38
105-60-2	Caprolactam	390 U	UJ,C	390	7.66
86-74-8	Carbazole	200 U	UJ,C	200	7.32
218-01-9	Chrysene	200 U		200	12.2
53-70-3	Dibenzo (a,h) Anthracene	200 U		200	7.08
132-64-9	Dibenzofuran	200 U		200	3.79
84-66-2	**Diethylphthalate**	**8.0 J**		200	2.28
131-11-3	Dimethylphthalate	200 U		200	3.97
84-74-2	**Di-n-Butylphthalate**	**320**		200	4.58
117-84-0	Di-n-Octylphthalate	200 U		200	3.72
206-44-0	Fluoranthene	200 U		200	2.82
86-73-7	Fluorene	200 U		200	2.02
118-74-1	Hexachlorobenzene	200 U		200	3.01
87-68-3	Hexachlorobutadiene	200 U		200	4.64
77-47-4	Hexachlorocyclopentadiene	200 U		200	2.38
67-72-1	Hexachloroethane	200 U		200	2.80
193-39-5	Indeno (1,2,3-cd) Pyrene	200 U		200	4.70
78-59-1	Isophorone	200 U		200	2.08
91-20-3	Naphthalene	200 U		200	3.30
98-95-3	Nitrobenzene	200 U		200	3.84

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:30
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/04/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB3C**	QC Batch:	89985 -118
Sample #:	**346253**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	84
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	200 U	200	3.95
86-30-6	N-Nitroso-di-Phenylamine	200 U	200	5.70
87-86-5	Pentachlorophenol	390 U	390	5.27
85-01-8	Phenanthrene	200 U	200	2.76
108-95-2	Phenol	200 U	200	4.75
129-00-0	Pyrene	200 U	200	1.78

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:30
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/04/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB3C**	QC Batch:	89985 -118
Sample #:	**346253**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	84
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
1,2-Benzenedicarboxylic acid, butyl 2-methylpropyl ester	17851-53-5	340	E	NJ,+
2,4,6-Triallyloxy-1,3,5-triazine	101-37-1	65	E	B,X
2-Ethyl-1-Hexanol	104-76-7	30	E	NJ,+
Erucylamide	112-84-5	950	E	B,X
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~340~~	~~E~~	~~AB 1/20/2004~~

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/04/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB2A**	QC Batch:	89985 -118
Sample #:	**346254**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	210 U		210	2.95
95-94-3	1,2,4,5-Tetrachloro-benzene	210 U		210	34.4
108-60-1	Bis (2-Chloroisopropyl)-Ether	210 U		210	1.58
95-95-4	2,4,5-Trichlorophenol	210 U		210	4.01
88-06-2	2,4,6-Trichlorophenol	210 U		210	3.14
120-83-2	2,4-Dichlorophenol	210 U		210	4.22
105-67-9	2,4-Dimethylphenol	210 U	UJ,I	210	9.53
51-28-5	2,4-Dinitrophenol	410 U	UJ,C	410	3.84
121-14-2	**2,4-Dinitrotoluene**	**1000**		210	3.78
606-20-2	**2,6-Dinitrotoluene**	**100 J**		210	33.2
91-58-7	2-Chloronaphthalene	210 U		210	2.76
95-57-8	2-Chlorophenol	210 U		210	2.41
91-57-6	2-Methylnaphthalene	210 U		210	3.29
95-48-7	2-Methylphenol	210 U		210	5.81
88-74-4	2-Nitroaniline	210 U		210	5.52
88-75-5	2-Nitrophenol	210 U		210	2.04
91-94-1	3,3'-Dichlorobenzidine	210 U		210	66.5
99-09-2	3-Nitroaniline	210 U	UJ,C	210	22.0
534-52-1	4,6-Dinitro-2-Methylphenol	210 U		210	5.41
101-55-3	4-Bromophenyl Phenylether	210 U		210	4.06
59-50-7	4-Chloro-3-Methylphenol	210 U		210	6.25
106-47-8	4-Chloroaniline	210 U	UJ,C	210	1.51
7005-72-3	4-Chlorophenylphenyl-Ether	210 U		210	3.92
106-44-5	4-Methylphenol	210 U		210	7.64
100-01-6	4-Nitroaniline	210 U		210	8.70
100-02-7	4-Nitrophenol	410 U	UJ,C	410	3.40
83-32-9	Acenaphthene	210 U		210	2.06
208-96-8	Acenaphthylene	210 U		210	1.80
98-86-2	Acetophenone	210 U		210	2.28

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:15
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/04/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**ASB2A**	QC Batch:	89985 -118
Sample #:	**346254**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	210 U		210	5.54
1912-24-9	Atrazine	210 U		210	8.26
100-52-7	Benzaldehyde	210 U		210	4.86
56-55-3	Benzo (a) Anthracene	210 U		210	16.0
50-32-8	Benzo (a) Pyrene	210 U		210	6.85
205-99-2	Benzo (b) Fluoranthene	210 U		210	11.7
191-24-2	Benzo (g,h,i,) Perylene	210 U		210	10.5
207-08-9	Benzo (k) Fluoranthene	210 U		210	16.1
111-91-1	Bis (2-Chloroethoxy)-Methane	210 U		210	3.77
111-44-4	Bis (2-Chloroethyl) Ether	210 U		210	2.08
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**110 J**		210	2.48
85-68-7	Butyl Benzyl Phthalate	210 U		210	5.38
105-60-2	Caprolactam	410 U	UJ,C	410	7.66
86-74-8	Carbazole	210 U	UJ,C	210	7.32
218-01-9	Chrysene	210 U		210	12.2
53-70-3	Dibenzo (a,h) Anthracene	210 U		210	7.08
132-64-9	Dibenzofuran	210 U		210	3.79
84-66-2	**Diethylphthalate**	**10 J**		210	2.28
131-11-3	Dimethylphthalate	210 U		210	3.97
~~84-74-2~~	~~**Di-n-Butylphthalate**~~	~~**3000 E**~~	J,Q	210	~~4.58~~ dm 1/15/04
117-84-0	Di-n-Octylphthalate	210 U		210	3.72
206-44-0	**Fluoranthene**	**3.0 J**		210	2.82
86-73-7	Fluorene	210 U		210	2.02
118-74-1	Hexachlorobenzene	210 U		210	3.01
87-68-3	Hexachlorobutadiene	210 U		210	4.64
77-47-4	Hexachlorocyclopentadiene	210 U		210	2.38
67-72-1	Hexachloroethane	210 U		210	2.80
193-39-5	Indeno (1,2,3-cd) Pyrene	210 U		210	4.70
78-59-1	Isophorone	210 U		210	2.08
91-20-3	Naphthalene	210 U		210	3.30
98-95-3	Nitrobenzene	210 U		210	3.84

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/04/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB2A**	QC Batch:	89985 -118
Sample #:	**346254**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	210 U	210	3.95
86-30-6	**N-Nitroso-di-Phenylamine**	**120 J**	210	5.70
87-86-5	Pentachlorophenol	410 U	410	5.27
85-01-8	Phenanthrene	210 U	210	2.76
108-95-2	Phenol	210 U	210	4.75
129-00-0	**Pyrene**	**3.0 J**	210	1.78

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:15
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/04/03 JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**ASB2A**	QC Batch:	89985 -118
Sample #:	**346254**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	80
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
(Z)-9-Octadecenamide	301-02-0	190	E	NJ,t
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	490	E	NJ,t
Erucylamide	112-84-5	1100	E	B,x
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~680~~	~~E~~	~~1/20/2004~~

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:15
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/04/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**ASB2A**	QC Batch:	89985 -118
Sample #:	**346254DL**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	6.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	1100 U		1100	15.3
95-94-3	1,2,4,5-Tetrachloro-benzene	1100 U		1100	178
108-60-1	Bis (2-Chloroisopropyl)-Ether	1100 U		1100	8.18
95-95-4	2,4,5-Trichlorophenol	1100 U		1100	20.7
88-06-2	2,4,6-Trichlorophenol	1100 U		1100	16.2
120-83-2	2,4-Dichlorophenol	1100 U		1100	21.8
105-67-9	2,4-Dimethylphenol	1100 U	UJ,I	1100	49.2
51-28-5	2,4-Dinitrophenol	2100 U	UJ,C	2100	19.8
121-14-2	**2,4-Dinitrotoluene**	**710** J		1100	19.5
606-20-2	2,6-Dinitrotoluene	1100 U		1100	172
91-58-7	2-Chloronaphthalene	1100 U		1100	14.3
95-57-8	2-Chlorophenol	1100 U		1100	12.5
91-57-6	2-Methylnaphthalene	1100 U		1100	17.0
95-48-7	2-Methylphenol	1100 U		1100	30.0
88-74-4	2-Nitroaniline	1100 U		1100	28.5
88-75-5	2-Nitrophenol	1100 U		1100	10.5
91-94-1	3,3'-Dichlorobenzidine	1100 U		1100	343
99-09-2	3-Nitroaniline	1100 U	UJ,C	1100	113
534-52-1	4,6-Dinitro-2-Methylphenol	1100 U		1100	28.0
101-55-3	4-Bromophenyl Phenylether	1100 U		1100	21.0
59-50-7	4-Chloro-3-Methylphenol	1100 U		1100	32.3
106-47-8	4-Chloroaniline	1100 U	UJ,C	1100	7.81
7005-72-3	4-Chlorophenylphenyl-Ether	1100 U		1100	20.3
106-44-5	4-Methylphenol	1100 U		1100	39.5
100-01-6	4-Nitroaniline	1100 U		1100	45.0
100-02-7	4-Nitrophenol	2100 U	UJ,C	2100	17.5
83-32-9	Acenaphthene	1100 U		1100	10.7
208-96-8	Acenaphthylene	1100 U		1100	9.30
98-86-2	Acetophenone	1100 U		1100	11.8

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:15
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/04/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**ASB2A**	QC Batch:	89985 -118
Sample #:	**346254DL**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	6.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	1100 U		1100	28.6
1912-24-9	Atrazine	1100 U		1100	42.7
100-52-7	Benzaldehyde	1100 U		1100	25.1
56-55-3	Benzo (a) Anthracene	1100 U		1100	82.5
50-32-8	Benzo (a) Pyrene	1100 U		1100	35.4
205-99-2	Benzo (b) Fluoranthene	1100 U		1100	60.5
191-24-2	Benzo (g,h,i,) Perylene	1100 U		1100	54.1
207-08-9	Benzo (k) Fluoranthene	1100 U		1100	83.1
111-91-1	Bis (2-Chloroethoxy)-Methane	1100 U		1100	19.5
111-44-4	Bis (2-Chloroethyl) Ether	1100 U		1100	10.7
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**90 J**		1100	12.8
85-68-7	Butyl Benzyl Phthalate	1100 U		1100	27.8
105-60-2	Caprolactam	2100 U	UJ,C	2100	39.6
86-74-8	Carbazole	1100 U	UJ,C	1100	37.8
218-01-9	Chrysene	1100 U		1100	63.2
53-70-3	Dibenzo (a,h) Anthracene	1100 U		1100	36.6
132-64-9	Dibenzofuran	1100 U		1100	19.6
84-66-2	Diethylphthalate	1100 U		1100	11.8
131-11-3	Dimethylphthalate	1100 U		1100	20.5
84-74-2	√**Di-n-Butylphthalate**	**4300**		1100	23.7
117-84-0	Di-n-Octylphthalate	1100 U		1100	19.2
206-44-0	Fluoranthene	1100 U		1100	14.6
86-73-7	Fluorene	1100 U		1100	10.4
118-74-1	Hexachlorobenzene	1100 U		1100	15.6
87-68-3	Hexachlorobutadiene	1100 U		1100	24.0
77-47-4	Hexachlorocyclopentadiene	1100 U		1100	12.3
67-72-1	Hexachloroethane	1100 U		1100	14.5
193-39-5	Indeno (1,2,3-cd) Pyrene	1100 U		1100	24.3
78-59-1	Isophorone	1100 U		1100	10.7
91-20-3	Naphthalene	1100 U		1100	17.1
98-95-3	Nitrobenzene	1100 U		1100	19.8

Use only di-n-Butylphthalate, see neat analysis -AS 1/20/2004

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:15
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/04/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**ASB2A**	QC Batch:	89985 -118
Sample #:	**346254DL**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	6.2

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	1100 U	1100	20.4
86-30-6	**N-Nitroso-di-Phenylamine**	**80 J**	1100	29.5
87-86-5	Pentachlorophenol	2100 U	2100	27.2
85-01-8	Phenanthrene	1100 U	1100	14.3
108-95-2	Phenol	1100 U	1100	24.6
129-00-0	Pyrene	1100 U	1100	9.18

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:10
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/04/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**ASB2B**	QC Batch:	89985 -118
Sample #:	**346255**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	76
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	220 U		220	3.20
95-94-3	1,2,4,5-Tetrachloro-benzene	220 U		220	37.3
108-60-1	Bis (2-Chloroisopropyl)-Ether	220 U		220	1.72
95-95-4	2,4,5-Trichlorophenol	220 U		220	4.34
88-06-2	2,4,6-Trichlorophenol	220 U		220	3.41
120-83-2	2,4-Dichlorophenol	220 U		220	4.58
105-67-9	2,4-Dimethylphenol	220 U	UJ,l	220	10.3
51-28-5	2,4-Dinitrophenol	430 U	UJ,c	430	4.16
121-14-2	2,4-Dinitrotoluene	220 U		220	4.10
606-20-2	2,6-Dinitrotoluene	220 U		220	36.0
91-58-7	2-Chloronaphthalene	220 U		220	2.99
95-57-8	2-Chlorophenol	220 U		220	2.61
91-57-6	2-Methylnaphthalene	220 U		220	3.56
95-48-7	2-Methylphenol	220 U		220	6.29
88-74-4	2-Nitroaniline	220 U		220	5.98
88-75-5	2-Nitrophenol	220 U		220	2.21
91-94-1	3,3'-Dichlorobenzidine	220 U		220	72.0
99-09-2	3-Nitroaniline	220 U	UJ,c	220	23.8
534-52-1	4,6-Dinitro-2-Methylphenol	220 U		220	5.86
101-55-3	4-Bromophenyl Phenylether	220 U		220	4.39
59-50-7	4-Chloro-3-Methylphenol	220 U		220	6.77
106-47-8	4-Chloroaniline	220 U	UJ,c	220	1.64
7005-72-3	4-Chlorophenylphenyl-Ether	220 U		220	4.25
106-44-5	4-Methylphenol	220 U		220	8.28
100-01-6	4-Nitroaniline	220 U		220	9.43
100-02-7	4-Nitrophenol	430 U	UJ,c	430	3.68
83-32-9	Acenaphthene	220 U		220	2.24
208-96-8	Acenaphthylene	220 U		220	1.95
98-86-2	Acetophenone	220 U		220	2.47

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:10
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/04/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB2B**	QC Batch:	89985 -118
Sample #:	**346255**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	76
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	220 U		220	6.01
1912-24-9	Atrazine	220 U		220	8.94
100-52-7	Benzaldehyde	220 U		220	5.27
56-55-3	Benzo (a) Anthracene	220 U		220	17.3
50-32-8	Benzo (a) Pyrene	220 U		220	7.42
205-99-2	Benzo (b) Fluoranthene	220 U		220	12.7
191-24-2	Benzo (g,h,i,) Perylene	220 U		220	11.3
207-08-9	Benzo (k) Fluoranthene	220 U		220	17.4
111-91-1	Bis (2-Chloroethoxy)-Methane	220 U		220	4.08
111-44-4	Bis (2-Chloroethyl) Ether	220 U		220	2.25
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**22 J**		220	2.69
85-68-7	Butyl Benzyl Phthalate	220 U		220	5.82
105-60-2	Caprolactam	430 U	UJ,C	430	8.29
86-74-8	Carbazole	220 U	UJ,C	220	7.93
218-01-9	Chrysene	220 U		220	13.3
53-70-3	Dibenzo (a,h) Anthracene	220 U		220	7.67
132-64-9	Dibenzofuran	220 U		220	4.11
84-66-2	**Diethylphthalate**	**10 J**		220	2.47
131-11-3	Dimethylphthalate	220 U		220	4.30
84-74-2	**Di-n-Butylphthalate**	**590**		220	4.97
117-84-0	Di-n-Octylphthalate	220 U		220	4.03
206-44-0	Fluoranthene	220 U		220	3.06
86-73-7	Fluorene	220 U		220	2.18
118-74-1	Hexachlorobenzene	220 U		220	3.26
87-68-3	Hexachlorobutadiene	220 U		220	5.03
77-47-4	Hexachlorocyclopentadiene	220 U		220	2.57
67-72-1	Hexachloroethane	220 U		220	3.03
193-39-5	Indeno (1,2,3-cd) Pyrene	220 U		220	5.10
78-59-1	Isophorone	220 U		220	2.25
91-20-3	Naphthalene	220 U		220	3.58
98-95-3	Nitrobenzene	220 U		220	4.16

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:10
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/04/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB2B**	QC Batch:	89985 -118
Sample #:	**346255**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	76
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	220 U	220	4.28
86-30-6	N-Nitroso-di-Phenylamine	220 U	220	6.18
87-86-5	Pentachlorophenol	430 U	430	5.71
85-01-8	Phenanthrene	220 U	220	2.99
108-95-2	Phenol	220 U	220	5.15
129-00-0	Pyrene	220 U	220	1.92

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:10
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
Submittal #:	**36440-6**	Prepared:	10/18/03 by DJM
Submittal:	Delivery Order 0046 RAAP	Prep. Method:	
		Analyzed:	11/04/03 JMK1
Sample ID:	**ASB2B**	Anal. Method:	USEPA-8270C
Sample #:	**346255**	QC Batch:	89985 -118
Matrix:	Soil	Anal. Batch:	209009
		Percent Solids:	76
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
(Z)-9-Octadecenamide	301-02-0	230	E	NJ,+
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	510	E	NJ,+
2,4,6-Triallyloxy-1,3,5-triazine	101-37-1	87	E	B, X
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~1200~~	~~E~~	~~AS~~ 1/20/2004

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 00:00
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/04/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**SBD-10**	QC Batch:	89985 -118
Sample #:	**346256**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	72
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	220 U		220	3.20
95-94-3	1,2,4,5-Tetrachloro-benzene	220 U		220	37.3
108-60-1	Bis (2-Chloroisopropyl)-Ether	220 U		220	1.72
95-95-4	2,4,5-Trichlorophenol	220 U		220	4.34
88-06-2	2,4,6-Trichlorophenol	220 U		220	3.41
120-83-2	2,4-Dichlorophenol	220 U		220	4.58
105-67-9	2,4-Dimethylphenol	220 U	UJ,l	220	10.3
51-28-5	2,4-Dinitrophenol	430 U	UJ,c	430	4.16
121-14-2	2,4-Dinitrotoluene	220 U		220	4.10
606-20-2	2,6-Dinitrotoluene	220 U		220	36.0
91-58-7	2-Chloronaphthalene	220 U		220	2.99
95-57-8	2-Chlorophenol	220 U		220	2.61
91-57-6	2-Methylnaphthalene	220 U		220	3.56
95-48-7	2-Methylphenol	220 U		220	6.29
88-74-4	2-Nitroaniline	220 U		220	5.98
88-75-5	2-Nitrophenol	220 U		220	2.21
91-94-1	3,3'-Dichlorobenzidine	220 U		220	72.0
99-09-2	3-Nitroaniline	220 U	UJ,c	220	23.8
534-52-1	4,6-Dinitro-2-Methylphenol	220 U		220	5.86
101-55-3	4-Bromophenyl Phenylether	220 U		220	4.39
59-50-7	4-Chloro-3-Methylphenol	220 U		220	6.77
106-47-8	4-Chloroaniline	220 U	UJ,c	220	1.64
7005-72-3	4-Chlorophenylphenyl-Ether	220 U		220	4.25
106-44-5	4-Methylphenol	220 U		220	8.28
100-01-6	4-Nitroaniline	220 U		220	9.43
100-02-7	4-Nitrophenol	430 U	UJ,c	430	3.68
83-32-9	Acenaphthene	220 U		220	2.24
208-96-8	Acenaphthylene	220 U		220	1.95
98-86-2	Acetophenone	220 U		220	2.47

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 00:00
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
Submittal #:	**36440-6**	Prepared:	10/18/03 by DJM
Submittal:	Delivery Order 0046 RAAP	Prep. Method:	USEPA-3550B
		Analyzed:	11/04/03 by JMK1
Sample ID:	**SBD-10**	Anal. Method:	USEPA-8270C
Sample #:	**346256**	QC Batch:	89985 -118
Matrix:	Soil	Anal. Batch:	209009
Unit:	ug/kg dry	Percent Solids:	72
		Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	220 U		220	6.01
1912-24-9	Atrazine	220 U		220	8.94
100-52-7	Benzaldehyde	220 U		220	5.27
56-55-3	Benzo (a) Anthracene	220 U		220	17.3
50-32-8	Benzo (a) Pyrene	220 U		220	7.42
205-99-2	Benzo (b) Fluoranthene	220 U		220	12.7
191-24-2	Benzo (g,h,i,) Perylene	220 U		220	11.3
207-08-9	Benzo (k) Fluoranthene	220 U		220	17.4
111-91-1	Bis (2-Chloroethoxy)-Methane	220 U		220	4.08
111-44-4	Bis (2-Chloroethyl) Ether	220 U		220	2.25
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**16 J**		220	2.69
85-68-7	Butyl Benzyl Phthalate	220 U		220	5.82
105-60-2	Caprolactam	430 U	UJ,C	430	8.29
86-74-8	Carbazole	220 U	UJ,C	220	7.93
218-01-9	Chrysene	220 U		220	13.3
53-70-3	Dibenzo (a,h) Anthracene	220 U		220	7.67
132-64-9	Dibenzofuran	220 U		220	4.11
84-66-2	Diethylphthalate	220 U		220	2.47
131-11-3	Dimethylphthalate	220 U		220	4.30
84-74-2	**Di-n-Butylphthalate**	**640**		220	4.97
117-84-0	Di-n-Octylphthalate	220 U		220	4.03
206-44-0	Fluoranthene	220 U		220	3.06
86-73-7	Fluorene	220 U		220	2.18
118-74-1	Hexachlorobenzene	220 U		220	3.26
87-68-3	Hexachlorobutadiene	220 U		220	5.03
77-47-4	Hexachlorocyclopentadiene	220 U		220	2.57
67-72-1	Hexachloroethane	220 U		220	3.03
193-39-5	Indeno (1,2,3-cd) Pyrene	220 U		220	5.10
78-59-1	Isophorone	220 U		220	2.25
91-20-3	Naphthalene	220 U		220	3.58
98-95-3	Nitrobenzene	220 U		220	4.16

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ANALYTICAL REPORT

Client:	**URS Corporation**
Project:	Richmond, VA
	RAAP
Submittal #:	**36440-6**
Submittal:	Delivery Order 0046
	RAAP
Sample ID:	**SBD-10**
Sample #:	**346256**
Matrix:	Soil
Unit:	ug/kg dry

Sampled:	10/11/03 @ 00:00
Sampler:	B.F.& J.S.
Received:	10/14/03 @ 09:30
Prepared:	10/18/03 by DJM
Prep. Method:	USEPA-3550B
Analyzed:	11/04/03 by JMK1
Anal. Method:	USEPA-8270C
QC Batch:	89985 -118
Anal. Batch:	209009
Percent Solids:	72
Dilution Factor:	1.3

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	220 U	220	4.28
86-30-6	N-Nitroso-di-Phenylamine	220 U	220	6.18
87-86-5	Pentachlorophenol	430 U	430	5.71
85-01-8	Phenanthrene	220 U	220	2.99
108-95-2	Phenol	220 U	220	5.15
129-00-0	Pyrene	220 U	220	1.92

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	
Submittal:	Delivery Order 0046	Analyzed:	11/04/03 JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**SBD-10**	QC Batch:	89985 -118
Sample #:	**346256**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	72
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
(Z)-9-Octadecenamide	301-02-0	94	E	NJ,+
1,2-Benzenedicarboxylic acid, butyl 2-methylpropyl ester	17851-53-5	510	E	NJ,+
2,4,6-Triallyloxy-1,3,5-triazine	101-37-1	69	E	B,x
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~2000~~	~~E~~	~~AS~~ 1/20/2004

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 11:15
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/04/03 by JMK1
		Anal. Method:	USEPA-8270C
Sample ID:	**ASB2C**	QC Batch:	89985 -118
Sample #:	**346257**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	73
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
92-52-4	1,1'-Biphenyl	230 U		230	3.44
95-94-3	1,2,4,5-Tetrachloro-benzene	230 U		230	40.2
108-60-1	Bis (2-Chloroisopropyl)-Ether	230 U		230	1.85
95-95-4	2,4,5-Trichlorophenol	230 U		230	4.68
88-06-2	2,4,6-Trichlorophenol	230 U		230	3.67
120-83-2	2,4-Dichlorophenol	230 U		230	4.93
105-67-9	2,4-Dimethylphenol	230 U	UJ,I	230	11.1
51-28-5	2,4-Dinitrophenol	450 U	UJ,C	450	4.48
121-14-2	2,4-Dinitrotoluene	230 U		230	4.41
606-20-2	2,6-Dinitrotoluene	230 U		230	38.8
91-58-7	2-Chloronaphthalene	230 U		230	3.22
95-57-8	2-Chlorophenol	230 U		230	2.81
91-57-6	2-Methylnaphthalene	230 U		230	3.84
95-48-7	2-Methylphenol	230 U		230	6.78
88-74-4	2-Nitroaniline	230 U		230	6.44
88-75-5	2-Nitrophenol	230 U		230	2.38
91-94-1	3,3'-Dichlorobenzidine	230 U	UJ,M	230	77.6
99-09-2	3-Nitroaniline	230 U	UJ,C	230	25.6
534-52-1	4,6-Dinitro-2-Methylphenol	230 U		230	6.31
101-55-3	4-Bromophenyl Phenylether	230 U		230	4.73
59-50-7	4-Chloro-3-Methylphenol	230 U		230	7.29
106-47-8	4-Chloroaniline	230 U	UJ,C	230	1.76
7005-72-3	4-Chlorophenylphenyl-Ether	230 U		230	4.58
106-44-5	4-Methylphenol	230 U		230	8.92
100-01-6	4-Nitroaniline	230 U	UJ,M	230	10.2
100-02-7	4-Nitrophenol	450 U	UJ,C	450	3.96
83-32-9	Acenaphthene	230 U		230	2.41
208-96-8	Acenaphthylene	230 U		230	2.10
98-86-2	Acetophenone	230 U		230	2.66

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 11:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/04/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB2C**	QC Batch:	89985 -118
Sample #:	**346257**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	73
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result		Reporting Limit	MDL
120-12-7	Anthracene	230 U		230	6.47
1912-24-9	Atrazine	230 U		230	9.63
100-52-7	Benzaldehyde	230 U		230	5.67
56-55-3	Benzo (a) Anthracene	230 U		230	18.6
50-32-8	Benzo (a) Pyrene	230 U		230	7.99
205-99-2	Benzo (b) Fluoranthene	230 U		230	13.7
191-24-2	Benzo (g,h,i,) Perylene	230 U		230	12.2
207-08-9	Benzo (k) Fluoranthene	230 U		230	18.8
111-91-1	Bis (2-Chloroethoxy)-Methane	230 U		230	4.40
111-44-4	Bis (2-Chloroethyl) Ether	230 U		230	2.42
117-81-7	**Bis (2-ethylhexyl)-Phthalate**	**34 J**		230	2.90
85-68-7	**Butyl Benzyl Phthalate**	**9.0 J**		230	6.27
105-60-2	Caprolactam	450 U	UJ,C	450	8.93
86-74-8	Carbazole	230 U	UJ,C	230	8.54
218-01-9	Chrysene	230 U		230	14.3
53-70-3	Dibenzo (a,h) Anthracene	230 U		230	8.26
132-64-9	Dibenzofuran	230 U		230	4.42
84-66-2	**Diethylphthalate**	**8.0 J**		230	2.66
131-11-3	Dimethylphthalate	230 U		230	4.63
84-74-2	**Di-n-Butylphthalate**	**600**		230	5.35
117-84-0	Di-n-Octylphthalate	230 U		230	4.34
206-44-0	Fluoranthene	230 U		230	3.29
86-73-7	Fluorene	230 U		230	2.35
118-74-1	Hexachlorobenzene	230 U		230	3.51
87-68-3	Hexachlorobutadiene	230 U		230	5.42
77-47-4	Hexachlorocyclopentadiene	230 U	UJ,M	230	2.77
67-72-1	Hexachloroethane	230 U		230	3.27
193-39-5	Indeno (1,2,3-cd) Pyrene	230 U		230	5.49
78-59-1	Isophorone	230 U		230	2.42
91-20-3	Naphthalene	230 U		230	3.85
98-95-3	Nitrobenzene	230 U		230	4.48

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 11:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	11/04/03 by JMK1
	RAAP	Anal. Method:	USEPA-8270C
Sample ID:	**ASB2C**	QC Batch:	89985 -118
Sample #:	**346257**	Anal. Batch:	209009
Matrix:	Soil	Percent Solids:	73
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Semivolatile Organics OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
621-64-7	N-Nitrosodi-n-Propylamine	230 U	230	4.61
86-30-6	N-Nitroso-di-Phenylamine	230 U	230	6.65
87-86-5	Pentachlorophenol	450 U	450	6.15
85-01-8	Phenanthrene	230 U	230	3.22
108-95-2	Phenol	230 U	230	5.54
129-00-0	Pyrene	230 U	230	2.07

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 11:15
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
Submittal #:	**36440-6**	Prepared:	10/18/03 by DJM
Submittal:	Delivery Order 0046 RAAP	Prep. Method:	
		Analyzed:	11/04/03 JMK1
Sample ID:	**ASB2C**	Anal. Method:	USEPA-8270C
Sample #:	**346257**	QC Batch:	89985 -118
Matrix:	Soil	Anal. Batch:	209009
		Percent Solids:	73
		Dilution Factor:	1

Tentatively Identified Compound Scan USEPA Method 8270	**CAS Number**	**Result (ug/kg dr**	**Qualifier**	
1,2-Benzenedicarboxylic acid, bis(2-methylpropyl) ester	84-69-5	500	E	NJ, +
1-Heptadecanol	1454-85-9	260	E	NJ, +
Bis(2-ethylhexyl)maleate	142-16-5	76	E	NJ, +
~~Hydrocarbons, Total~~	~~XXXXXX~~	~~4300~~	~~E~~	AS 1/20/2004

Any tentatively identified compound listed above was detected in this sample in addition to those reported in the requested target list.

The compounds found that were also in the initial calibration standard were quantified using a response factor from the initial calibration. The results provided are not considered estimated and are flagged 'Q'.

Results quantified from the initial calibration, but estimated due to levels above the linear range of the calibration curve, are flagged 'CE'.

A forward library search was also performed to tentatively identify other analytes present in this sample. The results for any compound listed above that is not present in a calibration standard, has been calculated using total peak areas from reconstructed ion chromatograms and a response factor of 1. These results must be considered estimated and are flagged 'E'.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 09:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/27/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**EQB5**	QC Batch:	90710 -114
Sample #:	**346013**	Anal. Batch:	208739
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	1.2 U	1.2	0.0279
208-96-8	Acenaphthylene	1.2 U	1.2	0.0525
120-12-7	Anthracene	1.2 U	1.2	0.0024
56-55-3	Benzo (a) Anthracene	0.062 U	0.062	0.0026
50-32-8	Benzo (a) Pyrene	0.062 U	0.062	0.0069
205-99-2	Benzo (b) Fluoranthene	0.090 U	0.090	0.0138
191-24-2	Benzo (g,h,i,) Perylene	1.2 U	1.2	0.0539
207-08-9	Benzo (k) Fluoranthene	0.12 U	0.12	0.0043
218-01-9	Chrysene	1.2 U	1.2	0.0034
53-70-3	Dibenzo (a,h) Anthracene	0.24 U	0.24	0.0416
206-44-0	Fluoranthene	1.2 U	1.2	0.0074
86-73-7	Fluorene	1.2 U	1.2	0.0096
193-39-5	Indeno (1,2,3-cd) Pyrene	0.062 U	0.062	0.0050
91-20-3	Naphthalene	0.62 U	0.62	0.0422
85-01-8	Phenanthrene	1.2 U	1.2	0.0032
129-00-0	Pyrene	1.2 U	1.2	0.0194

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 11:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/27/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**EQB6**	QC Batch:	90710 -114
Sample #:	**346015**	Anal. Batch:	208739
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	1.2 U	1.2	0.0279
208-96-8	Acenaphthylene	1.2 U	1.2	0.0525
120-12-7	Anthracene	1.2 U	1.2	0.0024
56-55-3	Benzo (a) Anthracene	0.062 U	0.062	0.0026
50-32-8	Benzo (a) Pyrene	0.062 U	0.062	0.0069
205-99-2	Benzo (b) Fluoranthene	0.090 U	0.090	0.0138
191-24-2	Benzo (g,h,i,) Perylene	1.2 U	1.2	0.0539
207-08-9	Benzo (k) Fluoranthene	0.12 U	0.12	0.0043
218-01-9	Chrysene	1.2 U	1.2	0.0034
53-70-3	Dibenzo (a,h) Anthracene	0.24 U	0.24	0.0416
206-44-0	Fluoranthene	1.2 U	1.2	0.0074
86-73-7	Fluorene	1.2 U	1.2	0.0096
193-39-5	Indeno (1,2,3-cd) Pyrene	0.062 U	0.062	0.0050
91-20-3	Naphthalene	0.62 U	0.62	0.0422
85-01-8	Phenanthrene	1.2 U	1.2	0.0032
129-00-0	Pyrene	1.2 U	1.2	0.0194

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 13:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/24/03 by TAJ
		Anal. Method:	USEPA-8310
Sample ID:	**13SD3**	QC Batch:	91080 -118
Sample #:	**346017**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	68
Unit:	ug/kg dry	Dilution Factor:	1.5

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	150 U	150	14.1
208-96-8	Acenaphthylene	310 U	310	17.4
120-12-7	**Anthracene**	**9.4 J**	31	1.05
56-55-3	**Benzo (a) Anthracene**	**30 J**	31	1.20
50-32-8	**Benzo (a) Pyrene**	**49**	31	1.50
205-99-2	**Benzo (b) Fluoranthene**	**36**	31	1.95
191-24-2	**Benzo (g,h,i,) Perylene**	**88**	31	18.8
207-08-9	**Benzo (k) Fluoranthene**	**24 J**	31	1.50
218-01-9	**Chrysene**	**84**	31	1.80
53-70-3	**Dibenzo (a,h) Anthracene**	**6.2 J**	31	2.10
206-44-0	**Fluoranthene**	**19 J**	31	2.55
86-73-7	Fluorene	31 U	31	1.95
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**45**	31	1.05
91-20-3	Naphthalene	150 U	150	11.9
85-01-8	**Phenanthrene**	**5.2 J**	31	0.900
129-00-0	**Pyrene**	**14 J**	31	1.35

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**SDD1**	QC Batch:	91080 -118
Sample #:	**346018**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	63
Unit:	ug/kg dry	Dilution Factor:	1.6

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	160 U	160	15.0
208-96-8	Acenaphthylene	330 U	330	18.6
120-12-7	Anthracene	33 U	33	1.12
56-55-3	Benzo (a) Anthracene	33 U	33	1.28
50-32-8	Benzo (a) Pyrene	33 U	33	1.60
205-99-2	Benzo (b) Fluoranthene	33 U	33	2.08
191-24-2	Benzo (g,h,i,) Perylene	33 U	33	20.0
207-08-9	Benzo (k) Fluoranthene	33 U	33	1.60
218-01-9	**Chrysene**	**2.6 J**	33	1.92
53-70-3	Dibenzo (a,h) Anthracene	33 U	33	2.24
206-44-0	Fluoranthene	33 U	33	2.72
86-73-7	Fluorene	33 U	33	2.08
193-39-5	Indeno (1,2,3-cd) Pyrene	33 U	33	1.12
91-20-3	Naphthalene	160 U	160	12.6
85-01-8	Phenanthrene	33 U	33	0.960
129-00-0	Pyrene	33 U	33	1.44

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**13SD2**	QC Batch:	91080 -118
Sample #:	**346019**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	65
Unit:	ug/kg dry	Dilution Factor:	1.5

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	150 U	150	14.1
208-96-8	Acenaphthylene	320 U	320	17.4
120-12-7	**Anthracene**	**3.8 J**	32	1.05
56-55-3	**Benzo (a) Anthracene**	**21 J**	32	1.20
50-32-8	**Benzo (a) Pyrene**	**26 J**	32	1.50
205-99-2	**Benzo (b) Fluoranthene**	**23 J**	32	1.95
191-24-2	**Benzo (g,h,i,) Perylene**	**40**	32	18.8
207-08-9	**Benzo (k) Fluoranthene**	**12 J**	32	1.50
218-01-9	**Chrysene**	**19 J**	32	1.80
53-70-3	Dibenzo (a,h) Anthracene	32 U	32	2.10
206-44-0	**Fluoranthene**	**48**	32	2.55
86-73-7	Fluorene	32 U	32	1.95
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**18 J**	32	1.05
91-20-3	Naphthalene	150 U	150	11.9
85-01-8	**Phenanthrene**	**16 J**	32	0.900
129-00-0	**Pyrene**	**45**	32	1.35

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 13:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/27/03 by TAJ
		Anal. Method:	USEPA-8310
Sample ID:	**13SW3**	QC Batch:	90710 -114
Sample #:	**346020**	Anal. Batch:	208739
Matrix:	Surface Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	1.2 U	1.2	0.0279
208-96-8	Acenaphthylene	1.2 U	1.2	0.0525
120-12-7	Anthracene	1.2 U	1.2	0.0024
56-55-3	Benzo (a) Anthracene	0.062 U	0.062	0.0026
50-32-8	Benzo (a) Pyrene	0.062 U	0.062	0.0069
205-99-2	Benzo (b) Fluoranthene	0.090 U	0.090	0.0138
191-24-2	Benzo (g,h,i,) Perylene	1.2 U	1.2	0.0539
207-08-9	Benzo (k) Fluoranthene	0.12 U	0.12	0.0043
218-01-9	Chrysene	1.2 U	1.2	0.0034
53-70-3	Dibenzo (a,h) Anthracene	0.24 U	0.24	0.0416
206-44-0	Fluoranthene	1.2 U	1.2	0.0074
86-73-7	Fluorene	1.2 U	1.2	0.0096
193-39-5	Indeno (1,2,3-cd) Pyrene	0.062 U	0.062	0.0050
91-20-3	Naphthalene	0.62 U	0.62	0.0422
85-01-8	Phenanthrene	1.2 U	1.2	0.0032
129-00-0	Pyrene	1.2 U	1.2	0.0194

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/27/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**SWD1**	QC Batch:	90710 -114
Sample #:	**346021**	Anal. Batch:	208739
Matrix:	Surface Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	1.2 U	1.2	0.0279
208-96-8	Acenaphthylene	1.2 U	1.2	0.0525
120-12-7	Anthracene	1.2 U	1.2	0.0024
56-55-3	Benzo (a) Anthracene	0.062 U	0.062	0.0026
50-32-8	Benzo (a) Pyrene	0.062 U	0.062	0.0069
205-99-2	Benzo (b) Fluoranthene	0.090 U	0.090	0.0138
191-24-2	Benzo (g,h,i,) Perylene	1.2 U	1.2	0.0539
207-08-9	Benzo (k) Fluoranthene	0.12 U	0.12	0.0043
218-01-9	Chrysene	1.2 U	1.2	0.0034
53-70-3	Dibenzo (a,h) Anthracene	0.24 U	0.24	0.0416
206-44-0	Fluoranthene	1.2 U	1.2	0.0074
86-73-7	Fluorene	1.2 U	1.2	0.0096
193-39-5	Indeno (1,2,3-cd) Pyrene	0.062 U	0.062	0.0050
91-20-3	Naphthalene	0.62 U	0.62	0.0422
85-01-8	Phenanthrene	1.2 U	1.2	0.0032
129-00-0	Pyrene	1.2 U	1.2	0.0194

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/27/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**13SW2**	QC Batch:	90710 -114
Sample #:	**346022**	Anal. Batch:	208739
Matrix:	Surface Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1.1

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	1.2 U	1.2	0.0307
208-96-8	Acenaphthylene	1.2 U	1.2	0.0578
120-12-7	Anthracene	1.2 U	1.2	0.00264
56-55-3	Benzo (a) Anthracene	0.062 U	0.062	0.00286
50-32-8	Benzo (a) Pyrene	0.062 U	0.062	0.00759
205-99-2	Benzo (b) Fluoranthene	0.090 U	0.090	0.0152
191-24-2	Benzo (g,h,i,) Perylene	1.2 U	1.2	0.0593
207-08-9	Benzo (k) Fluoranthene	0.12 U	0.12	0.00473
218-01-9	Chrysene	1.2 U	1.2	0.00374
53-70-3	Dibenzo (a,h) Anthracene	0.24 U	0.24	0.0458
206-44-0	Fluoranthene	1.2 U	1.2	0.00814
86-73-7	Fluorene	1.2 U	1.2	0.0106
193-39-5	Indeno (1,2,3-cd) Pyrene	0.062 U	0.062	0.00550
91-20-3	Naphthalene	0.62 U	0.62	0.0464
85-01-8	Phenanthrene	1.2 U	1.2	0.00352
129-00-0	Pyrene	1.2 U	1.2	0.0213

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Client:	**URS Corporation**	Sampled:	10/11/03 @ 08:45
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**ASB1A**	QC Batch:	91218 -118
Sample #:	**346248**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	82
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result		Reporting Limit	MDL
83-32-9	Acenaphthene	120 U		120	11.3
208-96-8	Acenaphthylene	260 U		260	13.9
120-12-7	Anthracene	26 U		26	0.840
56-55-3	Benzo (a) Anthracene	26 U		26	0.960
50-32-8	Benzo (a) Pyrene	26 U	UJ,c	26	1.20
205-99-2	Benzo (b) Fluoranthene	26 U		26	1.56
191-24-2	Benzo (g,h,i,) Perylene	26 U		26	15.0
207-08-9	Benzo (k) Fluoranthene	26 U		26	1.20
218-01-9	**Chrysene**	**5.0 J**		26	1.44
53-70-3	Dibenzo (a,h) Anthracene	26 U		26	1.68
206-44-0	**Fluoranthene**	**17 J**	J,c	26	2.04
86-73-7	Fluorene	26 U		26	1.56
193-39-5	Indeno (1,2,3-cd) Pyrene	26 U		26	0.840
91-20-3	Naphthalene	120 U		120	9.48
85-01-8	**Phenanthrene**	**3.1 J**		26	0.720
129-00-0	**Pyrene**	**11 J**		26	1.08

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 09:00
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**ASB1B**	QC Batch:	91218 -118
Sample #:	**346249**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	78
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	130 U	130	12.2
208-96-8	Acenaphthylene	270 U	270	15.1
120-12-7	Anthracene	27 U	27	0.910
56-55-3	Benzo (a) Anthracene	27 U	27	1.04
50-32-8	Benzo (a) Pyrene	27 U	27	1.30
205-99-2	Benzo (b) Fluoranthene	27 U	27	1.69
191-24-2	Benzo (g,h,i,) Perylene	27 U	27	16.3
207-08-9	Benzo (k) Fluoranthene	27 U	27	1.30
218-01-9	Chrysene	27 U	27	1.56
53-70-3	Dibenzo (a,h) Anthracene	27 U	27	1.82
206-44-0	Fluoranthene	27 U	27	2.21
86-73-7	Fluorene	27 U	27	1.69
193-39-5	Indeno (1,2,3-cd) Pyrene	27 U	27	0.910
91-20-3	Naphthalene	130 U	130	10.3
85-01-8	Phenanthrene	27 U	27	0.780
129-00-0	Pyrene	27 U	27	1.17

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 09:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**ASB1C**	QC Batch:	91218 -118
Sample #:	**346250**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	77
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	130 U	130	12.2
208-96-8	Acenaphthylene	270 U	270	15.1
120-12-7	Anthracene	27 U	27	0.910
56-55-3	Benzo (a) Anthracene	27 U	27	1.04
50-32-8	Benzo (a) Pyrene	27 U	27	1.30
205-99-2	Benzo (b) Fluoranthene	27 U	27	1.69
191-24-2	Benzo (g,h,i,) Perylene	27 U	27	16.3
207-08-9	Benzo (k) Fluoranthene	27 U	27	1.30
218-01-9	Chrysene	27 U	27	1.56
53-70-3	Dibenzo (a,h) Anthracene	27 U	27	1.82
206-44-0	Fluoranthene	27 U	27	2.21
86-73-7	Fluorene	27 U	27	1.69
193-39-5	Indeno (1,2,3-cd) Pyrene	27 U	27	0.910
91-20-3	Naphthalene	130 U	130	10.3
85-01-8	Phenanthrene	27 U	27	0.780
129-00-0	Pyrene	27 U	27	1.17

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:00
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**ASB3A**	QC Batch:	91218 -118
Sample #:	**346251**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	130 U	130	12.2
208-96-8	Acenaphthylene	260 U	260	15.1
120-12-7	Anthracene	26 U	26	0.910
56-55-3	Benzo (a) Anthracene	26 U	26	1.04
50-32-8	Benzo (a) Pyrene	26 U	26	1.30
205-99-2	Benzo (b) Fluoranthene	26 U	26	1.69
191-24-2	Benzo (g,h,i,) Perylene	26 U	26	16.3
207-08-9	Benzo (k) Fluoranthene	26 U	26	1.30
218-01-9	Chrysene	26 U	26	1.56
53-70-3	Dibenzo (a,h) Anthracene	26 U	26	1.82
206-44-0	Fluoranthene	26 U	26	2.21
86-73-7	Fluorene	26 U	26	1.69
193-39-5	Indeno (1,2,3-cd) Pyrene	26 U	26	0.910
91-20-3	Naphthalene	130 U	130	10.3
85-01-8	**Phenanthrene**	**1.9 J**	26	0.780
129-00-0	Pyrene	26 U	26	1.17

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**ASB3B**	QC Batch:	91218 -118
Sample #:	**346252**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	130 U	130	12.2
208-96-8	Acenaphthylene	260 U	260	15.1
120-12-7	Anthracene	26 U	26	0.910
56-55-3	Benzo (a) Anthracene	26 U	26	1.04
50-32-8	Benzo (a) Pyrene	26 U	26	1.30
205-99-2	Benzo (b) Fluoranthene	26 U	26	1.69
191-24-2	Benzo (g,h,i,) Perylene	26 U	26	16.3
207-08-9	Benzo (k) Fluoranthene	26 U	26	1.30
218-01-9	Chrysene	26 U	26	1.56
53-70-3	Dibenzo (a,h) Anthracene	26 U	26	1.82
206-44-0	Fluoranthene	26 U	26	2.21
86-73-7	Fluorene	26 U	26	1.69
193-39-5	Indeno (1,2,3-cd) Pyrene	26 U	26	0.910
91-20-3	Naphthalene	130 U	130	10.3
85-01-8	Phenanthrene	26 U	26	0.780
129-00-0	Pyrene	26 U	26	1.17

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:30
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**ASB3C**	QC Batch:	91218 -118
Sample #:	**346253**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	84
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	120 U	120	11.3
208-96-8	Acenaphthylene	250 U	250	13.9
120-12-7	Anthracene	25 U	25	0.840
56-55-3	Benzo (a) Anthracene	25 U	25	0.960
50-32-8	Benzo (a) Pyrene	25 U	25	1.20
205-99-2	Benzo (b) Fluoranthene	25 U	25	1.56
191-24-2	Benzo (g,h,i,) Perylene	25 U	25	15.0
207-08-9	Benzo (k) Fluoranthene	25 U	25	1.20
218-01-9	**Chrysene**	**1.8 J**	25	1.44
53-70-3	Dibenzo (a,h) Anthracene	25 U	25	1.68
206-44-0	**Fluoranthene**	**8.7 J**	25	2.04
86-73-7	Fluorene	25 U	25	1.56
193-39-5	Indeno (1,2,3-cd) Pyrene	25 U	25	0.840
91-20-3	Naphthalene	120 U	120	9.48
85-01-8	**Phenanthrene**	**3.0 J**	25	0.720
129-00-0	**Pyrene**	**9.9 J**	25	1.08

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:15
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046 RAAP	Analyzed:	11/27/03 by TAJ
		Anal. Method:	USEPA-8310
Sample ID:	**ASB2A**	QC Batch:	91218 -118
Sample #:	**346254**	Anal. Batch:	210003
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.25

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	130 U	130	11.8
208-96-8	Acenaphthylene	260 U	260	14.5
120-12-7	Anthracene	26 U	26	0.875
56-55-3	**Benzo (a) Anthracene**	**3.6 J**	26	1.00
50-32-8	Benzo (a) Pyrene	26 U	26	1.25
205-99-2	Benzo (b) Fluoranthene	26 U	26	1.63
191-24-2	Benzo (g,h,i,) Perylene	26 U	26	15.6
207-08-9	Benzo (k) Fluoranthene	26 U	26	1.25
218-01-9	**Chrysene**	**3.7 J**	26	1.50
53-70-3	Dibenzo (a,h) Anthracene	26 U	26	1.75
206-44-0	**Fluoranthene**	**7.7 J**	26	2.13
86-73-7	Fluorene	26 U	26	1.63
193-39-5	**Indeno (1,2,3-cd) Pyrene**	**6.2 J**	26	0.875
91-20-3	Naphthalene	130 U	130	9.88
85-01-8	**Phenanthrene**	**4.0 J**	26	0.750
129-00-0	**Pyrene**	**21 J**	26	1.13

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:10
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**ASB2B**	QC Batch:	91218 -118
Sample #:	**346255**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	76
Unit:	ug/kg dry	Dilution Factor:	1.3

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	130 U	130	12.2
208-96-8	Acenaphthylene	280 U	280	15.1
120-12-7	Anthracene	28 U	28	0.910
56-55-3	Benzo (a) Anthracene	28 U	28	1.04
50-32-8	Benzo (a) Pyrene	28 U	28	1.30
205-99-2	Benzo (b) Fluoranthene	28 U	28	1.69
191-24-2	Benzo (g,h,i,) Perylene	28 U	28	16.3
207-08-9	Benzo (k) Fluoranthene	28 U	28	1.30
218-01-9	Chrysene	28 U	28	1.56
53-70-3	Dibenzo (a,h) Anthracene	28 U	28	1.82
206-44-0	Fluoranthene	28 U	28	2.21
86-73-7	Fluorene	28 U	28	1.69
193-39-5	Indeno (1,2,3-cd) Pyrene	28 U	28	0.910
91-20-3	Naphthalene	130 U	130	10.3
85-01-8	Phenanthrene	28 U	28	0.780
129-00-0	Pyrene	28 U	28	1.17

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 00:00
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/24/03 by TAJ
		Anal. Method:	USEPA-8310
Sample ID:	**SBD-10**	QC Batch:	91218 -118
Sample #:	**346256**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	72
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	140 U	140	13.2
208-96-8	Acenaphthylene	290 U	290	16.2
120-12-7	Anthracene	29 U	29	0.980
56-55-3	Benzo (a) Anthracene	29 U	29	1.12
50-32-8	Benzo (a) Pyrene	29 U	29	1.40
205-99-2	Benzo (b) Fluoranthene	29 U	29	1.82
191-24-2	Benzo (g,h,i,) Perylene	29 U	29	17.5
207-08-9	Benzo (k) Fluoranthene	29 U	29	1.40
218-01-9	Chrysene	29 U	29	1.68
53-70-3	Dibenzo (a,h) Anthracene	29 U	29	1.96
206-44-0	Fluoranthene	29 U	29	2.38
86-73-7	Fluorene	29 U	29	1.82
193-39-5	Indeno (1,2,3-cd) Pyrene	29 U	29	0.980
91-20-3	Naphthalene	140 U	140	11.1
85-01-8	Phenanthrene	29 U	29	0.840
129-00-0	Pyrene	29 U	29	1.26

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 11:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/18/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8310
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by TAJ
	RAAP	Anal. Method:	USEPA-8310
Sample ID:	**ASB2C**	QC Batch:	91218 -118
Sample #:	**346257**	Anal. Batch:	209020
Matrix:	Soil	Percent Solids:	73
Unit:	ug/kg dry	Dilution Factor:	1.4

CAS Number	Polynuclear Aromatic Hydrocarbons	Analytical Result	Reporting Limit	MDL
83-32-9	Acenaphthene	140 U	140	13.2
208-96-8	Acenaphthylene	650 U	650	16.2
120-12-7	Anthracene	65 U	65	0.980
56-55-3	Benzo (a) Anthracene	65 U	65	1.12
50-32-8	Benzo (a) Pyrene	65 U	65	1.40
205-99-2	Benzo (b) Fluoranthene	65 U	65	1.82
191-24-2	Benzo (g,h,i,) Perylene	65 U	65	17.5
207-08-9	Benzo (k) Fluoranthene	65 U	65	1.40
218-01-9	Chrysene	65 U	65	1.68
53-70-3	Dibenzo (a,h) Anthracene	65 U	65	1.96
206-44-0	Fluoranthene	65 U	65	2.38
86-73-7	Fluorene	65 U	65	1.82
193-39-5	Indeno (1,2,3-cd) Pyrene	65 U	65	0.980
91-20-3	Naphthalene	140 U	140	11.1
85-01-8	Phenanthrene	65 U	65	0.840
129-00-0	Pyrene	65 U	65	1.26

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 09:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/17/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046	Analyzed:	10/27/03 by JMK1
	RAAP	Anal. Method:	USEPA-8330
Sample ID:	**EQB5**	QC Batch:	89804 -117
Sample #:	**346013**	Anal. Batch:	208354
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.65 U	0.65	0.150
99-65-0	1,3-Dinitrobenzene	0.65 U	0.65	0.121
118-96-7	2,4,6-Trinitrotoluene	0.65 U	0.65	0.102
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.114
606-20-2	2,6-Dinitrotoluene	0.65 U	0.65	0.217
35572-78-2	2-Amino-4,6-dinitro-toluene	1.0 U	1.0	0.245
88-72-2	2-Nitrotoluene	0.65 U	0.65	0.175
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.413
19406-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	1.0	0.239
99-99-0	4-Nitrotoluene	2.0 U	2.0	0.488
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.277
98-95-3	Nitrobenzene	0.65 U	0.65	0.0825
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.65 U	0.65	0.109
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.0931

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 11:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	10/17/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/27/03 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**EQB6**	QC Batch:	89804 -117
Sample #:	**346015**	Anal. Batch:	208354
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.65 U	0.65	0.150
99-65-0	1,3-Dinitrobenzene	0.65 U	0.65	0.121
118-96-7	2,4,6-Trinitrotoluene	0.65 U	0.65	0.102
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.114
606-20-2	2,6-Dinitrotoluene	0.65 U	0.65	0.217
35572-78-2	2-Amino-4,6-dinitro-toluene	1.0 U	1.0	0.245
88-72-2	2-Nitrotoluene	0.65 U	0.65	0.175
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.413
19406-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	1.0	0.239
99-99-0	4-Nitrotoluene	2.0 U	2.0	0.488
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.277
98-95-3	Nitrobenzene	0.65 U	0.65	0.0825
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.65 U	0.65	0.109
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.0931

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Client:	**URS Corporation**	Sampled:	10/10/03 @ 13:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	10/21/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/24/03 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**13SD3**	QC Batch:	90908 -121
Sample #:	**346017**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	68
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U	0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.229
98-95-3	Nitrobenzene	0.50 U	0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/21/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046	Analyzed:	10/24/03 by JMK1
	RAAP	Anal. Method:	USEPA-8330
Sample ID:	**SDD1**	QC Batch:	90908 -121
Sample #:	**346018**	Anal. Batch:	208771
Matrix:	Soil	Percent Solids:	63
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U	0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.229
98-95-3	Nitrobenzene	0.50 U	0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 14:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
Submittal #:	**36440-6**	Prepared:	10/21/03 by DJM
Submittal:	Delivery Order 0046 RAAP	Prep. Method:	USEPA-8330
		Analyzed:	10/24/03 by JMK1
Sample ID:	**13SD2**	Anal. Method:	USEPA-8330
Sample #:	**346019**	QC Batch:	90908 -121
Matrix:	Soil	Anal. Batch:	208771
Unit:	mg/kg dry	Percent Solids:	65
		Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U	0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.229
98-95-3	Nitrobenzene	0.50 U	0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 13:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/17/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046	Analyzed:	10/27/03 by JMK1
	RAAP	Anal. Method:	USEPA-8330
Sample ID:	**13SW3**	QC Batch:	89804 -117
Sample #:	**346020**	Anal. Batch:	208354
Matrix:	Surface Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.65 U	0.65	0.150
99-65-0	1,3-Dinitrobenzene	0.65 U	0.65	0.121
118-96-7	2,4,6-Trinitrotoluene	0.65 U	0.65	0.102
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.114
606-20-2	2,6-Dinitrotoluene	0.65 U	0.65	0.217
35572-78-2	2-Amino-4,6-dinitro-toluene	1.0 U	1.0	0.245
88-72-2	2-Nitrotoluene	0.65 U	0.65	0.175
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.413
19406-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	1.0	0.239
99-99-0	4-Nitrotoluene	2.0 U	2.0	0.488
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.277
98-95-3	Nitrobenzene	0.65 U	0.65	0.0825
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.65 U	0.65	0.109
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.0931

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 00:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	10/17/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/28/03 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**SWD1**	QC Batch:	89804 -117
Sample #:	**346021**	Anal. Batch:	208354
Matrix:	Surface Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.65 U	0.65	0.150
99-65-0	1,3-Dinitrobenzene	0.65 U	0.65	0.121
118-96-7	2,4,6-Trinitrotoluene	0.65 U	0.65	0.102
121-14-2	2,4-Dinitrotoluene	0.65 U	0.65	0.114
606-20-2	2,6-Dinitrotoluene	0.65 U	0.65	0.217
35572-78-2	2-Amino-4,6-dinitro-toluene	1.0 U	1.0	0.245
88-72-2	2-Nitrotoluene	0.65 U	0.65	0.175
99-08-1	3-Nitrotoluene	2.0 U	2.0	0.413
19406-51-0	4-Amino-2,6-dinitro-toluene	1.0 U	1.0	0.239
99-99-0	4-Nitrotoluene	2.0 U	2.0	0.488
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.277
98-95-3	Nitrobenzene	0.65 U	0.65	0.0825
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.65 U	0.65	0.109
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	2.0	0.0931

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 14:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
Submittal #:	**36440-6**	Prepared:	10/17/03 by DJM
Submittal:	Delivery Order 0046 RAAP	Prep. Method:	USEPA-8330
		Analyzed:	10/28/03 by JMK1
Sample ID:	**13SW2**	Anal. Method:	USEPA-8330
Sample #:	**346022**	QC Batch:	89804 -117
Matrix:	Surface Water	Anal. Batch:	208354
Unit:	ug/L	Percent Solids:	n/a
		Dilution Factor:	1

CAS Number	Explosives	Analytical Result		Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.65 U		0.65	0.150
99-65-0	1,3-Dinitrobenzene	0.65 U		0.65	0.121
118-96-7	2,4,6-Trinitrotoluene	0.65 U		0.65	0.102
121-14-2	2,4-Dinitrotoluene	0.65 U		0.65	0.114
606-20-2	2,6-Dinitrotoluene	0.65 U		0.65	0.217
35572-78-2	2-Amino-4,6-dinitro-toluene	1.0 U		1.0	0.245
88-72-2	2-Nitrotoluene	0.65 U		0.65	0.175
99-08-1	3-Nitrotoluene	2.0 U		2.0	0.413
19406-51-0	4-Amino-2,6-dinitro-toluene	1.0 U		1.0	0.239
99-99-0	4-Nitrotoluene	2.0 U		2.0	0.488
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U		1.0	0.277
98-95-3	Nitrobenzene	0.65 U		0.65	0.0825
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.65 U		0.65	0.109
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	2.0 U	UJ, M	2.0	0.0931

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 08:45
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
Submittal #:	**36440-6**	Prepared:	10/23/03 by DJM
Submittal:	Delivery Order 0046 RAAP	Prep. Method:	USEPA-8330
		Analyzed:	10/28/03 by JMK1
Sample ID:	**ASB1A**	Anal. Method:	USEPA-8330
Sample #:	**346248**	QC Batch:	90905 -123
Matrix:	Soil	Anal. Batch:	208354
Unit:	mg/kg dry	Percent Solids:	82
		Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U	0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.229
98-95-3	Nitrobenzene	0.50 U	0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 09:00
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/23/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046	Analyzed:	10/28/03 by JMK1
	RAAP	Anal. Method:	USEPA-8330
Sample ID:	**ASB1B**	QC Batch:	90905 -123
Sample #:	**346249**	Anal. Batch:	209312
Matrix:	Soil	Percent Solids:	78
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U	0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.229
98-95-3	Nitrobenzene	0.50 U	0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 09:15
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/23/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/28/03 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**ASB1C**	QC Batch:	90905 -123
Sample #:	**346250**	Anal. Batch:	209312
Matrix:	Soil	Percent Solids:	77
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U	0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.229
98-95-3	Nitrobenzene	0.50 U	0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:00
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/23/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/28/03 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**ASB3A**	QC Batch:	90905 -123
Sample #:	**346251**	Anal. Batch:	209312
Matrix:	Soil	Percent Solids:	80
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U	0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.167
~~121-14-2~~	~~2,4-Dinitrotoluene~~	~~25 E~~ J,Y	~~0.50~~	~~0.142~~
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.229
98-95-3	Nitrobenzene	0.50 U	0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.169

~~2,4-Dinitrotoluene~~ ~~25 E~~ ~~0.50~~ ~~0.142~~ JK, 1/15/04 see dilution

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:00
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/23/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/28/03 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**ASB3A**	QC Batch:	90905 -123
Sample #:	**346251DL**	Anal. Batch:	209312
Matrix:	Soil	Percent Solids:	80
Unit:	mg/kg dry	Dilution Factor:	5

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U	0.50	0.700
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.795
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.835
121-14-2	✓ **2,4-Dinitrotoluene**	**20**	0.50	0.710
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	1.25
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.755
88-72-2	2-Nitrotoluene	1.0 U	1.0	1.33
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.920
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.810
99-99-0	4-Nitrotoluene	1.0 U	1.0	1.26
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	1.15
98-95-3	Nitrobenzene	0.50 U	0.50	0.510
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.655
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.845

Use only 2,4-DNT, ✍ 1/20/04

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:15
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
Submittal #:	**36440-6**	Prepared:	10/23/03 by DJM
Submittal:	Delivery Order 0046 RAAP	Prep. Method:	USEPA-8330
		Analyzed:	10/28/03 by JMK1
Sample ID:	**ASB3B**	Anal. Method:	USEPA-8330
Sample #:	**346252**	QC Batch:	90905 -123
Matrix:	Soil	Anal. Batch:	209312
Unit:	mg/kg dry	Percent Solids:	80
		Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U	0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.229
98-95-3	Nitrobenzene	0.50 U	0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:30
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/23/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/28/03 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**ASB3C**	QC Batch:	90905 -123
Sample #:	**346253**	Anal. Batch:	209312
Matrix:	Soil	Percent Solids:	84
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U	0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.229
98-95-3	Nitrobenzene	0.50 U	0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:15
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
		Prepared:	10/23/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/28/03 by JMK1
		Anal. Method:	USEPA-8330
Sample ID:	**ASB2A**	QC Batch:	90905 -123
Sample #:	**346254**	Anal. Batch:	209312
Matrix:	Soil	Percent Solids:	80
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U	0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.229
98-95-3	Nitrobenzene	0.50 U	0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:10
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/23/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046	Analyzed:	10/28/03 by JMK1
	RAAP	Anal. Method:	USEPA-8330
Sample ID:	**ASB2B**	QC Batch:	90905 -123
Sample #:	**346255**	Anal. Batch:	209312
Matrix:	Soil	Percent Solids:	76
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U	0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.229
98-95-3	Nitrobenzene	0.50 U	0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 00:00
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/23/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8330
Submittal:	Delivery Order 0046	Analyzed:	10/28/03 by JMK1
	RAAP	Anal. Method:	USEPA-8330
Sample ID:	**SBD-10**	QC Batch:	90905 -123
Sample #:	**346256**	Anal. Batch:	209312
Matrix:	Soil	Percent Solids:	72
Unit:	mg/kg dry	Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U	0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.167
121-14-2	2,4-Dinitrotoluene	0.50 U	0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.229
98-95-3	Nitrobenzene	0.50 U	0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.169

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 11:15
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
Submittal #:	**36440-6**	Prepared:	10/23/03 by DJM
Submittal:	Delivery Order 0046 RAAP	Prep. Method:	USEPA-8330
		Analyzed:	10/28/03 by JMK1
Sample ID:	**ASB2C**	Anal. Method:	USEPA-8330
Sample #:	**346257**	QC Batch:	90905 -123
Matrix:	Soil	Anal. Batch:	209312
Unit:	mg/kg dry	Percent Solids:	73
		Dilution Factor:	1

CAS Number	Explosives	Analytical Result	Reporting Limit	MDL
99-35-4	1,3,5-Trinitrobenzene	0.50 U	0.50	0.140
99-65-0	1,3-Dinitrobenzene	0.50 U	0.50	0.159
118-96-7	2,4,6-Trinitrotoluene	0.50 U	0.50	0.167
121-14-2	**2,4-Dinitrotoluene**	**0.20 J**	0.50	0.142
606-20-2	2,6-Dinitrotoluene	1.0 U	1.0	0.250
35572-78-2	2-Amino-4,6-dinitro-toluene	0.50 U	0.50	0.151
88-72-2	2-Nitrotoluene	1.0 U	1.0	0.266
99-08-1	3-Nitrotoluene	1.0 U	1.0	0.184
19406-51-0	4-Amino-2,6-dinitro-toluene	0.50 U	0.50	0.162
99-99-0	4-Nitrotoluene	1.0 U	1.0	0.251
2691-41-0	Octahydro-1,3,5,7-tetra-nitro-1,3,5,7-tetrazocine	1.0 U	1.0	0.229
98-95-3	Nitrobenzene	0.50 U	0.50	0.102
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	0.50 U	0.50	0.131
479-45-8	Methyl-2,4,6-trinitro-phenylnitramine	1.0 U	1.0	0.169

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 09:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3510C
Submittal:	Delivery Order 0046	Analyzed:	10/18/03 by MSN
	RAAP	Anal. Method:	USEPA-8081A
Sample ID:	**EQB5**	QC Batch:	90180 -114
Sample #:	**346013**	Anal. Batch:	208237
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	0.10 U	0.10	0.0016
72-55-9	4,4'-DDE	0.10 U	0.10	0.0025
50-29-3	4,4'-DDT	0.10 U	0.10	0.0018
309-00-2	Aldrin	0.050 U	0.050	0.0019
319-84-6	Alpha-BHC	0.050 U	0.050	0.0014
57-74-9	A-Chlordane	0.050 U	0.050	0.0024
5103-74-2	G-Chlordane	0.050 U	0.050	0.0023
319-85-7	Beta-BHC	0.050 U	0.050	0.0039
319-86-8	Delta-BHC	0.050 U	0.050	0.0025
60-57-1	Dieldrin	0.10 U	0.10	0.0034
115-29-7	Endosulfan I	0.050 U	0.050	0.0026
33213-65-9	Endosulfan II	0.10 U	0.10	0.0021
1031-07-8	Endosulfan Sulfate	0.10 U	0.10	0.0022
72-20-8	Endrin	0.10 U	0.10	0.0038
7421-93-4	Endrin Aldehyde	0.10 U	0.10	0.0053
53494-70-5	Endrin Ketone	0.10 U	0.10	0.0020
58-89-9	Lindane	0.050 U	0.050	0.0016
76-44-8	Heptachlor	0.050 U	0.050	0.0021
1024-57-3	Heptachlor Epoxide	0.050 U	0.050	0.0022
72-43-5	Methoxychlor	0.50 U	0.50	0.0032
8001-35-2	Toxaphene	1.0 U	1.0	0.118

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 11:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3510C
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/18/03 by MSN
		Anal. Method:	USEPA-8081A
Sample ID:	**EQB6**	QC Batch:	90180 -114
Sample #:	**346015**	Anal. Batch:	208237
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	0.10 U	0.10	0.0016
72-55-9	4,4'-DDE	0.10 U	0.10	0.0025
50-29-3	4,4'-DDT	0.10 U	0.10	0.0018
309-00-2	Aldrin	0.050 U	0.050	0.0019
319-84-6	Alpha-BHC	0.050 U	0.050	0.0014
57-74-9	A-Chlordane	0.050 U	0.050	0.0024
5103-74-2	G-Chlordane	0.050 U	0.050	0.0023
319-85-7	Beta-BHC	0.050 U	0.050	0.0039
319-86-8	Delta-BHC	0.050 U	0.050	0.0025
60-57-1	Dieldrin	0.10 U	0.10	0.0034
115-29-7	Endosulfan I	0.050 U	0.050	0.0026
33213-65-9	Endosulfan II	0.10 U	0.10	0.0021
1031-07-8	Endosulfan Sulfate	0.10 U	0.10	0.0022
72-20-8	Endrin	0.10 U	0.10	0.0038
7421-93-4	Endrin Aldehyde	0.10 U	0.10	0.0053
53494-70-5	Endrin Ketone	0.10 U	0.10	0.0020
58-89-9	Lindane	0.050 U	0.050	0.0016
76-44-8	Heptachlor	0.050 U	0.050	0.0021
1024-57-3	Heptachlor Epoxide	0.050 U	0.050	0.0022
72-43-5	Methoxychlor	0.50 U	0.50	0.0032
8001-35-2	Toxaphene	1.0 U	1.0	0.118

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/16/03 by JRR
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	10/31/03 by JLRM
	RAAP	Anal. Method:	USEPA-8081A
Sample ID:	**ASB2A**	QC Batch:	90181 -116
Sample #:	**346254**	Anal. Batch:	208635
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Chlorinated Pesticides OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
72-54-8	4,4'-DDD	25 U	25	0.286
72-55-9	4,4'-DDE	25 U	25	0.210
50-29-3	4,4'-DDT	25 U	25	0.216
309-00-2	Aldrin	25 U	25	0.365
319-84-6	Alpha-BHC	25 U	25	0.364
57-74-9	A-Chlordane	25 U	25	0.521
5103-74-2	G-Chlordane	25 U	25	0.844
319-85-7	Beta-BHC	25 U	25	1.36
319-86-8	Delta-BHC	25 U	25	0.982
60-57-1	Dieldrin	25 U	25	0.371
115-29-7	Endosulfan I	25 U	25	1.09
33213-65-9	Endosulfan II	25 U	25	0.257
1031-07-8	Endosulfan Sulfate	25 U	25	0.604
72-20-8	Endrin	25 U	25	0.358
7421-93-4	Endrin Aldehyde	25 U	25	1.33
53494-70-5	Endrin Ketone	25 U	25	0.330
58-89-9	Lindane	25 U	25	0.233
76-44-8	Heptachlor	25 U	25	0.846
1024-57-3	Heptachlor Epoxide	25 U	25	0.546
72-43-5	Methoxychlor	25 U	25	0.336
8001-35-2	Toxaphene	210 U	210	28.0

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 09:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3510C
Submittal:	Delivery Order 0046	Analyzed:	10/16/03 by JLRM
	RAAP	Anal. Method:	USEPA-8082
Sample ID:	**EQB5**	QC Batch:	89851 -114
Sample #:	**346013**	Anal. Batch:	207778
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Polychlorinated Biphenyls OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	0.30 U	0.30	0.0753
11104-28-2	PCB-1221	0.50 U	0.50	0.0504
11141-16-5	PCB-1232	0.30 U	0.30	0.0794
53469-21-9	PCB-1242	0.30 U	0.30	0.0809
12672-29-6	PCB-1248	0.25 U	0.25	0.0828
11097-69-1	PCB-1254	0.10 U	0.10	0.0341
11096-82-5	PCB-1260	0.20 U	0.20	0.0481

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 11:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
		Prepared:	10/14/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-3510C
Submittal:	Delivery Order 0046	Analyzed:	10/16/03 by JLRM
	RAAP	Anal. Method:	USEPA-8082
Sample ID:	**EQB6**	QC Batch:	89851 -114
Sample #:	**346015**	Anal. Batch:	207778
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Polychlorinated Biphenyls OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	0.30 U	0.30	0.0753
11104-28-2	PCB-1221	0.50 U	0.50	0.0504
11141-16-5	PCB-1232	0.30 U	0.30	0.0794
53469-21-9	PCB-1242	0.30 U	0.30	0.0809
12672-29-6	PCB-1248	0.25 U	0.25	0.0828
11097-69-1	PCB-1254	0.10 U	0.10	0.0341
11096-82-5	PCB-1260	0.20 U	0.20	0.0481

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/16/03 by JRR
Submittal #:	**36440-6**	Prep. Method:	USEPA-3550B
Submittal:	Delivery Order 0046	Analyzed:	10/23/03 by JLRM
	RAAP	Anal. Method:	USEPA-8082
Sample ID:	**ASB2A**	QC Batch:	89881 -116
Sample #:	**346254**	Anal. Batch:	208229
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Polychlorinated Biphenyls OLM04.2 TCL	Analytical Result	Reporting Limit	MDL
12674-11-2	PCB-1016	82 U	82	19.2
11104-28-2	PCB-1221	41 U	41	2.40
11141-16-5	PCB-1232	41 U	41	6.00
53469-21-9	PCB-1242	41 U	41	3.60
12672-29-6	PCB-1248	41 U	41	6.00
11097-69-1	**PCB-1254**	**9.9 J**	41	3.60
11096-82-5	PCB-1260	41 U	41	8.40

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 09:45
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	10/17/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8151A
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/28/03 by JLRM
		Anal. Method:	USEPA-8151A
Sample ID:	**EQB5**	QC Batch:	90447 -117
Sample #:	**346013**	Anal. Batch:	208365
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Herbicides	Analytical Result	Reporting Limit	MDL
93-76-5	2,4,5-T	0.50 U	0.50	0.053
93-72-1	2,4,5-TP (Silvex)	0.50 U	0.50	0.104
94-75-7	2,4-D	5.0 U	5.0	0.670
94-82-6	2,4-DB	5.0 U	5.0	0.955
75-99-0	Dalapon	5.0 U	5.0	0.862
1918-00-9	Dicamba	0.50 U	0.50	0.104
120-36-5	Dichlorprop	5.0 U	5.0	0.195
88-85-7	Dinoseb	1.0 U	1.0	0.168
94-74-6	MCPA	250 U	250	76.8
93-65-2	MCPP	250 U	250	74.8

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 11:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
		Prepared:	10/17/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8151A
Submittal:	Delivery Order 0046 RAAP	Analyzed:	10/28/03 by JLRM
		Anal. Method:	USEPA-8151A
Sample ID:	**EQB6**	QC Batch:	90447 -117
Sample #:	**346015**	Anal. Batch:	208365
Matrix:	QC Water	Percent Solids:	n/a
Unit:	ug/L	Dilution Factor:	1

CAS Number	Herbicides	Analytical Result	Reporting Limit	MDL
93-76-5	2,4,5-T	0.50 U	0.50	0.053
93-72-1	2,4,5-TP (Silvex)	0.50 U	0.50	0.104
94-75-7	2,4-D	5.0 U	5.0	0.670
94-82-6	2,4-DB	5.0 U	5.0	0.955
75-99-0	Dalapon	5.0 U	5.0	0.862
1918-00-9	Dicamba	0.50 U	0.50	0.104
120-36-5	Dichlorprop	5.0 U	5.0	0.195
88-85-7	Dinoseb	1.0 U	1.0	0.168
94-74-6	MCPA	250 U	250	76.8
93-65-2	MCPP	250 U	250	74.8

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 10:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
		Prepared:	10/17/03 by DJM
Submittal #:	**36440-6**	Prep. Method:	USEPA-8151A
Submittal:	Delivery Order 0046	Analyzed:	10/28/03 by JLRM
	RAAP	Anal. Method:	USEPA-8151A
Sample ID:	**ASB2A**	QC Batch:	90218 -117
Sample #:	**346254**	Anal. Batch:	208365
Matrix:	Soil	Percent Solids:	80
Unit:	ug/kg dry	Dilution Factor:	1.2

CAS Number	Herbicides	Analytical Result	Reporting Limit	MDL
93-76-5	2,4,5-T	62 U	62	2.40
93-72-1	2,4,5-TP (Silvex)	62 U	62	4.80
94-75-7	2,4-D	250 U	250	19.2
94-82-6	2,4-DB	250 U	250	74.4
75-99-0	Dalapon	310 U	310	68.4
1918-00-9	Dicamba	250 U	250	2.40
120-36-5	Dichlorprop	250 U	250	20.4
88-85-7	Dinoseb	250 U	250	25.2
94-74-6	MCPA	25000 U	25000	1680
93-65-2	MCPP	25000 U	25000	6070

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/10/03 @ 09:45
Sampler: B.F. & J.S.
Received: 10/11/03 @ 08:45

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **EQB5**
Sample #: **346013**
Matrix: QC Water

Percent Solids: n/a

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	100 U		100	18.7	ug/L	10/17/03	DSC	EPA-200.7/6010B
Antimony, Total	1.0 U		1.0	0.552	ug/L	10/16/03	JMF	EPA-200.8/6020
Arsenic, Total	1.0 U		1.0	0.429	ug/L	10/16/03	JMF	EPA-200.8/6020
Barium, Total	10 U		10	1.82	ug/L	10/17/03	DSC	EPA-200.7/6010B
Beryllium, Total	0.3 J	B,P	4.0	0.295	ug/L	10/17/03	DSC	EPA-200.7/6010B
Cadmium, Total	0.5 U		0.5	0.135	ug/L	10/16/03	JMF	EPA-200.8/6020
Calcium, Total	500 U		500	33.9	ug/L	10/17/03	DSC	EPA-200.7/6010B
Chromium, Total	4.5		1.0	0.554	ug/L	10/30/03	MSG	EPA-200.8/6020
Cobalt, Total	10 U		10	3.91	ug/L	10/17/03	DSC	EPA-200.7/6010B
Copper, Total	10 U		10	5.36	ug/L	10/17/03	DSC	EPA-200.7/6010B
Iron, Total	21 J	B,P	100	2.95	ug/L	10/17/03	DSC	EPA-200.7/6010B
Lead, Total	1.0 U		1.0	0.281	ug/L	10/16/03	JMF	EPA-200.8/6020
Magnesium, Total	500 U		500	57.4	ug/L	10/17/03	DSC	EPA-200.7/6010B
Manganese, Total	10 U		10	3.16	ug/L	10/17/03	DSC	EPA-200.7/6010B
Mercury, Total	0.4 U		0.4	0.0584	ug/L	10/22/03	MSS	USEPA-7470A
Nickel, Total	1.0 U		1.0	0.410	ug/L	10/16/03	JMF	EPA-200.8/6020
Potassium, Total	200 U		200	59.7	ug/L	10/17/03	DSC	EPA-200.7/6010B
Selenium, Total	2.0 U		2.0	0.933	ug/L	10/16/03	JMF	EPA-200.8/6020
Silver, Total	0.5 U		0.5	0.0765	ug/L	10/16/03	JMF	EPA-200.8/6020
Sodium, Total	280 J	B,P	500	76.9	ug/L	10/17/03	DSC	EPA-200.7/6010B
Thallium, Total	0.5 J		1.0	0.208	ug/L	10/16/03	JMF	EPA-200.8/6020
Vanadium, Total	10 U		10	2.89	ug/L	10/17/03	DSC	EPA-200.7/6010B
Zinc, Total	20 U		20	4.55	ug/L	10/17/03	DSC	EPA-200.7/6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/10/03 @ 11:00
Sampler: B.F. & J.S.
Received: 10/11/03 @ 08:45

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **EQB6**
Sample #: **346015**
Matrix: QC Water

Percent Solids: n/a

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	100 U		100	18.7	ug/L	10/17/03	DSC	EPA-200.7/6010B
Antimony, Total	1.0 U		1.0	0.552	ug/L	10/16/03	JMF	EPA-200.8/6020
Arsenic, Total	1.0 U		1.0	0.429	ug/L	10/16/03	JMF	EPA-200.8/6020
Barium, Total	10 U		10	1.82	ug/L	10/17/03	DSC	EPA-200.7/6010B
Beryllium, Total	4.0 U		4.0	0.295	ug/L	10/17/03	DSC	EPA-200.7/6010B
Cadmium, Total	0.5 U		0.5	0.135	ug/L	10/16/03	JMF	EPA-200.8/6020
Calcium, Total	500 U		500	33.9	ug/L	10/17/03	DSC	EPA-200.7/6010B
Chromium, Total	0.9 J	B/P	1.0	0.554	ug/L	10/16/03	JMF	EPA-200.8/6020
Cobalt, Total	10 U		10	3.91	ug/L	10/17/03	DSC	EPA-200.7/6010B
Copper, Total	10 U		10	5.36	ug/L	10/17/03	DSC	EPA-200.7/6010B
Iron, Total	7.6 J	B/P	100	2.95	ug/L	10/17/03	DSC	EPA-200.7/6010B
Lead, Total	1.0 U		1.0	0.281	ug/L	10/16/03	JMF	EPA-200.8/6020
Magnesium, Total	500 U		500	57.4	ug/L	10/17/03	DSC	EPA-200.7/6010B
Manganese, Total	10 U		10	3.16	ug/L	10/17/03	DSC	EPA-200.7/6010B
Mercury, Total	0.4 U		0.4	0.0584	ug/L	10/22/03	MSS	USEPA-7470A
Nickel, Total	1.0 U		1.0	0.410	ug/L	10/16/03	JMF	EPA-200.8/6020
Potassium, Total	200 U		200	59.7	ug/L	10/17/03	DSC	EPA-200.7/6010B
Selenium, Total	2.0 U		2.0	0.933	ug/L	10/16/03	JMF	EPA-200.8/6020
Silver, Total	0.5 U		0.5	0.0765	ug/L	10/16/03	JMF	EPA-200.8/6020
Sodium, Total	180 J	B/P	500	76.9	ug/L	10/17/03	DSC	EPA-200.7/6010B
Thallium, Total	0.4 J		1.0	0.208	ug/L	10/16/03	JMF	EPA-200.8/6020
Vanadium, Total	10 U		10	2.89	ug/L	10/17/03	DSC	EPA-200.7/6010B
Zinc, Total	4.6 J		20	4.55	ug/L	10/17/03	DSC	EPA-200.7/6010B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/10/03 @ 13:00
Sampler: B.F. & J.S.
Received: 10/11/03 @ 08:45

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SD3**
Sample #: **346017**
Matrix: Soil

Percent Solids: 68

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	23400		500	5.10	mg/kg dry	10/23/03	DSC	USEPA-6010B
Antimony, Total	3.5		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	3.4		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	169		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	1.3		1.0	0.167	mg/kg dry	11/03/03	KLVM	USEPA-6010B
Cadmium, Total	1.0		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	2080	K,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	40		5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	13		1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	36		2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	37100		1000	71.6	mg/kg dry	10/23/03	DSC	USEPA-6010B
Lead, Total	247		50	1.09	mg/kg dry	10/24/03	DWJ	USEPA-6020
Magnesium, Total	3870	K,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	544		5.0	0.264	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Mercury, Total	0.13		0.10	0.0077	mg/kg dry	10/21/03	MSS	USEPA-7471A
Nickel, Total	19		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1950		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	1.2		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.12	J	3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	52	J	100	8.92	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Thallium, Total	0.52		0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	44		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	541		40	3.35	mg/kg dry	10/23/03	DSC	USEPA-6010B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/10/03 @ 00:00
Sampler: B.F. & J.S.
Received: 10/11/03 @ 08:45

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **SDD1**
Sample #: **346018**
Matrix: Soil

Percent Solids: 63

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	19600		50	1.83	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Antimony, Total	1.9		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	3.7		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	131		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	1.3		1.0	0.167	mg/kg dry	11/03/03	KLVM	USEPA-6010B
Cadmium, Total	0.94 J		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	1620	K,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	31		5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	12		1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	31		2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	32000		1000	71.6	mg/kg dry	10/23/03	DSC	USEPA-6010B
Lead, Total	271		50	1.09	mg/kg dry	10/24/03	DWJ	USEPA-6020
Magnesium, Total	3030	K,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	644		5.0	0.264	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Mercury, Total	0.11		0.10	0.0077	mg/kg dry	10/21/03	MSS	USEPA-7471A
Nickel, Total	18		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1520		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	1.2		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.14 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	38 J		100	8.92	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Thallium, Total	0.49 J		0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	32		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	541		40	3.35	mg/kg dry	10/23/03	DSC	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/10/03 @ 14:00
Sampler: B.F. & J.S.
Received: 10/11/03 @ 08:45

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SD2**
Sample #: **346019**
Matrix: Soil

Percent Solids: 65

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	9870		50	1.83	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Antimony, Total	0.18 J		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	3.3		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	101		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	0.83 J		1.0	0.167	mg/kg dry	11/03/03	JMF	USEPA-6010B
Cadmium, Total	0.57 J		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
* Calcium, Total	1270	K,M	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	27		5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	9.9		1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	14		2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	34600		1000	71.6	mg/kg dry	10/23/03	DSC	USEPA-6010B
Lead, Total	132		25	0.545	mg/kg dry	10/24/03	DWJ	USEPA-6020
* Magnesium, Total	2130	K,M	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	720		5.0	0.264	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Mercury, Total	0.033 J		0.10	0.0077	mg/kg dry	10/21/03	MSS	USEPA-7471A
Nickel, Total	12		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1020		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.85 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.12 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	53 J		100	8.92	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Thallium, Total	0.46 J		0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	19		1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	442		40	3.35	mg/kg dry	10/23/03	DSC	USEPA-6010B

* See attached Statement of Data Qualifications.

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/10/03 @ 13:00
Sampler: B.F. & J.S.
Received: 10/11/03 @ 08:45

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SW3**
Sample #: **346020**
Matrix: Surface Water

Percent Solids: n/a

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	66 J		100	18.7	ug/L	10/17/03	DSC	EPA-200.7/6010B
Aluminum, Dissolved	100 U		100	18.7	ug/L	10/29/03	DSC	EPA-200.7/6010B
Antimony, Total	0.7 J		1.0	0.552	ug/L	10/16/03	JMF	EPA-200.8/6020
Antimony, Dissolved	0.8 J		2.0	0.552	ug/L	10/30/03	MSG	EPA-200.8/6020
Arsenic, Total	1.0 U		1.0	0.429	ug/L	10/16/03	JMF	EPA-200.8/6020
Arsenic, Dissolved	2.0 U		2.0	0.429	ug/L	10/30/03	MSG	EPA-200.8/6020
Barium, Total	21		10	1.82	ug/L	10/17/03	DSC	EPA-200.7/6010B
Barium, Dissolved	18		10	1.82	ug/L	10/29/03	DSC	EPA-200.7/6010B
Beryllium, Total	4.0 U		4.0	0.295	ug/L	10/17/03	DSC	EPA-200.7/6010B
Beryllium, Dissolved	4.0 U		4.0	0.295	ug/L	10/29/03	DSC	EPA-200.7/6010B
Cadmium, Total	0.5 U		0.5	0.135	ug/L	10/16/03	JMF	EPA-200.8/6020
Cadmium, Dissolved	0.5 U		0.5	0.135	ug/L	10/30/03	MSG	EPA-200.8/6020
Calcium, Total	13000		2500	170	ug/L	10/23/03	KLVM	EPA-200.7/6010B
Calcium, Dissolved	13000		2500	170	ug/L	10/29/03	DSC	EPA-200.7/6010B
Chromium, Total	0.8 J	B,P	1.0	0.554	ug/L	10/16/03	JMF	EPA-200.8/6020
Chromium, Dissolved	0.6 J		2.0	0.554	ug/L	10/30/03	MSG	EPA-200.8/6020
Cobalt, Total	10 U		10	3.91	ug/L	10/17/03	DSC	EPA-200.7/6010B
Cobalt, Dissolved	20 U		20	3.91	ug/L	10/29/03	DSC	EPA-200.7/6010B
Copper, Total	10 U		10	5.36	ug/L	10/17/03	DSC	EPA-200.7/6010B
Copper, Dissolved	20 U		20	5.36	ug/L	10/29/03	DSC	EPA-200.7/6010B
Iron, Total	180		100	2.95	ug/L	10/17/03	DSC	EPA-200.7/6010B
Iron, Dissolved	38 J		100	2.95	ug/L	10/29/03	DSC	EPA-200.7/6010B
Lead, Total	0.9 J	B,P	1.0	0.281	ug/L	10/16/03	JMF	EPA-200.8/6020
Lead, Dissolved	1.0 U		1.0	0.281	ug/L	10/30/03	MSG	EPA-200.8/6020
Magnesium, Total	5400		500	57.4	ug/L	10/17/03	DSC	EPA-200.7/6010B
Magnesium, Dissolved	5500		500	57.4	ug/L	10/29/03	DSC	EPA-200.7/6010B
Manganese, Total	30		10	3.16	ug/L	10/17/03	DSC	EPA-200.7/6010B
Manganese, Dissolved	7.9 J		10	3.16	ug/L	10/29/03	DSC	EPA-200.7/6010B
Mercury, Total	0.4 U		0.4	0.0584	ug/L	10/22/03	MSS	USEPA-7470A
Mercury, Dissolved	0.4 U		0.4	0.0584	ug/L	10/22/03	MSS	USEPA-7470A
Nickel, Total	0.8 J		1.0	0.410	ug/L	10/16/03	JMF	EPA-200.8/6020
Nickel, Dissolved	1.0 J		2.0	0.410	ug/L	10/30/03	MSG	EPA-200.8/6020
Potassium, Total	1900		200	59.7	ug/L	10/17/03	DSC	EPA-200.7/6010B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/10/03 @ 13:00
Sampler: B.F. & J.S.
Received: 10/11/03 @ 08:45

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SW3**
Sample #: **346020**
Matrix: Surface Water

Percent Solids: n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Potassium, Dissolved	1600	200	59.7	ug/L	10/29/03	DSC	EPA-200.7/6010B
Selenium, Total	2.0 U	2.0	0.933	ug/L	10/16/03	JMF	EPA-200.8/6020
Selenium, Dissolved	3.0 U	3.0	0.933	ug/L	10/30/03	MSG	EPA-200.8/6020
Silver, Total	0.5 U	0.5	0.0765	ug/L	10/16/03	JMF	EPA-200.8/6020
Silver, Dissolved	0.5 U	0.5	0.0765	ug/L	10/30/03	MSG	EPA-200.8/6020
Sodium, Total	5100 J,S	500	76.9	ug/L	10/17/03	DSC	EPA-200.7/6010B
Sodium, Dissolved	5100	500	76.9	ug/L	10/29/03	DSC	EPA-200.7/6010B
Thallium, Total	0.3 J	1.0	0.208	ug/L	10/16/03	JMF	EPA-200.8/6020
Thallium, Dissolved	1.0 U	1.0	0.208	ug/L	10/30/03	MSG	EPA-200.8/6020
Vanadium, Total	10 U	10	2.89	ug/L	10/17/03	DSC	EPA-200.7/6010B
Vanadium, Dissolved	10 U	10	2.89	ug/L	10/29/03	DSC	EPA-200.7/6010B
Zinc, Total	20 U	20	4.55	ug/L	10/17/03	DSC	EPA-200.7/6010B
Zinc, Dissolved	20 U	20	4.55	ug/L	10/29/03	DSC	EPA-200.7/6010B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/10/03 @ 00:00
Sampler: B.F. & J.S.
Received: 10/11/03 @ 08:45

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **SWD1**
Sample #: **346021**
Matrix: Surface Water

Percent Solids: n/a

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	53 J		100	18.7	ug/L	10/17/03	DSC	EPA-200.7/6010B
Aluminum, Dissolved	100 U		100	18.7	ug/L	10/29/03	DSC	EPA-200.7/6010B
Antimony, Total	1.0 U		1.0	0.552	ug/L	10/16/03	JMF	EPA-200.8/6020
Antimony, Dissolved	2.0 U		2.0	0.552	ug/L	10/30/03	MSG	EPA-200.8/6020
Arsenic, Total	1.0 U		1.0	0.429	ug/L	10/16/03	JMF	EPA-200.8/6020
Arsenic, Dissolved	2.0 U		2.0	0.429	ug/L	10/30/03	MSG	EPA-200.8/6020
Barium, Total	21		10	1.82	ug/L	10/17/03	DSC	EPA-200.7/6010B
Barium, Dissolved	17		10	1.82	ug/L	10/29/03	DSC	EPA-200.7/6010B
Beryllium, Total	4.0 U		4.0	0.295	ug/L	10/17/03	DSC	EPA-200.7/6010B
Beryllium, Dissolved	4.0 U		4.0	0.295	ug/L	10/29/03	DSC	EPA-200.7/6010B
Cadmium, Total	0.5 U		0.5	0.135	ug/L	10/16/03	JMF	EPA-200.8/6020
Cadmium, Dissolved	0.5 U		0.5	0.135	ug/L	10/30/03	MSG	EPA-200.8/6020
Calcium, Total	13000		2500	170	ug/L	10/23/03	KLVM	EPA-200.7/6010B
Calcium, Dissolved	13000		2500	170	ug/L	10/29/03	DSC	EPA-200.7/6010B
Chromium, Total	0.6 J	B,P	1.0	0.554	ug/L	10/16/03	JMF	EPA-200.8/6020
Chromium, Dissolved	0.8 J		2.0	0.554	ug/L	10/30/03	MSG	EPA-200.8/6020
Cobalt, Total	10 U		10	3.91	ug/L	10/17/03	DSC	EPA-200.7/6010B
Cobalt, Dissolved	20 U		20	3.91	ug/L	10/29/03	DSC	EPA-200.7/6010B
Copper, Total	10 U		10	5.36	ug/L	10/17/03	DSC	EPA-200.7/6010B
Copper, Dissolved	20 U		20	5.36	ug/L	10/29/03	DSC	EPA-200.7/6010B
Iron, Total	170		100	2.95	ug/L	10/17/03	DSC	EPA-200.7/6010B
Iron, Dissolved	36 J		100	2.95	ug/L	10/29/03	DSC	EPA-200.7/6010B
Lead, Total	0.9 J	B,P	1.0	0.281	ug/L	10/16/03	JMF	EPA-200.8/6020
Lead, Dissolved	1.0 U		1.0	0.281	ug/L	10/30/03	MSG	EPA-200.8/6020
Magnesium, Total	5300		500	57.4	ug/L	10/17/03	DSC	EPA-200.7/6010B
Magnesium, Dissolved	5400		500	57.4	ug/L	10/29/03	DSC	EPA-200.7/6010B
Manganese, Total	24		10	3.16	ug/L	10/17/03	DSC	EPA-200.7/6010B
Manganese, Dissolved	4.3 J		10	3.16	ug/L	10/29/03	DSC	EPA-200.7/6010B
Mercury, Total	0.4 U		0.4	0.0584	ug/L	10/22/03	MSS	USEPA-7470A
Mercury, Dissolved	0.4 U		0.4	0.0584	ug/L	10/22/03	MSS	USEPA-7470A
Nickel, Total	0.8 J		1.0	0.410	ug/L	10/16/03	JMF	EPA-200.8/6020
Nickel, Dissolved	0.8 J		2.0	0.410	ug/L	10/30/03	MSG	EPA-200.8/6020
Potassium, Total	1800		200	59.7	ug/L	10/17/03	DSC	EPA-200.7/6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/10/03 @ 00:00
Sampler: B.F. & J.S.
Received: 10/11/03 @ 08:45

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **SWD1**
Sample #: **346021**
Matrix: Surface Water

Percent Solids: n/a

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Potassium, Dissolved	1700		200	59.7	ug/L	10/29/03	DSC	EPA-200.7/6010B
Selenium, Total	2.0 U		2.0	0.933	ug/L	10/16/03	JMF	EPA-200.8/6020
Selenium, Dissolved	3.0 U		3.0	0.933	ug/L	10/30/03	MSG	EPA-200.8/6020
Silver, Total	0.5 U		0.5	0.0765	ug/L	10/16/03	JMF	EPA-200.8/6020
Silver, Dissolved	0.5 U		0.5	0.0765	ug/L	10/30/03	MSG	EPA-200.8/6020
Sodium, Total	5000	J,S	500	76.9	ug/L	10/17/03	DSC	EPA-200.7/6010B
Sodium, Dissolved	5000		500	76.9	ug/L	10/29/03	DSC	EPA-200.7/6010B
Thallium, Total	0.24 J		1.0	0.208	ug/L	10/16/03	JMF	EPA-200.8/6020
Thallium, Dissolved	1.0 U		1.0	0.208	ug/L	10/30/03	MSG	EPA-200.8/6020
Vanadium, Total	10 U		10	2.89	ug/L	10/17/03	DSC	EPA-200.7/6010B
Vanadium, Dissolved	10 U		10	2.89	ug/L	10/29/03	DSC	EPA-200.7/6010B
Zinc, Total	20 U		20	4.55	ug/L	10/17/03	DSC	EPA-200.7/6010B
Zinc, Dissolved	20 U		20	4.55	ug/L	10/29/03	DSC	EPA-200.7/6010B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/10/03 @ 14:00
Sampler: B.F. & J.S.
Received: 10/11/03 @ 08:45

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SW2**
Sample #: **346022**
Matrix: Surface Water

Percent Solids: n/a

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	74 J		100	18.7	ug/L	10/17/03	DSC	EPA-200.7/6010B
Aluminum, Dissolved	100 U		100	18.7	ug/L	10/29/03	DSC	EPA-200.7/6010B
Antimony, Total	1.0 U		1.0	0.552	ug/L	10/16/03	JMF	EPA-200.8/6020
Antimony, Dissolved	2.0 U		2.0	0.552	ug/L	10/30/03	MSG	EPA-200.8/6020
Arsenic, Total	1.0 U		1.0	0.429	ug/L	10/16/03	JMF	EPA-200.8/6020
Arsenic, Dissolved	2.0 U		2.0	0.429	ug/L	10/30/03	MSG	EPA-200.8/6020
Barium, Total	22		10	1.82	ug/L	10/17/03	DSC	EPA-200.7/6010B
Barium, Dissolved	18		10	1.82	ug/L	10/29/03	DSC	EPA-200.7/6010B
Beryllium, Total	4.0 U		4.0	0.295	ug/L	10/17/03	DSC	EPA-200.7/6010B
Beryllium, Dissolved	4.0 U		4.0	0.295	ug/L	10/29/03	DSC	EPA-200.7/6010B
Cadmium, Total	0.5 U		0.5	0.135	ug/L	10/16/03	JMF	EPA-200.8/6020
Cadmium, Dissolved	0.5 U		0.5	0.135	ug/L	10/30/03	MSG	EPA-200.8/6020
Calcium, Total	13000		2500	170	ug/L	10/23/03	KLVM	EPA-200.7/6010B
Calcium, Dissolved	13000		2500	170	ug/L	10/29/03	DSC	EPA-200.7/6010B
Chromium, Total	0.8 J	B,P	1.0	0.554	ug/L	10/16/03	JMF	EPA-200.8/6020
Chromium, Dissolved	2.0 U		2.0	0.554	ug/L	10/30/03	MSG	EPA-200.8/6020
Cobalt, Total	10 U		10	3.91	ug/L	10/17/03	DSC	EPA-200.7/6010B
Cobalt, Dissolved	20 U		20	3.91	ug/L	10/29/03	DSC	EPA-200.7/6010B
Copper, Total	10 U		10	5.36	ug/L	10/17/03	DSC	EPA-200.7/6010B
Copper, Dissolved	20 U		20	5.36	ug/L	10/29/03	DSC	EPA-200.7/6010B
Iron, Total	190		100	2.95	ug/L	10/17/03	DSC	EPA-200.7/6010B
Iron, Dissolved	37 J		100	2.95	ug/L	10/29/03	DSC	EPA-200.7/6010B
Lead, Total	0.6 J	B,P	1.0	0.281	ug/L	10/16/03	JMF	EPA-200.8/6020
Lead, Dissolved	1.0 U		1.0	0.281	ug/L	10/30/03	MSG	EPA-200.8/6020
Magnesium, Total	5700		500	57.4	ug/L	10/17/03	DSC	EPA-200.7/6010B
Magnesium, Dissolved	5600		500	57.4	ug/L	10/29/03	DSC	EPA-200.7/6010B
Manganese, Total	27		10	3.16	ug/L	10/17/03	DSC	EPA-200.7/6010B
Manganese, Dissolved	10		10	3.16	ug/L	10/29/03	DSC	EPA-200.7/6010B
Mercury, Total	0.4 U		0.4	0.0584	ug/L	10/22/03	MSS	USEPA-7470A
Mercury, Dissolved	0.4 U		0.4	0.0584	ug/L	10/22/03	MSS	USEPA-7470A
Nickel, Total	0.96 J		1.0	0.410	ug/L	10/16/03	JMF	EPA-200.8/6020
Nickel, Dissolved	1.1 J		2.0	0.410	ug/L	10/30/03	MSG	EPA-200.8/6020
Potassium, Total	1800		200	59.7	ug/L	10/17/03	DSC	EPA-200.7/6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/10/03 @ 14:00
Sampler: B.F. & J.S.
Received: 10/11/03 @ 08:45

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **13SW2**
Sample #: **346022**
Matrix: Surface Water

Percent Solids: n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Potassium, Dissolved	1600	200	59.7	ug/L	10/29/03	DSC	EPA-200.7/6010B
Selenium, Total	2.0 U	2.0	0.933	ug/L	10/16/03	JMF	EPA-200.8/6020
Selenium, Dissolved	3.0 U	3.0	0.933	ug/L	10/30/03	MSG	EPA-200.8/6020
Silver, Total	0.5 U	0.5	0.0765	ug/L	10/16/03	JMF	EPA-200.8/6020
Silver, Dissolved	0.5 U	0.5	0.0765	ug/L	10/30/03	MSG	EPA-200.8/6020
Sodium, Total	5100 J,S	500	76.9	ug/L	10/17/03	DSC	EPA-200.7/6010B
Sodium, Dissolved	5100	500	76.9	ug/L	10/29/03	DSC	EPA-200.7/6010B
Thallium, Total	1.0 U	1.0	0.208	ug/L	10/16/03	JMF	EPA-200.8/6020
Thallium, Dissolved	1.0 U	1.0	0.208	ug/L	10/30/03	MSG	EPA-200.8/6020
Vanadium, Total	10 U	10	2.89	ug/L	10/17/03	DSC	EPA-200.7/6010B
Vanadium, Dissolved	10 U	10	2.89	ug/L	10/29/03	DSC	EPA-200.7/6010B
Zinc, Total	5.5 J	20	4.55	ug/L	10/17/03	DSC	EPA-200.7/6010B
Zinc, Dissolved	20 U	20	4.55	ug/L	10/29/03	DSC	EPA-200.7/6010B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/11/03 @ 08:45
Sampler: B.F.& J.S.
Received: 10/14/03 @ 09:30

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **ASB1A**
Sample #: **346248**
Matrix: Soil

Percent Solids: 82

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	32000		250	9.15	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Antimony, Total	0.086 J		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	3.0		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	86		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	0.53 J		1.0	0.0333	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Cadmium, Total	0.94 J		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	2569		250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	38	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	8.8	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	155		5.0	1.84	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Iron, Total	41600		200	42.4	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Lead, Total	76		10	0.218	mg/kg dry	10/24/03	DWJ	USEPA-6020
Magnesium, Total	2450		250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	315		5.0	0.264	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Mercury, Total	0.067 J		0.10	0.0077	mg/kg dry	10/21/03	MSS	USEPA-7471A
Nickel, Total	13		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1540		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.56 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.070 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	95 J		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.24 J	B,X	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	68	L,M	1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	78		4.0	0.517	mg/kg dry	10/23/03	KLVM	USEPA-6010B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/11/03 @ 09:00
Sampler: B.F.& J.S.
Received: 10/14/03 @ 09:30

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **ASB1B**
Sample #: **346249**
Matrix: Soil

Percent Solids: 78

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	30800	250	9.15	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Antimony, Total	0.50 U	0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	1.8	0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	99	5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	0.90 J	1.0	0.167	mg/kg dry	11/03/03	KLVM	USEPA-6010B
Cadmium, Total	1.0 U	1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	408	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	31 J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	24 J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	20	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	37500	1000	71.6	mg/kg dry	10/23/03	DSC	USEPA-6010B
Lead, Total	26	1.0	0.0218	mg/kg dry	10/23/03	DWJ	USEPA-6020
Magnesium, Total	2050	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	1750	25	1.32	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Mercury, Total	0.019 J	0.10	0.0077	mg/kg dry	10/21/03	MSS	USEPA-7471A
Nickel, Total	16	0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1840	100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.52 J	1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.061 J	3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	122	100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.43 J	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	66 L,M	1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	56	4.0	0.517	mg/kg dry	10/23/03	KLVM	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/11/03 @ 09:15
Sampler: B.F.& J.S.
Received: 10/14/03 @ 09:30

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **ASB1C**
Sample #: **346250**
Matrix: Soil

Percent Solids: 77

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	36300	250	9.15	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Antimony, Total	0.18 J	0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	8.1	0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	115	5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	1.8	1.0	0.167	mg/kg dry	11/03/03	KLVM	USEPA-6010B
Cadmium, Total	0.46 J	1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	126 J	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	40 J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	15 J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	43	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	42200	1000	71.6	mg/kg dry	10/23/03	DSC	USEPA-6010B
Lead, Total	19	1.0	0.0218	mg/kg dry	10/23/03	DWJ	USEPA-6020
Magnesium, Total	5870	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	1170	25	1.32	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Mercury, Total	0.075 J	0.10	0.0077	mg/kg dry	10/21/03	MSS	USEPA-7471A
Nickel, Total	28	0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	3780	100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.99 J	1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.11 J	3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	54 J	100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.45 J	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	56 L,M	1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	109	20	2.59	mg/kg dry	10/27/03	KLVM	USEPA-6010B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/11/03 @ 12:00
Sampler: B.F.& J.S.
Received: 10/14/03 @ 09:30

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **ASB3A**
Sample #: **346251**
Matrix: Soil

Percent Solids: 80

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	32100	250	9.15	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Antimony, Total	0.50 U	0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	1.9	0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	114	5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	0.62 J	1.0	0.0333	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Cadmium, Total	1.0 U	1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	3910	250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	33 J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	24 J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	36	2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	38300	1000	71.6	mg/kg dry	10/23/03	DSC	USEPA-6010B
Lead, Total	34	1.0	0.0218	mg/kg dry	10/23/03	DWJ	USEPA-6020
Magnesium, Total	2090	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	2400	25	1.32	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Mercury, Total	0.052 J	0.10	0.0077	mg/kg dry	10/21/03	MSS	USEPA-7471A
Nickel, Total	12	0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1410	100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.30 J	1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.054 J	3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	207	100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.48 J	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	68 L,M	1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	56	4.0	0.517	mg/kg dry	10/23/03	KLVM	USEPA-6010B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/11/03 @ 12:15
Sampler: B.F.& J.S.
Received: 10/14/03 @ 09:30

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **ASB3B**
Sample #: **346252**
Matrix: Soil

Percent Solids: 80

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	28300		250	9.15	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	1.6		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	63		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	0.57 J		1.0	0.0333	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Cadmium, Total	0.75 J		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	644		250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	30	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	12	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	17		2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	36500		1000	71.6	mg/kg dry	10/23/03	DSC	USEPA-6010B
Lead, Total	11		1.0	0.0218	mg/kg dry	10/23/03	DWJ	USEPA-6020
Magnesium, Total	1980		250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	483		5.0	0.264	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Mercury, Total	0.030 J		0.10	0.0077	mg/kg dry	10/21/03	MSS	USEPA-7471A
Nickel, Total	13		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1670		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.40 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.048 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	237		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.20 J	B,X	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	66	L,M	1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	46		4.0	0.517	mg/kg dry	10/23/03	KLVM	USEPA-6010B

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/11/03 @ 12:30
Sampler: B.F.& J.S.
Received: 10/14/03 @ 09:30

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **ASB3C**
Sample #: **346253**
Matrix: Soil

Percent Solids: 84

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	24500		50	1.83	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	2.2		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	50		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	0.64 J		1.0	0.0333	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Cadmium, Total	1.0 U		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	293		250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	41	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	11	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	14		2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	33600		1000	71.6	mg/kg dry	10/23/03	DSC	USEPA-6010B
Lead, Total	12		1.0	0.0218	mg/kg dry	10/23/03	DWJ	USEPA-6020
Magnesium, Total	1160		250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	330		5.0	0.264	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Mercury, Total	0.025 J		0.10	0.0077	mg/kg dry	10/21/03	MSS	USEPA-7471A
Nickel, Total	14		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1010		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.40 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.074 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	131		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.15 J	B,X	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	42	L,M	1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	44		4.0	0.517	mg/kg dry	10/23/03	KLVM	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/11/03 @ 10:15
Sampler: B.F.& J.S.
Received: 10/14/03 @ 09:30

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **ASB2A**
Sample #: **346254**
Matrix: Soil

Percent Solids: 80

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	28500		250	9.15	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Antimony, Total	0.071 J		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	2.9		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	61		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	0.55 J		1.0	0.0333	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Cadmium, Total	0.26 J		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	6100		250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	36	J,m	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	9.3	J,s	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	57		2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	38100		1000	71.6	mg/kg dry	10/23/03	DSC	USEPA-6010B
Lead, Total	25		1.0	0.0218	mg/kg dry	10/23/03	DWJ	USEPA-6020
Magnesium, Total	3180		250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	426		5.0	0.264	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Mercury, Total	0.045 J		0.10	0.0077	mg/kg dry	10/21/03	MSS	USEPA-7471A
Nickel, Total	13		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1220		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.47 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.072 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	77 J		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.23 J	B,x	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	63	L,m	1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	58		4.0	0.517	mg/kg dry	10/23/03	KLVM	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/11/03 @ 10:10
Sampler: B.F.& J.S.
Received: 10/14/03 @ 09:30

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **ASB2B**
Sample #: **346255**
Matrix: Soil

Percent Solids: 76

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	32300		250	9.15	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	3.4		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	77		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	1.3		1.0	0.167	mg/kg dry	11/03/03	KLVM	USEPA-6010B
Cadmium, Total	0.36 J		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	867		250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	39	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	14	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	19		2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	40300		1000	71.6	mg/kg dry	10/23/03	DSC	USEPA-6010B
Lead, Total	8.8	J,F	1.0	0.0218	mg/kg dry	10/23/03	DWJ	USEPA-6020
Magnesium, Total	5220	J,F	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	648		5.0	0.264	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Mercury, Total	0.014 J		0.10	0.0077	mg/kg dry	10/21/03	MSS	USEPA-7471A
Nickel, Total	36	J,F	0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	2750	J,F	100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.60 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.093 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	77 J		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.23 J	B,X	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	55	L,M	1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	45		4.0	0.517	mg/kg dry	10/23/03	KLVM	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/11/03 @ 00:00
Sampler: B.F.& J.S.
Received: 10/14/03 @ 09:30

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **SBD-10**
Sample #: **346256**
Matrix: Soil

Percent Solids: 72

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	34800		250	9.15	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Antimony, Total	0.068 J		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	4.7		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	98		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	0.86 J		1.0	0.167	mg/kg dry	11/03/03	JMF	USEPA-6010B
Cadmium, Total	1.0 U		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	380		250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Chromium, Total	41	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	22	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	23		2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	38000		1000	71.6	mg/kg dry	10/23/03	DSC	USEPA-6010B
Lead, Total	13	J,f	1.0	0.0218	mg/kg dry	10/23/03	DWJ	USEPA-6020
Magnesium, Total	2800	J,f	250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	859		5.0	0.264	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Mercury, Total	0.022 J		0.10	0.0077	mg/kg dry	10/21/03	MSS	USEPA-7471A
Nickel, Total	21	J,f	0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1560	J,f	100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.50 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.094 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	50 J		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.22 J	B,X	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
Vanadium, Total	49	L,M	1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	37		4.0	0.517	mg/kg dry	10/23/03	KLVM	USEPA-6010B

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/11/03 @ 11:15
Sampler: B.F.& J.S.
Received: 10/14/03 @ 09:30

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **ASB2C**
Sample #: **346257**
Matrix: Soil

Percent Solids: 73

Parameter	Analytical Result		Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Aluminum, Total	35000		250	9.15	mg/kg dry	10/27/03	KLVM	USEPA-6010B
Antimony, Total	0.50 U		0.50	0.0518	mg/kg dry	10/21/03	MSG	USEPA-6020
Arsenic, Total	4.5		0.40	0.0232	mg/kg dry	10/23/03	DWJ	USEPA-6020
Barium, Total	88		5.0	0.106	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Beryllium, Total	0.59 J		1.0	0.167	mg/kg dry	11/03/03	JMF	USEPA-6010B
Cadmium, Total	1.0 U		1.0	0.182	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Calcium, Total	310		250	16.6	mg/kg dry	10/23/03	KLVM	USEPA-6010B
* Chromium, Total	52	J,M	5.0	0.912	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Cobalt, Total	20	J,S	1.0	0.208	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Copper, Total	22		2.0	0.368	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Iron, Total	40200		1000	71.6	mg/kg dry	10/23/03	DSC	USEPA-6010B
Lead, Total	12		1.0	0.0218	mg/kg dry	10/23/03	DWJ	USEPA-6020
Magnesium, Total	2120		250	3.21	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Manganese, Total	704		5.0	0.264	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Mercury, Total	0.020 J		0.10	0.0077	mg/kg dry	10/21/03	MSS	USEPA-7471A
Nickel, Total	20		0.50	0.0356	mg/kg dry	10/23/03	DWJ	USEPA-6020
Potassium, Total	1260		100	5.00	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Selenium, Total	0.45 J		1.0	0.0502	mg/kg dry	10/23/03	DWJ	USEPA-6020
Silver, Total	0.075 J		3.0	0.0044	mg/kg dry	10/24/03	DWJ	USEPA-6020
Sodium, Total	50 J		100	18.1	mg/kg dry	10/28/03	DWJ	USEPA-6010B
Thallium, Total	0.21 J	B,X	0.50	0.0270	mg/kg dry	10/24/03	DWJ	USEPA-6020
* Vanadium, Total	54	L,M	1.0	0.207	mg/kg dry	10/23/03	KLVM	USEPA-6010B
Zinc, Total	40		4.0	0.517	mg/kg dry	10/23/03	KLVM	USEPA-6010B

* See attached Statement of Data Qualifications.

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 09:45
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
Submittal #:	**36440-6**		
Submittal:	Delivery Order 0046		
	RAAP		
Sample ID:	**EQB5**		
Sample #:	**346013**		
Matrix:	QC Water	Percent Solids:	n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Cyanide, Total	10 U	10	3.40	ug/L	10/16/03	JLB	USEPA-9012A

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 11:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
Submittal #:	**36440-6**		
Submittal:	Delivery Order 0046 RAAP		
Sample ID:	**EQB6**		
Sample #:	**346015**		
Matrix:	QC Water	Percent Solids:	n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Cyanide, Total	10 U	10	3.40	ug/L	10/16/03	JLB	USEPA-9012A

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 13:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
Submittal #:	**36440-6**		
Submittal:	Delivery Order 0046		
	RAAP		
Sample ID:	**13SD3**		
Sample #:	**346017**		
Matrix:	Soil	Percent Solids:	68

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	68	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.20 J	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 00:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
Submittal #:	**36440-6**		
Submittal:	Delivery Order 0046 RAAP		
Sample ID:	**SDD1**		
Sample #:	**346018**		
Matrix:	Soil	Percent Solids:	63

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	63	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.39 J	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 14:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
Submittal #:	**36440-6**		
Submittal:	Delivery Order 0046		
	RAAP		
Sample ID:	**13SD2**		
Sample #:	**346019**		
Matrix:	Soil	Percent Solids:	65

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	65	0.1	0.1	%	10/14/03	TAM	SW-846 3550B
Cyanide, Total	0.07 J	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 13:00
Project:	Richmond, VA	Sampler:	B.F. & J.S.
	RAAP	Received:	10/11/03 @ 08:45
Submittal #:	**36440-6**		
Submittal:	Delivery Order 0046		
	RAAP		
Sample ID:	**13SW3**		
Sample #:	**346020**		
Matrix:	Surface Water	Percent Solids:	n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Cyanide, Total	10 U	10	3.40	ug/L	10/16/03	JLB	USEPA-9012A

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/10/03 @ 00:00
Sampler: B.F. & J.S.
Received: 10/11/03 @ 08:45

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **SWD1**
Sample #: **346021**
Matrix: Surface Water

Percent Solids: n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Cyanide, Total	10 U	10	3.40	ug/L	10/16/03	JLB	USEPA-9012A

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/10/03 @ 14:00
Project:	Richmond, VA RAAP	Sampler:	B.F. & J.S.
		Received:	10/11/03 @ 08:45
Submittal #:	**36440-6**		
Submittal:	Delivery Order 0046 RAAP		
Sample ID:	**13SW2**		
Sample #:	**346022**		
Matrix:	Surface Water	Percent Solids:	n/a

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Cyanide, Total	10 U	10	3.40	ug/L	10/16/03	JLB	USEPA-9012A

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/11/03 @ 08:45
Sampler: B.F.& J.S.
Received: 10/14/03 @ 09:30

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **ASB1A**
Sample #: **346248**
Matrix: Soil

Percent Solids: 82

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	82	0.1	0.1	%	10/16/03	TAM	SW-846 3550B
Cyanide, Total	0.06 J	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 09:00
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
Submittal #:	**36440-6**		
Submittal:	Delivery Order 0046 RAAP		
Sample ID:	**ASB1B**		
Sample #:	**346249**		
Matrix:	Soil	Percent Solids:	78

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	78	0.1	0.1	%	10/16/03	TAM	SW-846 3550B
Cyanide, Total	0.50 U	0.50	0.0356	mg/kg dry	10/20/03	JLB	USEPA-9012A

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 09:15
Project:	Richmond, VA RAAP	Sampler:	B.F.& J.S.
		Received:	10/14/03 @ 09:30
Submittal #:	**36440-6**		
Submittal:	Delivery Order 0046 RAAP		
Sample ID:	**ASB1C**		
Sample #:	**346250**		
Matrix:	Soil	Percent Solids:	77

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	77	0.1	0.1	%	10/16/03	TAM	SW-846 3550B
Cyanide, Total	0.47 J	0.50	0.0356	mg/kg dry	10/24/03	JLB	USEPA-9012A

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/11/03 @ 12:00
Sampler: B.F.& J.S.
Received: 10/14/03 @ 09:30

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **ASB3A**
Sample #: **346251**
Matrix: Soil

Percent Solids: 80

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	80	0.1	0.1	%	10/16/03	TAM	SW-846 3550B
Cyanide, Total	0.15 J	0.50	0.0356	mg/kg dry	10/24/03	JLB	USEPA-9012A

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client:	**URS Corporation**	Sampled:	10/11/03 @ 12:15
Project:	Richmond, VA	Sampler:	B.F.& J.S.
	RAAP	Received:	10/14/03 @ 09:30
Submittal #:	**36440-6**		
Submittal:	Delivery Order 0046		
	RAAP		
Sample ID:	**ASB3B**		
Sample #:	**346252**		
Matrix:	Soil	Percent Solids:	80

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	80	0.1	0.1	%	10/16/03	TAM	SW-846 3550B
Cyanide, Total	0.50 U	0.50	0.0356	mg/kg dry	10/24/03	JLB	USEPA-9012A

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/11/03 @ 12:30
Sampler: B.F.& J.S.
Received: 10/14/03 @ 09:30

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **ASB3C**
Sample #: **346253**
Matrix: Soil

Percent Solids: 84

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	84	0.1	0.1	%	10/16/03	TAM	SW-846 3550B
Cyanide, Total	0.50 U	0.50	0.0356	mg/kg dry	10/24/03	JLB	USEPA-9012A

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/11/03 @ 10:15
Sampler: B.F.& J.S.
Received: 10/14/03 @ 09:30

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **ASB2A**
Sample #: **346254**
Matrix: Soil

Percent Solids: 80

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	80	0.1	0.1	%	10/16/03	TAM	SW-846 3550B
Cyanide, Total	0.23 J	0.50	0.0356	mg/kg dry	10/24/03	JLB	USEPA-9012A

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ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/11/03 @ 10:10
Sampler: B.F.& J.S.
Received: 10/14/03 @ 09:30

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **ASB2B**
Sample #: **346255**
Matrix: Soil

Percent Solids: 76

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	76	0.1	0.1	%	10/16/03	TAM	SW-846 3550B
Cyanide, Total	0.18 J	0.50	0.0356	mg/kg dry	10/24/03	JLB	USEPA-9012A

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/11/03 @ 00:00
Sampler: B.F.& J.S.
Received: 10/14/03 @ 09:30

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **SBD-10**
Sample #: **346256**
Matrix: Soil

Percent Solids: 72

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	72	0.1	0.1	%	10/16/03	TAM	SW-846 3550B
Cyanide, Total	0.14 J	0.50	0.0356	mg/kg dry	10/24/03	JLB	USEPA-9012A

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TriMatrix Laboratories, Inc.

ANALYTICAL REPORT

Client: **URS Corporation**
Project: Richmond, VA
RAAP

Sampled: 10/11/03 @ 11:15
Sampler: B.F.& J.S.
Received: 10/14/03 @ 09:30

Submittal #: **36440-6**
Submittal: Delivery Order 0046
RAAP
Sample ID: **ASB2C**
Sample #: **346257**
Matrix: Soil

Percent Solids: 73

Parameter	Analytical Result	Reporting Limit	MDL	Unit	Analysis Date	Chem	Reference Citation
Percent Solids	73	0.1	0.1	%	10/16/03	TAM	SW-846 3550B
Cyanide, Total	0.50 U	0.50	0.0356	mg/kg dry	10/24/03	JLB	USEPA-9012A

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DATA VALIDATION WORKSHEET

Volatile Organic Analysis by GC/MS

Reviewer: AS
Date: January-04
DV Level: II III IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: Radford SSP
Project Number: 15291974.30000
Laboratory: TriMatrix
SDG No.: 36440-6
Test Name: 8260B
Method No.: VOC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	x		
1.4	Do sample preservation, collection and storage condition meet method requirement?	x		
	If the temperature of the cooler was elevated (> 10 °C) or bubble size in aqueous sample was too big (tiny bubble is OK.), then flag all positive results with a "L" and all non-detects "UL".			
1.5	Do any soil samples contain more than 50% water?		x	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV report.			

Notes: ten coolers @ 3.8C, 2.8C, 2.6C, 9.8C, 2.6C, 2.1C, 3.9C, 2.1C, 2.0C, & 3.5C.

1.0 Cooler TM0436 received at laboratory at 9.8C contained EQB5 for all parameters except VOC. All VOC sample containers were received in TM0500 at 3.8C.

2.0 All samples from Area A were collected on Saturday 10/11/03 and could not be shipped until Monday the 13th. Samples were received at laboratory on Tuesday the 14th. The encore aliquots could not be used since the holding time to preservation had expired. All sample aliquots were taken from bulk.

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method or project QAPP?	see above		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, L(+)/UL(-). For aqueous unpreserved - 7 days for aromatic compounds All others - 14 days.		x	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .		x	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per GCMS, 20 samples, batch, matrix, and level)?	x		
3.2	Do any method blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to 5 times (or 10 times for the common volatile lab contaminants - methylene chloride, acetone, and 2-butanone) the amount in the associated blank.	x		
3.3	Do any field equipment blanks/trip blanks have positive results? If Yes, use same rules above.	x		
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, noted in the DV report.	x		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	x		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	x		
4.3	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	x		
4.4	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 15% and %D < ± 20%		x	
	For initial Calibration: for %RSD > ±15%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 20% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >20%, J(+).			
4.5	Do any SPCC compounds have an RRF < control limit? Control limits: >0.10 for chloromethane, 1,1-dichloroethane, & bromoform or >0.30 for chlorobenzene & 1,1,2,2-tetrachloroethane. If yes, L(+)/R(-).		x	

Notes: The second source for methyl acetate was analyzed after sample analyses, but passed at 89% - no action was taken.

5.0 GC/MS Instrument Performance Check		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	x		
5.2	Are BFB enchanced bar graph spectrum and mass/charge (m/z) listing provided for each 12-hour shift?	x		
5.3	Have all samples been analyzed within twelve hours of the BFB tune?	x		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
5.4	Have ion abundance criteria for BFB been met for each instrument used?	x		
	If the BFB criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Notes:

6.0 Surrogate Recovery		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	x		
6.2	Are surrogate recoveries within acceptance criteria (not to exceed 50-150%) for all samples and method blanks?	x		
6.3	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?			x
	If any system monitoring compound(s) in the volatile fraction is out of specification, there should be a reanalysis to confirm that the non-compliance is because of sample matrix effects rather than laboratory deficiencies.			
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? DV report should indicate that extraction efficiency/ method accuracy cannot be verified.			x
	1 or more <10% / 1 high/low / 2 or 3 high/low / 2 or 3 all low / 2 or 3 all high			
	Positives: L / J / J / L / K			
	Non-detects: R / UJ / UJ / UL / NONE			
	Note: The B qualifier remains over surrogate flagging.			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	x		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
7.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 50-150%?	x		
7.4	Are there any RPD outside the QC limits not to exceed 50%?	x		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	x		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 50-150%?	x		
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 50%?			x
	If Yes, J(+) only.			

Notes:

9.0 Internal Standard		Yes	No	NA
9.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? If not, J(+)/UJ(-).	x		
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	x		
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.			

Notes:

10.0 Field Duplicate		Yes	No	NA
10.1	Was a field duplicate prepared and analyzed at the correct frequency (one per 20 samples, matrix, and level)?	x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
10.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	x		

Notes:

11.0 Tentatively Identified Compounds (TICs) and Detection Limit Verification		Yes	No	NA
11.1	Are any TICs detected in the field samples? If Yes, all TIC results should be flagged "NJ" (tentatively identified and approximate concentration).		x	
11.2	Do detection limits meet those required by the project QAPP and were they properly adjusted to reflect all sample dilutions and dry weight factors?	x		
11.3	Were sample concentrations above the highest standard run at a dilution? If not, for ion saturation flag "L", unsaturated results "J".			x

Notes:

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	x		
	Number of samples: 22			
	Number of target compounds in each analysis:50			
	Number of results rejected and not reported:0			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100.0%			

Notes:

DATA VALIDATION WORKSHEET

Semivolatile Organic Analysis

Reviewer: AS
Date: January-04
DV Level: II III IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: Radford SSP
Project Number: 15291974.30000
Laboratory: TriMatrix
SDG No.: 36440-6
Test Name: SVOC
Method No.: 8270C

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		x	
1.4	Do sample preservation, collection and storage condition meet method requirement?		x	
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "L" and all non-detects "UL".			
1.5	Do any soil samples contain more than 50% water?		x	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV report.			

Notes: ten coolers @ 3.8C, 2.8C, 2.6C, 9.8C, 2.6C, 2.1C, 3.9C, 2.1C, 2.0C, & 3.5C.

Cooler TM0436 received at laboratory at 9.8C contained EQB5 for all parameters except VOC. All VOC sample containers were received in TM0500.

2.0 Holding Times

		Yes	No	NA
2.1	Were sample preserved as specified in the method or project QAPP?	x		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, L(+)/UL(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		x	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .		x	

Notes:

Since cooler temperature of 9.8C is less than 10C, no qualifying action was taken.

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	x		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to 5 times (or 10 times for the common phthalate contaminants) the amount in the associated blank.	x		
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.	x		
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, noted in the Dv report.	x		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	x		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	x		
4.3	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	x		
4.4	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD ≤ 15%, ICV %D < 30%, and CCV %D ≤ 20%.		x	
	For initial Calibration: for %RSD > ±15%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 20% and < + 60%, J(+)/UJ(-), >60%J(+)/R(-); displaying a positive bias >20%, J(+).			
4.5	Do any SPCC compounds have an RRF < 0.05? (n-nitroso-di-n-propylamine,hexachlorocyclopentadiene,2,4-dinitrophenol, & 4-nitrophenol) If yes, J(+)/R(-).		x	

Notes:

5.0 GC/MS Instrument Performance Check		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for decafluorotriphenylphosphine (DFTPP)?	x		
5.2	Are DFTPP enchanced bar graph spectrum and mass/charge (m/z) listing provided for each 12-hour shift?	x		
	If DFTPP was analyzed simultaneously with any calibration standard or blank, the instrument performance check (IPC) is rejected "R" as well as all associated data.			
5.3	Have all samples been analyzed within twelve hours of the DFTPP tune?	x		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
5.4	Have ion abundance criteria for DFTPP been met for each instrument used?	x		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Notes:

6.0 Surrogate Recovery		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	x		
6.2	Are surrogate recoveries within acceptance criteria not to exceed 10-150% for all samples and method blanks?		x	
6.3	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?		x	
	If any two base/neutral or acid fraction are out of specification, or if any one base/neutral or acid extractable surrogate has a recovery of less than 10%, then there should be a reanalysis to confirm that the non-compliance is because of sample matrix effects rather than laboratory deficiencies.			
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? (recoveries may be diluted out.)	x		
	1 or more <10% / 2 or 3 high/low / 2 or 3 all low / 2 or 3 all high Positives: L / J / L / K Non-detects: R / UJ / UL / NONE			
	Note: The B qualifier remains over surrogate flagging.			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	x		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
7.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 10-150%?	x		
7.4	Are there any RPDs outside the QC limits not to exceed 60%?	x		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	x		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 10-150%?	x		
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 50%?		x	
	If Yes, J(+) only.			

Notes:

9.0 Internal Standard		Yes	No	NA
9.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? If not, J(+)/UJ(-).		x	
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	x		
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.			

Notes:

10.0 Field Duplicate		Yes	No	NA
10.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
10.2	Are all analyte duplicate results within control limits? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.		x	

Notes:

11.0 Tentatively Identified Compounds (TICs) and Detection Limit Verification		Yes	No	NA
11.1	Are any TICs detected in the field samples? If Yes, all TIC results should be flagged "NJ" (tentativelyidenified, and approximate concentration).	x		
11.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?	x		
11.3	Were sample concentrations above the highest standard run at a dilution? If not, for ion saturation flag "L", unsaturated results "J".			x

Notes:

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	x		
	Number of samples: 18			
	Number of target compounds in each analysis:66			
	Number of results rejected and not reported:0			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 100.0%			

Notes:

DATA VALIDATION WORKSHEET

Polyaromatic Hydrocarbons

Reviewer: AS
Date: January-04
DV Level: II III IV

Review Document:

__X__ Region III Modified for National Functional Guidelines
_____ NFG for organic Data review (February 1994)
__X__ Project QAPP/SAP

Project Name: Radford SSP
Project Number: 15291974.30000
Laboratory: TriMatrix
SDG No.: 36440-6
Test Name: PAH
Method No.: 8310-HPLC

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	x		
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids		x	
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	x		

Notes: ten coolers @ 3.8C, 2.8C, 2.6C, 9.8C, 2.6C, 2.1C, 3.9C, 2.1C, 2.0C, & 3.5C.

Cooler TM0436 received at laboratory at 9.8C contained EQB5 for all parameters except VOC. All VOC sample containers were received in TM0500.

2.0 Holding Times

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?		see above	
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyses, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		x	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		x	

Notes:

Since cooler temperature of 9.8C is less than 10C, no qualifying action was taken.

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	x		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		x	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		x	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	x		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	x		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	x		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		x	
	For initial Calibration: for %RSD > ±20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	x		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	x		
5.2	Are surrogate recoveries within acceptance criteria not to exceed 30-150% for all samples and method blanks?		x	
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			x
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			x
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	x		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
6.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 40-150%?	x		
	Are there any RPDs outside the QC limits not to exceed 60%?		x	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	x		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 40-150%?		x	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 60%?		x	
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	x		

Notes:

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are all positive identifications confirmed on second column or detector? If not, reject or estimate this detection.	x		
9.2	For positive sample detections, is RPD <40% between first and second columns. If not, apply J.			x
9.3	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	x		

Notes:

10.0 Data Completeness			Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)		x		
	Number of samples:	18			
	Number of target compounds in each analysis:	16			
	Number of results rejected and not reported:	0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)				
	% Completeness =	100%			

Notes:

DATA VALIDATION WORKSHEET

Explosives

Reviewer:	AS	**Project Name:**	Radford SSP
Date:	January-04	**Project Number:**	15291974.30000
DV Level:	II III IV	**Laboratory:**	TriMatrix
Review Document:		**SDG No.:**	36440-6
_X_ Region III Modified for National Functional Guidelines		**Test Name:**	Explosives
____ NFG for organic Data review (February 1994)		**Method No.:**	8330-HPLC
_X_ Project QAPP/SAP			

1.0 Laboratory Deliverables		**Yes**	**No**	**NA**
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	x		
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids		x	
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	x		

Notes: ten coolers @ 3.8C, 2.8C, 2.6C, 9.8C, 2.6C, 2.1C, 3.9C, 2.1C, 2.0C, & 3.5C.

Cooler TM0436 received at laboratory at 9.8C contained EQB5 for all parameters except VOC. All VOC sample containers were received in TM0500.

2.0 Holding Times		**Yes**	**No**	**NA**
2.1	Do sample preservation, collection and storage condition meet method requirement?		see above	
	Action: If the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		x	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		x	

Notes:

Since cooler temperature of 9.8C is less than 10C, no qualifying action was taken.

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	x		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		x	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		x	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	x		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	x		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	x		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%		x	
	For initial Calibration: for %RSD > ±20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	x		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	x		
5.2	Are surrogate recoveries within acceptance criteria not to exceed 30-150% for all samples and method blanks?	x		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			x
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			x
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	x		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
6.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 40-150%?	x		
6.4	Are there any RPDs outside the QC limits not to exceed 60%?	x		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: 13SD2 RPDs out
13SW2 tetryl 42/40% (50%)
ASB2C RPDs out

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	x		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 40-150%?		x	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 60%?			x
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	x		

Notes:

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are all positive identifications confirmed on second column or detector? If not, reject or estimate this detection.	x		
9.2	For positive sample detections, is RPD <40% between first and second columns. If not, apply J.	x		
9.3	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	x		

Notes:

10.0 Data Completeness			Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)		x		
	Number of samples:	18			
	Number of target compounds in each analysis:	14			
	Number of results rejected and not reported:	0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)				
	% Completeness =	100%			

Notes:

DATA VALIDATION WORKSHEET

Pesticides/PCBs

Reviewer:	AS	**Project Name:**	Radford SSP
Date:	January-04	**Project Number:**	15291974.30000
DV Level:	II III IV	**Laboratory:**	TriMatrix
Review Document:		**SDG No.:**	36440-6
X SW-846 - 8081/8082		**Test Name:**	PEST/PCB
X NFG - Region III Modifications		**Method No.:**	8081A/8082
___ CLP			

1.0 Laboratory Deliverables		**Yes**	**No**	**NA**
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	x		
1.4	Do any soil samples contain more than 50% water?		x	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV report.			

Notes: ten coolers @ 3.8C, 2.8C, 2.6C, 9.8C, 2.6C, 2.1C, 3.9C, 2.1C, 2.0C, & 3.5C.

Cooler TM0436 received at laboratory at 9.8C contained EQB5 for all parameters except VOC. All VOC sample containers were received in TM0500.

2.0 Preservation/ Holding Times		**Yes**	**No**	**NA**
2.1	Do sample preservation, collection and storage condition meet method requirement?		see above	
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampleing to date of analysis, been exceeded? If yes, J(+)/UJ(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		x	
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		x	

Notes: sampled on 10/2/03, extracted on 10/8-9/03, analyzed 10/10-30/03

Since cooler temperature of 9.8C is less than 10C, no qualifying action was taken.

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix)?	x		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to five times the amount in the associated blank.		x	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		x	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note it in the DV report.	x		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards included in the calibration curve? 1016 and 1260 need at least three peaks at five concentrations. The multi-component target compounds (the other Aroclors, Toxaphene, & Chlordane) must each be analyzed separately at a single concentration level during the initial calibration sequence.	x		
4.2	Has a continuing calibration standard been analyzed for every 12 hours or twenty samples?	x		
4.3	Are all calibration standard (IC and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r>0.99, %RSD < ± 20% and %D < ± 15%		x	
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Do all standard retention times in the continuing calibration fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.	x		

Notes:

5.0 GC/ECD Instrument Performance Check for Pesticides		Yes	No	NA
5.1	Is the 4,4'-DDT breakdown </= to 15%? If No, for positive DDT results, DDT-L(+), DDD/DDE - NJ(+). For non-detect DDT results, DDD/DDE - R(+).	x		
5.2	Is the endrin breakdown </= to 15%? If No, for positive endrin results, endrin-L(+), endrin aldehyde/ketone - NJ(+). For non-detect DDT results, endrin aldehyde/ketone - R(+).	x		

Notes:

6.0 Surrogate Recovery					Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?				x		
6.2	Do all surrogate retention times fall within the RT windows established during the initial calibration sequence? If No, the associated sample result should be carefully evaluated.				x		
6.3	Are surrogate recoveries within acceptance criteria not to exceed 30-150% for all samples and method blanks?				x		
6.4	If No in Section 6.3, are these sample(s) or method blank(s) reanalyzed?						x
6.5	If No in Section 6.4, is any sample dilution factor greater than 10? (recoveries may be diluted out.)						x
	# of outliers	Recovery	Sample result from column with non-conformance	Sample result from column without non-conformance			
	1 out	high/low	No action	No action			
	2 out	2 high same column	K	No action			
		2 low same column	L, UL	No action			
		mixed same column	J, UJ	No action			
		2 high diff columns	J	Not applicable			
		2 low diff columns	J, UJ	Not applicable			
		mixed diff columns	Professional judgement	Not applicable			
	3 out	All high	K	Not applicable			
		All low	L, UL	Not applicable			
		2 high, 1 low	K (2 high)	J (1 low 2nd column)			
		2 low, 1 high	L, UJ (2 low)	J (1 high 2nd column)			
		other mixed	J, UJ	Not applicable			
	4 out	All high	K	Not applicable			
		All low	L, UL	Not applicable			
		Mixed	J, UJ	Not applicable			
	If any recovery is >0% and <10% then L(+)/R(-).						
	If any recovery is 0% then R(+/-).						

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	x		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
7.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 30-150%?	pest	pcb	
7.4	Are there any RPDs outside the QC limits not to exceed 60%?	pest	pcb	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: MS/MSD from SDG 36440-1

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	x		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 30-150%?			
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).		x	
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 60%?		x	
	If Yes, J(+) only.			

Notes:

9.0 Field Duplicate		Yes	No	NA
9.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
9.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	x		

Notes: QSB1A/SBD1 submitted in SDG 36440-2, BDL for pest and 0.053/0.051 for Aroclor 1254.

10.0 Compound Identification and Detection Limit Verification		Yes	No	NA
10.1	Is the percent difference calculated for the positive sample results on both columns < 40%? If No, J(+).	x		
10.2	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	x		

Notes:

11.0 Pesticide Cleanup Checks		Yes	No	NA
11.1	Is Form IX PEST-1 present and complete for each lot of Florisil Cartridges used? (Florisil Cleanup is required for all Pest/PCB extracts to reduce matrix interference caused by polar compounds.)			x
	Every lot number of Florisil cartridges used for sample cleanup must be checked by spiking with 2,4,5-trichlorophenol and the midpoint concentration of Individual Standard Mixture A.			
11.2	Are all samples listed on the Pesticide Florisil cartridge Check Form?			
11.3	Are percent recoveries of pesticide and surrogate compounds within control limit, 80-120%(if the recovery of 2,4,5-trichlorophenol < 5%), for the florisil cartridge check? If No, the raw data should be examined for the presence of polar interferences and professional judgement should be used in qualifying the data.			

Notes:

Florisil cleanup was performed, no laboratory submission for these CLP descriptors was provided.

12.0 Data Completeness				Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	Pest	PCB	x		
	Number of samples:	3	3			
	Number of target compounds in each analysis:	21	7			
	Number of results rejected and not reported:	0	0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)					
	% Completeness =	100%	100%			

Notes:

DATA VALIDATION WORKSHEET

Herbicides

Reviewer: AS
Date: January-04
DV Level: II III IV

Review Document:

__X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
__X__ Project QAPP/SAP

Project Name: Radford SSP
Project Number: 15291974.30000
Laboratory: TriMatrix
SDG No.: 36440-6
Test Name: Herbicides
Method No.: 8151A

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	x		
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids		x	
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	x		

Notes: ten coolers @ 3.8C, 2.8C, 2.6C, 9.8C, 2.6C, 2.1C, 3.9C, 2.1C, 2.0C, & 3.5C.

Cooler TM0436 received at laboratory at 9.8C contained EQB5 for all parameters except VOC. All VOC sample containers were received in TM0500.

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?		see above	
	Action: If the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		x	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		x	

Notes:

Since cooler temperature of 9.8C is less than 10C, no qualifying action was taken.

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	x		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		x	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		x	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	x		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	x		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	x		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	x		
	For initial Calibration: for %RSD > ±20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	x		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	x		
5.2	Are surrogate recoveries within acceptance criteria not to exceed 25-150% for all samples and method blanks?		x	
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?		x	
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.		x	
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	x		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
6.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 25-150%?	x		
6.4	Are there any RPDs outside the QC limits not to exceed 60%?	x		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes: MS/MSD see SDG 36440-1

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	x		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 25-150%?	x		
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 60%?		x	
	Action: If Yes, J(+) only.			

Notes: original extraction Dinoseb LCS recovery low, re-extraction passed.

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	x		

Notes: QSB1A and SDB-3 submitted in SDG 36440-2 were both non-detect.

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are all positive identifications confirmed on second column or detector? If not, reject or estimate this detection.	x		
9.2	For positive sample detections, is RPD <40% between first and second columns. If not, apply J.	x		
9.3	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	x		

Notes:

10.0 Data Completeness			Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)		x		
	Number of samples:	3			
	Number of target compounds in each analysis:	10			
	Number of results rejected and not reported:	0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)				
	% Completeness =	100%			

Notes:

DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

Project Name: Radford SSP
SDG No.: 36440-6 **Reviewer:** AS
Project No.: 15291974.30000 **Date:** January-04

1.0 Chain of Custody/Sample Condition/Raw Data		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	x			x			x			x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x			x			x			x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		x			x			x			x	
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 $^{O}C \pm 2\ ^{O}C$)		x			x			x			x	
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	x			x			x			x		

Note: ten coolers @ 3.8C, 2.8C, 2.6C, 9.8C, 2.6C, 2.1C, 3.9C, 2.1C, 2.0C, & 3.5C.

Cooler TM0436 received at laboratory at 9.8C contained EQB5 for all parameters except VOC. All VOC sample containers were received in TM0500.

2.0 Holding Time		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, CN: 14 days, other metals: 6 months) Action:L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		x			x		x			x		

Note: 38SB2C was collected on 10/3/03 and distilled/analyzed on 10/21/03 the 18th day.

Since cooler temperature of 9.8C is less than 10C, no qualifying action was taken.

3.0 Instrument Calibration		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? (ICP& ICPMS: blank + one standard & a RL standard OR 3 standards and a blank with one standard at the RL; CVAA: blank + five standards with one standard at the RL). If not, qualify with "R".	7 + BLK			4 + BLK			5 + BLK			6 + BLK		
3.2	Are the correlation coefficients > 0.99? Action: J(+)/UJ(-).	x			x			x			x		
3.3	Once per calibration, did a high and low distilled standard recovery within 85-115%? If no, follow 3.6.										x		
3.4	Was an initial calibration check standard (labelled LCS by TriMatrix) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	x			x			x			x		
3.5	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.	x			x			x			x		
3.6	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR ICP 90%-110%, FOR Hg 80-120%, FOR CN 85-115%.	x			x			x			x		
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury < 65% 65% - 79% > 120% Cyanide < 65% 65% - 84% > 115% Other Metals < 75% 75% - 89% > 110%												
3.7	For ICP & ICPMS, did the CRDL standard recover between 80-120%?	x					x	x			x		
	<50% 50%-79% >120% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K							passed within 70-130%			passed within 59-101%		

Note: A high point added to Al, Ba, Ca, Fe, Mg, Mn, & K curves and the RLs were elevated by 5.

4.0 Blanks		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	x			x			x			x		
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	x			x			x			x		
4.3	Are there reported MB or ICB/CCBs values > RL?	x			x				x			x	
	Sample Results > RL												
	< 5X Blank Contamination B												
4.4	Are there negative blank results with the absolute value > RL?		x			x			x			x	
	Sample Results Non-detects > RL												
	< 5X absolute Blank Contamination UL L												
4.5	Are there reported field blank > ± RL?	x			x				x			x	
	Sample Results > RL												
	< 5X Blank Contamination B												

Note: _____

5.0 ICP Interference Check Sample (ICS)		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning of each ICP run?	x			x								
5.2	Are the ICS AB recoveries within 80% - 120%?	x			x								
5.3	Are the results for unspiked analytes (in ICS A) < ± RL?	x			x								
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?			x			x						
	If not...												
	Action: Not Spiked Analytes Spiked analytes (ICS AB analytes)												
	< -RL > RL < 50% 50% - 79% >120%												
	L(+)/UL(-) K(+) L(+)/R(-) L(+)/UL(-) K(+)												

Note: _____

6.0 Laboratory Control Sample (LCS)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	x			x			x			x		
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		x			x			x			x	
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)												

Note: _____

7.0 Laboratory Duplicates (MSD)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.	x			x			x			x		
	For aqueous 6010B and Hg - RPD< 25%, aqueous CN - RPD < 20%, aqueous 6020 - RPD < 20%, and for soil - use laboratory generated limits for MS/MSD.												
7.2	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ(-) for the analyte with results that fall outside criteria.	x			x			x			x		

Note: _____

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.	x			x			x			x		
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125% for aqueous and lab limits for soil?												
	%R > 125% 30%< %R < 74% < 30%	x				x		x			x		
	Positive K L L												
	Non-detect None UL R												
8.3	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.	x			x					x			x

Note: 13SD2 Calcium and Magnesium, post digetion spike passes

13SW2 passes for pre and post

ASB2C Chromium and Vanadium, post digestion spike recovery passes

9.0 Instrument Detection Limits (IDL)		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?	x			x			x			x		

Note:

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	x			x								
10.2	Was a five-fold dilution performed?	x			x								
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 5 X the RL for 6010 or > 20 X the RL for 6020 in the original sample? If no, J(+).	x				x							

Note: Serial Dilution: 13SW2 - total sodium 15.7% , post digestion spike recovery pass

Serial Dilution: ASB2C - cobalt 30.0% , post digestion spike recovery passes

Serial Dilution: 13SD2 - calcium 12.6% , post digestion spike recovery pass

11.0 Field Duplicate Samples		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	x			x			x			x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.												
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report		x			x		x			x		

Note: _____

12.0 Result Verification/ Internal Standards/ Tune		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?	x			x			x			x		
12.2	Were all dilution reflected in the positive results and detection limits?	x			x			x			x		
12.3	Were the Internal Standard recoveries within 30-120%	x			x								
12.4	Were the tunes run at a minimum of four times with RSD < 5% for analytes in solution?	x											
12.5	Were the tune mass calibrations < 0.1 amu from the true value?	x											
12.6	Was the resolution check peak width < 0.9 amu at 10% peak height?	x											

Note: _____

Several metals by 6010B and lead by 6020 were analyzed straight and then at dilution due to the presence of high target concentrations

13.0 Completeness Calculation		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	x			x			x			x		
13.1.1	Number of samples: 18												
13.1.2	Number of target compounds in each analysis: various												
13.1.3	Number of results rejected and not reported: 0												
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2)												
	% Completeness = 100%	100%			100%			100%			100%		

Note: _____

Cart 1
602-R-12

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1140 000058

Project Number	Project Name
89604 317	TCFAAP

Project Contact (Name and Phone Number): Doreen Frame (804) 765 9008

Samplers: Brett Fisher / John Spangler

LAB: Test-America

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, [redacted])	Dioxin/Furan(8290)	TAL Metals (Including Mercury) / CN	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	[redacted]	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
375G1 B	10/10/03 915	5		X	5	F	/	3	X														346012
EQB5	10/10/03 945	5		X	4	F,C	/	14	X	X	X	X	X	X		X						X	346013
Trip Blank	10/10/03 945 T							2	X														346014
	TIME for TB added - WR 10/13/03																						

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Brett Fisher	10/10/03 1800				
Relinquished by:	Date/time	Received by: (for lab) John Spangler	Date/Time 10/11/03 08:45	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

36440-6

23-1

TMU3V 1

Capt 602-R-12

№ 1139

000059

Radford Army Ammunition Plant
Chain Of Custody Record

Project Number	Project Name
96049317	RFAAP

Project Contact (Name and Phone Number): Darren Rowe (804) 765 9000

Samplers: Brett Fisher / John Spagher

LAB: Tri-Matrix

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, [redacted])	Dioxin/Furan(8290)	TAL Metals (Including Mercury) ICN	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	[redacted] Hard	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
EQB 6	10/10/03 1100	5		X	4	ABS EF	U	14	X	X	X	X	X	X		X						X	346015
Trip Blk	10/10/03 1100							2	X														346016
	TIME for TB added - WR 10/13/03																						

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Brett Fisher	10/10/03 1800				
Relinquished by:	Date/time	Received by: (for lab) JAF	Date/Time 10/11/03 08:45	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

36440-6

23-1

TMO 616

VOC Rack # 400, 602-R-12
Carts 4 + 1

Radford Army Ammunition Plant
Chain Of Custody Record

Vol Soil Fridge No 1111

Project Number	Project Name
69604 317	RFAAP

Project Contact (Name and Phone Number): Darren Rentz (804) 765 9000

Samplers: Brett Fisher / John Spangler

LAB: Tri-Matrix

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330[redacted])	Dioxin/Furan(8290)	TAL Metals (Including Mercury) ICP	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
1355B	10/10/03 1300	5		X	5	F	Y	5	X	X	X			X		X							346017
5DD1	10/10/03 —	5		X	5	F	Y	5	X	X	X			X		X							346018
1355D2	10/10/03 1400	5		X	5	F	Y	5	X	X	X			X		X							346019
1355D2 MS	10/10/03 1400	5		X	5	F	Y	5	X	X	X			X		X							—
1355D2 MSD	10/10/03 1400	5		X	5	F	Y	5	X	X	X			X		X							—

Box #1: 1. Surface Water; 2. Ground Water; 3. Leachate; 4. Rinsate; 5. Soil Sediment/Sludge; 6. Trip Blank; 7. Oil; 8. Waste; 9. Other _____

Box #2: A. HCl + Ice; B. HNO3 + Ice; C. NaOH + Ice; D. H2SO4 + Ice; E. Unpreserved; F. Ice Only; G. Other _____; H. NaHSO4 + Ice; I. ZnAc + NaOH + Ice

Box #3: F. Filtered; U. Unfiltered

Box #4: R. Rush - 3 Day; S. Standard 28 Day; T. Timely 14 Day; O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	10/10/03 800				
Relinquished by:	Date/time	Received by: (for lab) JAF	Date/Time 10/11/03 08:45	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

36440-6

23-1

TM0086 3

Radford Army Ammunition Plant
Chain Of Custody Record

Nº 1116

000061

Project Number	Project Name
96043.17	RFAAP

Project Contact (Name and Phone Number): Darren Reese (804) 765-9000

Samplers: Brett Fisher / John Sparks

LAB: Tri-Matrix

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, [illegible])	Dioxin/Furan(8290)	TAL Metals (Including Mercury) /CN	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
155W3	10/10/03 1300	5		X	1	BC EF	F/U	14		X	X			X		X				346020			Metals also filtered

Box #1			Box #2			Box #3		Box #4	
1.	Surface Water	6. Trip Blank	A.	HCl + Ice	F. Ice Only	F.	Filtered	R.	Rush - 3 Day
2.	Ground Water	7. Oil	B.	HNO3 + Ice	G. Other _____	U.	Unfiltered	S.	Standard 28 Day
3.	Leachate	8. Waste	C.	NaOH + Ice	H. NaHSO4 + Ice			T.	Timely 14 Day
4.	Rinsate	9. Other _____	D.	H2SO4 + Ice	I. ZnAc + NaOH + Ice			O.	Other _____
5.	Soil Sediment/Sludge		E.	Unpreserved					

Relinquished by:	Date/Time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	10/10/03 1800				
Relinquished by:	Date/time	Received by: (for lab) JAF	Date/Time 10/11/03 08:45	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

36440-6

23-1

TM0435

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1117 00062

Project Number	Project Name
960317	RFAAP

Project Contact (Name and Phone Number): Darren Rivera (804) 965 7000

Samplers: Brett Fralon / John Spagna

LAB: TH: Matrix

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, [redacted])	Dioxin/Furan(8290)	TAL Metals (Including Mercury) /CN	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
SWD1	10/10/03	5		X	1	BC EF	F/U	14		X	X			X		X					346021		Metals also filtered

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	10/10/03 1800				
Relinquished by:	Date/time	Received by: (for lab) JAF	Date/Time 10/11/03 08:45	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

36440-6

23-1

TM0166

Radford Army Ammunition Plant
Chain Of Custody Record

No 1113

000063

Project Number	Project Name
07604 317	RFAAP

Project Contact (Name and Phone Number): Darran Renna (804)965-9000

Samplers: Brett Fisher / John Snyder

LAB: Tri-Matrix

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)/CN	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
135WS	10/10/03 1300	5		X	1	ABC EF	F/U		X														Metals filtered —
135WD1	10/10/03 —	5		X	1	↓	↓	JAF	X														as well —
135WS2	10/10/03 1400	5		X	1			(14)	X	X	X			X		X							346022
135WS2 MS	10/10/03 1400	5		X	1				X														—
135WS2 MSD	10/10/03 1400	5		X	1	↓	↓		X														—
TRIP BLANK	10/10/03 1400							2	X														

added by us 10/16/03

Box #1			Box #2			Box #3	Box #4	
1. Surface Water	6. Trip Blank		A. HCl + Ice	F. Ice Only		F. Filtered	R. Rush - 3 Day	
2. Ground Water	7. Oil		B. HNO3 + Ice	G. Other _____		U. Unfiltered	S. Standard 28 Day	
3. Leachate	8. Waste		C. NaOH + Ice	H. NaHSO4 + Ice			T. Timely 14 Day	
4. Rinsate	9. Other _____		D. H2SO4 + Ice	I. ZnAc + NaOH + Ice			O. Other _____	
5. Soil Sediment/Sludge			E. Unpreserved					

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Brett Fisher	10/10/03 1800				
Relinquished by:	Date/time	Received by: (for lab) JAF	Date/Time 10/11/03 08:45	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

36440-6

23-1

Radford Army Ammunition Plant
Chain Of Custody Record

No 1114

0000641

Project Number	Project Name
09604-317	RFAAP

Project Contact (Name and Phone Number): Darren Rentz (804) 965 9000

Samplers: Brett Fidler / John Spagnolo

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, [redacted])	Dioxin/Furan(8290)	TAL Metals (Including Mercury) /Ca	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
135W2M3	10/10/03 1400	5		X	1	BC CF	F/U	14		X	X			X		X							Metals filtered as well.

Box #1			Box #2			Box #3		Box #4	
1.	Surface Water	6. Trip Blank	A.	HCl + Ice	F. Ice Only	F.	Filtered	R.	Rush - 3 Day
2.	Ground Water	7. Oil	B.	HNO3 + Ice	G. Other _____	U.	Unfiltered	S.	Standard 28 Day
3.	Leachate	8. Waste	C.	NaOH + Ice	H. NaHSO4 + Ice			T.	Timely 14 Day
4.	Rinsate	9. Other _____	D.	H2SO4 + Ice	I. ZnAc + NaOH + Ice			O.	Other _____
5.	Soil Sediment/Sludge		E.	Unpreserved					

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	10/10/03 1800				
Relinquished by:	Date/time	Received by: (for lab) JAF	Date/Time 10/11/03 08:45	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

36440-6

23-1

TM0579

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1115

000065

Project Number	Project Name
09604817	RFAAP

Project Contact (Name and Phone Number): Darren Rene (804) 965 9000

Samplers: Brad Fisher / John Spagler

LAB:

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury) /CN	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
135W2 MSD	10/10/03 1400	5		X	1	S&F	F/U	14		X	X			X		X							Metals also filtered

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	10/10/03 1810				
Relinquished by:	Date/time	Received by: (for lab) JAF	Date/Time 10/11/03 08:45	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

23-1

TMA389

Cart 7
TM0128
000081

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1118

Project Number	Project Name
09604317	SSP

Project Contact (Name and Phone Number): Darren Renn 804 965 9000

Samplers: John Spangler

LAB: TAMaterson

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, [redacted])	Dioxin/Furan(8290)	TAL Metals (Including Mercury) /CN	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
A501A	10/11/03 8:45			X	5	F	-	5	X	X	X			X		X							
A5B1B	10/11/03 9:00			X	5	F	-	5	X	X	X			X		X							
A5B1C	9:15			X	5	F	-	5	X	X	X			X		X							
A5B3A	12:00			X	5	F	-	5	X	X	X			X		X							
A5B3B	12:15			X	5	F	-	5	X	X	X			X		X							
A5B3C	12:30			X	5	F	-	5	X	X	X			X		X							

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/Time	Received by:	Relinquished by:	Date/Time	Received by:
John Spangler	10/13/03 1700				
Relinquished by:	Date/Time	Received by: (for lab) John Plaka	Date/Time 10/14/03 9:30	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

36440-6

1

Cart 7
TM0621

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1119

Project Number	Project Name
09601317	RFAAP 55P

Project Contact (Name and Phone Number): Darren Reams

Samplers: T Spangler

LAB: TRIMATRIX

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, [illegible])	Dioxin/Furan(8290)	TAL Metals (Including Mercury) /CN	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	~~Paint Filter (9095B)~~ Herb	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
ASB2A	10-11-03 10:15	S		X	5	F	-	7	X	X	X	X	X	X		X						X	
ASB2B	10:30	S		X	5	F	-	5	X	X	X			X		X							
SBD-10	—	S		X	5	F	-	5	X	X	X			X		X							
ASB2C	11:15	S		X	5	F	-	5	X	X	X			X		X							
ASB2C-MS	11:15	S		X	5	F	-	5	X	X	X			X		X							—
ASB2C-MSD	11:15	S		X	5	F	-	5	X	X	X			X		X							—

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
T Spangler	10/13/03 1400				
Relinquished by:	Date/time	Received by: (for lab) Tia Plakos	Date/Time 10/14/03 9:30	**NOTE:** Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

27-9

36440-6

2

DATA VALIDATION REPORT - Level III Review

SDG No.: 03E-0443-01 **Fraction:** PETN_&_Nitroglycerin

Lab: DataChem **Project Name:** Radford_SSP

Reviewer: AS **Date:** February_3,_2004

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific Quality Assurance Project Plan (QAPP).

Major Anomalies: None.

Minor Anomalies: The relative percent difference between the two analytical column concentrations for nitroglycerin was greater than the control limit (i.e., 40%) for samples 13SB10C at 58.4% and 13SB9B at 52.0%. The higher of the two concentrations was reported from the primary calibrated column. These results were flagged "J,g". Samples 13SB9B and SBD9 displayed retention times for nitroglycerin that were marginally outside the calculated retention time window. Upon the confirmation analysis of these two samples, the analyst approved reporting the low level detections based on professional judgement.

Correctable Anomalies: None.

Comments: Positive field sample results from the primary column were analyzed to confirm on an alternate column. Mid-point standards and standards at levels approximate to the method detection limit were analyzed concurrently to qualitatively identify positive detections by retention time responses only.

All data are usable, as qualified, for their intended purpose based on the data reviewed.

Signed: Andrea Sansom

Andrea Sansom

DATA CHEM LABORATORIES
A Sorenson Company

COVER PAGE

ANALYTICAL REPORT FOR URS Group, Inc.

E-mail: Darren_Renne@URScorp.com

Form COVER-V1.4
10220317394875
Page 1

G039900Z

DCL Report Group..: **03E-0443-01**

Date Printed.....: 22-OCT-03 17:39

Project Protocol #: P021C002
Client Ref Number.: Subcontract DCL-09
Release Number....: URS#02

Analysis Method(s): 8332

URS Group, Inc.
Attention: Mr. J Darren Renne
5540 Falmouth Street
Suite 201
Richmond, VA 23229

Client Sample Name	Laboratory Sample Name	Date Sampled	Date Received
Method Blank	BL-211507-1	NA	NA
LCS	QC-211507-1	NA	NA
13SB10C	03E04253	09-OCT-03	10-OCT-03
13SB9A	03E04254	09-OCT-03	10-OCT-03
SBD9	03E04255	09-OCT-03	10-OCT-03
13SB9B	03E04256	09-OCT-03	10-OCT-03
13SB9C	03E04257	09-OCT-03	10-OCT-03
13SB8A	03E04258	09-OCT-03	10-OCT-03
13SB8B	03E04259	09-OCT-03	10-OCT-03

Analyst: Gloria W. Heung — Date: 10/23/03

Reviewer: Thomas T McKay — Date: 10/23/03

Lab Supervisor: Richard W. Wade — Date: 10/23/03

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547
Phone (801) 266-7700 Web Page: www.datachem.com
FAX (801) 268-9992 E-mail: lab@datachem.com

DATA CHEM LABORATORIES
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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S039902Q

Date Printed.....: 22-OCT-03 17:39

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: RFAAP/09604-317
Release Number.....: URS#02

Date Received.....: 10-OCT-03 00:00

DCL Preparation Group: G039C001
Date Prepared.....: 13-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 1 gm
Net Weight/Volume....: Not Required

Client Sample Name: **13SB10C**
DCL Sample Name...: **03E04253**
DCL Report Group..: **03E-0443-01**

Matrix.....: SOIL
Date Sampled.....: 09-OCT-03 13:30
Reporting Units...: mg/kg
Report Basis.....: ☐ As Received ☒ Dried
Percent Moisture..: 27.9

DCL Analysis Group: G039C001
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	21-OCT-03 19:58	0.309	ND		U	1	1.39
Nitroglycerin	21-OCT-03 19:58	0.225	2.46			1	0.693

JG

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547
Phone (801) 266-7700 Web Page: www.datachem.com
FAX (801) 268-9992 E-mail: lab@datachem.com

Date Printed.....: 23-OCT-03 15:57

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: RFAAP/09604-317
Release Number.....: URS#02

Date Received.....: 10-OCT-03 00:00

DCL Preparation Group: G039C001
Date Prepared.....: 13-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 1 gm
Net Weight/Volume....: Not Required

Client Sample Name: **13SB9A**
DCL Sample Name...: **03E04254**
DCL Report Group..: **03E-0443-01**

Matrix.....: SOIL
Date Sampled.....: 09-OCT-03 14:00
Reporting Units...: mg/kg
Report Basis.....: ☐ As Received ☒ Dried
Percent Moisture..: 26.7

DCL Analysis Group: G039C001
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	21-OCT-03 20:20	0.304	ND		U	1	1.36
Nitroglycerin	21-OCT-03 20:20	0.221	ND		U	1	0.682

DATA CHEM LABORATORIES
A Sorenson Company

FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S039902S

Date Printed.....: 22-OCT-03 17:39

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: RFAAP/09604-317
Release Number.....: URS#02

Date Received.....: 10-OCT-03 00:00

DCL Preparation Group: G039C001
Date Prepared.....: 13-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 1 gm
Net Weight/Volume....: Not Required

Client Sample Name: **SBD9**
DCL Sample Name...: **03E04255**
DCL Report Group..: **03E-0443-01**

Matrix.....: SOIL
Date Sampled.....: 09-OCT-03 00:00
Reporting Units...: mg/kg
Report Basis.....: ☐ As Received ☒ Dried
Percent Moisture..: 31.8

DCL Analysis Group: G039C001
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: 1c03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	21-OCT-03 20:42	0.327	ND		U	1	1.47
Nitroglycerin	21-OCT-03 20:42	0.238	0.793			1	0.733

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547
Phone (801) 266-7700 Web Page: www.datachem.com
FAX (801) 268-9992 E-mail: lab@datachem.com

DATA CHEM LABORATORIES
A Sorenson Company

FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S039902T

Date Printed.....: 22-OCT-03 17:39

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: RFAAP/09604-317
Release Number.....: URS#02

Date Received.....: 10-OCT-03 00:00

DCL Preparation Group: G039C001
Date Prepared.....: 13-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 1 gm
Net Weight/Volume....: Not Required

Client Sample Name: **13SB9B**
DCL Sample Name...: **03E04256**
DCL Report Group..: **03E-0443-01**

Matrix.....: SOIL
Date Sampled.....: 09-OCT-03 14:15
Reporting Units...: mg/kg
Report Basis.....: ☐ As Received ☒ Dried
Percent Moisture..: 24.2

DCL Analysis Group: G039C001
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: 1c03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	21-OCT-03 21:03	0.294	ND		U	1	1.32
Nitroglycerin	21-OCT-03 21:03	0.214	0.954			1	0.660

JG

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547
Phone (801) 266-7700 Web Page: www.datachem.com
FAX (801) 268-9992 E-mail: lab@datachem.com

DATA CHEM LABORATORIES
A Sorenson Company

FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S039902V

Date Printed.....: 22-OCT-03 17:39

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: RFAAP/09604-317
Release Number.....: URS#02

Date Received.....: 10-OCT-03 00:00

DCL Preparation Group: G039C001
Date Prepared.....: 13-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 1 gm
Net Weight/Volume....: Not Required

Client Sample Name: **13SB9C**
DCL Sample Name...: **03E04257**
DCL Report Group..: **03E-0443-01**

Matrix.....: SOIL
Date Sampled.....: 09-OCT-03 14:30
Reporting Units...: mg/kg
Report Basis.....: ☐ As Received ☒ Dried
Percent Moisture..: 24.8

DCL Analysis Group: G039C001
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	21-OCT-03 21:25	0.297	ND		U	1	1.33
Nitroglycerin	21-OCT-03 21:25	0.215	ND		U	1	0.665

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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S039902W

Date Printed.....: 22-OCT-03 17:39

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: RFAAP/09604-317
Release Number.....: URS#02

Date Received.....: 10-OCT-03 00:00

DCL Preparation Group: G039C001
Date Prepared.....: 13-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 1 gm
Net Weight/Volume....: Not Required

Client Sample Name: **13SB8A**
DCL Sample Name...: **03E04258**
DCL Report Group..: **03E-0443-01**

Matrix.....: SOIL
Date Sampled.....: 09-OCT-03 15:15
Reporting Units...: mg/kg
Report Basis.....: ☐ As Received ☒ Dried
Percent Moisture..: 26.7

DCL Analysis Group: G039C001
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	21-OCT-03 21:47	0.304	ND		U	1	1.36
Nitroglycerin	21-OCT-03 21:47	0.221	ND		U	1	0.682

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SAMPLE ANALYSIS DATA SHEET

Date Printed.....: 22-OCT-03 17:39

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: RFAAP/09604-317
Release Number.....: URS#02

Date Received.....: 10-OCT-03 00:00

DCL Preparation Group: G039C001
Date Prepared.....: 13-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 1 gm
Net Weight/Volume....: Not Required

Client Sample Name: **13SB8B**
DCL Sample Name...: **03E04259**
DCL Report Group..: **03E-0443-01**

Matrix.....: SOIL
Date Sampled.....: 09-OCT-03 15:30
Reporting Units...: mg/kg
Report Basis.....: ☐ As Received ☒ Dried
Percent Moisture..: 22.2

DCL Analysis Group: G039C001
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	21-OCT-03 22:32	0.287	ND		U	1	1.29
Nitroglycerin	21-OCT-03 22:32	0.208	ND		U	1	0.643

DATA VALIDATION WORKSHEET

Reviewer: AS
Date: January-04
DV Level: II III IV
Review Document:
X Region III Modified for National Functional Guidelines
___ NFG for organic Data review (February 1994)
X Project QAPP/SAP

Explosives

Project Name: Radford SSP
Project Number: 15291974.30000
Laboratory: DataChem
SDG No.: 03E-0443-01
Test Name: Explosives
Method No.: 8332-HPLC

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		x	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids		x	
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	x		

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	x		
	Action: If the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		x	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		x	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	x		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		x	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		x	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	x		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	x		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	x		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	x		
	For initial Calibration: for %RSD > ±20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	x		

Notes:

Second column was used to not confirm primary column low level hits. The second column does not have an initial calibration or bracketing continuing calibrations. The one points provided are for retention time purposes only.

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	x		
5.2	Are surrogate recoveries within acceptance criteria not to exceed 30-150% for all samples and method blanks?	x		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			x
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			x
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	x		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
6.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 40-150%?		x	
6.4	Are there any RPDs outside the QC limits not to exceed 60%?		x	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	x		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 40-150%?		x	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 60%?			x
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	x		

Notes:

	SBD9	13SB9A		RPD	Delta	RL	5XRL	4XRL
PETN	ND	ND				1.58	7.9	6.32
nitroglycerin	0.793	0.682	U	15%	0.111	0.79	3.95	3.16

9.0 Compound Identification and Detection Limit Verification

		Yes	No	NA
9.1	Are all positive identifications confirmed on second column or detector? If not, reject or estimate this detection.	x		
9.2	For positive sample detections, is RPD <40% between first and second columns. If not, apply J.		x	
9.3	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	x		

Notes:

10.0 Data Completeness

			Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)		x		
	Number of samples:	7			
	Number of target compounds in each analysis:	2			
	Number of results rejected and not reported:	0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)				
	% Completeness =	100%			

Notes:

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FORM F (TYPE I)
SINGLE METHOD ANALYSES

QUALITY CONTROL DATA SHEET
MATRIX SPIKE SAMPLE
MATRIX SPIKE DUPLICATE SAMPLE

S039903D

Client Name.....: URS Group, Inc.
Release Number.....: URS#02

Matrix.....: SOIL
Reporting Units.....: mg/Kg

DCL Preparation Group: G039C001
Date Prepared.....: 13-OCT-03 00:00
Preparation Method...: 8332

DCL Sample Name...: **03E04262MS**
Date Printed.....: 22-OCT-03 17:39

DCL Analysis Group: G039C001
Analysis Method...: OL-SW-8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

QC Limit Type.....: Method

Analytical Results

Analyte	Date Analyzed	Sample Result	Spiked Result	Spike Added	Percent Recovery	QC Limits	QC Flag
PETN	22-OCT-03 00:01	ND	16.7	20.0	83.4	65.0/125.	
Nitroglycerin	22-OCT-03 00:01	ND	19.8	20.0	99.0	65.0/125.	

S039903F

DCL Sample Name...: **03E04262MSD**

Analytical Results

Analyte	Date Analyzed	Duplicate Result	Percent Recovery	Mean	Range	RPD	QC Limits	QC Flag
PETN	22-OCT-03 00:24	17.5	87.6	17.1	0.839	4.9	0.00/35.0	
Nitroglycerin	22-OCT-03 00:24	18.6	92.8	19.2	1.24	6.5	0.00/35.0	

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Sample No.		Primary Column Result (mg/Kg)	Secondary Column Result (mg/Kg)	RPD
03E04253	13SB10C	1.77	3.23	58.4%
03E04255	SB09	0.541	0.716	27.8%
03E04256	13SB9B	0.724	0.425	52.6%

Results were not moisture corrected.

Gloria W. Heung 10/23/03

Gloria W. Heung

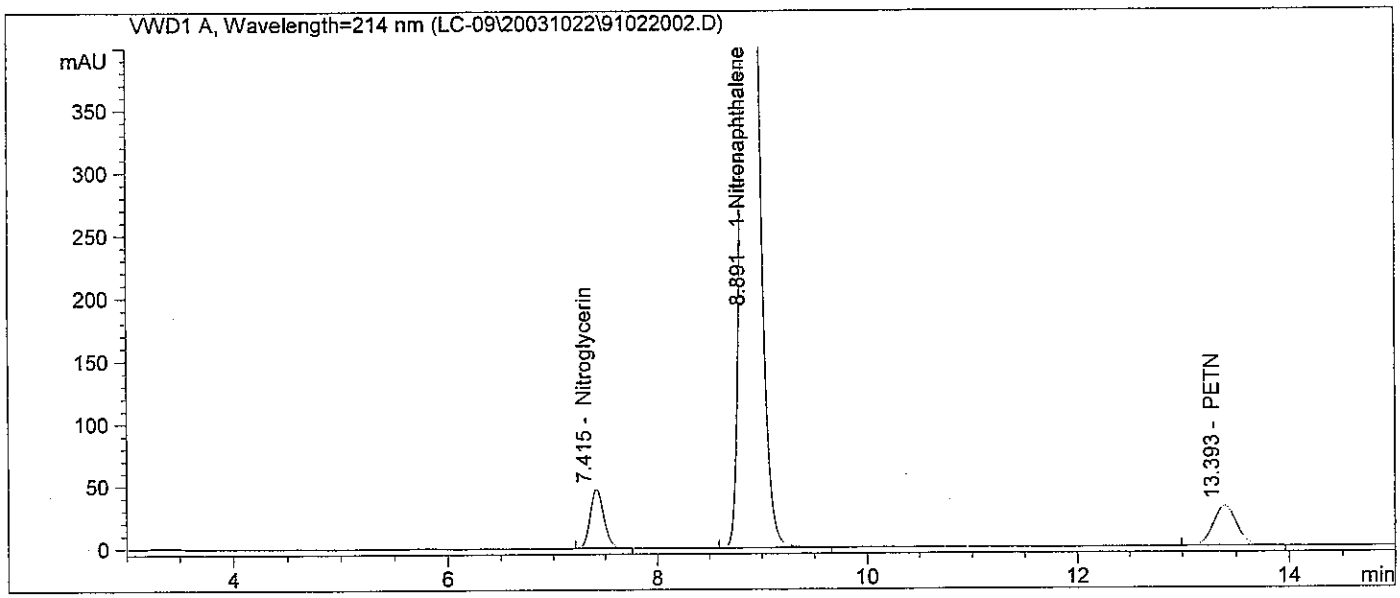
Thomas T. McKay 10/23/03

Thomas T. McKay

Data file :C:\HPCHEM\1\DATA\LC-09\20031022\91022002.D
Sample Name:CCV1 Info:239WS VAYO

Seq Line :2
Vial No. :2
Inj. No. :1

Injection Date :Wed, 22 Oct. 2003 01:14:05 PM
Acq. Method :8330CNEW.M
Acq Operator :HEUNG
Analysis Method :C:\HPCHEM\1\METHODS\8332CPR9.M
Last Changed->Wed, 22 Oct. 2003, 02:31:04 pm
Confirm for 8332 on LC-9, 214nm.



Sorted By Signal
Calib. Data Modified :Wed, 22 Oct. 2003, 02:24:25 pm
Multiplier :1.000000
Dilution :1.000000
Uncalibrated Peaks :not reported
Signal Description :VWD1 A, Wavelength=214 nm

Type	Exp. RT [min]	RT [min]	Compound	Amount [ug/L]	Area
MM	7.415	7.415	Nitroglycerin	19.81958	431.079
MM	8.891	8.891	1-Nitronaphthalene	20.77540	9.139e3
PV	13.393	13.393	PETN	19.51716	494.135
		Totals:		60.11214	

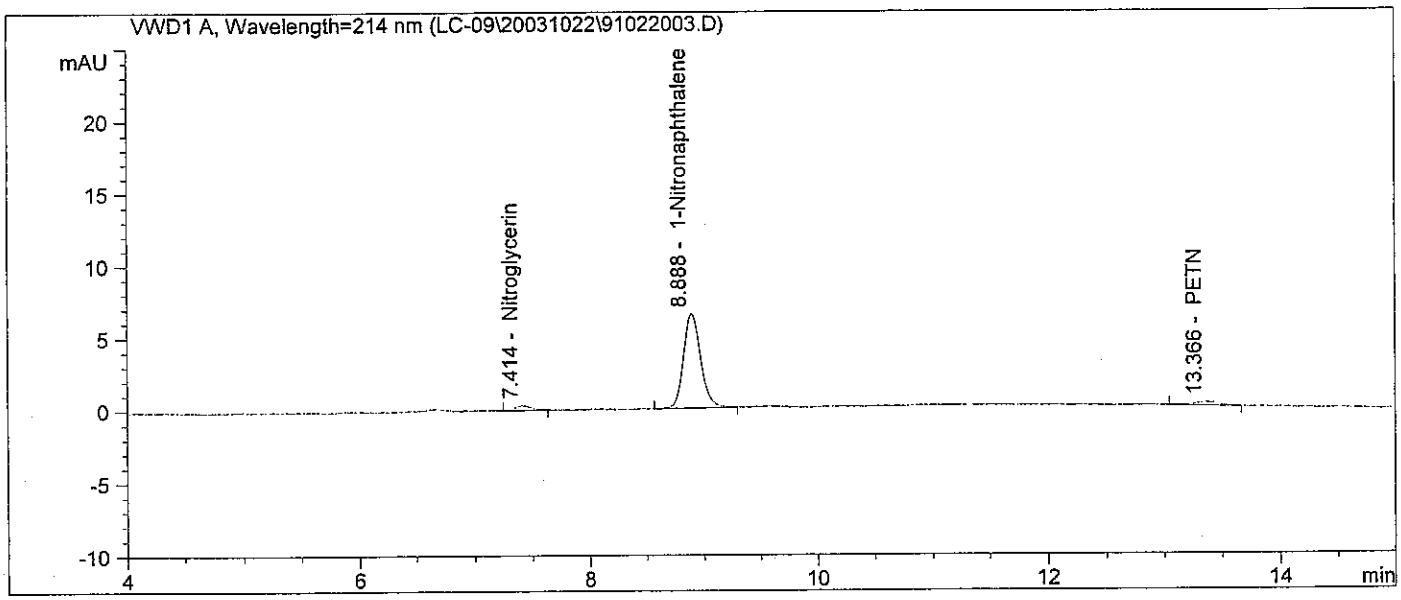
Analyst:_____
SurrTarget=12.98, Range=8.44-16.22ug/L
MDL/CRDLs:
NG=0.198/0.970ug/L
PETN=0.259/0.970ug/L

*** End of Report ***

Data file :C:\HPCHEM\1\DATA\LC-09\20031022\91022003.D
Sample Name:CS1 Info:239WS VAYO

Seq Line :3
Vial No. :3
Inj. No. :1

Injection Date :Wed, 22 Oct. 2003 01:29:45 PM
Acq. Method :8330CNEW.M
Acq Operator :HEUNG
Analysis Method :C:\HPCHEM\1\METHODS\8332CPR9.M
Last Changed->Thu, 23 Oct. 2003, 11:36:26 am
Confirm for 8332 on LC-9, 214nm.



Sorted By Signal
Calib. Data Modified :Wed, 22 Oct. 2003, 02:24:25 pm
Multiplier :1.000000
Dilution :1.000000
Uncalibrated Peaks :not reported
Signal Description :VWD1 A, Wavelength=214 nm

Type	RT [min]	Compound	Amount [ug/ml]	Area
MM	7.414	Nitroglycerin	0.13104	3.531
MM	8.888	1-Nitronaphthalene	0.11352	68.513
MM	13.366	PETN	0.10794	4.267
Totals:			0.35249	

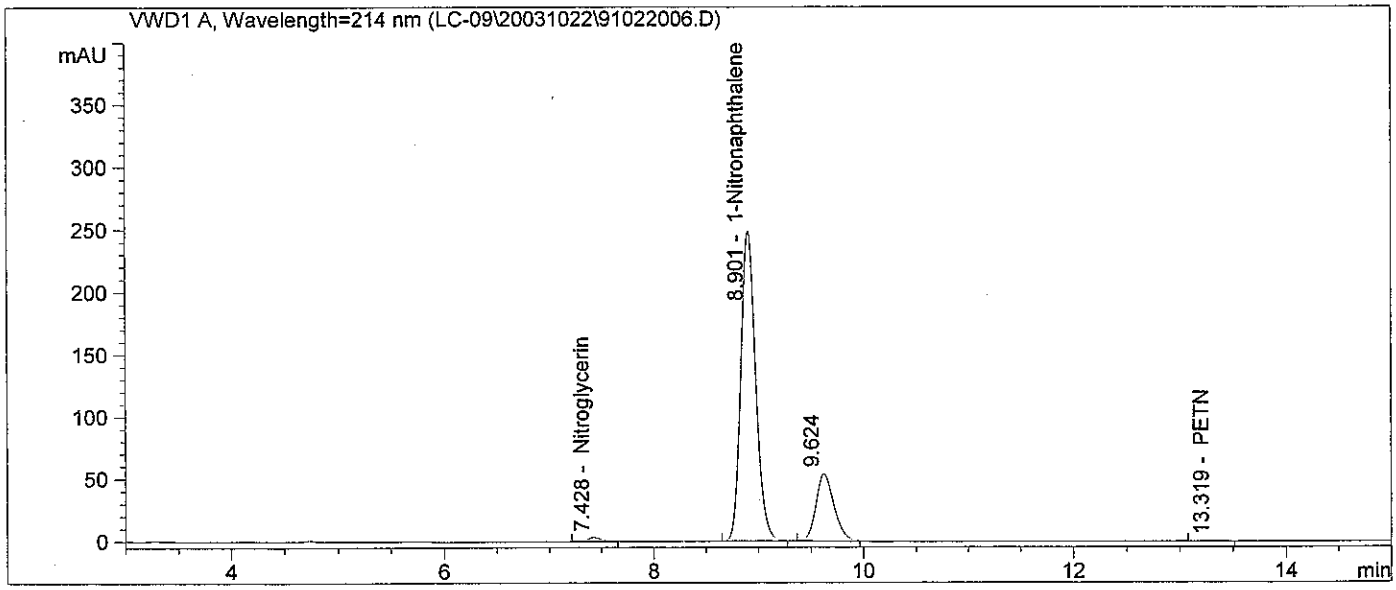
Analyst:_____

Comments:

*** End of Report ***

Data file :C:\HPCHEM\1\DATA\LC-09\20031022\91022006.D
Sample Name:03E04253 Info: VAYO

Seq Line :6
Injection Date :Wed, 22 Oct. 2003 02:16:46 PM Vial No. :6
Acq. Method :8330CNEW.M Inj. No. :1
Acq Operator :HEUNG
Analysis Method :C:\HPCHEM\1\METHODS\8332CPR9.M
Last Changed->Thu, 23 Oct. 2003, 11:38:17 am(modified after loading)
Confirm for 8332 on LC-9, 214nm.



Sorted By Signal
Calib. Data Modified :Wed, 22 Oct. 2003, 02:24:25 pm
Multiplier :2.000000
Dilution :1.000000
Uncalibrated Peaks :not reported
Signal Description :VWD1 A, Wavelength=214 nm

Type	Exp. RT [min]	RT [min]	Compound	Amount [ug/L] mg/kg	Area
MM	7.415	7.428	Nitroglycerin	3.22913	35.747
MM	8.891	8.901	1-Nitronaphthalene	11.10198	2.455e3
MM	0.000	9.624		0.00000	658.244
MM	13.393	13.319	PETN	0.25988	4.823
		Totals:		14.59098	

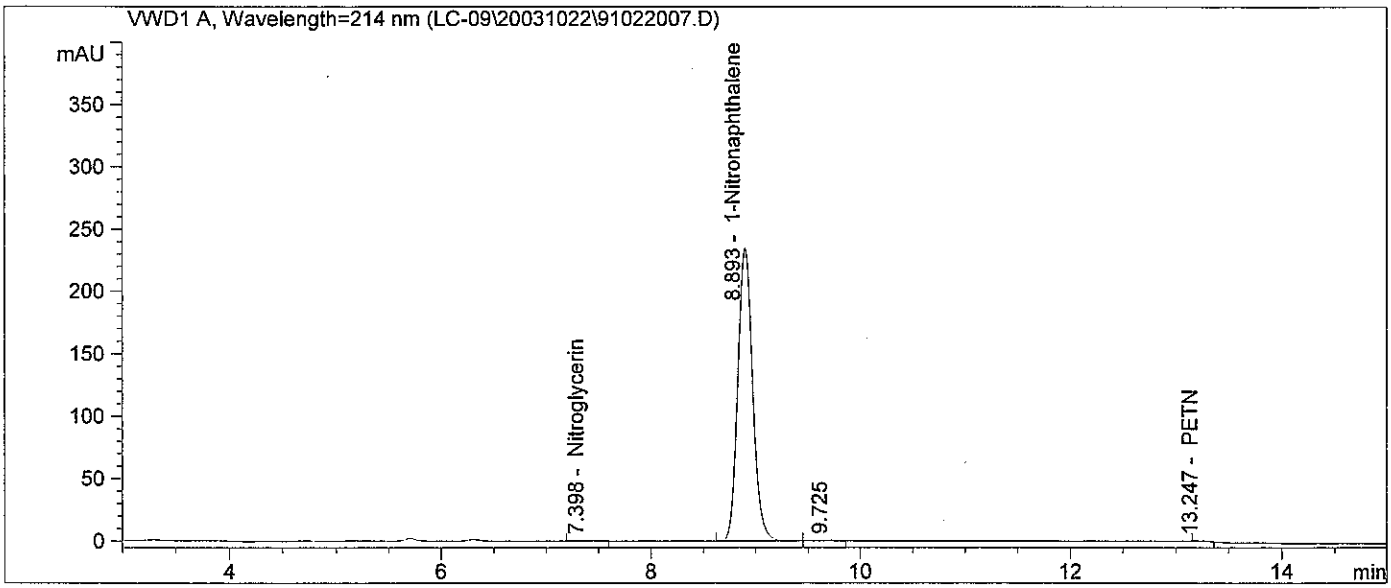
Ext 10/23/03

Analyst:_____
SurrTarget=12.98, Range=8.44-16.22ug/L
MDL/CRDLs:
NG=0.198/0.970ug/L
PETN=0.259/0.970ug/L

*** End of Report ***

Data file :C:\HPCHEM\1\DATA\LC-09\20031022\91022007.D
Sample Name:03E04254 Info: VAYO

Seq Line :7
Injection Date :Wed, 22 Oct. 2003 02:32:26 PM Vial No. :7
Acq. Method :8330CNEW.M Inj. No. :1
Acq Operator :HEUNG
Analysis Method :C:\HPCHEM\1\METHODS\8332CPR9.M
Last Changed->Thu, 23 Oct. 2003, 11:38:17 am(modified after loading)
Confirm for 8332 on LC-9, 214nm.



Sorted By Signal
Calib. Data Modified :Wed, 22 Oct. 2003, 02:24:25 pm
Multiplier :2.000000
Dilution :1.000000
Uncalibrated Peaks :not reported
Signal Description :VWD1 A, Wavelength=214 nm

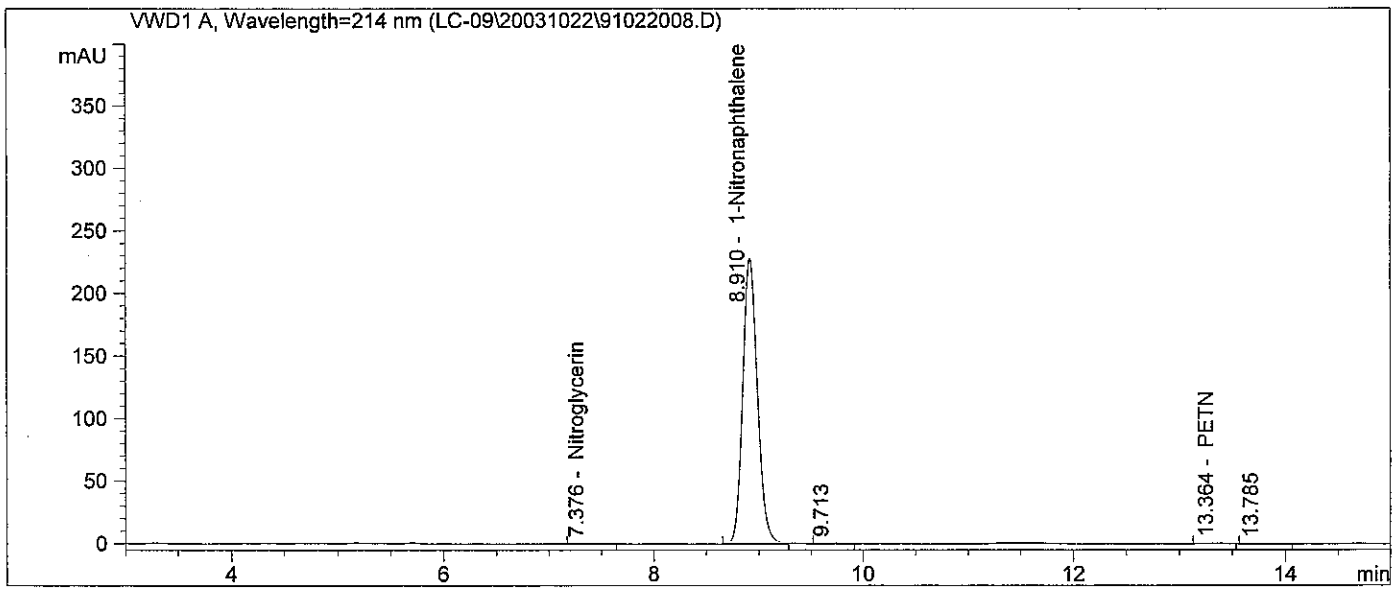
Type	Exp. RT [min]	RT [min]	Compound	Amount [ug/L] mg/kg dat 10/23/03	Area
MM	7.415	7.398	Nitroglycerin	0.33090	4.278
MF	8.891	8.893	1-Nitronaphthalene	10.48940	2.321e3
FM	0.000	9.725		0.00000	8.575
MM	13.393	13.247	PETN	0.25674	4.783
		Totals:		11.07703	

Analyst:_____
SurrTarget=12.98, Range=8.44-16.22ug/L
MDL/CRDLs:
NG=0.198/0.970ug/L
PETN=0.259/0.970ug/L

*** End of Report ***

Data file :C:\HPCHEM\1\DATA\LC-09\20031022\91022008.D
Sample Name:03E04255 Info: VAYO

Seq Line :8
Injection Date :Wed, 22 Oct. 2003 02:48:07 PM Vial No. :8
Acq. Method :8330CNEW.M Inj. No. :1
Acq Operator :HEUNG
Analysis Method :C:\HPCHEM\1\METHODS\8332CPR9.M
Last Changed->Thu, 23 Oct. 2003, 11:38:17 am(modified after loading)
Confirm for 8332 on LC-9, 214nm.



Sorted By Signal
Calib. Data Modified :Wed, 22 Oct. 2003, 02:24:25 pm
Multiplier :2.000000
Dilution :1.000000
Uncalibrated Peaks :not reported
Signal Description :VWD1 A, Wavelength=214 nm

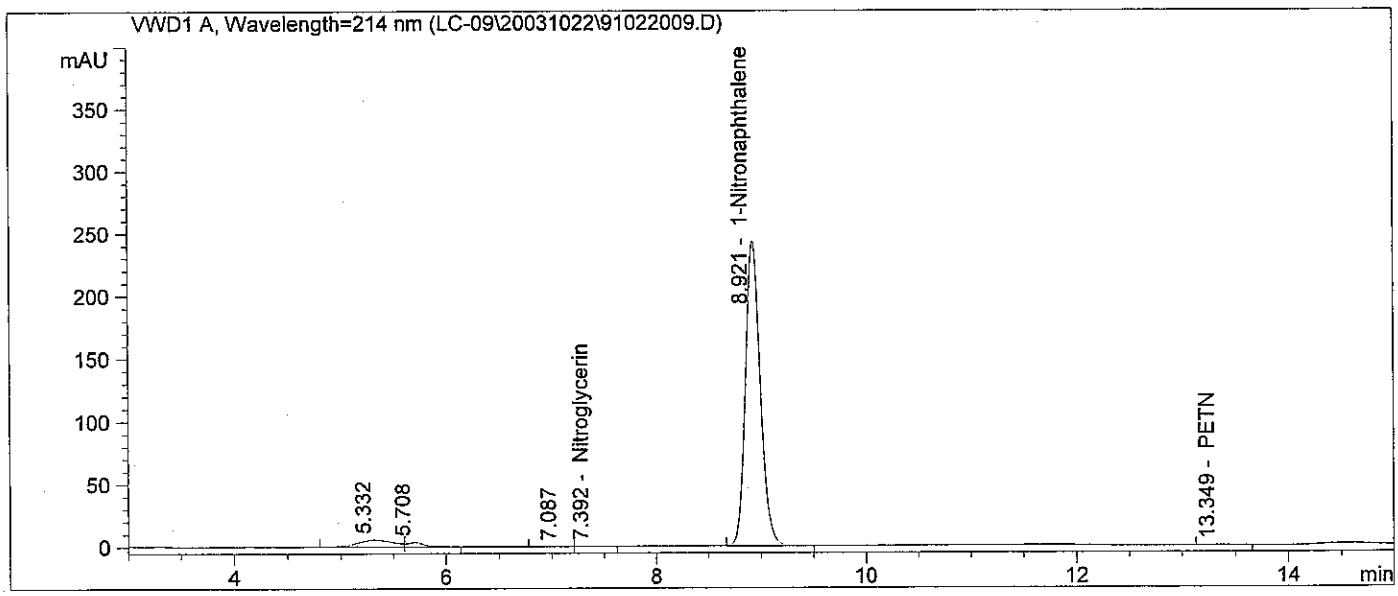
Type	Exp. RT [min]	RT [min]	Compound	Amount [ug/L]	Area
MM	7.415	7.376	Nitroglycerin	0.71604	8.460
MF	8.891	8.910	1-Nitronaphthalene	10.17398	2.252e3
FM	0.000	9.713		0.00000	10.004
MM	13.393	13.364	PETN	0.68784	10.223
VV	0.000	13.785		0.00000	7.568
		Totals:		11.57786	

Analyst:_____
SurrTarget=12.98, Range=8.44-16.22ug/L
MDL/CRDLs:
NG=0.198/0.970ug/L
PETN=0.259/0.970ug/L

*** End of Report ***

Data file :C:\HPCHEM\1\DATA\LC-09\20031022\91022009.D
Sample Name:03E04256 Info: VAYO

Seq Line :9
Injection Date :Wed, 22 Oct. 2003 03:03:48 PM Vial No. :9
Acq. Method :8330CNEW.M Inj. No. :1
Acq Operator :HEUNG
Analysis Method :C:\HPCHEM\1\METHODS\8332CPR9.M
Last Changed->Thu, 23 Oct. 2003, 11:38:17 am(modified after loading)
Confirm for 8332 on LC-9, 214nm.



Sorted By Signal
Calib. Data Modified :Wed, 22 Oct. 2003, 02:24:25 pm
Multiplier :2.000000
Dilution :1.000000
Uncalibrated Peaks :not reported
Signal Description :VWD1 A, Wavelength=214 nm

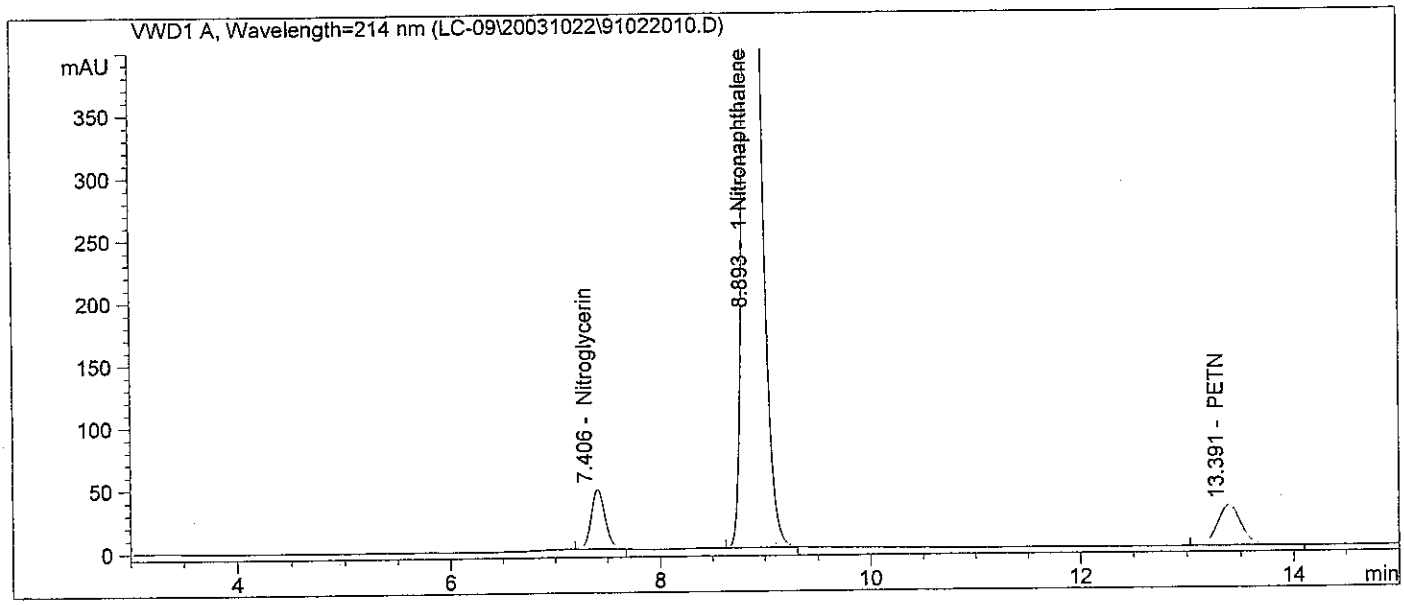
Type	Exp. RT [min]	RT [min]	Compound	Amount [ug/L]	Area
MF	0.000	5.332		0.00000	137.720
FM	0.000	5.708		0.00000	42.540
MF	0.000	7.087		0.00000	3.963
FM	7.415	7.392	Nitroglycerin	0.42505	5.301
MF	8.891	8.921	1-Nitronaphthalene	10.85451	2.401e3
MM	13.393	13.349	PETN	0.31034	5.459
		Totals:		11.58991	

Analyst:_____
SurrTarget=12.98, Range=8.44-16.22ug/L
MDL/CRDLs:
NG=0.198/0.970ug/L
PETN=0.259/0.970ug/L

*** End of Report ***

Data file :C:\HPCHEM\1\DATA\LC-09\20031022\91022010.D
Sample Name:CCV2 Info:239WS VAYO

Seq Line :10
Injection Date :Wed, 22 Oct. 2003 03:19:28 PM Vial No. :2
Acq. Method :8330CNEW.M Inj. No. :1
Acq Operator :HEUNG
Analysis Method :C:\HPCHEM\1\METHODS\8332CPR9.M
Last Changed->Thu, 23 Oct. 2003, 11:38:17 am(modified after loading)
Confirm for 8332 on LC-9, 214nm.



Sorted By Signal
Calib. Data Modified :Wed, 22 Oct. 2003, 02:24:25 pm
Multiplier :1.000000
Dilution :1.000000
Uncalibrated Peaks :not reported
Signal Description :VWD1 A, Wavelength=214 nm

Type	Exp. RT [min]	RT [min]	Compound	Amount [ug/L]	Area
MM	7.415	7.406	Nitroglycerin	20.34765	442.547
MM	8.891	8.893	1-Nitronaphthalene	20.65281	9.085e3
BP	13.393	13.391	PETN	19.56939	495.453
		Totals:		60.56985	

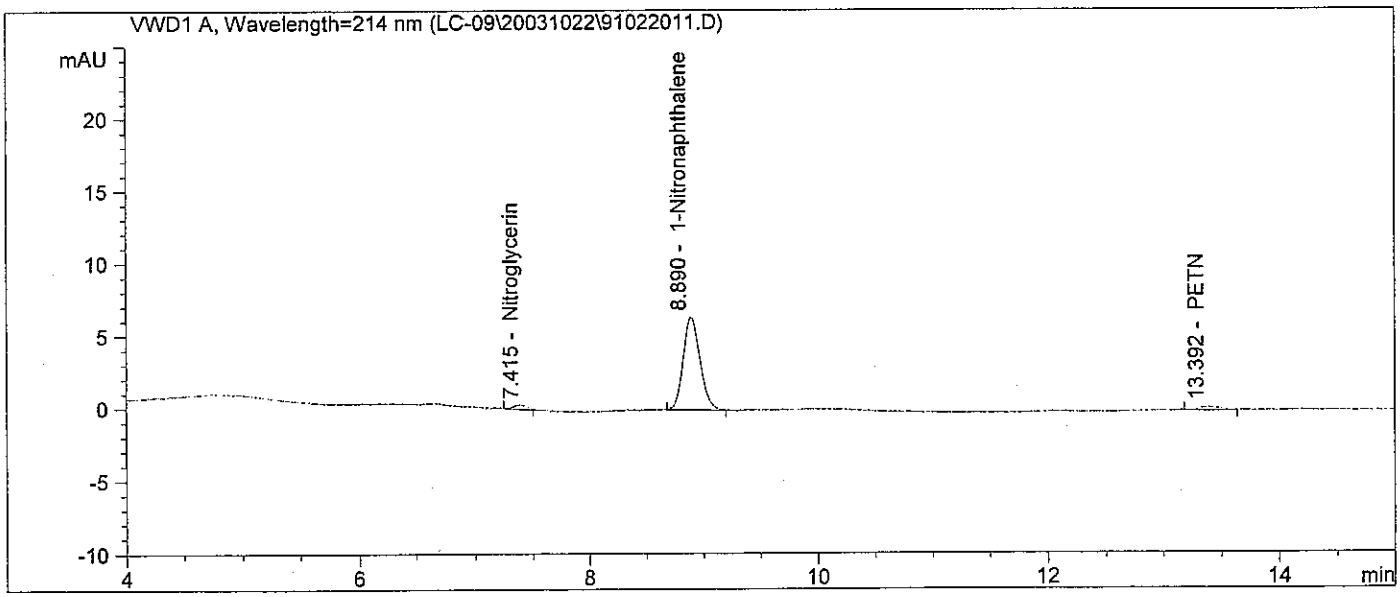
Analyst:_____
SurrTarget=12.98, Range=8.44-16.22ug/L
MDL/CRDLs:
NG=0.198/0.970ug/L
PETN=0.259/0.970ug/L

*** End of Report ***

Data file :C:\HPCHEM\1\DATA\LC-09\20031022\91022011.D
Sample Name:CS2 Info:239WS VAYO

Injection Date :Wed, 22 Oct. 2003 03:35:08 PM
Acq. Method :8330CNEW.M
Acq Operator :HEUNG
Analysis Method :C:\HPCHEM\1\METHODS\8332CPR9.M
Last Changed->Thu, 23 Oct. 2003, 11:36:26 am
Confirm for 8332 on LC-9, 214nm.

Seq Line :11
Vial No. :3
Inj. No. :1



Sorted By Signal
Calib. Data Modified :Wed, 22 Oct. 2003, 02:24:25 pm
Multiplier :1.000000
Dilution :1.000000
Uncalibrated Peaks :not reported
Signal Description :VWD1 A, Wavelength=214 nm

Type	RT [min]	Compound	Amount [ug/ml]	Area
MM	7.415	Nitroglycerin	0.09726	2.797
MM	8.890	1-Nitronaphthalene	0.10841	66.269
MM	13.392	PETN	0.08370	3.656
Totals:			0.28937	

Analyst:_____

Comments:

*** End of Report ***

Method 8332

RT Windows For Analytical Sequence From 72 Hr RT Study

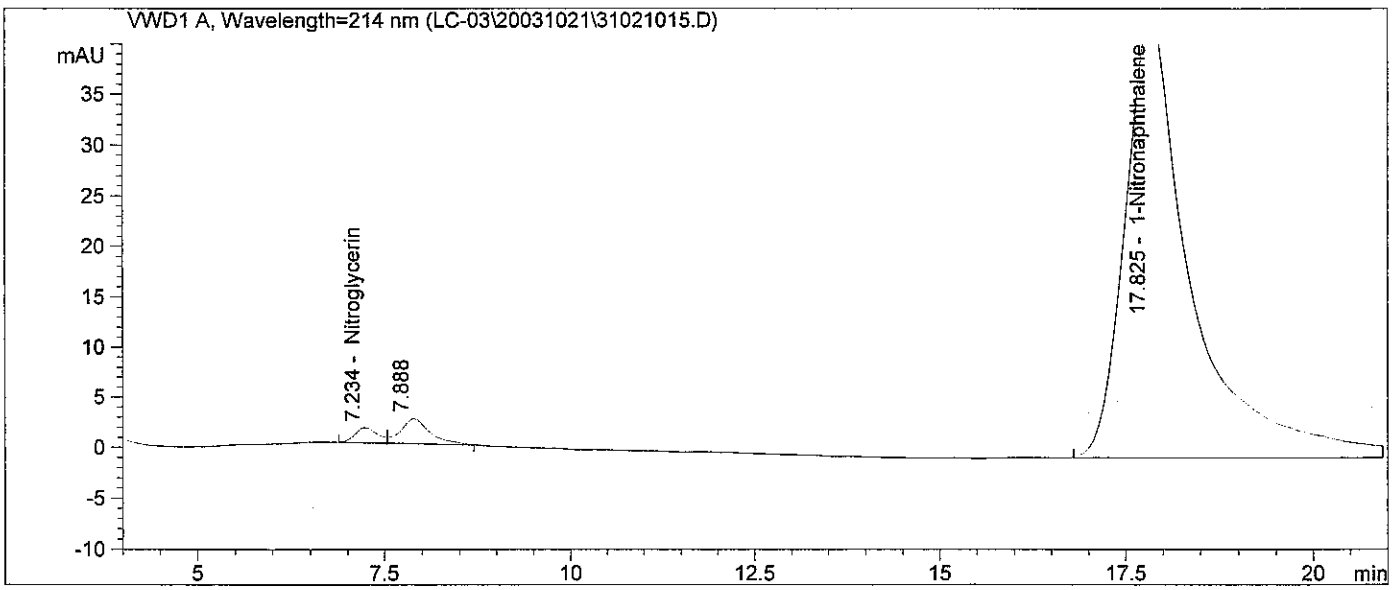
Sequence: **1021LC3** Sample Info: **239WS106**

Analyte	RT Low	RT High	CCV RT	0 Hr RT	Mid Hr RT	72 Hr RT	3xStDv
Datafile:			**31021012.D**	30525-06	30527-01	03528-01	
Nitroglycerin	**7.110**	**7.318**	7.214	7.267	7.314	7.246	0.104
PETN	**13.737**	**14.249**	13.993	14.009	14.179	14.081	0.256
1-Nitronaphthalene	**17.413**	**17.959**	17.686	17.595	17.776	17.702	0.273

Default Minimum Window=+/- 0.030 minutes

Data file :C:\HPCHEM\1\DATA\LC-03\20031021\31021015.D
Sample Name:03E04253 Info: VAYO

Seq Line :15
Injection Date :Tue, 21 Oct. 2003 07:58:27 PM Vial No. :14
Acq. Method :N0527LC3.M Inj. No. :1
Acq Operator :HEUNG
Analysis Method :C:\HPCHEM\1\METHODS\N0527PR3.M
Last Changed->Wed, 22 Oct. 2003, 11:38:56 am(modified after loading)
SOIL/WATER BY SW-846 8332 ON LC-3. Init Cal ID:092100LC3



Sorted By Signal
Calib. Data Modified :Thu, 16 Oct. 2003, 04:50:02 pm
Multiplier :2.000000
Dilution :1.000000
Uncalibrated Peaks :not reported
Signal Description :VWD1 A, Wavelength=214 nm

Type	Exp. RT [min]	RT [min]	Compound	Amount [ug/g]	Area
MF	7.041	7.234	Nitroglycerin	1.77416	33.900
FM	0.000	7.888		0.00000	68.028
	13.567	0.000	PETN	0.00000	0.000
BBA	17.364	17.825	1-Nitronaphthalene	10.79375	2.695e3

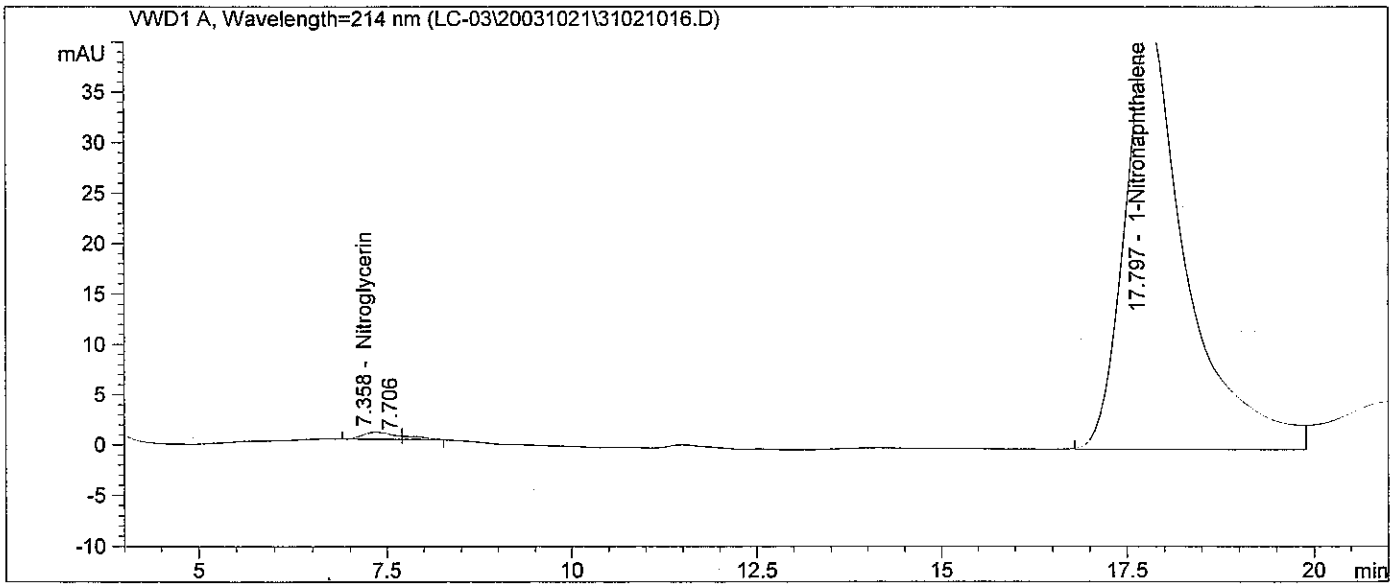
RTN 7.174 - 7.318 ✓

Totals: 12.56791
Analyst: GH
Surr Target=10.ug/g, Range=6.5-12.5ug/g
MDL/CRDLs:
NG:0.180/0.300ug/g
PETN:0.250/0.300ug/g

*** End of Report ***

Data file :C:\HPCHEM\1\DATA\LC-03\20031021\31021016.D
Sample Name:03E04254 Info: VAYO

Seq Line :16
Injection Date :Tue, 21 Oct. 2003 08:20:17 PM Vial No. :17
Acq. Method :N0527LC3.M Inj. No. :1
Acq Operator :HEUNG
Analysis Method :C:\HPCHEM\1\METHODS\N0527PR3.M
Last Changed->Wed, 22 Oct. 2003, 11:38:56 am(modified after loading)
SOIL/WATER BY SW-846 8332 ON LC-3. Init Cal ID:092100LC3



Sorted By Signal
Calib. Data Modified :Thu, 16 Oct. 2003, 04:50:02 pm
Multiplier :2.000000
Dilution :1.000000
Uncalibrated Peaks :not reported
Signal Description :VWD1 A, Wavelength=214 nm

Type	Exp. RT [min]	RT [min]	Compound	Amount [ug/g]	Area
MF	7.041	7.358	Nitroglycerin	~~1.10643~~ EXCLUDED NC	21.142
FM	0.000	7.706		0.00000	6.491
	13.567	0.000	PETN	0.00000	0.000
BV	17.364	17.797	1-Nitronaphthalene	9.70293	2.423e3
		Totals:		10.80936	

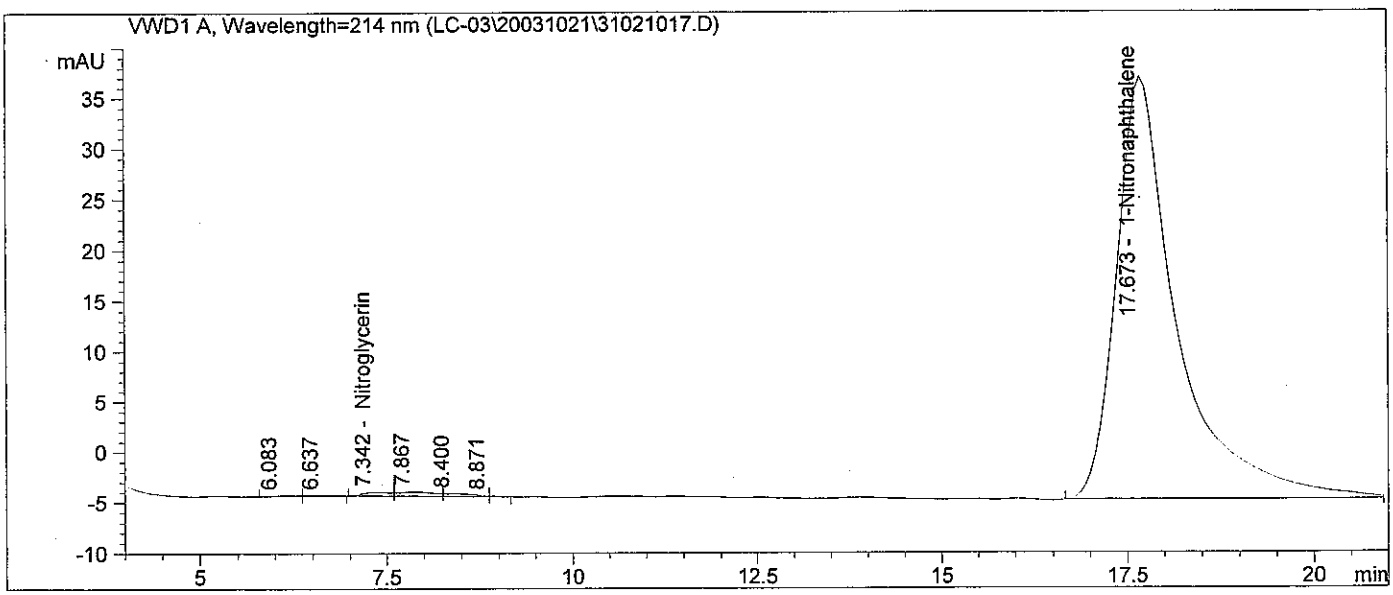
RTW
7.174 - 7.318 OUT

Analyst: GH
Surr Target=10.ug/g, Range=6.5-12.5ug/g
MDL/CRDLs:
NG:0.180/0.300ug/g
PETN:0.250/0.300ug/g

*** End of Report ***

Data file :C:\HPCHEM\1\DATA\LC-03\20031021\31021017.D
Sample Name:03E04255 Info: VAYO

Seq Line :17
Injection Date :Tue, 21 Oct. 2003 08:42:08 PM Vial No. :18
Acq. Method :N0527LC3.M Inj. No. :1
Acq Operator :HEUNG
Analysis Method :C:\HPCHEM\1\METHODS\N0527PR3.M
Last Changed->Wed, 22 Oct. 2003, 11:38:56 am(modified after loading)
SOIL/WATER BY SW-846 8332 ON LC-3. Init Cal ID:092100LC3



Sorted By Signal
Calib. Data Modified :Thu, 16 Oct. 2003, 04:50:02 pm
Multiplier :2.000000
Dilution :1.000000
Uncalibrated Peaks :not reported
Signal Description :VWD1 A, Wavelength=214 nm

Type	Exp. RT [min]	RT [min]	Compound	Amount [ug/g]	Area
MF	0.000	6.083		0.00000	2.252
FM	0.000	6.637		0.00000	2.237
MF	7.041	7.342	Nitroglycerin	0.54070	10.332
MF	0.000	7.867		0.00000	14.172
MF	0.000	8.400		0.00000	7.875
FM	0.000	8.871		0.00000	0.874
	13.567	0.000	PETN	0.00000	0.000
PBA	17.364	17.673	1-Nitronaphthalene	9.47405	2.366e3
		Totals:		10.01475	

RTW

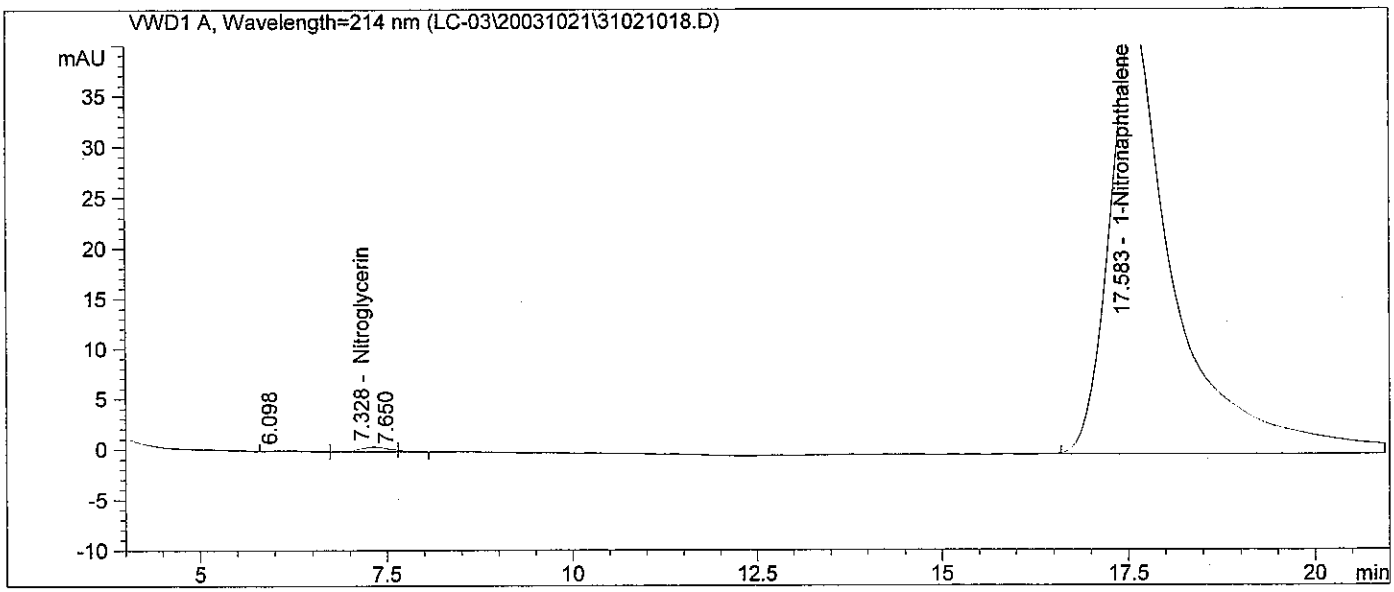
7.174 - 7.318 out

Analyst: ____
Surr Target=10.ug/g, Range=6.5-12.5ug/g
MDL/CRDLs:
NG:0.180/0.300ug/g
PETN:0.250/0.300ug/g

*** End of Report ***

Data file :C:\HPCHEM\1\DATA\LC-03\20031021\31021018.D
Sample Name:03E04256 Info: VAYO

Seq Line :18
Injection Date :Tue, 21 Oct. 2003 09:03:59 PM Vial No. :19
Acq. Method :N0527LC3.M Inj. No. :1
Acq Operator :HEUNG
Analysis Method :C:\HPCHEM\1\METHODS\N0527PR3.M
Last Changed->Wed, 22 Oct. 2003, 11:38:56 am(modified after loading)
SOIL/WATER BY SW-846 8332 ON LC-3. Init Cal ID:092100LC3



Sorted By Signal
Calib. Data Modified :Thu, 16 Oct. 2003, 04:50:02 pm
Multiplier :2.000000
Dilution :1.000000
Uncalibrated Peaks :not reported
Signal Description :VWD1 A, Wavelength=214 nm

Type	Exp. RT [min]	RT [min]	Compound	Amount [ug/g]	Area
BP	0.000	6.098		0.00000	4.432
MF	7.041	7.328	Nitroglycerin	0.72353	13.825
FM	0.000	7.650		0.00000	1.547
	13.567	0.000	PETN	0.00000	0.000
BBA	17.364	17.583	1-Nitronaphthalene	10.43881	2.607e3
		Totals:		11.16234	

RTW
7.174-7.38 out

Analyst: _____
Surr Target=10.ug/g, Range=6.5-12.5ug/g
MDL/CRDLs:
NG:0.180/0.300ug/g
PETN:0.250/0.300ug/g

*** End of Report ***

From Page No. X

Insert of preparatory report for sets: 03E-0443-02 & 0444-02

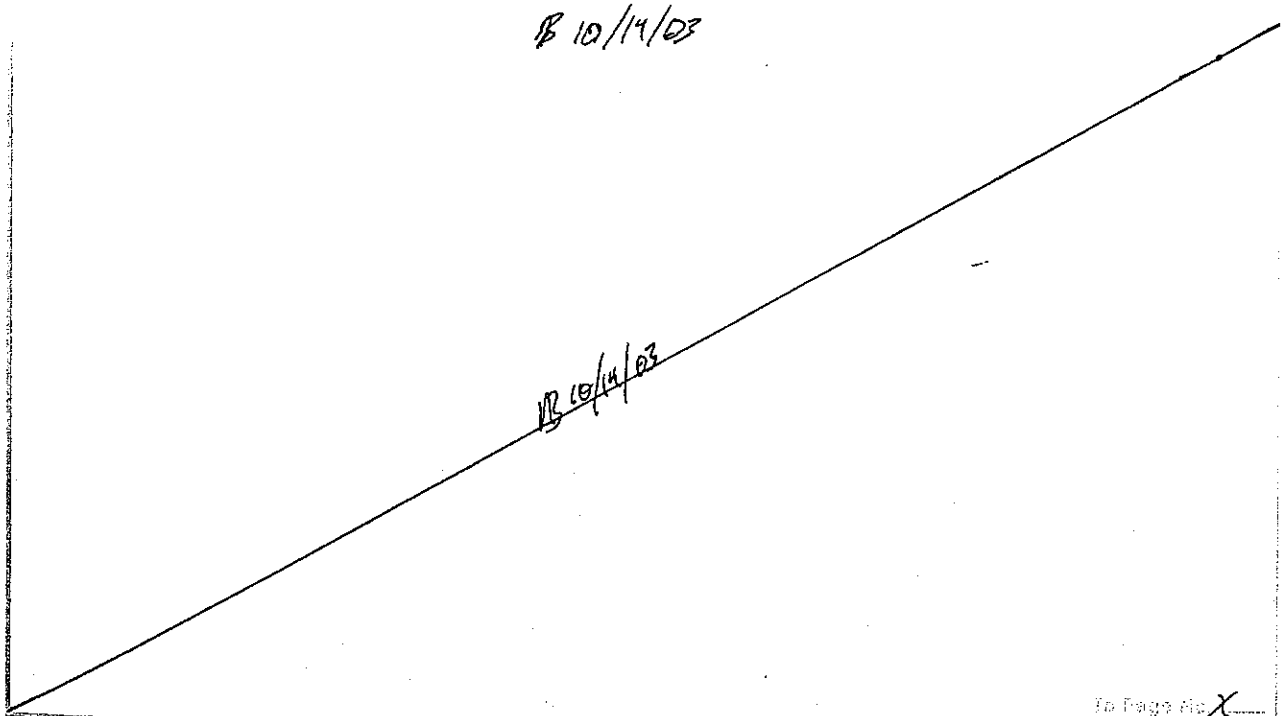
JB 10/14/03

%Moistures & Solids

Start Time: 16:31 13-Oct-03
Finish Time: 9:24 14-Oct-03

Set ID #	Dish #	Sample #	Dish (g)	Dish + Soil (g)	Soil weight(g)	Dish + Dry Soil (g)	Dry Soil (g)	% Solids	% Moistures
03E-0444-02	1	03E04260	1.23	5.22	3.99	4.54	3.31	83.0%	17.0%
03E-0444-02	2	03E04261	1.24	5.23	3.99	4.47	3.23	81.0%	19.0%
03E-0444-02	3	03E04262	1.25	5.74	4.49	4.67	3.42	76.2%	23.8%
03E-0444-02	4	03E04262MD	1.25	5.38	4.13	4.27	3.02	73.1%	26.9%
03E-0444-02	5	03E04263	1.23	8.66	7.43	6.81	5.58	75.1%	24.9%
03E-0444-02	6	03E04264	1.23	5.37	4.14	3.85	2.62	63.3%	36.7%
03E-0444-02	7	03E04265	1.23	5.13	3.90	3.96	2.73	70.0%	30.0%
03E-0444-02	8	03E04266	1.25	5.52	4.27	3.86	2.61	61.1%	38.9%
03E-0444-02	9	03E04267	1.23	5.84	4.61	4.58	3.35	72.7%	27.3%
03E-0444-02	10	03E04268	1.25	5.03	3.78	4.14	2.89	76.5%	23.5%
03E-0444-02	11	03E04269	1.25	5.88	4.63	4.58	3.33	71.9%	28.1%
03E-0444-02	12	03E04270	1.24	5.20	3.96	3.56	2.32	58.6%	41.4%
03E-0444-02	13	03E04271	1.23	5.68	4.45	4.57	3.34	75.1%	24.9%
03E-0443-02	15	03E04253	1.24	6.62	5.38	5.12	3.88	72.1%	27.9%
03E-0443-02	16	03E04253MD	1.23	5.13	3.90	3.97	2.74	70.3%	29.7%
03E-0443-02	17	03E04254	1.24	6.03	4.79	4.75	3.51	73.3%	26.7%
03E-0443-02	18	03E04255	1.24	5.61	4.37	4.22	2.98	68.2%	31.8%
03E-0443-02	19	03E04256	1.24	6.15	4.91	4.96	3.72	75.8%	24.2%
03E-0443-02	20	03E04257	1.24	5.80	4.56	4.67	3.43	75.2%	24.8%
03E-0443-02	21	03E04258	1.23	5.31	4.08	4.22	2.99	73.3%	26.7%
03E-0443-02	22	03E04259	1.24	5.16	3.92	4.29	3.05	77.8%	22.2%

JB 10/14/03



JB 10/14/03

To Page No. X

Witnessed & Understood by me,	Date	Invented by	Date
Jose G. Rocha	10/14/03	N/A	10/14/03
		Recorded by Norman Bleagle	

DATA CHEM LABORATORIES
A Sorenson Company

ANALYTICAL REPORT

Form ARF-AL
Page 1 of 2
Part 1 of 1
10140309553246X

Date _____
Laboratory Group Name 03E-0443-02
Account No. 08001 URS02

URS
Attention: Andrea Sansom
849 Intermountain Dr.
Sutie 320
Linthicum, MD 21090

FAX (410) 859-5202
Telephone (410) 859-5049
E-mail Andrea_Sansom@URScorp.com

Sampling Collection and Shipment

Sampling Site RFAAP/09604-317 Date of Collection October 09, 2003

Date Samples Received at Laboratory October 10, 2003

Analysis

Method of Analysis XX-EP-800

Date(s) of Analysis October 14, 2003

Analytical Results

Field Sample Number	Laboratory Number	Sample Type	MOISTURE %								
13SB10C	03E04253	SOIL	27.9								
13SB10C	03E04253MD	SOIL	29.7								
13SB9A	03E04254	SOIL	26.7								
SBD9	03E04255	SOIL	31.8								
13SB9B	03E04256	SOIL	24.2								
13SB9C	03E04257	SOIL	24.8								
13SB8A	03E04258	SOIL	26.7								
13SB8B	03E04259	SOIL	22.2								
Limit of Detection											

† See comment on last page.
ND Parameter not detected above LOD.
NR Parameter not requested.
NA Parameter not applicable.

** See comment on last page.
( ) Parameter between LOD and LOQ.

Norman Breese
Analyst: Norman Breese

Jon Yonk
Reviewer: Johnathan M. Yonk

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547
Phone (801) 266-7700 Web Page: www.datachem.com
FAX (801) 268-9992 E-mail: lab@datachem.com

Bmy 10/12/03

Date of Extraction:	OCT 12, 2003	**DataChem** Laboratories Extraction Notebook	Book # Ext 246 Page#
Account #(s):	8001		
DCL Set ID(s):	03E-0443-01, 0444-01		Matrix: SOIL
Group/Lot ID:	G039C001/2 10/13/03		Method: 8332

	DCL Sample ID	Field ID	Initial Vol. / WT	Initial pH	Adj pH		Surr. Added	Matrix Spike		Final Volume
1	BL-211507-1	BL-211507-1	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
2	QC-211507-1	QC-211507-1	1.0gm	N/A	N/A	N/A	1mL	1mL	----	2mL
3	03E04253	13SB10C	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
4	03E04254	13SB9A	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
5	03E04255	SBD9	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
6	03E04256	13SB9B	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
7	03E04257	13SB9C	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
8	03E04258	13SB8A	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
9	03E04259	13SB8B	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
10	03E04260	13SB7A	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
11	03E04261	13SB7B	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
12	03E04262	13SB7C	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
13	03E04262MS	13SB7CMS	1.0gm	N/A	N/A	N/A	1mL	1mL	----	2mL
14	03E04262MSD	13SB7CMSD	1.0gm	N/A	N/A	N/A	1mL	1mL	----	2mL
15	03E04263	13SB12A	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
16	03E04264	13SB12B	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
17	03E04265	SBD8	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
18	03E04266	13SB12C	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
19	03E04267	13SB11A	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
20	03E04268	13SB11B	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
21	03E04269	13SB11C	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
22	03E04270	13SB10A	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
23	03E04271	13SB10B	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
24										
25										
26										
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39										
40										

Solvents:	MeCN	CH016	Comments:
Surrogate Spike:	239 ws 3	1/30/04 By: Bmy	
Matrix Spike:	239 ws 2	1/30/04 6/10/2000 By: Bmy	
Matrix Spike:	----------	---------- By:	
Extractionist:	Benny Yang	10/12/03	
Checker:	Wendy Yang	10/13/03	Sonicators tunned by:

*=Entry Error

Bmy 10/12/03

DATA CHEM
LABORATORIES, INC.
A SORENSON COMPANY

Case Narrative

Method:	SW-846 8332	**Client:**	URS
Analysis:	Nitroglycerin, PETN	**Account:**	8001
Preparation SOP #:	OL-SW-8332	**Matrix:**	Solid
Analysis SOP#:	OL-SW-8332	**SDG#:**	URS#02
DCL Set ID's:	03E-0443-01		

General Set Information: This set contained seven solid samples, a method blank, and a laboratory control sample (LCS). This set was batched with another set, which contained twelve samples, a matrix spiked sample (MS) and a matrix spike duplicate.

Method Summary: A 1.0 gram portion of the soil samples was weighed, transferred into a suitable container, and 2 ml of acetonitrile was added. The samples were placed in an ultrasonic bath for a minimum of one hour. The samples were allowed to settle and the supernatant was filtered through a 0.45µ PTFE filter. One part acetonitrile extract was mixed with one part of a 1% calcium chloride solution, then injected into an HP1050 HPLC equipped with UV detection and a Phenomenex Ultracarb ODS C18 column. The instrument was adjusted to the proper operating parameters and allowed to equilibrate until a stable baseline was established. Initial calibration standards were analyzed and linear calibration curves were generated from the data. A continuing calibration standard was analyzed at the beginning of sample analysis, after each ten samples, and at the end of the analysis. The response of the continuing calibration standard must be within method limits when compared to the initial calibration curve.

Samples and QCs were analyzed under identical conditions as those used for initial and continuing calibration. Quantitation was based on calibration curves using the initial calibration standards. Results were reported in units of mg/Kg.

Sample Preparation: No anomalies were observed during the preparation of the samples.

Holding Times: The samples were prepared and analyzed within method required hold times.

Dilution(s): None.

Quality Control Data:

Blank: No confirmed method analytes were detected in the method blank above half of the CRDL.

Laboratory Control Samples: All recoveries met the method limits.

Surrogate Recovery: Surrogate recoveries were acceptable.

MS/MSD: Matrix spiking was performed on sample 03E04262 which belonged to set# 03E-0444-01. All percent recoveries and RPDs were within method limits. does not match 2/2/04

Instrument QC: All initial and continuing calibration verification samples met method criteria.

Flagging Codes: The "U" flag indicates that the analyte was not detected at or above the MDL level. The "J" flag indicates that a value reported between the MDL and CRDL.

NC/CAR: None.

Miscellaneous Comments: None.

Confirmation Analyses: Any sample with a positive result above the MDL was qualitatively analyzed for confirmation on a second column. For samples requiring confirmation, one part acetonitrile extract was mixed with one part of a 1% calcium chloride solution, then injected into an HP1050 HPLC equipped with UV detection and a Phenomenex Synergi Polar-RP column. The instrument was adjusted to the proper operating parameters and allowed to equilibrate until a stable baseline was established. A CCV standard was run to establish retention times and a standard at a level near the reporting limits was run to verify low concentration sensitivity. The second column analyses were used for qualitative confirmation of analytes based on retention time. If a positive result is confirmed, the quantitative result from the primary column is reported.

Gloria W. Heung 10/23/03

Gloria W. Heung Date

Earliest Sampling Date: 8-Oct-2003

DataChem Laboratories
CHAIN-OF-CUSTODY

Results due by: 23-Oct-2003

Project/Job/Task: P021C002 | *Split:* | **Root Set ID:** 03E-0441 * | **Reporting Group** 01 02

Account: 08001

Client: URS

Comments:

Verified: JW 10/9/03

Date Sampled	Field ID Number	DCL Sample Name	DCL Sample ID	QC	Matrix	Customer ID 2	Analysis: Nitroglycerin/PETN by 8332	Analysis: Moisture	# Bottles
8-Oct-2003	57SB4A	03E04239			SOIL		X	X	1
8-Oct-2003	69SB1A	03E04240			SOIL		X	X	1
8-Oct-2003	69SB1B	03E04241			SOIL		X	X	1
8-Oct-2003	69SB1C	03E04242			SOIL		X	X	1
8-Oct-2003	69SB3A	03E04243			SOIL		X	X	1
8-Oct-2003	SBD7	03E04244			SOIL		X	X	1
8-Oct-2003	69SB3B	03E04245			SOIL		X	X	1
8-Oct-2003	69SB3C	03E04246			SOIL		X	X	1
8-Oct-2003	69SB2A	03E04247			SOIL		X	X	1
8-Oct-2003	69SB2B	03E04248			SOIL		X	X	1

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

GSR

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Reason for Transfer/ Storage Location
Walk-in/ Room/ Shelf/ Fridge R-33-1 MB	10/10/03 13:30	Norman Breese	%Moisture
Norman Breese R-33-1 MB	10/10/03 14:40 (10/11/03 12:..)	R-319-1 MB	storage

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep/Analysis for: _____ Lab Notebook No.: _____

Prepared/Analyzed by: _____ Date/Time: _____

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Reason for Transfer/ Storage Location

Printed 10/9/2003 13:2

Check box if there is a continuation page ☐

Form: COPC1.01-SWV2.30

Earliest Sampling Date: 8-Oct-2003

DataChem Laboratories
CHAIN-OF-CUSTODY

Results due by: 23-Oct-2003

Project/Job/Task: P021C002	Split:	Root Set ID: 03E-0441 *	Reporting Group
Client: URS		Account: 08001	Analysis
Comments:			
Verified: JW 10/9/03			

Date Sampled	Field ID Number	DCL Sample Name	DCL Sample ID	QC	Matrix	Customer ID 2	01 Nitroglycerin/PETN by 8332	02 Moisture	# Bottles
8-Oct-2003	69SB2C	03E04249			SOIL		X	X	1
8-Oct-2003	57SB4B	03E04250			SOIL		X	X	1

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

6C SP

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Reason for Transfer/ Storage Location
Walk-in/ Room/ Shelf/ Fridge R-33-1 MB	10/10/03 13:30	Norman Breed	% Moisture
Norman Breed	10/10/03 14:40	R-319-1 MB	storage
R-33-1 MB	10/10/03 12:11		

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep/Analysis for: _____ Lab Notebook No.: _____

Prepared/Analyzed by: _____ Date/Time: _____

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Reason for Transfer/ Storage Location

Check box if there is a continuation page ☐

Printed 10/9/2003 13:29

Form: COFC1.01-SWV2.30

Earliest Sampling Date: 9-Oct-2003

DataChem Laboratories
CHAIN-OF-CUSTODY

Results due by: 24-Oct-2003

Project/Job/Task: P021C002 | *Split:* | **Root Set ID:** 03E-0443 * | **Reporting Group**

Client: URS | **Account:** 08001

Comments:

Verified: JW 10/10/03

Date Sampled	Field ID Number	DCL Sample Name	DCL Sample ID	QC	Matrix	Customer ID 2	Analysis: Nitroglycein/PETN by 8332	Analysis: Moisture	# Bottles
9-Oct-2003	13SB10C	03E04253			SOIL		X	X	1
9-Oct-2003	13SB9A	03E04254			SOIL		X	X	1
9-Oct-2003	SBD9	03E04255			SOIL		X	X	1
9-Oct-2003	13SB9B	03E04256			SOIL		X	X	1
9-Oct-2003	13SB9C	03E04257			SOIL		X	X	1
9-Oct-2003	13SB8A	03E04258			SOIL		X	X	1
9-Oct-2003	13SB8B	03E04259			SOIL		X	X	1

SC 38

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Reason for Transfer/ Storage Location
Walk in/ Room/(Shelf/ Fridge R-33-1 Ms	10/12/03 11:20		
	10/13/03 14:30	Norman Briese	to Moisture
Norman Briese	10/13/03 16:34	R-319-1 BB	storage

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep/Analysis for: _____ Lab Notebook No.: _____

Prepared/Analyzed by: _____ Date/Time: _____

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Reason for Transfer/ Storage Location

Check box if there is a continuation page ☐

Printed 10/10/2003 12:06

Form: COFCL.01-SWV2.30

DATACHEM LABORATORIES CLIENT-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: URS

Project/Task/Site: 03E-0441

Date/Time of Receipt: 10/9/03 0830

Number of Coolers Received: 1

Condition of Coolers:	~~Acceptable~~/Unacceptable	Temperature Control:	Present/~~Not Included~~
Custody Seals:	~~Present~~/Absent/NA	Location Temp Taken:	Control/~~Between Samples~~
	~~Intact~~/Broken/NA	Are all temperatures within project specific guidelines?	~~Yes~~/No/NA
Tamper Evident:	Yes/~~No~~/NA		
Ice Present:	~~Yes~~/No/NA	Are all applicable pHs within specific guidelines?	Yes/No/~~NA~~
	~~Frozen~~/Melted/NA		

pH Check Performed:	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA
Residual Chlorine Check Performed:	8270	Yes/No/NA	8310	Yes/No/NA	8330	Yes/No/NA
	8081	Yes/No/NA	8151	Yes/No/NA		

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C03- 0437	4 °C	4	C03-	°C	7	C03 -	°C
2	C03-	°C	5	C03-	°C	8	C03-	°C
3	C03-	°C	6	C03-	°C	9	C03-	°C

Taken By: R (Signature) J. Pate (Printed Name) 10/9/03 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	EPA Custody Seal:

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKE Date 10/8/03 FedEx Tracking Number 832942539697

ender's ame Brett Fisher Phone 804 965-9000

Company DAMES & MOORE/URS/CRC

Address 5540 FALMOUTH ST STE 201 Dept/Floor/Suite/Room

ty RICHMOND State VA ZIP 23230

Faxed to Client? YES ☐ NO ☐ our Internal Billing Reference 09604 317

Response Req

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

DCL Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

DATACHEM LABORATORIES CLIENT-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: URS

Project/Task/Site: 03E-0443

Date/Time of Receipt: 10/10/03 0900

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Custody Seals:	Present/Absent/NA	Location Temp Taken:	Control/Between Samples
	Intact/Broken/NA	Are all temperatures within	
Tamper Evident:	Yes/No/NA	project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA	Are all applicable pHs within	
	Frozen/Melted/NA	specific guidelines?	Yes/No/NA

pH Check Performed:	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA
Residual Chlorine Check Performed:	8270	Yes/No/NA	8310	Yes/No/NA	8330	Yes/No/NA
	8081	Yes/No/NA	8151	Yes/No/NA		

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C03- 0441	5 °C	4	C03-	°C	7	C03 -	°C
2	C03-	°C	5	C03-	°C	8	C03-	°C
3	C03-	°C	6	C03-	°C	9	C03-	°C

Taken By: _____ (Signature) J. Pate (Printed Name) 10/10/03 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	EPA Custody Seal:

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN: Date 10/9/03 FedEx Tracking Number 832942539675

Sender's Name Brett Fisher Phone 804 965-9000

Company DAMES & MOORE/URS/CRC

Address 5540 FALMOUTH ST STE 201 Dept/Floor/Suite/Room

City RICHMOND State VA ZIP 23230

Faxed to Client? YES ☐ NO ☐ Your Internal Billing Reference 09604 317

Response Requ...

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

DCL Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

SLC/CRIR.doc Revised 1/01/03

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: 03E-0444-01 **Fraction:** PETN_&_Nitroglycerin

Lab: DataChem **Project Name:** Radford_SSP

Reviewer: AS **Date:** February_3,_2004

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific Quality Assurance Project Plan (QAPP).

Major Anomalies: None.

Minor Anomalies: The relative percent difference between the two analytical column concentrations for nitroglycerin was greater than the control limit (i.e., 40%) for samples 13SB11A at 71% and 13SB11B at 54%. The higher of the two concentrations was reported from the primary calibrated column. These results were flagged "J,g".

The field duplicate pair (13SB12B/SBD8) displayed a relative percent difference greater than the control limit (i.e., 35%) for nitroglycerin at 185%. The data user should be made aware of the possibility for replicate sampling error.

Correctable Anomalies: None.

Comments: Positive field sample results from the primary column were analyzed to confirm on an alternate column. Mid-point standards and standards at levels approximate to the method detection limit were analyzed concurrently to qualitatively identify positive detections by retention time responses only.

Sample SBD8 was analyzed at dilution factor of two for nitroglycerin to report a positive detection within the linear range of the instrument.

All data are usable, as qualified, for their intended purpose based on the data reviewed.

Signed: Andrea Sansom

Andrea Sansom

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COVER PAGE

ANALYTICAL REPORT FOR URS Group, Inc.

E-mail: Darren_Renne@URScorp.com

G0399013

DCL Report Group..: **03E-0444-01**

Date Printed.....: 22-OCT-03 17:40

Project Protocol #: P021C002
Client Ref Number.: Subcontract DCL-09
Release Number....: URS#03

Analysis Method(s): 8332

URS Group, Inc.
Attention: Mr. J Darren Renne
5540 Falmouth Street
Suite 201
Richmond, VA 23229

Client Sample Name	Laboratory Sample Name	Date Sampled	Date Received
13SB7A	03E04260	09-OCT-03	10-OCT-03
13SB7B	03E04261	09-OCT-03	10-OCT-03
13SB7C	03E04262	09-OCT-03	10-OCT-03
13SB7CMS	03E04262MS	09-OCT-03	10-OCT-03
13SB7CMSD	03E04262MSD	09-OCT-03	10-OCT-03
13SB12A	03E04263	09-OCT-03	10-OCT-03
13SB12B	03E04264	09-OCT-03	10-OCT-03
SBD8	03E04265	09-OCT-03	10-OCT-03
13SB12C	03E04266	09-OCT-03	10-OCT-03
13SB11A	03E04267	09-OCT-03	10-OCT-03
13SB11B	03E04268	09-OCT-03	10-OCT-03
13SB11C	03E04269	09-OCT-03	10-OCT-03
13SB10A	03E04270	09-OCT-03	10-OCT-03
13SB10B	03E04271	09-OCT-03	10-OCT-03
Method Blank	BL-211507-1	NA	NA
LCS	QC-211507-1	NA	NA

Gloria W. Heung — Analyst: Gloria W. Heung — 10/23/03 Date

Thomas T. McKay — Reviewer: Thomas T McKay — 10/23/03 Date

Richard W. Wade — Lab Supervisor: Richard W. Wade — 10/23/03 Date

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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S0399039

Date Printed.....: 23-OCT-03 14:29

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: RFAAP/09604-317
Release Number.....: URS#03

Date Received.....: 10-OCT-03 00:00

DCL Preparation Group: G039C001
Date Prepared.....: 13-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 1 gm
Net Weight/Volume....: Not Required

Client Sample Name: **13SB7A**
DCL Sample Name...: **03E04260**
DCL Report Group..: **03E-0444-01**

Matrix.....: SOIL
Date Sampled.....: 09-OCT-03 09:45
Reporting Units...: mg/kg
Report Basis.....: ☐ As Received ☒ Dried
Percent Moisture..: 17.0

DCL Analysis Group: G039C001
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	21-OCT-03 22:54	0.269	ND		U	1	1.20
Nitroglycerin	21-OCT-03 22:54	0.195	ND		U	1	0.602

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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

Form RLIMS63A-V1.4
10220317400326

S039903B

Date Printed.....: 22-OCT-03 17:40

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: RFAAP/09604-317
Release Number.....: URS#03

Date Received.....: 10-OCT-03 00:00

DCL Preparation Group: G039C001
Date Prepared.....: 13-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 1 gm
Net Weight/Volume....: Not Required

Client Sample Name: **13SB7B**
DCL Sample Name...: **03E04261**
DCL Report Group..: **03E-0444-01**

Matrix.....: SOIL
Date Sampled.....: 09-OCT-03 10:00
Reporting Units...: mg/kg
Report Basis.....: ☐ As Received ☒ Dried
Percent Moisture..: 19.0

DCL Analysis Group: G039C001
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	21-OCT-03 23:16	0.275	ND		U	1	1.23
Nitroglycerin	21-OCT-03 23:16	0.200	ND		U	1	0.617

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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S039903C

Date Printed.....: 22-OCT-03 17:40

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: RFAAP/09604-317
Release Number.....: URS#03

Date Received.....: 10-OCT-03 00:00

DCL Preparation Group: G039C001
Date Prepared.....: 13-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 1 gm
Net Weight/Volume....: Not Required

Client Sample Name: **13SB7C**
DCL Sample Name...: **03E04262**
DCL Report Group..: **03E-0444-01**

Matrix.....: SOIL
Date Sampled.....: 09-OCT-03 10:15
Reporting Units...: mg/kg
Report Basis.....: ☐ As Received ☒ Dried
Percent Moisture..: 23.8

DCL Analysis Group: G039C001
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	21-OCT-03 23:39	0.293	ND		U	1	1.31
Nitroglycerin	21-OCT-03 23:39	0.213	ND		U	1	0.656

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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S039903G

Date Printed.....: 22-OCT-03 17:40

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: RFAAP/09604-317
Release Number.....: URS#03

Date Received.....: 10-OCT-03 00:00

DCL Preparation Group: G039C001
Date Prepared.....: 13-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 1 gm
Net Weight/Volume....: Not Required

Client Sample Name: **13SB12A**
DCL Sample Name...: **03E04263**
DCL Report Group..: **03E-0444-01**

Matrix.....: SOIL
Date Sampled.....: 09-OCT-03 10:45
Reporting Units...: mg/kg
Report Basis.....: ☐ As Received ☒ Dried
Percent Moisture..: 24.9

DCL Analysis Group: G039C001
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	22-OCT-03 00:46	0.297	ND		U	1	1.33
Nitroglycerin	22-OCT-03 00:46	0.216	8.48			1	0.666

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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S039903H

Date Printed.....: 22-OCT-03 17:40

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: RFAAP/09604-317
Release Number.....: URS#03

Date Received.....: 10-OCT-03 00:00

DCL Preparation Group: G039C001
Date Prepared.....: 13-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 1 gm
Net Weight/Volume....: Not Required

Client Sample Name: **13SB12B**
DCL Sample Name...: **03E04264**
DCL Report Group..: **03E-0444-01**

Matrix.....: SOIL
Date Sampled.....: 09-OCT-03 11:00
Reporting Units...: mg/kg
Report Basis.....: ☐ As Received ☒ Dried
Percent Moisture..: 36.7

DCL Analysis Group: G039C001
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	22-OCT-03 01:09	0.352	ND		U	1	1.58
Nitroglycerin	22-OCT-03 01:09	0.256	4.05			1	0.790

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A Sorenson Company

FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S039903J

Date Printed.....: 23-OCT-03 14:29

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: RFAAP/09604-317
Release Number.....: URS#03

Date Received.....: 10-OCT-03 00:00

DCL Preparation Group: G039C001
Date Prepared.....: 13-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 1 gm
Net Weight/Volume....: Not Required

Client Sample Name: **SBD8**
DCL Sample Name...: **03E04265**
DCL Report Group..: **03E-0444-01**

Matrix.....: SOIL
Date Sampled.....: 09-OCT-03 00:00
Reporting Units...: mg/kg
Report Basis.....: ☐ As Received ☒ Dried
Percent Moisture..: 30.0

DCL Analysis Group: G039C001
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	22-OCT-03 01:53	0.319	ND		U	1	1.43
Nitroglycerin	23-OCT-03 12:20	0.462	67.4			2	1.43

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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S039903K

Date Printed.....: 22-OCT-03 17:40

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: RFAAP/09604-317
Release Number.....: URS#03

Date Received.....: 10-OCT-03 00:00

DCL Preparation Group: G039C001
Date Prepared.....: 13-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 1 gm
Net Weight/Volume....: Not Required

Client Sample Name: **13SB12C**
DCL Sample Name...: **03E04266**
DCL Report Group..: **03E-0444-01**

Matrix.....: SOIL
Date Sampled.....: 09-OCT-03 11:15
Reporting Units...: mg/kg
Report Basis.....: ☐ As Received ☒ Dried
Percent Moisture..: 38.9

DCL Analysis Group: G039C001
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	22-OCT-03 02:16	0.365	ND		U	1	1.64
Nitroglycerin	22-OCT-03 02:16	0.265	2.54			1	0.818

DATA CHEM LABORATORIES
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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S039903L

Date Printed.....: 22-OCT-03 17:40

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: RFAAP/09604-317
Release Number.....: URS#03

Date Received.....: 10-OCT-03 00:00

DCL Preparation Group: G039C001
Date Prepared.....: 13-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 1 gm
Net Weight/Volume....: Not Required

Client Sample Name: **13SB11A**
DCL Sample Name...: **03E04267**
DCL Report Group..: **03E-0444-01**

Matrix.....: SOIL
Date Sampled.....: 09-OCT-03 12:15
Reporting Units...: mg/kg
Report Basis.....: ☐ As Received ☒ Dried
Percent Moisture..: 27.3

DCL Analysis Group: G039C001
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	22-OCT-03 02:38	0.307	ND		U	1	1.38
Nitroglycerin	22-OCT-03 02:38	0.223	2.11			1	0.688

J,g

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FAX (801) 268-9992 E-mail: lab@datachem.com

DATA CHEM LABORATORIES
A Sorenson Company

FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S039903M

Date Printed.....: 22-OCT-03 18:01

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: RFAAP/09604-317
Release Number.....: URS#03

Date Received.....: 10-OCT-03 00:00

DCL Preparation Group: G039C001
Date Prepared.....: 13-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 1 gm
Net Weight/Volume....: Not Required

Client Sample Name: **13SB11B**
DCL Sample Name...: **03E04268**
DCL Report Group..: **03E-0444-01**

Matrix.....: SOIL
Date Sampled.....: 09-OCT-03 12:30
Reporting Units...: mg/kg
Report Basis.....: ☐ As Received ☒ Dried
Percent Moisture..: 23.5

DCL Analysis Group: G039C001
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	22-OCT-03 03:01	0.292	ND		U	1	1.31
Nitroglycerin	22-OCT-03 03:01	0.212	2.55			1	0.654

JJg

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DATA CHEM LABORATORIES
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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

Date Printed.....: 22-OCT-03 18:01

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: RFAAP/09604-317
Release Number.....: URS#03

Date Received.....: 10-OCT-03 00:00

DCL Preparation Group: G039C001
Date Prepared.....: 13-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 1 gm
Net Weight/Volume....: Not Required

Client Sample Name: **13SB11C**
DCL Sample Name...: **03E04269**
DCL Report Group..: **03E-0444-01**

Matrix.....: SOIL
Date Sampled.....: 09-OCT-03 12:45
Reporting Units...: mg/kg
Report Basis.....: ☐ As Received ☒ Dried
Percent Moisture..: 28.1

DCL Analysis Group: G039C001
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	22-OCT-03 03:23	0.310	ND		U	1	1.39
Nitroglycerin	22-OCT-03 03:23	0.225	ND		U	1	0.695

DATA CHEM LABORATORIES
A Sorenson Company

FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S039903P

Date Printed.....: 22-OCT-03 17:40

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: RFAAP/09604-317
Release Number.....: URS#03

Date Received.....: 10-OCT-03 00:00

DCL Preparation Group: G039C001
Date Prepared.....: 13-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 1 gm
Net Weight/Volume....: Not Required

Client Sample Name: **13SB10A**
DCL Sample Name...: **03E04270**
DCL Report Group..: **03E-0444-01**

Matrix.....: SOIL
Date Sampled.....: 09-OCT-03 13:00
Reporting Units...: mg/kg
Report Basis.....: ☐ As Received ☒ Dried
Percent Moisture..: 41.4

DCL Analysis Group: G039C001
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	22-OCT-03 03:46	0.381	ND		U	1	1.71
Nitroglycerin	22-OCT-03 03:46	0.276	ND		U	1	0.853

DATA CHEM LABORATORIES
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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S039903Q

Date Printed.....: 22-OCT-03 17:40

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: RFAAP/09604-317
Release Number.....: URS#03

Date Received.....: 10-OCT-03 00:00

DCL Preparation Group: G039C001
Date Prepared.....: 13-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 1 gm
Net Weight/Volume....: Not Required

Client Sample Name: **13SB10B**
DCL Sample Name...: **03E04271**
DCL Report Group..: **03E-0444-01**

Matrix.....: SOIL
Date Sampled.....: 09-OCT-03 13:15
Reporting Units...: mg/kg
Report Basis.....: ☐ As Received ☒ Dried
Percent Moisture..: 24.9

DCL Analysis Group: G039C001
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	22-OCT-03 04:08	0.297	ND		U	1	1.33
Nitroglycerin	22-OCT-03 04:08	0.216	ND		U	1	0.666

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DATA VALIDATION WORKSHEET

Explosives

Reviewer: AS
Date: January-04
DV Level: II III IV

Review Document:

_X_ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
_X_ Project QAPP/SAP

Project Name: Radford SSP
Project Number: 15291974.30000
Laboratory: DataChem
SDG No.: 03E-0444-01
Test Name: Explosives
Method No.: 8332-HPLC

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		x	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids		x	
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	x		

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	x		
	Action: If the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		x	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		x	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	x		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		x	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		x	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	x		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	x		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	x		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	x		
	For initial Calibration: for %RSD > ±20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	x		

Notes: Second column was used to not confirm primary column low level hits. The second column does not have an initial calibration or bracketing continuing calibrations. The one points provided are for retention time purposes only.

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	x		
5.2	Are surrogate recoveries within acceptance criteria not to exceed 30-150% for all samples and method blanks?	x		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			x
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			x
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	x		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
6.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 40-150%?		x	
6.4	Are there any RPDs outside the QC limits not to exceed 60%? Are there any RPDs outside the QC limits not to exceed 60%?		x	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	x		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 40-150%?		x	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 60%?			x
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.		x	

Notes:	SBD8	13SB12B	RPD	Delta	RL	5XRL	4XRL
PETN	ND	ND			1.58	7.9	6.32
nitroglycerin	67.4	2.54	185%	64.86	0.79	3.95	3.16

9.0 Compound Identification and Detection Limit Verification

		Yes	No	NA
9.1	Are all positive identifications confirmed on second column or detector? If not, reject or estimate this detection.	x		
9.2	For positive sample detections, is RPD <40% between first and second columns. If not, apply J.		x	
9.3	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	x		

Notes:

10.0 Data Completeness

			Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)		x		
	Number of samples:	12			
	Number of target compounds in each analysis:	2			
	Number of results rejected and not reported:	0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)				
	% Completeness =	100%			

Notes:

Nitroglycerin Results

Sample No.	Primary Column Result (mg/Kg)	Secondary Column Result (mg/Kg)	RPD
03E04263	6.37	7.38	14.7%
03E04264	2.57	3.81	38.9%
03E04265	47.2*	53.3	12.%
03E04266	1.55	1.82	16.%
03E04267	1.53	0.725	(71%)
03E04268	1.95	1.12	(54%)

Results were not moisture corrected.
*This result was from the dilution run, sequence 1023LC3.

Gloria W. Heung 10/23/03

Thomas T. McKay 10/23/03

DATA CHEM LABORATORIES
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FORM F (TYPE I)
SINGLE METHOD ANALYSES

QUALITY CONTROL DATA SHEET
MATRIX SPIKE SAMPLE
MATRIX SPIKE DUPLICATE SAMPLE

S039903D

Client Name.....: URS Group, Inc.
Release Number.....: URS#03

Matrix.....: SOIL
Reporting Units.....: mg/Kg

DCL Preparation Group: G039C001
Date Prepared.....: 13-OCT-03 00:00
Preparation Method...: 8332

DCL Sample Name...: **03E04262MS**
Date Printed.....: 22-OCT-03 17:40

DCL Analysis Group: G039C001
Analysis Method...: OL-SW-8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

QC Limit Type.....: Method

Analytical Results

Analyte	Date Analyzed	Sample Result	Spiked Result	Spike Added	Percent Recovery	QC Limits	QC Flag
PETN	22-OCT-03 00:01	ND	16.7	20.0	83.4	65.0/125.	
Nitroglycerin	22-OCT-03 00:01	ND	19.8	20.0	99.0	65.0/125.	

S039903F

DCL Sample Name...: **03E04262MSD**

Analytical Results

Analyte	Date Analyzed	Duplicate Result	Percent Recovery	Mean	Range	RPD	QC Limits	QC Flag
PETN	22-OCT-03 00:24	17.5	87.6	17.1	0.839	4.9	0.00/35.0	
Nitroglycerin	22-OCT-03 00:24	18.6	92.8	19.2	1.24	6.5	0.00/35.0	

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Date of Extraction:	OCT 12, 2003	**DataChem Laboratories Extraction Notebook**	Book # Ext 246 Page#
Account #(s):	8001		
DCL Set ID(s):	03E-0443-01, 0444-01		Matrix: SOIL
Group/Lot ID:	G039C001		Method: 8332

	DCL Sample ID	Field ID	Initial Vol. / WT	Initial pH	Adj pH		Surr. Added	Matrix Spike		Final Volume
1	BL-211507-1	BL-211507-1	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
2	QC-211507-1	QC-211507-1	1.0gm	N/A	N/A	N/A	1mL	1mL	----	2mL
3	03E04253	13SB10C	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
4	03E04254	13SB9A	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
5	03E04255	SBD9	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
6	03E04256	13SB9B	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
7	03E04257	13SB9C	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
8	03E04258	13SB8A	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
9	03E04259	13SB8B	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
10	03E04260	13SB7A	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
11	03E04261	13SB7B	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
12	03E04262	13SB7C	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
13	03E04262MS	13SB7CMS	1.0gm	N/A	N/A	N/A	1mL	1mL	----	2mL
14	03E04262MSD	13SB7CMSD	1.0gm	N/A	N/A	N/A	1mL	1mL	----	2mL
15	03E04263	13SB12A	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
16	03E04264	13SB12B	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
17	03E04265	SBD8	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
18	03E04266	13SB12C	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
19	03E04267	13SB11A	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
20	03E04268	13SB11B	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
21	03E04269	13SB11C	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
22	03E04270	13SB10A	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
23	03E04271	13SB10B	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
24										
25										
26										
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37										
38										
39										
40										

Solvents:	MeCN	CH016	Comments:
Surrogate Spike:	239 ws 3	1/30/04 By:	
Matrix Spike:	239 ws 2	1/30/04 6/10/2000 By:	
Matrix Spike:	----------	---------- By:	
Extractionist:		10/12/03	
Checker:		10/13/03	Sonicators tunned by:

*=Entry Error

Project No. X

TITLE Data Chem Laboratories % Moisture Book No. 4146

From Page No. X

Insert of preparatory report for sets: 03E-0443-02 & 0444-02

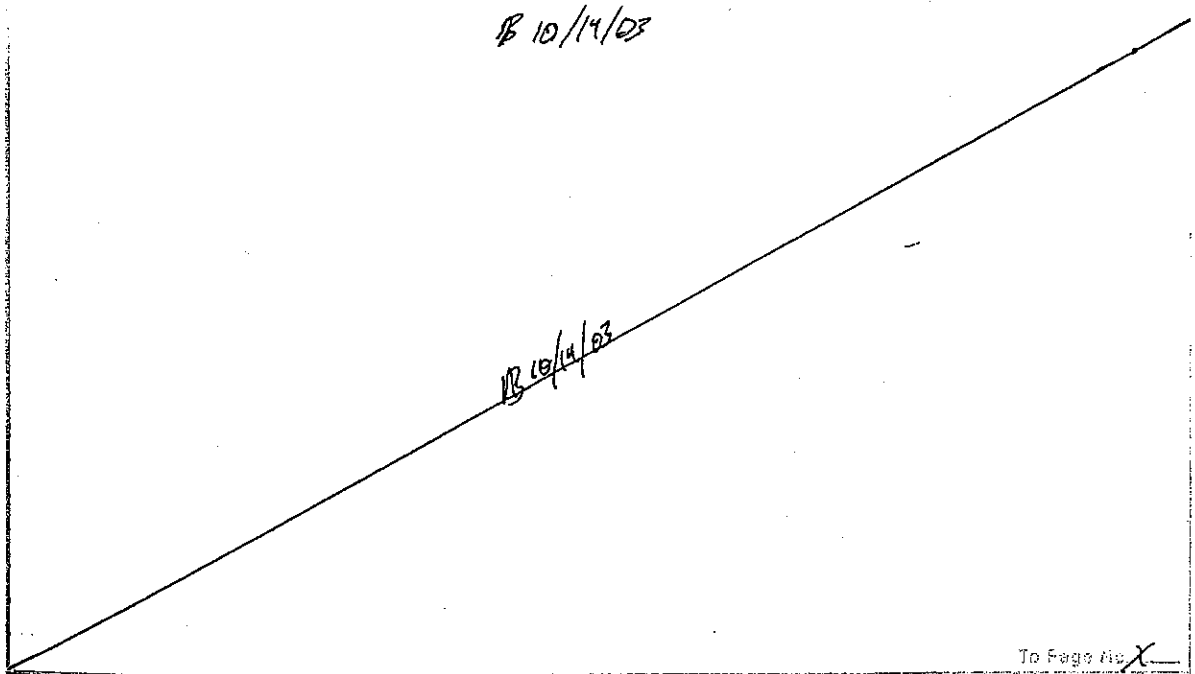
VB 10/14/03

%Moistures & Solids

Start Time: 16:31 13-Oct-03
Finish Time: 9:24 14-Oct-03

Set ID #	Dish #	Sample #	Dish (g)	Dish + Soil (g)	Soil weight(g)	Dish + Dry Soil (g)	Dry Soil (g)	% Solids	% Moistures
03E-0444-02	1	03E04260	1.23	5.22	3.99	4.54	3.31	83.0%	17.0%
03E-0444-02	2	03E04261	1.24	5.23	3.99	4.47	3.23	81.0%	19.0%
03E-0444-02	3	03E04262	1.25	5.74	4.49	4.67	3.42	76.2%	23.8%
03E-0444-02	4	03E04262MD	1.25	5.38	4.13	4.27	3.02	73.1%	26.9%
03E-0444-02	5	03E04263	1.23	8.66	7.43	6.81	5.58	75.1%	24.9%
03E-0444-02	6	03E04264	1.23	5.37	4.14	3.85	2.62	63.3%	36.7%
03E-0444-02	7	03E04265	1.23	5.13	3.90	3.96	2.73	70.0%	30.0%
03E-0444-02	8	03E04266	1.25	5.52	4.27	3.86	2.61	61.1%	38.9%
03E-0444-02	9	03E04267	1.23	5.84	4.61	4.58	3.35	72.7%	27.3%
03E-0444-02	10	03E04268	1.25	5.03	3.78	4.14	2.89	76.5%	23.5%
03E-0444-02	11	03E04269	1.25	5.88	4.63	4.58	3.33	71.9%	28.1%
03E-0444-02	12	03E04270	1.24	5.20	3.96	3.56	2.32	58.6%	41.4%
03E-0444-02	13	03E04271	1.23	5.68	4.45	4.57	3.34	75.1%	24.9%
03E-0443-02	15	03E04253	1.24	6.62	5.38	5.12	3.88	72.1%	27.9%
03E-0443-02	16	03E04253MD	1.23	5.13	3.90	3.97	2.74	70.3%	29.7%
03E-0443-02	17	03E04254	1.24	6.03	4.79	4.75	3.51	73.3%	26.7%
03E-0443-02	18	03E04255	1.24	5.61	4.37	4.22	2.98	68.2%	31.8%
03E-0443-02	19	03E04256	1.24	6.15	4.91	4.96	3.72	75.8%	24.2%
03E-0443-02	20	03E04257	1.24	5.80	4.56	4.67	3.43	75.2%	24.8%
03E-0443-02	21	03E04258	1.23	5.31	4.08	4.22	2.99	73.3%	26.7%
03E-0443-02	22	03E04259	1.24	5.16	3.92	4.29	3.05	77.8%	22.2%

VB 10/14/03



VB 10/14/03

To Page No. X

Witnessed & Understood by me,	Date	Invented by	Date
Jose G. Rocha	10/14/03	N/A	10/14/03
		Recorded by Norman Breaux	

DATA CHEM LABORATORIES
A Sorenson Company

ANALYTICAL REPORT

Form ARF-AL
Page 1 of 3
Part 1 of 1
10140309510797X

Date _____
Laboratory Group Name 03E-0444-02
Account No. 08001 URS03

URS
Attention: Andrea Sansom
849 Intermountain Dr.
Sutie 320
Linthicum, MD 21090

FAX (410) 859-5202
Telephone (410) 859-5049
E-mail Andrea_Sansom@URScorp.com

Sampling Collection and Shipment

Sampling Site RFAAP/09604-317 Date of Collection October 09, 2003

Date Samples Received at Laboratory October 10, 2003

Analysis

Method of Analysis XX-EP-800

Date(s) of Analysis October 14, 2003

Analytical Results

Field Sample Number	Laboratory Number	Sample Type	MOISTURE %
13SB7A	03E04260	SOIL	17.0
13SB7B	03E04261	SOIL	19.0
13SB7C	03E04262	SOIL	23.8
13SB7CMD	03E04262MD	SOIL	26.9
13SB12A	03E04263	SOIL	24.9
13SB12B	03E04264	SOIL	36.7
SBD8	03E04265	SOIL	30.0
13SB12C	03E04266	SOIL	38.9
13SB11A	03E04267	SOIL	27.3
13SB11B	03E04268	SOIL	23.5
13SB11C	03E04269	SOIL	28.1
13SB10A	03E04270	SOIL	41.4
13SB10B	03E04271	SOIL	24.9

† See comment on last page.
ND Parameter not detected above LOD.
NR Parameter not requested.
NA Parameter not applicable.

** See comment on last page.
( ) Parameter between LOD and LOQ.

Norman Breese
Analyst: Norman Breese

Jon Yonk
Reviewer: Johnathan M. Yonk

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547
Phone (801) 266-7700 Web Page: www.datachem.com
FAX (801) 268-9992 E-mail: lab@datachem.com

DATA CHEM
LABORATORIES, INC.
A SORENSON COMPANY

Case Narrative

Method:	SW-846 8332	**Client:**	URS
Analysis:	Nitroglycerin, PETN	**Account:**	8001
Preparation SOP #:	OL-SW-8332	**Matrix:**	Solid
Analysis SOP#:	OL-SW-8332	**SDG#:**	URS#03
DCL Set ID's:	03E-0444-01		

General Set Information: This set contained twelve samples, a matrix spiked sample (MS) and a matrix spike duplicate. This set was batched with another set, which contained seven solid samples, a method blank, and a laboratory control sample (LCS).

Method Summary: A 1.0 gram portion of the soil samples was weighed, transferred into a suitable container, and 2 ml of acetonitrile was added. The samples were placed in an ultrasonic bath for a minimum of one hour. The samples were allowed to settle and the supernatant was filtered through a 0.45µ PTFE filter. One part acetonitrile extract was mixed with one part of a 1% calcium chloride solution, then injected into an HP1050 HPLC equipped with UV detection and a Phenomenex Ultracarb ODS C18 column. The instrument was adjusted to the proper operating parameters and allowed to equilibrate until a stable baseline was established. Initial calibration standards were analyzed and linear calibration curves were generated from the data. A continuing calibration standard was analyzed at the beginning of sample analysis, after each ten samples, and at the end of the analysis. The response of the continuing calibration standard must be within method limits when compared to the initial calibration curve.

Samples and QCs were analyzed under identical conditions as those used for initial and continuing calibration. Quantitation was based on calibration curves using the initial calibration standards. Results were reported in units of mg/Kg.

Sample Preparation: No anomalies were observed during the preparation of the samples.

Holding Times: The samples were prepared and analyzed within method required hold times.

Dilution(s): Sample 03E04265 was diluted at a ratio of 1 to 2.

Quality Control Data:

Blank: No confirmed method analytes were detected in the method blank above half of the CRDL. The method blank belonged to set# 03E-0443-01.

Laboratory Control Samples: All recoveries met the method limits. The LCS belonged to set# 03E-0443-01.

Surrogate Recovery: Surrogate recoveries were acceptable.

MS/MSD: Matrix spiking was performed on sample 03E04262. All percent recoveries and RPDs were within method limits.

Instrument QC: All initial and continuing calibration verification samples met method criteria.

Flagging Codes: The "U" flag indicates that the analyte was not detected at or above the MDL level. The "J" flag indicates that a value reported between the MDL and CRDL.

NC/CAR: None.

Miscellaneous Comments: None.

Confirmation Analyses: Any sample with a positive result above the MDL was qualitatively analyzed for confirmation on a second column. For samples requiring confirmation, one part acetonitrile extract was mixed with one part of a 1% calcium chloride solution, then injected into an HP1050 HPLC equipped with UV detection and a Phenomenex Synergi Polar-RP column. The instrument was adjusted to the proper operating parameters and allowed to equilibrate until a stable baseline was established. A CCV standard was run to establish retention times and a standard at a level near the reporting limits was run to verify low concentration sensitivity. The second column analyses were used for qualitative confirmation of analytes based on retention time. If a positive result is confirmed, the quantitative result from the primary column is reported.

Gloria W. Heung / Date

03E-0444
SDG#URS#03

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1145

Project Number	Project Name
07604317	RFAAP

Project Contact (Name and Phone Number): Darren Ferns (804) 765 9000

Samplers: Brad Fields / John Spangler

LAB: Data Chem

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332) PETN/NG	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
135B7A	10/9/03 945	5		X	S	F	/	1						X									03E04266
135B7B	10/9/03 1000	5		X	S	F	/	1						X									61
135B7C	10/9/03 1015	5		X	S	F	/	1						X									62
135B7CMS	10/9/03 1015	5		X	S	F	/	1						X									62MS
135B7CMSD	10/9/03 1015	5		X	S	F	/	1						X									62MSD
135B12A	10/9/03 1045	5		X	S	F	/	1						X									63
135B12B	10/9/03 1100	5		X	S	F	/	1						X									64
SBD8	10/9/03 —	5		X	S	F	/	1						X									65
135B12C	10/9/03 1115	5		X	S	F	/	1						X									66
135B11A	10/9/03 1215	5		X	S	F	/	1						X									67
135B11B	10/9/03 1230	5		X	S	F	/	1						X									68
135B11C	10/9/03 1245	5		X	S	F	/	1						X									69
135B10A	10/9/03 1300	5		X	S	F	/	1						X									70
135B10B	10/9/03 1315	5		X	S	F	/	1						X									71

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Brad Fields 10/9/03	1800	FedEx			
FedEx 10/10/03	0900	(for lab) R-33-1			

NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement

Earliest Sampling Date: 9-Oct-2003

DataChem Laboratories
CHAIN-OF-CUSTODY

Results due by: 24-Oct-2003

Project/Job/Task: P021C002 | *Split:* | **Root Set ID:** 03E-0444 * | **Reporting Group**

Client: URS | **Account:** 08001

Comments:

Verified: W 10/10/03

Date Sampled	Field ID Number	DCL Sample Name	DCL Sample ID	QC	Matrix	Customer ID 2	Analysis 01 Nitroglycein/PETN by 8332	Analysis 02 Moisture	# Bottles
9-Oct-2003	13SB7A	03E04260			SOIL		X	X	1
9-Oct-2003	13SB7B	03E04261			SOIL		X	X	1
9-Oct-2003	13SB7C	03E04262			SOIL		X	X	1
9-Oct-2003	13SB7CMS	03E04262MS		MS	SOIL		X		1
9-Oct-2003	13SB7CMSD	03E04262MSD		MSD	SOIL		X		1
9-Oct-2003	13SB12A	03E04263			SOIL		X	X	1
9-Oct-2003	13SB12B	03E04264			SOIL		X	X	1
9-Oct-2003	SBD8	03E04265			SOIL		X	X	1
9-Oct-2003	13SB12C	03E04266			SOIL		X	X	1
9-Oct-2003	13SB11A	03E04267			SOIL		X	X	1

1B SP ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Reason for Transfer/ Storage Location
Walk-in R Room/ Shelf/ Fridge	10/12/03 11:		
	10/12/03 14:30	Norman Burns	% Moisture
Norman Burns	10/13/03 16:34	R-329-1 1B	storage

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep/Analysis for: _____ Lab Notebook No.: _____

Prepared/Analyzed by: _____ Date/Time: _____

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Reason for Transfer/ Storage Location

Check box if there is a continuation page ☐

Printed 10/10/2003 12:06

Form: COFC1.01-SWV2.30

Earliest Sampling Date: 9-Oct-2003

DataChem Laboratories
CHAIN-OF-CUSTODY

Results due by: 24-Oct-2003

Project/Job/Task: P021C002 | *Split:* | **Root Set ID:** 03E-0444 * | **Reporting Group**

Client: URS | **Account:** 08001

Comments:

Verified: JW 10/10/03

Analysis

Date Sampled	Field ID Number	DCL Sample Name	DCL Sample ID	QC	Matrix	Customer ID 2	01 Nitroglycein/PETN by 8332	02 Moisture	# Bottles
9-Oct-2003	13SB11B	03E04268			SOIL		X	X	1
9-Oct-2003	13SB11C	03E04269			SOIL		X	X	1
9-Oct-2003	13SB10A	03E04270			SOIL		X	X	1
9-Oct-2003	13SB10B	03E04271			SOIL		X	X	1
9-Oct-2003	13SB7CMD	03E04262MD		MD	SOIL			X	0

IB JP

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Reason for Transfer/ Storage Location
Walk-in/ Room/ Shelf/ Fridge	10/12/03 11:..		
	10/13/03 14:30	Norman Burns	To Moisture
Norman Burns	10/13/03 16:34	R-309-1 B	storage

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep/Analysis for: _____ Lab Notebook No.: _____

Prepared/Analyzed by: _____ Date/Time: _____

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Reason for Transfer/ Storage Location

Check box if there is a continuation page ☐

Printed 10/10/2003 12:06

Form: COFCl.01-SWV2.30

DATACHEM LABORATORIES CLIENT-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: URS

Project/Task/Site: 03E-0444

Date/Time of Receipt: 10/10/03 0900

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable
Custody Seals:	Present/Absent/NA
	Intact/Broken/NA
Tamper Evident:	Yes/No/NA
Ice Present:	Yes/No/NA
	Frozen/Melted/NA
Temperature Control:	Present/Not Included
Location Temp Taken:	Control/Between Samples
Are all temperatures within project specific guidelines?	Yes/No/NA
Are all applicable pHs within specific guidelines?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA
Residual Chlorine Check Performed:	8270	Yes/No/NA	8310	Yes/No/NA	8330	Yes/No/NA
	8081	Yes/No/NA	8151	Yes/No/NA		

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C03- 0441	5 °C	4	C03-	°C	7	C03 -	°C
2	C03-	°C	5	C03-	°C	8	C03-	°C
3	C03-	°C	6	C03-	°C	9	C03-	°C

Taken By: _____ (Signature) J. Pate (Printed Name) 10/10/03 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	EPA Custody Seal:

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN: 10/9/03 FedEx Tracking Number 832942539675

Sender's Name: Brett Fisher Phone 804 965-9000

Company DAMES & MOORE/URS/CRC

Address 5540 FALMOUTH ST STE 201 Dept./Floor/Suite/Room

City RICHMOND State VA ZIP 23230

Faxed to Client? YES ☐ NO ☐ Your Internal Billing Reference 09604 317

Response Requested:

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

DCL Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

SLC/CRIR.doc Revised 1/01/03

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: 03E-0448-01 **Fraction:** PETN_&_Nitroglycerin

Lab: DataChem **Project Name:** Radford_SSP

Reviewer: AS **Date:** February_3,_2004

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific Quality Assurance Project Plan (QAPP).

Major Anomalies: None.

Minor Anomalies: None.

Correctable Anomalies: None.

Comments: All data are usable for their intended purpose based on the data reviewed.

Signed: Andrea Sansom

Andrea Sansom

DATA CHEM LABORATORIES
A Sorenson Company

COVER PAGE

ANALYTICAL REPORT FOR
URS Group, Inc.

E-mail: Darren_Renne@URScorp.com

Form COVER-V1.4
10230316223606
Page 1

G039D01L

DCL Report Group..: **03E-0448-01**

Date Printed.....: 23-OCT-03 16:22

Project Protocol #: P021C002
Client Ref Number.: Subcontract DCL-09
Release Number....: URS#03

Analysis Method(s): 8332

URS Group, Inc.
Attention: Mr. J Darren Renne
5540 Falmouth Street
Suite 201
Richmond, VA 23229

Client Sample Name	Laboratory Sample Name	Date Sampled	Date Received
Method Blank	BL-211588-1	NA	NA
LCS	QC-211588-1	NA	NA
13SW3	03E04283	10-OCT-03	11-OCT-03
SWD1	03E04284	10-OCT-03	11-OCT-03
13SW2	03E04285	10-OCT-03	11-OCT-03
13SW2MS	03E04285MS	10-OCT-03	11-OCT-03
13SW2MSD	03E04285MSD	10-OCT-03	11-OCT-03
EQB5	03E04286	10-OCT-03	11-OCT-03
EQB6	03E04287	10-OCT-03	11-OCT-03

Analyst: Gloria W. Heung — Date: 10/23/03

Reviewer: Thomas T McKay — Date: 10/23/03

Lab Supervisor: Richard W. Wade — Date: 10/23/03

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547
Phone (801) 266-7700 Web Page: www.datachem.com
FAX (801) 268-9992 E-mail: lab@datachem.com

DATA CHEM LABORATORIES
A Sorenson Company

FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

Form RLIMS63A-V1.4
10230316223606

S039D06Q

Date Printed.....: 23-OCT-03 16:22

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: 09604-317
Release Number.....: URS#03

Date Received.....: 11-OCT-03 00:00

Client Sample Name: **13SW3**
DCL Sample Name...: **03E04283**
DCL Report Group..: **03E-0448-01**

Matrix.....: WATER
Date Sampled.....: 10-OCT-03 13:00
Reporting Units...: ug/L
Report Basis.....: ☒ As Received ☐ Dried

DCL Preparation Group: G039F006
Date Prepared.....: 15-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 770 mL
Net Weight/Volume....: Not Required

DCL Analysis Group: G039F006
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	21-OCT-03 07:59	0.311	ND		U	1	0.970
Nitroglycerin	21-OCT-03 07:59	0.213	ND		U	1	0.970

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547
Phone (801) 266-7700 Web Page: www.datachem.com
FAX (801) 268-9992 E-mail: lab@datachem.com

DATA CHEM LABORATORIES
A Sorenson Company

FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S039D06R

Date Printed.....: 23-OCT-03 16:22

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: 09604-317
Release Number.....: URS#03

Date Received.....: 11-OCT-03 00:00

Client Sample Name: **SWD1**
DCL Sample Name...: **03E04284**
DCL Report Group..: **03E-0448-01**

Matrix.....: WATER
Date Sampled.....: 10-OCT-03 00:00
Reporting Units...: ug/L
Report Basis.....: [X] As Received [ ] Dried

DCL Preparation Group: G039F006
Date Prepared.....: 15-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 770 mL
Net Weight/Volume....: Not Required

DCL Analysis Group: G039F006
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
[X] Primary
[ ] Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	21-OCT-03 08:21	0.311	ND		U	1	0.970
Nitroglycerin	21-OCT-03 08:21	0.213	ND		U	1	0.970

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547
Phone (801) 266-7700 Web Page: www.datachem.com
FAX (801) 268-9992 E-mail: lab@datachem.com

DATA CHEM LABORATORIES
A Sorenson Company

FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S039D06S

Date Printed.....: 23-OCT-03 16:22

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: 09604-317
Release Number.....: URS#03

Date Received.....: 11-OCT-03 00:00

Client Sample Name: **13SW2**
DCL Sample Name...: **03E04285**
DCL Report Group..: **03E-0448-01**

Matrix.....: WATER
Date Sampled.....: 10-OCT-03 14:00
Reporting Units...: ug/L
Report Basis.....: ☒ As Received ☐ Dried

DCL Preparation Group: G039F006
Date Prepared.....: 15-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 770 mL
Net Weight/Volume....: Not Required

DCL Analysis Group: G039F006
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	21-OCT-03 08:44	0.311	ND		U	1	0.970
Nitroglycerin	21-OCT-03 08:44	0.213	ND		U	1	0.970

DATA CHEM LABORATORIES
A Sorenson Company

FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S039D06T

Date Printed.....: 23-OCT-03 16:22

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: 09604-317
Release Number.....: URS#03

Date Received.....: 11-OCT-03 00:00

Client Sample Name: **EQB5**
DCL Sample Name...: **03E04286**
DCL Report Group..: **03E-0448-01**

Matrix.....: WATER
Date Sampled.....: 10-OCT-03 09:45
Reporting Units...: ug/L
Report Basis.....: ☒ As Received ☐ Dried

DCL Preparation Group: G039F006
Date Prepared.....: 15-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 770 mL
Net Weight/Volume....: Not Required

DCL Analysis Group: G039F006
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	21-OCT-03 09:51	0.311	ND		U	1	0.970
Nitroglycerin	21-OCT-03 09:51	0.213	ND		U	1	0.970

DATA CHEM LABORATORIES
A Sorenson Company

FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S039D06V

Date Printed.....: 23-OCT-03 16:22

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: 09604-317
Release Number.....: URS#03

Date Received.....: 11-OCT-03 00:00

Client Sample Name: **EQB6**
DCL Sample Name...: **03E04287**
DCL Report Group..: **03E-0448-01**

Matrix.....: WATER
Date Sampled.....: 10-OCT-03 11:00
Reporting Units...: ug/L
Report Basis.....: ☒ As Received ☐ Dried

DCL Preparation Group: G039F006
Date Prepared.....: 15-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 770 mL
Net Weight/Volume....: Not Required

DCL Analysis Group: G039F006
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	21-OCT-03 10:13	0.311	ND		U	1	0.970
Nitroglycerin	21-OCT-03 10:13	0.213	ND		U	1	0.970

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547
Phone (801) 266-7700 Web Page: www.datachem.com
FAX (801) 268-9992 E-mail: lab@datachem.com

DATA VALIDATION WORKSHEET

Reviewer: AS
Date: January-04
DV Level: II III IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
_X__ Project QAPP/SAP

Explosives

Project Name: Radford SSP
Project Number: 15291974.30000
Laboratory: DataChem
SDG No.: 03E-0448-01
Test Name: Explosives
Method No.: 8332-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		x	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids		x	
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	x		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	x		
	Action: If the temperature of the cooler was elevated (> 10 ℃), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		x	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		x	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	x		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		x	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		x	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	x		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	x		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	x		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	x		
	For initial Calibration: for %RSD > ±20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	x		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	x		
5.2	Are surrogate recoveries within acceptance criteria not to exceed 30-150% for all samples and method blanks?	x		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			x
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			x
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	x		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
6.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 40-150%?		x	
6.4	Are there any RPDs outside the QC limits not to exceed 60%? Are there any RPDs outside the QC limits not to exceed 60%?		x	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample (LCS)

		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	x		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 40-150%?		x	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 60%?			x
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate

		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	x		

Notes:

	SWD1	13SW3	RPD	Delta	RL	5XRL	4XRL
PETN	ND	ND			0.97	4.85	3.88
nitroglycerin	ND	ND			0.97	4.85	3.88

9.0 Compound Identification and Detection Limit Verification

		Yes	No	NA
9.1	Are all positive identifications confirmed on second column or detector? If not, reject or estimate this detection.	x		
9.2	For positive sample detections, is RPD <40% between first and second columns. If not, apply J.	x		
9.3	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	x		

Notes:

10.0 Data Completeness

			Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)		x		
	Number of samples:	5			
	Number of target compounds in each analysis:	2			
	Number of results rejected and not reported:	0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)				
	% Completeness =	100%			

Notes:

DATA CHEM LABORATORIES
A Sorenson Company

FORM F (TYPE I)
SINGLE METHOD ANALYSES

QUALITY CONTROL DATA SHEET
MATRIX SPIKE SAMPLE
MATRIX SPIKE DUPLICATE SAMPLE

S039D07M

Client Name.....: URS Group, Inc.
Release Number.....: URS#03

Matrix.....: WATER
Reporting Units.....: ug/L

DCL Preparation Group: G039F006
Date Prepared.....: 15-OCT-03 00:00
Preparation Method...: 8332

DCL Sample Name...: **03E04285MS**
Date Printed.....: 23-OCT-03 16:22

DCL Analysis Group: G039F006
Analysis Method...: OL-SW-8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

QC Limit Type.....: Method

Analytical Results

Analyte	Date Analyzed	Sample Result	Spiked Result	Spike Added	Percent Recovery	QC Limits	QC Flag
PETN	21-OCT-03 09:06	ND	21.1	26.0	81.3	65.0/125.	
Nitroglycerin	21-OCT-03 09:06	ND	19.5	26.0	74.9	65.0/125.	

S039D07N

DCL Sample Name...: **03E04285MSD**

Analytical Results

Analyte	Date Analyzed	Duplicate Result	Percent Recovery	Mean	Range	RPD	QC Limits	QC Flag
PETN	21-OCT-03 09:28	19.4	74.6	20.2	1.74	8.6	0.00/35.0	
Nitroglycerin	21-OCT-03 09:28	20.2	77.6	19.8	0.697	3.5	0.00/35.0	

db 10/15/03

Date of Extraction:	10/15/03
Account #(s):	8001
DCL Set ID(s):	03E-0448-01
Group/Lot ID:	G039F006

DataChem Laboratories Extraction Notebook

Book #	Ext 007	Page# 56
Matrix:	WATER	
Method:	8332	

	DCL Sample ID	Field ID	Initial Vol. / WT	Initial pH	Adj pH		Surr. Added	Matrix Spike		Final Volume
1	BL-211588-1	BL-211588-1	770mL	N/A	N/A	N/A	1mL	----	----	5mL
2	QC-211588-1	QC-211588-1	770mL	N/A	N/A	N/A	1mL	1mL	----	5mL
3	03E04283	13SW3	770mL	N/A	N/A	N/A	1mL	----	----	5mL
4	03E04284	SWD1	770mL	N/A	N/A	N/A	1mL	----	----	5mL
5	03E04285	13SW2	770mL	N/A	N/A	N/A	1mL	----	----	5mL
6	03E04285MS	13SW2MS	770mL	N/A	N/A	N/A	1mL	1mL	----	5mL
7	03E04285MSD	13SW2MSD	770mL	N/A	N/A	N/A	1mL	1mL	----	5mL
8	03E04286	EQB5	770mL	N/A	N/A	N/A	1mL	----	----	5mL
9	03E04287	EQB6	770mL	N/A	N/A	N/A	1mL	----	----	5mL
10										
11										
12										
13										
14										
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37										
38										
39										
40										

Solvents:	MeCN	C1946	Comments:
Surrogate Spike:	239WS3 #2	01/30/2004 By: db	
Matrix Spike:	239WS99	04/12/2004 By: db	
Matrix Spike:	----------	---------- By: NA	
Extractionist:	DRB	10/15/03	
Checker:	[signature]	10/15/03	Sonicators tunned by: NA

*=Entry Error

db 10/15/03

DATA CHEM
LABORATORIES, INC.
A SORENSON COMPANY

Case Narrative

Method:	SW-846 8332	**Client:**	URS
Analysis:	Nitroglycerin, PETN	**Account:**	8001
Preparation SOP #:	OL-SW-8332	**Matrix:**	Water
Analysis SOP#:	OL-SW-8332	**SDG#:**	URS#03
DCL Set ID's:	03E-0448-01		

General Set Information: This set consisted of five water samples, a method blank, a laboratory control sample (LCS), a matrix spiked sample (MS), and a matrix spiked sample duplicate.

Method Summary: The samples were extracted using the double salting out procedure prescribed in EPA method 8332. An aliquot of 770 mL of each sample was saturated with salt and extracted twice with acetonitrile by stirring at timed intervals. The acetonitrile extracts were combined and re-extracted with fresh salt water. The final volume of the extract was adjusted to 5 mL for each sample and filtered through a 0.45 um PTFE filter. One part acetonitrile extract was mixed with one part of a 1% calcium chloride solution, and then injected into an HP1050 HPLC equipped with UV detection and a Phenomenex Ultracarb ODS column. The instrument was adjusted to the proper operating parameters and allowed to equilibrate until a stable baseline was established. Initial Calibration standards were analyzed and linear calibration curves were generated from the data. A continuing calibration standard was analyzed at the beginning of sample analysis and after each ten samples and at the end of the analysis. The response of the continuing calibration standard must be within method limits when compared to the initial calibration curve.

Samples and QCs were analyzed under identical conditions as those used for initial and continuing calibration. Quantitation was based on calibration curves using the initial calibration standards. Results were reported in units of µg/L.

Sample Preparation: No anomalies were observed during the preparation of the sample set.

Holding Times: The samples were prepared and analyzed within method required hold times.

Dilution(s): None

Quality Control Data:

Blank: No confirmed method analytes were detected in the method blank above half of the CRDL.

Laboratory Control Samples: All recoveries were within method limits.

Surrogate Recovery: Surrogate recoveries were all acceptable.

MS/MSD: Matrix spiking was performed on sample 03E04285. All percent recoveries and RPDs were within method limits.

Instrument QC: All initial and continuing calibration verification samples met method criteria.

Flagging Codes: The "U" flag indicates that the analyte was not detected at or above the MDL level. The "J" flag indicates that the value reported was between the MDL and CRDL.

NC/CAR: None.

Miscellaneous Comments: Any sample with a positive result above the MDL was qualitatively analyzed for confirmation on a second column. For samples requiring confirmation, one part acetonitrile extract was mixed with one part of a 1% calcium chloride solution, then injected into an HP1050 HPLC equipped with UV detection and Phenomenex Synergi Polar-RP column. The instrument was adjusted to the proper operating parameters and allowed to equilibrate until a stable baseline was established. A CCV standard was run to establish retention times and a standard at the reporting limits was run to verify low concentration sensitivity. The second column analyses were used for qualitative confirmation of analytes based on retention time. When a positive result is confirmed, the quantitative result from the primary column is reported.

Gloria W. Heung 09/23/03

Gloria W. Heung Date

03E-0448
SDG# URS#03

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1112

Project Number	Project Name
096049317	RFNAP

Project Contact (Name and Phone Number): Dawn Rowe (804) 765 9000

Samplers: Brett Fisher / John Spangler

LAB: Data Chem

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332 RDX/TNT/NG)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
135W1	10/10/03 1300	5		X	1	F	U	2						X									03E04283
5WD1	10/10/03 —	5		X	1	F	U	2						X									84
135W2	10/10/03 1400	5		X	1	F	U	2						X									85
135W2MS	10/10/03 1400	5		X	1	F	U	2						X									85MS
135W2MSD	10/10/03 1400	5		X	1	F	U	2						X									85MSD
135D3	10/10/03 1300	5		X	5	F	/	1						X									88
5DD1	10/10/03 —	5		X	5	F	/	1						X									89
135D2	10/10/03 1400	5		X	5	F	/	1						X									90
135D2MS	10/10/03 1400	5		X	5	F	/	1						X									90MS
135D2MSD	10/10/03 1400	5		X	5	F	/	1						X									90MSD

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	10/10/03 1800	FedEx			
FedEx	10/11/03 0900	(for lab) R-33-1			

Date/Time

NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement

2

03E-0448
SDG# URS#03

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1141

Project Number	Project Name
07604 317	RFAAP

Project Contact (Name and Phone Number): Darren Rennie (804) 765 9000

Samplers: Brett Fidler / John Spangler

LAB: Data Chem

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332) PETN/NG	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
EQ65	10/10/03 945	5		X	4	F	U	2						X									03E04286
EQ66	10/10/03 1100	5		X	4	F	U	2						X									187

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Brett Fidler	10/10/03 1800	FedEx			
Relinquished by: FedEx	Date/time 10/11/03 0900	Received by: (for lab) R-33-1	Date/Time	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

Earliest Sampling Date: 10-Oct-2003

DataChem Laboratories
CHAIN-OF-CUSTODY

Results due by: 24-Oct-2003

Project/Job/Task: P021C002 | *Split:* | **Root Set ID:** 03E-0448 * | **Reporting Group** 01

Client: URS | **Account:** 08001

Comments:

Verified: JW 10/13/03

Date Sampled	Field ID Number	DCL Sample Name	DCL Sample ID	QC	Matrix	Customer ID 2	Analysis: PETN/NG in Water by EPA 8332	# Bottles
10-Oct-2003	13SW3	03E04283			WATER		X	2
10-Oct-2003	SWD1	03E04284			WATER		X	2
10-Oct-2003	13SW2	03E04285			WATER		X	2
10-Oct-2003	13SW2MS	03E04285MS		MS	WATER		X	2
10-Oct-2003	13SW2MSD	03E04285MSD		MSD	WATER		X	2
10-Oct-2003	EQB5	03E04286			WATER		X	2
10-Oct-2003	EQB6	03E04287			WATER		X	2

15C JP

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Reason for Transfer/ Storage Location
Walk-in/ Room/ Shelf/ Fridge R-33-1 DB	10/15/03 11:40	D-e B-e	Ext. 8332
D-e B-e			

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep/Analysis for: _____ Lab Notebook No.: _____

Prepared/Analyzed by: _____ Date/Time: _____

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Reason for Transfer/ Storage Location

Check box if there is a continuation page ☐

Printed 10/13/2003 16:19

Form: COFC1.01-SWV2.30

3C-22

Pate, Justin M.

From: John_Spangler@URSCorp.com
Sent: Monday, October 13, 2003 3:04 PM
To: Andrea_Sansom@URSCorp.com
Cc: Darren_Renne@URSCorp.com; James_O_Spencer@URSCorp.com; Brett_Fisher@URSCorp.com; Pate, Justin M.
Subject: Re: COC/Label Problems

pic10980.pcx

Andrea the sample is 13SW3, not 13SW1. Same for the sediment sample.

The table was incorrect as the samples were identified in the WP as 13SW2 and 13SW3

Andrea Sansom
10/13/2003 02:16 PM

To: John Spangler/Richmond/URSCorp@URSCORP
cc: Darren Renne@URSCorp, James O Spencer/Richmond/URSCorp@URSCORP
Subject: COC/Label Problems

John,

I imagine this should be 13SW1, since there should not have been a 13SW3.

Please confirm.
(Embedded image moved to file: pic10980.pcx)
----- Forwarded by Andrea Sansom/Linthicum/URSCorp on 10/13/2003 02:15 PM -----

"Pate, Justin M." <pate@datachem.com>
10/13/2003 01:33 PM

To: <andrea_sansom@urscorp.com>
cc:
Subject: COC/Label Problems

Andrea,
We received samples from URS for the RFAAP project on Saturday and we had a discrepancy between the COC and the labels on one of the samples. The COC lists 13SW1 as the sample ID but the bottle lists 13SW3. Which one is correct, the bottle or COC? Could you get back to me with the corrections. Paul is out sick today so you can reach me by email or at (801) 904-4296.
Thanks,

Justin Pate
Sample Control Coordinator

USE-0448-

Fax To: URS - Andrea Sansom
(410)859-5202
Date Faxed:_____

Radford SSP

Corrective Action Log

Laboratory: DATACHEM LABORATORIES
Instrument: HPLC
Method: EPA 8332

Sample Date: 10/10/2003
Analysis Date: _____

Project Number/ Batch Number	Affected Samples	Excursions	Criteria Comparison	Corrective Action Proposed
0904317	135W1	incorrect sample#		Sample 135W1 of chain of custody did not match any samples in cooler. 135W1 was changed to 135W3.

Reviewed By: _____ Section Supervisor Date

Reviewed By: _____ QA/QC Officer Date

Reviewed By: _____ Project Supervisor Date

DATACHEM LABORATORIES CLIENT-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: URS

Project/Task/Site: 03E-0448

Date/Time of Receipt: 10/11/03 0900

Number of Coolers Received: 2

Condition of Coolers: (Acceptable)/Unacceptable

Custody Seals: (Present)/Absent/NA

(Intact)/Broken/NA

Tamper Evident: Yes/(No)/NA

Ice Present: (Yes)/No/NA

(Frozen)/Melted/NA

Temperature Control: (Present)/Not Included

Location Temp Taken: (Cooler)/Between Samples

Are all temperatures within project specific guidelines? (Yes)/No/NA

Are all applicable pHs within specific guidelines? Yes/No/(NA)

pH Check Performed:						
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA
Residual Chlorine Check Performed:	8270	Yes/No/NA	8310	Yes/No/NA	8330	Yes/No/NA
	8081	Yes/No/NA	8151	Yes/No/NA		

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C03- 0442	5 °C	4	C03-	°C	7	C03 -	°C
2	C03- 0443	6 °C	5	C03-	°C	8	C03 -	°C
3	C03 -	°C	6	C03-	°C	9	C03 -	°C

Taken By: _____ (Signature) J. Pate (Printed Name) 10/11/03 (Date)

CLIENT-RELATED INFORMATION

- ☐ Missing Cooler
- ☐ Cooler Conditions
- ☐ Missing Paperwork
- ☒ Missing/Incorrect Bottle Labels
- ☐ Missing Samples/Bottles
- ☐ Broken/Leaking Samples
- ☐ Incorrect Bottle Type
- ☐ Cooler Temperatures Out of Range
- ☐ Incorrect Preservation
- ☐ pH Criteria Not Met
- ☐ Residual Chlorine Present
- ☐ Head Space in Bottles
- ☐ Insufficient Sample Volume
- ☒ Chain of Custody Problems
- ☐ Other:

EPA Custody Seal:

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

COC lists 135W1, bottle lists 135W3.

Date 10/10/03 FedEx Tracking Number 832942539631

Sender's Name Brett Fitler Phone 804 965-9000

Company DAMES & MOORE/URS/CRC

Address 5540 FALMOUTH ST STE 201 Dept/Floor/Suite/Room

City RICHMOND State VA ZIP 23230

Faxed to Client? YES ☐ NO ☐

Your Internal Billing Reference 09604 317

Response Requi

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

135W3 is correct as per JohnSpangler @ URS. See email

DCL Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: 10/13/03

SLC/CRIR.doc

Revised 1/01/03

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: 03E-0448-02 **Fraction:** PETN_&_Nitroglycerin

Lab: DataChem **Project Name:** Radford_SSP

Reviewer: AS **Date:** February_3,_2004

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific Quality Assurance Project Plan (QAPP).

Major Anomalies: None.

Minor Anomalies: None.

Correctable Anomalies: None.

Comments: All data are usable for their intended purpose based on the data reviewed.

Signed: Andrea Sansom

Andrea Sansom

DATA CHEM LABORATORIES
A Sorenson Company

COVER PAGE

ANALYTICAL REPORT FOR URS Group, Inc.

E-mail: Darren_Renne@URScorp.com

G039D01M

DCL Report Group..: **03E-0448-02**

Date Printed.....: 24-OCT-03 11:50

Project Protocol #: P021C002
Client Ref Number.: Subcontract DCL-09
Release Number....: URS#03

Analysis Method(s): 8332

URS Group, Inc.
Attention: Mr. J Darren Renne
5540 Falmouth Street
Suite 201
Richmond, VA 23229

Client Sample Name	Laboratory Sample Name	Date Sampled	Date Received
Method Blank	BL-211589-1	NA	NA
LCS	QC-211589-1	NA	NA
13SD3	03E04288	10-OCT-03	11-OCT-03
SDD1	03E04289	10-OCT-03	11-OCT-03
13SD2	03E04290	10-OCT-03	11-OCT-03
13SD2MS	03E04290MS	10-OCT-03	11-OCT-03
13SD2MSD	03E04290MSD	10-OCT-03	11-OCT-03

Analyst: Gloria W. Heung — Date 10/24/03

Reviewer: Thomas F McKay — Date 10/27/03

Lab Supervisor: Richard W. Wade for RWW — Date 10.28.03

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547
Phone (801) 266-7700 Web Page: www.datachem.com
FAX (801) 268-9992 E-mail: lab@datachem.com

DATA CHEM LABORATORIES
A Sorenson Company

FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S039D06W

Date Printed.....: 27-OCT-03 14:13

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: 09604-317
Release Number.....: URS#03

Date Received.....: 11-OCT-03 00:00

DCL Preparation Group: G039F00P
Date Prepared.....: 15-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 1 gm
Net Weight/Volume....: Not Required

Client Sample Name: **13SD3**
DCL Sample Name...: **03E04288**
DCL Report Group..: **03E-0448-02**

Matrix.....: SOIL
Date Sampled.....: 10-OCT-03 13:00
Reporting Units...: mg/kg
Report Basis.....: ☐ As Received ☒ Dried
Percent Moisture..: 33.9

DCL Analysis Group: G039F00P
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	23-OCT-03 18:42	0.337	ND		U	1	1.51
Nitroglycerin	23-OCT-03 18:42	0.245	ND		U	1	0.756

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DATA CHEM LABORATORIES
A Sorenson Company

FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S039D06X

Date Printed.....: 27-OCT-03 14:13

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: 09604-317
Release Number.....: URS#03

Date Received.....: 11-OCT-03 00:00

DCL Preparation Group: G039F00P
Date Prepared.....: 15-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 1 gm
Net Weight/Volume....: Not Required

Client Sample Name: **SDD1**
DCL Sample Name...: **03E04289**
DCL Report Group..: **03E-0448-02**

Matrix.....: SOIL
Date Sampled.....: 10-OCT-03 00:00
Reporting Units...: mg/kg
Report Basis.....: ☐ As Received ☒ Dried
Percent Moisture..: 37.4

DCL Analysis Group: G039F00P
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	23-OCT-03 19:03	0.356	ND		U	1	1.60
Nitroglycerin	23-OCT-03 19:03	0.259	ND		U	1	0.799

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DATA CHEM LABORATORIES
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FORM A (TYPE I)
SINGLE METHOD ANALYSES

SAMPLE ANALYSIS DATA SHEET

S039D06Y

Date Printed.....: 24-OCT-03 11:50

Client Name.....: URS Group, Inc.
Client Ref Number....: Subcontract DCL-09292003
Sampling Site.....: 09604-317
Release Number.....: URS#03

Date Received.....: 11-OCT-03 00:00

DCL Preparation Group: G039F00P
Date Prepared.....: 15-OCT-03 00:00
Preparation Method...: 8332
Aliquot Weight/Volume: 1 gm
Net Weight/Volume....: Not Required

Client Sample Name: **13SD2**
DCL Sample Name...: **03E04290**
DCL Report Group..: **03E-0448-02**

Matrix.....: SOIL
Date Sampled.....: 10-OCT-03 14:00
Reporting Units...: mg/kg
Report Basis.....: ☐ As Received ☒ Dried
Percent Moisture..: 32.1

DCL Analysis Group: G039F00P
Analysis Method...: 8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
☒ Primary
☐ Confirmation

Analytical Results

Analyte	Date Analyzed	MDL	Result	Comment	Qual.	Dilution	CRDL
PETN	23-OCT-03 19:25	0.328	ND		U	1	1.47
Nitroglycerin	23-OCT-03 19:25	0.239	ND		U	1	0.736

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Phone (801) 266-7700 Web Page: www.datachem.com
FAX (801) 268-9992 E-mail: lab@datachem.com

DATA VALIDATION WORKSHEET

Reviewer: AS
Date: January-04
DV Level: II III IV
Review Document:
_X_ Region III Modified for National Functional Guidelines
___ NFG for organic Data review (February 1994)
_X_ Project QAPP/SAP

Explosives

Project Name: Radford SSP
Project Number: 15291974.30000
Laboratory: DataChem
SDG No.: 03E-0448-02
Test Name: Explosives
Method No.: 8332-HPLC

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		x	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids		x	
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	x		

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	x		
	Action: If the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		x	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		x	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	x		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		x	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		x	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	x		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	x		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	x		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	x		
	For initial Calibration: for %RSD > ±20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	x		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	x		
5.2	Are surrogate recoveries within acceptance criteria not to exceed 30-150% for all samples and method blanks?	x		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			x
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			x
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	x		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
6.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 40-150%?		x	
6.4	Are there any RPDs outside the QC limits not to exceed 60%? Are there any RPDs outside the QC limits not to exceed 60%?		x	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	x		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	x		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 40-150%?		x	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 60%?			x
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	x		

Notes:

	SDD1	13SD3	RPD	Delta	RL	5XRL	4XRL
PETN	ND	ND			1.51	7.55	6.04
nitroglycerin	ND	ND			0.756	3.78	3.024

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are all positive identifications confirmed on second column or detector? If not, reject or estimate this detection.	x		
9.2	For positive sample detections, is RPD <40% between first and second columns. If not, apply J.	x		
9.3	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	x		

Notes:

10.0 Data Completeness			Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)		x		
	Number of samples:	3			
	Number of target compounds in each analysis:	2			
	Number of results rejected and not reported:	0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)				
	% Completeness =	100%			

Notes:

DATA CHEM LABORATORIES
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FORM F (TYPE I)
SINGLE METHOD ANALYSES

QUALITY CONTROL DATA SHEET
MATRIX SPIKE SAMPLE
MATRIX SPIKE DUPLICATE SAMPLE

S039D06Z

Client Name.....: URS Group, Inc.
Release Number.....: URS#03

Matrix.....: SOIL
Reporting Units.....: mg/Kg

DCL Preparation Group: G039F00P
Date Prepared.....: 15-OCT-03 00:00
Preparation Method...: 8332

DCL Sample Name...: **03E04290MS**
Date Printed.....: 28-OCT-03 14:10

DCL Analysis Group: G039F00P
Analysis Method...: OL-SW-8332
Instrument Type...: HPLC
Instrument ID.....: lc03
Column Type.....: ultracarb ods
[X] Primary
[ ] Confirmation

QC Limit Type.....: Method

Analytical Results

Analyte	Date Analyzed	Sample Result	Spiked Result	Spike Added	Percent Recovery	QC Limits	QC Flag
PETN	23-OCT-03 19:47	ND	15.1	20.0	75.6	65.0/125.	
Nitroglycerin	23-OCT-03 19:47	ND	15.3	20.0	76.5	65.0/125.	

S039D070

DCL Sample Name...: **03E04290MSD**

Analytical Results

Analyte	Date Analyzed	Duplicate Result	Percent Recovery	Mean	Range	RPD	QC Limits	QC Flag
PETN	23-OCT-03 20:09	15.0	74.8	15.0	0.153	1.0	0.00/35.0	
Nitroglycerin	23-OCT-03 20:09	15.0	75.2	15.2	0.243	1.6	0.00/35.0	

Bm 10/15/03

Date of Extraction:	OCT 15, 2003	DataChem Laboratories Extraction Notebook	Book # Ext 246	Page#
Account #(s):	8001			
DCL Set ID(s):	03E-0448-02,0450-01		Matrix: SOIL	
Group/Lot ID:	G039F00P (10/15/03)		Method: 8332	

	DCL Sample ID	Field ID	Initial Vol. / WT	Initial pH	Adj pH		Surr. Added	Matrix Spike		Final Volume
1	BL-211589-1	BL-211589-1	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
2	QC-211589-1	QC-211589-1	1.0gm	N/A	N/A	N/A	1mL	1mL	----	2mL
3	03E04288	13SD3	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
4	03E04289	SDD1	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
5	03E04290	13SD2	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
6	03E04290MS	13SD2MS	1.0gm	N/A	N/A	N/A	1mL	1mL	----	2mL
7	03E04290MSD	13SD2MSD	1.0gm	N/A	N/A	N/A	1mL	1mL	----	2mL
8	03E04292	ASB1A	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
9	03E04293	ASB1B	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
10	03E04294	ASB1C	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
11	03E04295	ASB2A	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
12	03E04296	ASB2B	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
13	03E04297	SBD-10	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
14	03E04298	ASB2C	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
15	03E04298MS	ASB2CMS	1.0gm	N/A	N/A	N/A	1mL	1mL	----	2mL
16	03E04298MSD	ASB2CMSD	1.0gm	N/A	N/A	N/A	1mL	1mL	----	2mL
17	03E04299	ASB3A	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
18	03E04300	ASB3B	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
19	03E04301	ASB3C	1.0gm	N/A	N/A	N/A	1mL	----	----	2mL
20										
21										
22										
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40										

Bm 10/15/03

Solvents:	MeCN	CH016	Comments:
Surrogate Spike:	239 ws 3	1/30/04 By: Bm	
Matrix Spike:	239 ws 99	1/12/04 By: Bm	
Matrix Spike:	----	---- By:	
Extractionist:	Bm 10/15/03		
Checker:	10/15/03		Sonicators tunned by:

*=Entry Error

DATA CHEM LABORATORIES
A Sorenson Company

ANALYTICAL REPORT

Form ARF-AL
Page 1 of 2
Part 1 of 1
10160309150845X

Date _____
Laboratory Group Name 03E-0448-03
Account No. 08001 IRS#03

URS Group, Inc.
Attention: Mr. J Darren Renne
5540 Falmouth Street
Suite 201
Richmond, VA 23229

FAX _____
Telephone _____
E-mail _____

Sampling Collection and Shipment

Sampling Site 09604-317 Date of Collection October 10, 2003

Date Samples Received at Laboratory October 11, 2003

Analysis

Method of Analysis XX-EP-800

Date(s) of Analysis October 16, 2003

Analytical Results

Field Sample Number	Laboratory Number	Sample Type	MOISTURE %							
13SD3	03E04288	SOIL	33.9							
SDD1	03E04289	SOIL	37.4							
13SD2	03E04290	SOIL	32.1							
13SD2MD	03E04290MD	SOIL	31.8							
Limit of Detection										

† See comment on last page.
ND Parameter not detected above LOD.
NR Parameter not requested.
NA Parameter not applicable.

** See comment on last page.
( ) Parameter between LOD and LOQ.

Norman Breese
Analyst: Norman Breese

Jon Yonk
Reviewer: Johnathan M. Yonk

960 West LeVoy Drive / Salt Lake City, Utah 84123-2547
Phone (801) 266-7700 Web Page: www.datachem.com
FAX (801) 268-9992 E-mail: lab@datachem.com

Date _____

Laboratory Group Name 03E-0448-03

General Lab Comments

The results provided in this report relate only to the items tested.
This page is the concluding page of the report.

This went through drying twice, because of an error in a spreadsheet cell formula. The formula was corrected returning proper results.

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Project No. X

TITLE: 03E-0448-03 OstaChem Laboratories %moisture Book No 4146

From: Page No. X

Insert of preparatory report for set: 03E-0448-03
IB 10/16/03

%Moistures & Solids

						Start Time:	10:07	15-Oct-03	
						Finish Time:	8:56	16-Oct-03	
Set ID #	Dish #	Sample #	Dish (g)	Dish + Soil (g)	Soil weight(g)	Dish + Dry Soil (g)	Dry Soil (g)	% Solids	% Moistures
03E-0448-03	1	03E04288	1.24	5.60	4.36	4.12	2.88	66.1%	33.9%
03E-0448-03	2	03E04289	1.23	5.51	4.28	3.91	2.68	62.6%	37.4%
03E-0448-03	3	03E04290	1.23	6.09	4.86	4.53	3.30	67.9%	32.1%
03E-0448-03	4	03E04290MD	1.24	5.73	4.49	4.30	3.06	68.2%	31.8%

IB 10/16/03

IB 10/16/03

To Page No. X

Witnessed & Understood by:	Date	Inventor(s)	Date
Jose G. Rocha	10/16/03	NA	10/16/03
		Recorded by: Norman Bueso	

DATA CHEM
LABORATORIES, INC.
A SORENSON COMPANY

Case Narrative

Method:	SW-846 8332	**Client:**	URS
Analysis:	Nitroglycerin, PETN	**Account:**	8001
Preparation SOP #:	OL-SW-8332	**Matrix:**	Solid
Analysis SOP#:	OL-SW-8332	**SDG#:**	URS#03
DCL Set ID's:	03E-0448-02		

General Set Information: This set contained three solid samples, a method blank, a laboratory control sample (LCS), a matrix spiked sample and a matrix spiked duplicate. This set was batched with another set, which contained ten samples, a matrix spiked sample (MS) and a matrix spike duplicate.

Method Summary: A 1.0 gram portion of the soil samples was weighed, transferred into a suitable container, and 2 ml of acetonitrile was added. The samples were placed in an ultrasonic bath for a minimum of one hour. The samples were allowed to settle and the supernatant was filtered through a 0.45µ PTFE filter. One part acetonitrile extract was mixed with one part of a 1% calcium chloride solution, then injected into an HP1050 HPLC equipped with UV detection and a Phenomenex Ultracarb ODS C18 column. The instrument was adjusted to the proper operating parameters and allowed to equilibrate until a stable baseline was established. Initial calibration standards were analyzed and linear calibration curves were generated from the data. A continuing calibration standard was analyzed at the beginning of sample analysis, after each ten samples, and at the end of the analysis. The response of the continuing calibration standard must be within method limits when compared to the initial calibration curve.

Samples and QCs were analyzed under identical conditions as those used for initial and continuing calibration. Quantitation was based on calibration curves using the initial calibration standards. Results were reported in units of mg/Kg.

Sample Preparation: No anomalies were observed during the preparation of the samples.

Holding Times: The samples were prepared and analyzed within method required hold times.

Dilution(s): None.

Quality Control Data:

Blank: No confirmed method analytes were detected in the method blank above half of the CRDL.

Laboratory Control Samples: All recoveries met the method limits.

Surrogate Recovery: Surrogate recoveries were acceptable.

MS/MSD: Matrix spiking was performed on sample 03E04290. All percent recoveries and RPDs were within method limits.

Instrument QC: All initial and continuing calibration verification samples met method criteria.

Flagging Codes: The "U" flag indicates that the analyte was not detected at or above the MDL level. The "J" flag indicates that a value reported between the MDL and CRDL.

NC/CAR: None.

Miscellaneous Comments: None.

Confirmation Analyses: Any sample with a positive result above the MDL was qualitatively analyzed for confirmation on a second column. For samples requiring confirmation, one part acetonitrile extract was mixed with one part of a 1% calcium chloride solution, then injected into an HP1050 HPLC equipped with UV detection and a Phenomenex Synergi Polar-RP column. The instrument was adjusted to the proper operating parameters and allowed to equilibrate until a stable baseline was established. A CCV standard was run to establish retention times and a standard at a level near the reporting limits was run to verify low concentration sensitivity. The second column analyses were used for qualitative confirmation of analytes based on retention time. If a positive result is confirmed, the quantitative result from the primary column is reported.

Gloria W. Heung 10/27/03

Gloria W. Heung Date

03E-0448
SDG# URS#03

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1112

Project Number	Project Name
096-04317	RFAAP

Project Contact (Name and Phone Number): Dawn Reese (804) 765 9000

Samplers: Brett Fisher / John Spangler

LAB: Data Chem

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332 PETN/NG)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
135IW3	10/10/03 1300	S		X	1	F	U	2						X									03E0448 3
5IWD1	10/10/03	S		X	1	F	U	2						X									84
135IW2	10/10/03 1400	S		X	1	F	U	2						X									85
135IW2MS	10/10/03 1400	S		X	1	F	U	2						X									85MS
135IW2MSD	10/10/03 1400	S		X	1	F	U	2						X									85MSD
135D3	10/10/03 1300	S		X	5	F		1						X									88
5DD1	10/10/03	S		X	5	F		1						X									89
135D2	10/10/03 1400	S		X	5	F		1						X									90
135D2MS	10/10/03 1400	S		X	5	F		1						X									90MS
135D2MSD	10/10/03 1400	S		X	5	F		1						X									90MSD

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Brett Fisher 10/10/03	1500	FedEx			
Relinquished by: FedEx 10/11/03	Date/time 0900	Received by: (for lab) R-33-1	Date/Time	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

2

Earliest Sampling Date: 10-Oct-2003

DataChem Laboratories
CHAIN-OF-CUSTODY

Results due by: 24-Oct-2003

Project/Job/Task: P021C002	Split:	Root Set ID: 03E-0448 *	Reporting Group	02	03								#
Client: URS		Account: 08001	Analysis	Nitroglycein/PETN by 8332	Moisture								Bottles
Comments:													
Verified: JW 10/13/03													

Date Sampled	Field ID Number	DCL Sample Name	DCL Sample ID	QC	Matrix	Customer ID 2															
10-Oct-2003	13SD3	03E04288			SOIL						X	X									1
10-Oct-2003	SDD1	03E04289			SOIL						X	X									1
10-Oct-2003	13SD2	03E04290			SOIL						X	X									1
10-Oct-2003	13SD2MS	03E04290MS		MS	SOIL						X										1
10-Oct-2003	13SD2MSD	03E04290MSD		MSD	SOIL						X										1
10-Oct-2003	13SD2MD	03E04290MD		MD	SOIL							X									0

15C JR

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Reason for Transfer/ Storage Location
Walk-in/Room/Shelf/Fridge	10/14/03 10:30		
	10/14/03 16:11	Norman Breese	% Moisture
Norman Breese	10/14/03 17:00	R-319-1 NB	storage
R-319-1 NB	10/15/03 10:00	Norman Breese	% Moisture
Norman Breese	10/15/03 16:30	R-319-1 NB	storage

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep/Analysis for: _____ Lab Notebook No.: _____

Prepared/Analyzed by: _____ Date/Time: _____

Relinquished By: (Signature)	Date/Time	Received By: (Signature)	Reason for Transfer/ Storage Location

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Check box if there is a continuation page ☐

Printed 10/13/2003 16:19

Form: COFC1.01-SWV2.30

DATACHEM LABORATORIES CLIENT-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: URS

Project/Task/Site: 03E-0448

Date/Time of Receipt: 10/11/03 0900

Number of Coolers Received: 2

Condition of Coolers: (Acceptable/Unacceptable)

Custody Seals: (Present/Absent/NA) (Intact/Broken/NA)

Tamper Evident: Yes/(No)/NA

Ice Present: (Yes)/No/NA (Frozen/Melted/NA)

Temperature Control: (Present)/Not Included

Location Temp Taken: (Cooler)/Between Samples

Are all temperatures within project specific guidelines? (Yes)/No/NA

Are all applicable pHs within specific guidelines? Yes/No/(NA)

pH Check Performed:	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA
Residual Chlorine Check Performed:	8270	Yes/No/NA	8310	Yes/No/NA	8330	Yes/No/NA
	8081	Yes/No/NA	8151	Yes/No/NA		

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C03- 0442	5 °C	4	C03-	°C	7	C03 -	°C
2	C03- 0443	6 °C	5	C03-	°C	8	C03-	°C
3	C03-	°C	6	C03-	°C	9	C03-	°C

Taken By: [signature] (Signature) J. Pate (Printed Name) 10/11/03 (Date)

CLIENT-RELATED INFORMATION

- ☐ Missing Cooler
- ☐ Cooler Conditions
- ☐ Missing Paperwork
- ☒ Missing/Incorrect Bottle Labels
- ☐ Missing Samples/Bottles
- ☐ Broken/Leaking Samples
- ☐ Incorrect Bottle Type
- ☐ Cooler Temperatures Out of Range
- ☐ Incorrect Preservation
- ☐ pH Criteria Not Met
- ☐ Residual Chlorine Present
- ☐ Head Space in Bottles
- ☐ Insufficient Sample Volume
- ☒ Chain of Custody Problems
- ☐ Other:

EPA Custody Seal:

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

COC lists 13SW1, bottle ~~5~~ lists 13SW3.

Date 10/10/03 FedEx Tracking Number 832942539631

Sender's Name Brett Fisher Phone 804 965-9000

Company DAMES & MOORE/URS/CRC

Address 5540 FALMOUTH ST STE 201 Dept./Floor/Suite/Room

City RICHMOND State VA ZIP 23230

Faxed to Client? YES ☐ NO ☐

Your Internal Billing Reference 09604 317

Response Requi:

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

13SW3 is correct as per JohnSpangler @ URS. See email

DCL Project Manager: [signature] (Printed Name) Returned to Sample Receipt by: [signature] (Signature) Date: 10/13/03

SLC/CRIR.doc

Revised 1/01/03

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: G296-180 **Fraction:** Dioxin/Furan

Lab: Paradigm_Analytical **Project Name:** Radford_SSP

Reviewer: Andrea_Sansom **Date:** March_5,_2004

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic Data Review and National Functional Guidelines for Chlorinated Dioxin/Furan Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: The soil laboratory control spike pair displayed percent recoveries greater than the upper control limit (i.e., 120%) for 1,2,3,6,7,8-HxCDD (124%) and 1,2,3,7,8,9-HxCDD (130%/129%). The associated field sample results were positive for these constituents and were flagged "J,l". The aqueous laboratory control spike duplicate displayed recoveries greater than the upper control limit for several constituents. Since the laboratory control spike displayed acceptable recoveries and the associated equipment blank (EQB-4) was non-detect, no data qualifying action was required.

All the labeled extraction and cleanup standards displayed percent recoveries greater than the upper control limit (i.,e.,135%) for the soil method blank. Since this is a quality control sample, no data qualifying action was required. The equipment blank displayed a positive detection for Total TCDF at 0.00768 ng/L. The associated result less than five times the blank concentration was flagged "B,x" in sample SBD9.

The matrix spike pair performed on sample 13SB9A displayed recoveries greater than the upper control limit (i.e., 120%) for 1,2,3,6,7,8-HxCDD (122%), 1,2,3,7,8,9-HxCDD (125%/135%), 2,3,4,6,7,8-HxCDF (122%/126%), and 1,2,3,7,8,9-HxCDF (138%). Since the recoveries were marginally greater than the control limit and the laboratory control spike displayed similar anomalies, no data qualifying action was taken.

The field duplicate pair (13SB9A and SBD9) displayed a relative percent difference greater than the control limit (i.e., 35%) for OCDD at 62.4%. The positive OCDD result for 13SB9A was flagged "J,f". The concentration of OCDD was greater than the linear range of the initial calibration for sample SBD9. This result was flagged "J,q".

Correctable Anomalies: None.

Comments: The positive 2,3,7,8-TCDF detections for samples 13SB9A and SBD9 on the primary column was re-analyzed on a more suitable column for determination of this congener. The concentration for this congener from the re-analysis should be used for data interpretation.

Signed: Andrea Sansom

Radford SSP
Duplicate Statistics

13SB9A and SBD9

	Units	RL	5xRL	Sample Conc Hits	Duplicate Conc EMPC	Duplicate Conc Hits	Duplicate Conc EMPC	%RPD Hits	Delta Hits	4xRL	Pass/ Fail
Dioxin/Furan											
2,3,7,8-TCDD	pg/g	1.2	6.2	0.12 U		0.13 U		12.0%	0.015	4.96	N/A
1,2,3,7,8-PeCDD	pg/g	6.2	31	0.33 U	0.66 J	0.37 U		11.6%	0.041	24.84	N/A
1,2,3,4,7,8-HxCDD	pg/g	6.2	31	0.74 J		0.30 U	0.48 J	83.8%	0.434	24.84	N/A
1,2,3,6,7,8-HxCDD	pg/g	6.2	31	2.24 J		1.04 J		73.2%	1.20	24.84	N/A
1,2,3,7,8,9-HxCDD	pg/g	6.2	31	2.33 J		0.63 U	1.37 J	115%	1.702	24.84	N/A
1,2,3,4,6,7,8-HpCDD	pg/g	6.2	31	50.0		40.6		20.8%	9.4	24.84	PASS
OCDD	pg/g	12.4	62	1520		2900		**62.4%**	1380	49.6	**FAIL**
2,3,7,8-TCDF	pg/g	1.2	6.2	0.84 J		0.22 J		117%	0.622	4.96	N/A
1,2,3,7,8-PeCDF	pg/g	6.2	31	0.45 J		0.22 U		69.9%	0.233	24.84	N/A
2,3,4,7,8-PeCDF	pg/g	6.2	31	0.57 J		0.26 U		75.0%	0.313	24.84	N/A
1,2,3,4,7,8-HxCDF	pg/g	6.2	31	0.68 J		0.26 U	0.28 J	90.4%	0.424	24.84	N/A
1,2,3,6,7,8-HxCDF	pg/g	6.2	31	0.53 J		0.24 J		74.9%	0.291	24.84	N/A
2,3,4,6,7,8-HxCDF	pg/g	6.2	31	0.49 J		0.51 U		2.6%	0.013	24.84	N/A
1,2,3,7,8,9-HxCDF	pg/g	6.2	31	0.55 U		0.62 U		11.6%	0.068	24.84	N/A
1,2,3,4,6,7,8-HpCDF	pg/g	6.2	31	5.11 J		2.14 J		81.9%	2.97	24.84	N/A
1,2,3,4,7,8,9-HpCDF	pg/g	6.2	31	0.44 U	0.46 J	0.49 U		11.5%	0.053	24.84	N/A
OCDF	pg/g	12.4	62	11.2 J		4.35 J		88.1%	6.85	49.6	N/A
2,3,4,7,8-PeCDF	pg/g	6.2	31	1.08 J	2.24 J	0.13 U	0.40 J	156%	0.948	24.84	N/A
1,2,3,4,7,8-HxCDF	pg/g	6.2	31	3.82 J	6.03 J	2.57 J		39.1%	1.25	24.84	N/A
1,2,3,6,7,8-HxCDF	pg/g	6.2	31	21.6	22.1	10.50	13.10 J	69.2%	11.1	24.84	PASS
2,3,4,6,7,8-HxCDF	pg/g	6.2	31	96.8		93.90		3.0%	2.90	24.84	PASS
1,2,3,7,8,9-HxCDF	pg/g	6.2	31	7.11	8.80	1.07 J	1.94 J	148%	6.04	24.84	N/A
1,2,3,4,6,7,8-HpCDF	pg/g	6.2	31	4.85 J		0.92 J		136%	3.93	24.84	N/A
1,2,3,4,7,8,9-HpCDF	pg/g	6.2	31	8.31		2.18 J	2.93 J	117%	6.13	24.84	N/A
OCDF	pg/g	6.2	31	13.0	13.4	4.88 J		90.8%	8.12	24.84	N/A

Soil Control Limits

[sample] > 5 x RL, use 35%
[sample] < 5 x RL, use 4 x RL

Method 8290

EQB-4

URS Greiner Woodward Clyde

Analytical Data Summary Sheet

Analyte	Adj. MDL (ng/L)	Amount (ng/L)		Adj. RL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	0.00493	0.00493	U	0.0100				
1,2,3,7,8-PeCDD	0.0221	0.0221	U	0.0500				
1,2,3,4,7,8-HxCDD	0.00986	0.00986	U	0.0500				
1,2,3,6,7,8-HxCDD	0.0142	0.0142	U	0.0500				
1,2,3,7,8,9-HxCDD	0.0132	0.0132	U	0.0500				
1,2,3,4,6,7,8-HpCDD	0.0124	0.0124	U	0.0500				
OCDD	0.0619	0.0619	U	0.100				
2,3,7,8-TCDF	0.00493	0.00493	U	0.0100				
1,2,3,7,8-PeCDF	0.0221	0.0221	U	0.0500				
2,3,4,7,8-PeCDF	0.0201	0.0201	U	0.0500				
1,2,3,4,7,8-HxCDF	0.0115	0.0115	U	0.0500				
1,2,3,6,7,8-HxCDF	0.0122	0.0122	U	0.0500				
2,3,4,6,7,8-HxCDF	0.0107	0.0107	U	0.0500				
1,2,3,7,8,9-HxCDF	0.0131	0.0131	U	0.0500				
1,2,3,4,6,7,8-HpCDF	0.00962	0.00962	U	0.0500				
1,2,3,4,7,8,9-HpCDF	0.00866	0.00866	U	0.0500				
OCDF	0.0165	0.0165	U	0.100				
Total TCDDs	0.00493	0.00493	U	0.0500				
Total PeCDDs	0.0221	0.0221	U	0.0500				
Total HxCDDs	0.00986	0.00986	U	0.0500				
Total HpCDDs	0.0124	0.0124	U	0.0500				
Total TCDFs	0.00493	0.00768	J	0.0500				
Total PeCDFs	0.0201	0.0201	U	0.0500				
Total HxCDFs	0.0107	0.0107	U	0.0500				
Total HpCDFs	0.00866	0.00866	U	0.0500				
ITEF TEQ (ND=0)		0			0			
ITEF TEQ (ND=½)		0.00461			0.00461			

Client Information

Project Name:	Radford Army Ammunition Plant
Sample ID:	EQB-4

Laboratory Information

Project ID:	G296-180
Sample ID:	G296-180-1A
Collection Date/Time:	09-Oct-03 16:20
Receipt Date:	10-Oct-03
Extraction Date:	15-Oct-03
Analysis Date:	17-Oct-03

Sample Information

Matrix:	Water	
Weight / Volume:	500	mL
Solids / Lipids:	NA	%
Original pH :	6	
Batch ID:	WG10010	
Filename:	a15oct03a_5-11	
Retchk:	a15oct03a_4-14	
Begin ConCal:	a15oct03a_4-14	
End ConCal:	a15oct03a_5-14	
Initial Cal:	m8290-100103b	

Method 8290

13SB9A

URS Greiner Woodward Clyde

Analytical Data Summary Sheet

Analyte	Adj. MDL (pg/g)	Amount (pg/g)		Adj. RL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	0.117	0.117	U	1.24				
1,2,3,7,8-PeCDD	0.332	EMPC	J	6.21	0.656	33:28	1.31	
1,2,3,4,7,8-HxCDD	0.268	0.735	J	6.21		35:56	1.11	
1,2,3,6,7,8-HxCDD	0.456	2.24	J	6.21		36:01	1.16	
1,2,3,7,8,9-HxCDD	0.559	2.33	J	6.21		36:14	1.17	
1,2,3,4,6,7,8-HpCDD	0.423	50.0		6.21		39:07	1.00	
OCDD	1.12	1520		12.4		43:05	0.90	
~~2,3,7,8-TCDF~~	~~0.153~~	~~0.842~~	~~J~~	~~1.24~~		~~29:07~~	~~0.85~~	
1,2,3,7,8-PeCDF	0.193	0.450	J	6.21		32:41	1.61	
2,3,4,7,8-PeCDF	0.232	0.574	J	6.21		33:16	1.72	
1,2,3,4,7,8-HxCDF	0.229	0.681	J	6.21		35:15	1.41	
1,2,3,6,7,8-HxCDF	0.116	0.534	J	6.21		35:21	1.17	
2,3,4,6,7,8-HxCDF	0.451	0.494	J	6.21		35:49	1.16	
1,2,3,7,8,9-HxCDF	0.554	0.554	U	6.21				
1,2,3,4,6,7,8-HpCDF	0.489	5.11	J	6.21		37:57	1.00	
1,2,3,4,7,8,9-HpCDF	0.436	EMPC	J	6.21	0.460	39:43	1.49	
OCDF	0.709	11.2	J	12.4		43:18	0.88	
Total TCDDs	0.117	1.08	J	6.21	2.24			
Total PeCDDs	0.332	3.82	J	6.21	6.03			
Total HxCDDs	0.268	21.6		6.21	22.1			
Total HpCDDs	0.423	96.8		6.21				
Total TCDFs	0.153	7.11		6.21	8.80			
Total PeCDFs	0.193	4.85	J	6.21				
Total HxCDFs	0.116	8.31		6.21				
Total HpCDFs	0.436	13.0		6.21	13.4			
ITEF TEQ (ND=0)		3.18			3.51			
ITEF TEQ (ND=½)		3.43			3.69			

J, 1
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see next page. 3/5/04

Client Information

Project Name:	Radford Army Ammunition Plant
Sample ID:	13SB9A

Laboratory Information

Project ID:	G296-180
Sample ID:	G296-180-2A
Collection Date/Time:	09-Oct-03 14:00
Receipt Date:	10-Oct-03
Extraction Date:	13-Oct-03
Analysis Date:	15-Oct-03

Sample Information

Report Basis:	Dry Weight
Matrix:	Soil
Weight / Volume:	10.07 g
Solids / Lipids:	79.9 %
Original pH :	NA
Batch ID:	WG10007
Filename:	a13oct03a_4-12
Retchk:	a13oct03a_3-14
Begin ConCal:	a13oct03a_3-14
End ConCal:	a13oct03a_4-14
Initial Cal:	m8290-100103b

Method 8290
13SB9A
URS Greiner Woodward Clyde

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDF	0.784			13.34	0.78	A

Labeled Standard	Spiked Amount (ng)	RT (min.)	Ratio	Qualifier
Extraction Standards				
13C12-2,3,7,8-TCDF	2.00	13.33	0.79	

Client Information		**Sample Information**	
Project Name:	Radford Army Ammunition Plant	Report Basis:	Dry
		Matrix:	Soil
Sample ID:	13SB9A	Weight / Volume:	10.1 g
		Solids / Lipids:	79.9
		Original pH :	NA
Laboratory Information		Batch ID:	WG10007
Project ID:	G296-180	Instrument:	hrms3
Sample ID:	G296-180-2A	Filename:	c31oct03-5
Collection Date/Time:	10/09/03 14:00	Retchk:	c31oct03-2
Receipt Date:	10/10/03	Begin ConCal:	c31oct03-3
Extraction Date:	10/13/03	End ConCal:	c31oct03-9
Analysis Date/Time:	10/31/03 13:53	Initial Cal:	mCF-c100603

Analyzed by: _____
Date: 10/31/03

Reviewed by: _____
Date: 10/31/03

Method 8290

SBD9

URS Greiner Woodward Clyde

Analytical Data Summary Sheet

Analyte	Adj. MDL (pg/g)	Amount (pg/g)		Adj. RL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	0.132	0.132	U	1.39				
1,2,3,7,8-PeCDD	0.373	0.373	U	6.97				
1,2,3,4,7,8-HxCDF	0.301	EMPC	J	6.97	0.477	35:55	1.05	
1,2,3,6,7,8-HxCDF	0.512	1.04	J	6.97		36:00	1.07	
1,2,3,7,8,9-HxCDF	0.628	EMPC	J	6.97	1.37	36:15	1.03	
1,2,3,4,6,7,8-HpCDD	0.474	40.6		6.97		39:07	1.06	
OCDD	1.26	2900		13.9		43:04	0.88	E
~~2,3,7,8-TCDF~~	~~0.172~~	~~0.220~~	~~J~~	~~1.39~~		~~29:06~~	~~0.72~~	
1,2,3,7,8-PeCDF	0.217	0.217	U	6.97				
2,3,4,7,8-PeCDF	0.261	0.261	U	6.97				
1,2,3,4,7,8-HxCDF	0.257	EMPC	J	6.97	0.276	35:16	0.93	
1,2,3,6,7,8-HxCDF	0.130	0.243	J	6.97		35:21	1.16	
2,3,4,6,7,8-HxCDF	0.507	0.507	U	6.97				
1,2,3,7,8,9-HxCDF	0.622	0.622	U	6.97				
1,2,3,4,6,7,8-HpCDF	0.549	2.14	J	6.97		37:57	1.08	
1,2,3,4,7,8,9-HpCDF	0.489	0.489	U	6.97				
OCDF	0.796	4.35	J	13.9		43:18	0.87	
Total TCDDs	0.132	ND	J	6.97	0.399			
Total PeCDDs	0.373	2.57	J	6.97				
Total HxCDDs	0.301	10.5		6.97	13.1			
Total HpCDDs	0.474	93.9		6.97				
Total TCDFs	0.172	1.07	J	6.97	1.94			
Total PeCDFs	0.217	0.921	J	6.97				
Total HxCDFs	0.130	2.18	J	6.97	2.93			
Total HpCDFs	0.489	4.88	J	6.97				
ITEF TEQ (ND=0)		3.48			3.69			
ITEF TEQ (ND=½)		3.89			4.05			

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see next page
4/5 3/5/04
B, X

Client Information

Project Name:	Radford Army Ammunition Plant
Sample ID:	SBD9

Laboratory Information

Project ID:	G296-180
Sample ID:	G296-180-5A
Collection Date:	09-Oct-03
Receipt Date:	10-Oct-03
Extraction Date:	13-Oct-03
Analysis Date:	15-Oct-03

Sample Information

Report Basis:	Dry Weight	
Matrix:	Soil	
Weight / Volume:	10.00	g
Solids / Lipids:	71.7	%
Original pH :	NA	
Batch ID:	WG10007	
Filename:	a15oct03a-11	
Retchk:	a15oct03a-14	
Begin ConCal:	a15oct03a-14	
End ConCal:	a15oct03a-14	
Initial Cal:	m8290-100103b	

Method 8290

SBD9

URS Greiner Woodward Clyde

Analytical Data Summary Sheet

Analyte	Amount (pg/g)	EDL (pg/g)	EMPC (pg/g)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDF	EMPC	0.139	0.194	13.34	0.92 *	A

Labeled Standard	Spiked Amount (ng)	RT (min.)	Ratio	Qualifier
Extraction Standards				
13C12-2,3,7,8-TCDF	2.00	13.33	0.78	

Client Information		**Sample Information**	
Project Name:	Radford Army Ammunition Plant	Report Basis:	Dry
		Matrix:	Soil
Sample ID:	SBD9	Weight / Volume:	10.0 g
		Solids / Lipids:	71.7
		Original pH :	NA
Laboratory Information		Batch ID:	WG10007
Project ID:	G296-180	Instrument:	hrms3
Sample ID:	G296-180-5A	Filename:	c31oct03-11
Collection Date/Time:	10/09/03	Retchk:	c31oct03-2
Receipt Date:	10/10/03	Begin ConCal:	c31oct03-3
Extraction Date:	10/13/03	End ConCal:	c31oct03-12
Analysis Date/Time:	10/31/03 15:50	Initial Cal:	mCF-c100603

Analyzed by: _____
Date: 10/31/03

Reviewed by: _____
Date: 10/31/03

DATA VALIDATION WORKSHEET

Dioxins and Furans Analysis

Reviewer: AS
Date: March-03
DV Level: II III IV
Review Document:
__X__ SW-846 __X__ Project QAPP/SAP __X__ NFG EPA 540-R-02-003 (August 2002)

Project Name: Radford SSP
Project Number: 15291974.30000
Laboratory: Paradigm
SDG No.: G296-180
Method No.: 8290

1.0 General: Chain-of-Custody		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	

Notes:

2.0 Preservation/ Holding Times		Yes	No	NA
2.1	Were samples preserved properly? Stored at 4°C ± 2°C (<4°C to lab and <-10°C at lab for tissue) in the dark. For aqueous, 80mg/L of sodium thiosulfate is required if residual chlorine is present and if the pH is >9, this is adjusted to 7-9 with sulfuric acid. If not, J(+)/UJ(-)	X		
2.2	Have any technical holding times been exceeded? Extraction within 30 days of collection and analysis within 45 days of extraction (tissue must be extracted within 24 hours of defrost) (To comply with 40CFR Part 136.3, drinking water must be extracted within seven days of collection). If yes, J(+)/UJ(-).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, J(+)/R(-) .		X	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Was a preparation blank prepared with each batch?	X		
3.2	Do any blanks have positive results? Action: If yes, an action level of 5 times the blank value is used to qualify sample results "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? Use the same rule.	X		

Notes:

4.0 Instrument Calibration

		Yes	No	NA
4.1	Are five standards included in the calibration curve? If no, apply "J+/R-".	X		
4.2	Are RSD/%D ± 20% for standard compounds? If no, for RSD out apply "J+/UJ-" to associated specific analytes. For %D indicating a positive bias, flag "J+". For %D indicating a negative bias, flag "J+/UJ-".	X		
4.3	Are RSD/%D ± 30% for reference compounds? If no, apply "J" to all positive associated analytes.	X		
4.4	Is the signal to noise ratio acceptable for each selected ion current profile? (ICAL≥ 2.5:1 ; CCC ≥10:1) If no, apply "R" to estimated detection limits.	X		
4.5	Are Isotopic ratios within the following established control limits...? If no, apply "J+/R-".	X		
4.6	Was the CCV analyzed at the beginning and end of every 12 hours? If no, J(+)/UJ(-) all associated samples.	X		

# Cl ion atoms	Ion Type	Theoretical Ratio	Control Limits
4	M/M+2	0.77	0.65- 0.89
5	M+2/M+4	1.55	1.32- 1.78
6	M+2/M+2	1.24	1.05- 1.43
(13)C-HxCDF	M/M+2	0.51	0.43- 0.59
(13)C-HpCDF	M/M+2	0.44	0.37- 0.51
7	M+2/M+4	1.04	0.88- 1.2
8	M+2	0.89	0.76- 1.02

Notes:

5.0 GC/MS Instrument Performance Check

		Yes	No	NA
5.1	Are tuning forms present using perfluorokerosene (PFK) for each start of a 12 hour sequence? If no, apply "R".	X		
5.1a	Is the resolving power ≥ 10,000 with m/z 304.9824? If not, apply "R".	X		
5.1b	Is the deviation from exact m/z and theoretical m/z <0.005 amu or 5 ppm? If not, apply "R".	X		
5.2	Was a window defining mix analyzed defining descriptor switching times of scan ranges? If not, flag total homologue results "J+/UJ-".	X		
5.3	Was an isomer specificity check analyzed with peaks resolved with a valley ≥ 25%? (DB5 column: 2,3,7,8-TCDD and 1,2,3,8-TCDD ; DB225 column: 2,3,7,8-TCDF and 2,3,4,7-TCDF) If not, flag positive 2,3,7,8-TCDD and /or 2,3,7,8-TCDF, whichever failed, "J".	X		

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	X		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?	X		
6.4	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS recovery form present?	X		
7.2	Was an LCS analyzed for each batch?	X		
7.3	Are there any percent recoveries outside the QC limits of ±20% for targets and ±30% for reference compounds?	X		
	If Yes, for %R > UCL, "J+" only; for %R < LCL but greater than 10%, "J+/UJ-"; for %R < 10%, flag "J+/R-".			

Notes:

8.0 Nine Internal Standards and Two Clean-Up Recovery Standards		Yes	No	NA
8.1	Are internal standard recoveries for all samples within 40-135%? If no, apply J/UJ to associated targets.	X		
8.2	Are standard recoveries for all samples within 40-135% for all samples? If no, apply J/UJ.	X		

Notes: soil MB displayed all standards > 135%

9.0 Field Duplicate

		Yes	No	NA
9.1	Was a field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	X		
9.2	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.		X	

Notes:

10.0 Sample Results/Detection Limit Verification

		Yes	No	NA
10.1	Were all sample results within the calibrated range, if not apply J.	X		
10.2	Is the signal to noise ion ratios ≥ 2.5:1 for positive results? If not, flag "J".	X		
10.3	Is the ion abundance ratio within 10% of the ratio in the most current CCC for positive results? If no, this result should be reported as an EMPC.	X		
10.4	Are the two identification peak apexs within 2 seconds for positive identifications? If not, flag "R".	X		
10.5	Was a second column confirmation used for positive 2,3,7,8-TCDF? If no, apply "R" to the 2,3,7,8-TCDF results.	X		
10.6	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?	X		

Notes:

11.0 Data Completeness

		Yes	No	NA
11.1	Is the percent completeness within the control limits? (Control limit 90%)	X		
11.1.1	Number of samples: 3			
11.1.2	Number of target compounds in each analysis: 17			
11.1.3	Number of results rejected and not reported: 0			
	% Completeness = (11.1.1 x 11.1.2 - 11.1.3) x 100/(11.1.1 x 11.1.2)			
	% Completeness = 100%			

Notes:

Method 8290 - Blank Results

LMB

MB for 2 Soils

Analytical Data Summary Sheet

Analyte	Adj. MDL (ng/L)	Amount (ng/L)		Adj. RL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	0.246	0.246	U	0.500				
1,2,3,7,8-PeCDD	1.11	1.11	U	2.50				
1,2,3,4,7,8-HxCDD	0.493	0.493	U	2.50				
1,2,3,6,7,8-HxCDD	0.711	0.711	U	2.50				
1,2,3,7,8,9-HxCDD	0.661	0.661	U	2.50				
1,2,3,4,6,7,8-HpCDD	0.621	0.621	U	2.50				
OCDD	3.10	3.10	U	5.00				
2,3,7,8-TCDF	0.247	0.247	U	0.500				
1,2,3,7,8-PeCDF	1.10	1.10	U	2.50				
2,3,4,7,8-PeCDF	1.01	1.01	U	2.50				
1,2,3,4,7,8-HxCDF	0.573	0.573	U	2.50				
1,2,3,6,7,8-HxCDF	0.610	0.610	U	2.50				
2,3,4,6,7,8-HxCDF	0.536	0.536	U	2.50				
1,2,3,7,8,9-HxCDF	0.655	0.655	U	2.50				
1,2,3,4,6,7,8-HpCDF	0.481	0.481	U	2.50				
1,2,3,4,7,8,9-HpCDF	0.433	0.433	U	2.50				
OCDF	0.823	0.823	U	5.00				
Total TCDDs	0.246	0.246	U	2.50				
Total PeCDDs	1.11	1.11	U	2.50				
Total HxCDDs	0.493	0.493	U	2.50				
Total HpCDDs	0.621	0.621	U	2.50				
Total TCDFs	0.247	0.247	U	2.50				
Total PeCDFs	1.01	1.01	U	2.50				
Total HxCDFs	0.536	0.536	U	2.50				
Total HpCDFs	0.433	0.433	U	2.50				
ITEF TEQ (ND=0)		0			0			
ITEF TEQ (ND=½)		0.196			0.196			

Laboratory Information

Sample ID:	LMB10007-A
Extraction Date:	13-Oct-03
Analysis Date:	14-Oct-03

Sample Information

Matrix:	Water	
Weight / Volume:	10.0	mL
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG10007	
Filename:	a13oct03a_3-3	
Retchk:	a13oct03a_2-14	
Begin ConCal:	a13oct03a_2-14	
End ConCal:	a13oct03a_3-14	
Initial Cal:	m8290-100103b	

Method 8290 - Blank Results

LMB

Analytical Data Summary Sheet

Labeled Standard	Expected Amount (ng)	Measured Amount (ng)	Percent Recovery (%)	RT (min.)	Ratio	Qualifier
Extraction Standards						
$^{13}C_{12}$-2,3,7,8-TCDD	1.00	1.48	148	30:02	0.79	
$^{13}C_{12}$-1,2,3,7,8-PeCDD	1.00	1.64	164	33:28	1.58	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	1.00	1.43	143	36:02	1.23	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	1.00	1.57	157	39:08	1.05	
$^{13}C_{12}$-OCDD	2.00	2.71	136	43:06	0.84	
$^{13}C_{12}$-2,3,7,8-TCDF	1.00	1.47	147	29:06	0.82	
$^{13}C_{12}$-1,2,3,7,8-PeCDF	1.00	1.61	161	32:42	1.66	
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	1.00	1.46	146	35:22	0.52	
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	1.00	1.50	150	37:59	0.46	
Cleanup Standards						
$^{37}Cl_4$-2,3,7,8-TCDD	0.200	0.322	161	30:02		
$^{13}C_{12}$-2,3,4,7,8-PeCDF	0.200	0.340	170	33:17	1.64	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	0.200	0.301	151	35:57	1.21	
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	0.200	0.350	175	35:16	0.51	
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	0.200	0.280	140	39:44	0.47	
Injection Standards						
$^{13}C_{12}$-1,2,3,4-TCDD	2.00			29:18	0.79	
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	2.00			36:15	1.21	

Laboratory Information

Sample ID: LMB10007-A

Extraction Date: 13-Oct-03
Analysis Date: 14-Oct-03

Analyzed by: _____
Date: 10/31/03

Sample Information

Matrix:	Water	
Weight / Volume:	10.0	mL
Solids / Lipids:	NA	%
Original pH :	NA	
Batch ID:	WG10007	
Filename:	a13oct03a_3-3	
Retchk:	a13oct03a_2-14	
Begin ConCal:	a13oct03a_2-14	
End ConCal:	a13oct03a_3-14	
Initial Cal:	m8290-100103b	

Reviewed by: _____
Date: 10/31/03

Analytical Results
for
Ongoing Precision Result (OPRD)

Analyte	Spiked	AMT	Recovery		Range %		OPR		%D	
	pg/ul	pg/ul	%	#	Lower	Upper	Rec(%)	#		#
2,3,7,8-TCDD	10.0	11.4	114		80.0	120	113		0.670	
1,2,3,7,8-PeCDD	50.0	54.7	109		80.0	120	109		0.627	
1,2,3,4,7,8-HxCDD	50.0	54.2	108		80.0	120	118		8.21	
1,2,3,6,7,8-HxCDD	50.0	61.9	124	#	80.0	120	120		3.27	
1,2,3,7,8,9-HxCDD	50.0	64.9	130	#	80.0	120	129	#	0.309	
1,2,3,4,6,7,8-HpCDD	50.0	53.8	108		80.0	120	108		0.0966	
OCDD	100	106	106		80.0	120	104		1.55	
2,3,7,8-TCDF	10.0	11.2	112		80.0	120	106		4.94	
1,2,3,7,8-PeCDF	50.0	57.5	115		80.0	120	106		7.94	
2,3,4,7,8-PeCDF	50.0	53.6	107		80.0	120	98.2		8.66	
1,2,3,4,7,8-HxCDF	50.0	57.1	114		80.0	120	111		3.24	
1,2,3,6,7,8-HxCDF	50.0	60.2	120	#	80.0	120	112		7.18	
2,3,4,6,7,8-HxCDF	50.0	58.7	117		80.0	120	112		4.54	
1,2,3,7,8,9-HxCDF	50.0	55.7	111		80.0	120	110		1.55	
1,2,3,4,6,7,8-HpCDF	50.0	58.3	117		80.0	120	116		0.743	
1,2,3,4,7,8,9-HpCDF	50.0	53.6	107		80.0	120	108		0.499	
OCDF	100	110	110		80.0	120	108		1.61	

%D limit is 25%
= Outside URS limits
* = Ion Ratio Out

QC Information

OPR Project No:	OPRD10007
Extraction Date:	13-Oct-03
Analysis Date:	14-OCT-03
Method:	8290

Sample Information

Matrix:	Soil

File Information

OPRD Filename :	a13oct03a_3-2
Retchk:	a26oct03a_6-14
Begin ConCal:	a26oct03a_6-14
End ConCal:	a13oct03a_3-14
Initial Cal:	m8290-100103b

13SB9A

Method 8290

Results for MS/MSD

DP 558 0925

Analyte	Sample pg/g	Spike pg	MS pg/g	%REC (75-125)		MSD pg/g	%REC (75-125)		%RPD (20)	
2,3,7,8-TCDD	ND	200	29.1	117		27.4	117		0.0619	
1,2,3,7,8-PeCDD	0.656	1000	136	109		125	107		2.52	
1,2,3,4,7,8-HxCDD	0.735	1000	138	111		133	113		2.25	
1,2,3,6,7,8-HxCDD	2.24	1000	150	119		145	122		2.51	
1,2,3,7,8,9-HxCDD	2.33	1000	157	125		160	135	#	7.87	
1,2,3,4,6,7,8-HpCDD	50.0	1000	170	96.9		160	94.3		2.74	
OCDD	1520	2000	2090	2300	#	1870	1500	#	42.2	# OKAY due to 4x Rule
2,3,7,8-TCDF	0.842	200	27.4	107		25.8	107		0.256	
1,2,3,7,8-PeCDF	0.450	1000	135	109		129	110		1.40	
2,3,4,7,8-PeCDF	0.574	1000	141	113		136	116		2.33	
1,2,3,4,7,8-HxCDF	0.681	1000	149	120		138	118		1.75	
1,2,3,6,7,8-HxCDF	0.534	1000	144	116		138	118		1.69	
2,3,4,6,7,8-HxCDF	0.494	1000	152	122		147	126		2.60	
1,2,3,7,8,9-HxCDF	ND	1000	144	116		161	138	#	17.1	
1,2,3,4,6,7,8-HpCDF	5.11	1000	145	113		137	113		0.0688	
1,2,3,4,7,8,9-HpCDF	0.460	1000	128	103		129	110		6.74	
OCDF	11.2	2000	257	99.2		243	99.3		0.0932	

Client Information

		Solids:	79.9	%
Project ID:	Coleman Evans	Sample amount:	10.1	g
Sample ID:	DP 558 0925	MS amount:	10.1	g
		MSD amount:	10.7	g

Laboratory Information

Project ID:	G296-180
Sample ID:	G296-180-2A
MS ID:	G296-180-3A
MSD ID:	G296-180-4A

Reviewed By: _____

Extraction by Modified Method 3540C

(Soxhlet with Dean-Stark Adapter - SDS)

Soil 1 of 6

Analytical Method: 8290 1613 8280
1668 680 Other_____

QC Date	QC Batch*	Prev. WG	Workgroup*	Logbook#	Page#
~~30~~-Oct-03	100037	~~10005~~ N/A	WG	10	007

10.13.03

#20	Sample Identification								
	Client* ID	Project* ID	Sample* ID	Container* ID	Sample Matrix	Sample Weight*	ES Amt.* (µL)	MX Amt. (µL)	Analyst (initials)
	N/A	N/A	LMB-10007	N/A	Soil	10.00	40	0	BK
1 10	G515	561	1	A	Soil	5.32	40	0	
2 11	G349	85	1	B	Soil	1.01	40	0	
3 12	G349	85	2	B	Soil	1.02	40	0	
4 13	G296	180	2	A	Soil	10.07	40	0	
5 14	G296	180	3	A-MS	Soil	10.10	40	40	
6 15	G296	180	4	A-MSD	Soil	10.72	40	40	
7 16	G296	180	5	A	Soil	10.00	40	0	
8 17	G515	563	1	A	Soil	5.09	40	0	
9 18	G301	134	1	A	Soil	5.12	40	0	
10 19	G301	134	2	A	Soil	5.19	40	0	
11 20	G301	134	3	A	Soil	5.30	40	0	
	N/A	N/A	OPR-10007	N/A	Soil	10.00	40	40	
	N/A	N/A	OPR-10007D	N/A	Soil	10.00	40	40	

10.14.03

Items	Lot #	Conc. (ng/µL)	Witness
Toluene	04469		
Tridecane	SPL1-5		
Salt	43154324		
Thimbles	30466 10		
Extraction Std.	517-276	0.05	
Matrix Spike	517-277	0.005	

☐ Pre-Sox? ☑ Tridecane added?

Start Date/Time: 1500 10.13.03

Finish Date/Time: 800 10.14.03

Comments:

* = To be entered in the Prep Table.

DC7.083003.5

☑ Data in prep table?

247

Dry Weight Log

Soil 2 of 6

Sample #	tare*	total*	dry weight 1	dry weight 2*	dry weight 3*	Initials
6515561-1A	1.23 g	start time: 1400 date: ~~10-13-03~~ 10-13-03 12.08 g	time: 800 date: 10.14.03 10.07 g	time: 900 date: 10-14-03 10.07 g	time: date: g	PS
6296-180-2A	1.22 g	start time: 1400 date: 10.13.03 10.00 g	time: 800 date: 10.14.03 8.24 g	time: 900 date: 10-14-03 8.24 g	time: date: g	
6296-180-3A	1.23 g	start time: 1400 date: 10.13.03 935 10.58 g	time: 800 date: 10-14-03 8.71 g	time: 900 date: 10.14.03 80 8.70 g	time: date: g	
6296-180-4A	1.21 g	start time: 1400 ~~date: 10-13-03~~ time: ~~800~~ date: 10-1405 11.12 g	8.53 g	time: 900 date: 10.14.03 8.52 g 74	time: date: g	
6296180-5A	1.22 g	start time: 1400 date: 10-13-03 10.69 g	time: 800 date: 10-14-03 8.01 g	time: 900 date: 10.14.03 8.02 g	time: date: g	
6515-563-1A	1.23 g	start time: 1400 date: 10-13-03 16.14 g	time: 800 date: 10-14-03 8.02 g	time: 900 date: 10-14-03 8.02 g	time: date: g	
6291-134-1A	1.22 g	start time: 1400 date: 101303 10.72 g	time: 800 date: 10-14-03 9.41 g	time: 900 date: 10-14-03 9.42 g	time: date: g	

10.14.03

3 & 4 are missing same samples as 6296-180-2

*= Enter final weight in the Prep Table.

Page: 169

Extract cleanup by modified method 3630/3620

Silica/florisil

Soil 3of6

	Sample Identification											
	Client ID	Project ID	Sample ID	Container ID	Train	CS Amt.* (µL)	Witness (initials)	Analyzed (%)	Analyst (initials)	Date	Method	Matrix
	N/A	N/A	LMB10007	A	1	✓40	BWS	100	MM	14-Oct-03	8290	Soil
A	G515	561	1	A	2	✓40		100		14-Oct-03	8290	Soil
A	G301	134	1	A	3	✓40		100		14-Oct-03	8290	Soil
A	G301	134	2	A	4	✓40		100		14-Oct-03	8290	Soil
B	G301	134	3	A	5	✓40		100		14-Oct-03	8290	Soil
B	G515	563	1	A	6	✓40		100		14-Oct-03	8290	Soil
B	G349	85	1	B	7	✓40		100		14-Oct-03	8290	Soil
B	G349	85	2	B	8	✓40		100		14-Oct-03	8290	Soil
C	G296	180	2	A	9	✓40		100		14-Oct-03	8290	Soil
C	G296	180	3	A	10	✓40		100		14-Oct-03	8290	Soil
C	N/A	N/A	OPR10007	A	11	✓40		100		14-Oct-03	8290	Soil
C	N/A	N/A	OPRD10007	A	12	✓40		100		14-Oct-03	8290	Soil

Item	Lot #'s	Conc. (ng/µL)
Hexane	CI346	
Methylene Chloride	CI119	
Acid Silica	SPL1-7	
Base Silica	7/18/03	
Silica	SPL1-1B	
Florisil	SPO2578	
Salt	42364305	
Tridecane	N/A	
Cleanup Std.	S18-1	0.01

Comments:

252

DC1.090203.6

* = to be entered in the Prep table.

Log Book: 15 Page: 010

Extract cleanup by modified method 3630/3620

Silica/florisil

Soil 4 of 6

	Sample Identification											
	Client ID	Project ID	Sample ID	Container ID	Train	CS Amt.* (µL)	Witness (initials)	Analyzed (%)	Analyst (initials)	Date	Method	Matrix
A	G296	180	4	A	1	✓40	BWS	100	MM	14-Oct-03	8290	Soil
	G296	180	5	A	2	✓40	↓	100	↓	14-Oct-03	8290	Soil
					3							
					4							
B					5							
					6							
					7							
					8				MM 10.14.03			
C					9							
					10							
					11							
					12							

Item	Lot #'s
Hexane	CI346
Methylene Chloride	CI119
Acid Silica	SPL1-7
Base Silica	7/18/03
Silica	SPL1-1B
Florisil	SPO2578
Salt	42364305
Tridecane	N/A
Cleanup Std.	518-1

Conc. (ng/µL)
0.01

Comments:

253

DC1.090203.6

* = to be entered in the Prep table.

Log Book: 15 Page: 011

Cleanup Observation Form

Soil 5of6

Reference: PCU Log

Log:	Page:
15	010

	Train					
	7	8	9	10	11	12
Silica	☐ Clear/Colorless ☐ Brown 2 ☐ ____ ____ ☐ ____ ____ Travel 1	☐ Clear/Colorless ☐ Brown 1 ☐ ____ ____ ☐ ____ ____ Travel 1	☐ Clear/Colorless ☐ Brown 2 ☐ ____ ____ ☐ ____ ____ Travel 2	☐ Clear/Colorless ☐ Brown 2 ☐ ____ ____ ☐ ____ ____ Travel 2	☐ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☒ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____
Acid	☐ Clear/Colorless ☐ purple 1 ☐ ____ ____ ☐ ____ ____ Travel 2	☐ Clear/Colorless ☐ purple 1 ☐ ____ ____ ☐ ____ ____ Travel 1	☐ Clear/Colorless ☐ purple 2 ☐ ____ ____ ☐ ____ ____ Travel 2	☐ Clear/Colorless ☐ purple 2 ☐ ____ ____ ☐ ____ ____ Travel 2	☐ Clear/Colorless ☐ Orange 1 ☐ ____ ____ ☐ ____ ____ Travel 1	☐ Clear/Colorless ☐ Orange 1 ☐ ____ ____ ☐ ____ ____ Travel 1
Base	☒ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☒ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☒ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☒ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☒ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☒ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____
Florisil	☒ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☒ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☒ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☒ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☒ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☒ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____
Extract	☒ Clear/Colorless ☐ ____ ____	☒ Clear/Colorless ☐ ____ ____	☒ Clear/Colorless ☐ ____ ____	☒ Clear/Colorless ☐ ____ ____	☒ Clear/Colorless ☐ ____ ____	☒ Clear/Colorless ☐ ____ ____
Sx	G349-85-1B	G349-85-2B	G296-180-2A	G296-180-3A	OPR10007-A	OPRD10007-A
Comments						

Cleanup Observation Form

Soil 6of6

Reference: PCU Log

Log:	Page:
15	011

	Train 1	2	3	4	5	6
Silica	☐ Clear/Colorless ☐ Brown 2 ☐ Yellow 1 ☐ ____ ____ Travel 2	☐ Clear/Colorless ☐ Brown 1 ☐ ____ ____ ☐ ____ ____ Travel 1	☐ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☐ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☐ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☐ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____
Acid	☐ Clear/Colorless ☐ purple 3 ☐ ____ ____ ☐ ____ ____ Travel 2	☐ Clear/Colorless ☐ purple 2 ☐ ____ ____ ☐ ____ ____ Travel 1	☐ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☐ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☐ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☐ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____
Base	☐ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☐ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☐ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☐ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☐ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☐ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____
Florisil	☐ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☐ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☐ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☐ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☐ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____	☐ Clear/Colorless ☐ ____ ____ ☐ ____ ____ ☐ ____ ____ Travel ____
Extract	☐ Clear/Colorless ☐ ____ ____	☐ Clear/Colorless ☐ ____ ____	☐ Clear/Colorless ☐ ____ ____	☐ Clear/Colorless ☐ ____ ____	☐ Clear/Colorless ☐ ____ ____	☐ Clear/Colorless ☐ ____ ____
Sx	G296-180-4A	G296-180-5A	--	--	--	--
Comments						MRA 10-14-03

QCZ

DC29.072500.3

☐ Continued on next page.

Method 8290 - Blank Results

LMB

MB for EQB

Analytical Data Summary Sheet

Analyte	Adj. MDL (ng/L)	Amount (ng/L)		Adj. RL (ng/L)	EMPC (ng/L)	RT (min.)	Ratio	Qualifier
2,3,7,8-TCDD	0.00493	0.00493	U	0.0100				
1,2,3,7,8-PeCDD	0.0221	0.0221	U	0.0500				
1,2,3,4,7,8-HxCDD	0.00986	0.00986	U	0.0500				
1,2,3,6,7,8-HxCDD	0.0142	0.0142	U	0.0500				
1,2,3,7,8,9-HxCDD	0.0132	0.0132	U	0.0500				
1,2,3,4,6,7,8-HpCDD	0.0124	0.0124	U	0.0500				
OCDD	0.0619	0.0619	U	0.100				
2,3,7,8-TCDF	0.00493	0.00493	U	0.0100				
1,2,3,7,8-PeCDF	0.0221	0.0221	U	0.0500				
2,3,4,7,8-PeCDF	0.0201	0.0201	U	0.0500				
1,2,3,4,7,8-HxCDF	0.0115	0.0115	U	0.0500				
1,2,3,6,7,8-HxCDF	0.0122	0.0122	U	0.0500				
2,3,4,6,7,8-HxCDF	0.0107	0.0107	U	0.0500				
1,2,3,7,8,9-HxCDF	0.0131	0.0131	U	0.0500				
1,2,3,4,6,7,8-HpCDF	0.00962	0.00962	U	0.0500				
1,2,3,4,7,8,9-HpCDF	0.00866	0.00866	U	0.0500				
OCDF	0.0165	0.0165	U	0.100				
Total TCDDs	0.00493	0.00493	U	0.0500				
Total PeCDDs	0.0221	0.0221	U	0.0500				
Total HxCDDs	0.00986	0.00986	U	0.0500				
Total HpCDDs	0.0124	0.0124	U	0.0500				
Total TCDFs	0.00493	0.00493	U	0.0500				
Total PeCDFs	0.0201	0.0201	U	0.0500				
Total HxCDFs	0.0107	0.0107	U	0.0500				
Total HpCDFs	0.00866	0.00866	U	0.0500				
ITEF TEQ (ND=0)		0			0			
ITEF TEQ (ND=½)		0.00475			0.00475			

Laboratory Information

Sample ID:	LMB10010-A
Extraction Date:	15-Oct-03
Analysis Date:	17-Oct-03

Sample Information

Matrix:	Water	
Weight / Volume:	500	mL
Solids / Lipids:	NA	%
Original pH :	5	
Batch ID:	WG10010	
Filename:	a15oct03a_4-6	
Retchk:	a15oct03a_3-14	
Begin ConCal:	a15oct03a_3-14	
End ConCal:	a15oct03a_4-14	
Initial Cal:	m8290-100103b	

Analytical Results
for
Ongoing Precision Result (OPRD)

LCS for EQB

Analyte	Spiked pg/ul	AMT pg/ul	Recovery %	#	Range % Lower	Range % Upper	OPR Rec(%)	#	%D	#
			LCSD				LCS			
2,3,7,8-TCDD	5.00	5.29	106		80.0	120	124	#	15.4	
1,2,3,7,8-PeCDD	25.0	25.3	101		80.0	120	112		9.92	
1,2,3,4,7,8-HxCDD	25.0	23.7	95.0		80.0	120	110		14.3	
1,2,3,6,7,8-HxCDD	25.0	27.6	111		80.0	120	124	#	11.8	
1,2,3,7,8,9-HxCDD	25.0	28.7	115		80.0	120	130	#	12.5	
1,2,3,4,6,7,8-HpCD	25.0	24.6	98.5		80.0	120	109		10.4	
OCDD	50.0	47.1	94.2		80.0	120	106		11.9	
2,3,7,8-TCDF	5.00	5.00	100		80.0	120	115		13.9	
1,2,3,7,8-PeCDF	25.0	25.2	101		80.0	120	114		11.8	
2,3,4,7,8-PeCDF	25.0	24.4	97.7		80.0	120	107		8.62	
1,2,3,4,7,8-HxCDF	25.0	26.9	108		80.0	120	120		10.6	
1,2,3,6,7,8-HxCDF	25.0	27.1	109		80.0	120	123	#	12.5	
2,3,4,6,7,8-HxCDF	25.0	27.2	109		80.0	120	125	#	13.4	
1,2,3,7,8,9-HxCDF	25.0	25.1	100		80.0	120	116		14.2	
1,2,3,4,6,7,8-HpCDF	25.0	25.8	103		80.0	120	116		11.7	
1,2,3,4,7,8,9-HpCDF	25.0	23.1	92.6		80.0	120	107		14.1	
OCDF	50.0	51.3	103		80.0	120	115		11.1	

%D limit is 25%
= Outside URS limits
* = Ion Ratio Out

QC Information

OPR Project No:	OPRD10010
Extraction Date:	15-Oct-03
Analysis Date:	17-OCT-03
Method:	8290

Sample Information

Matrix:	Soil

File Information

OPRD Filename :	a15oct03a_4-5
Retchk:	a15oct03a_3-14
Begin ConCal:	a15oct03a_3-14
End ConCal:	a15oct03a_4-14
Initial Cal:	m8290-100103b

Extraction by Modified Method 3520C

EQB 1 of 5

(Continuous Liquid/Liquid - CLLE)

Analytical Method: (8290) 1613 8280 1613DW 1668 680 Other _____

QC Date	QC Batch*	Prev. WG	Workgroup*	Logbook#	Page#
15-Oct-03	10010	N/A	WG	10	010

	Sample Identification											
#/20	Client ID* ID	Project* ID	Sample*	Container*	Volume*	Sample*	pH*	ES Amt.*	MX Amt. (µL)	Tridecane (100 µL)	CS Amt. (µL)	Analyst (Initials)
	N/A	N/A	LMB10010	N/A	500	5.00	✓	↘ 20	0	✓	↘ 20	BLS
	G341	159	1	A	515 ✓	8	✓	↘ 20	0	✓	↘ 20	
	G341	159	2	A	507 ✓	8	✓	↘ 20	0	✓	↘ 20	
	G341	159	3	A	517 ✓	8	✓	↘ 20	0	✓	↘ 20	
	G341	159	4	A	505 ✓	8	✓	↘ 20	0	✓	↘ 20	
	G341	159	5	A	510 ✓	8	✓	↘ 20	0	✓	↘ 20	
	G341	159	6	A	505 ✓	8	✓	↘ 20	0	✓	↘Δ 20	
	G341	159	7	A	508 ✓	8	✓	↘ 20	0	✓	↘ 20	
	G341	159	8	A	507 ✓	8	✓	↘ 20	0	✓	↘ 20	
	G341	159	9	A	510 ✓	8	✓	↘ 20	0	✓	↘ 20	
	G341	159	10	A	518 ✓	8	✓	↘ 20	0	✓	↘ 20	
	G341	159	11	A	515 ✓	8	✓	↘ 20	0	✓	↘ 20	
	G341	159	12	A	508 ✓	8	✓	↘ 20	0	✓	↘ 20	
	G341	159	13	A	511 ✓	8	✓	↘ 20	0	✓	↘ 20	
	G341	159	14	A	512 ✓	8	✓	↘ 20	0	✓	↘ 20	
	G341	159	15	A	513 ✓	8	✓	↘ ★★ 20	0	✓	↘ 20	
	G341	159	16	A	512 ✓	8	✓	↘ 20	0	✓	↘ 20	
	G341	159	17	A	501 ✓	8	✓	↘ 20	0	✓	↘ 20	
	G341	159	18	A	510 ✓	8	✓	↘ 20	0	✓	↘ 20	
	G341	159	19	A-MS	509 ✓	8	✓	↘ 20	↘ 20	✓	↘ 20	
	G341	159	20	A-MSD	516 ✓	8	✓	↘ 20	↘ 20	✓	↘ 20	
▷	G296	180	1	A	500 ✓	6	✓	↘ 20	0	✓	↘ 20	
	N/A	N/A	OPR10010	N/A	500	5.00	✓	↘ 20	↘ 20	✓	↘ 20	
	N/A	N/A	OPRD10010	N/A	500	5.00	✓	↘ 20	↘ ★20	✓	↘ 20	↓

Items	Lot #	Conc. (ng/µL)	Witness
MeCl	CI 785		
Tridecane	SPLI-5		
Salt	43196331		
H_2SO_4	Y09046		
Extraction Std.	517-276	0.05	MPR
Matrix Spike	517-277	0.005	MPR
Clean-up Std.	518-1	0.01	MPR
DC61.081903.3	Δ 518-5	0.01 ng/µL	MPR

☐ Pre-Sox? ☑ Tridecane added?

Start Date/Time: 10-15-03 9:05

Finish Date/Time: 10-15-03 1335

Comments: ★ 8290 MX 0.05 ng/µL Lot # 518-7 ES (MPR 10-15-03)
★★ 8290 ES 0.005 ng/µL Lot # 518-8 MX

* = To be entered in the Prep Table.

☑ Data in prep table?

EQB 2of5

WG10010

Sample ID	EXT	WG	Tare	Total	Final	Ext Date	%2ms	Final Vol	Init Vol	pH	ES Add	CS Add	% Moisture	QC Batch
G296-180-1		G1001	0	0	0	2003-10-15	100	20	500	6	1	0.2	0	10010
G341-159-1		G1001	0	0	0	2003-10-15	100	20	518	8	1	0.2	0	10010
G341-159-1		G1001	0	0	0	2003-10-15	100	20	515	8	1	0.2	0	10010
G341-159-1		G1001	0	0	0	2003-10-15	100	20	508	8	1	0.2	0	10010
G341-159-1		G1001	0	0	0	2003-10-15	100	20	511	8	1	0.2	0	10010
G341-159-1		G1001	0	0	0	2003-10-15	100	20	512	8	1	0.2	0	10010
G341-159-1		G1001	0	0	0	2003-10-15	100	20	513	8	1	0.2	0	10010
G341-159-1		G1001	0	0	0	2003-10-15	100	20	512	8	1	0.2	0	10010
G341-159-1		G1001	0	0	0	2003-10-15	100	20	501	8	1	0.2	0	10010
G341-159-1		G1001	0	0	0	2003-10-15	100	20	510	8	1	0.2	0	10010
G341-159-1		G1001	0	0	0	2003-10-15	100	20	509	8	1	0.2	0	10010
G341-159-1		G1001	0	0	0	2003-10-15	100	20	515	8	1	0.2	0	10010
G341-159-2		G1001	0	0	0	2003-10-15	100	20	516	8	1	0.2	0	10010
G341-159-2		G1001	0	0	0	2003-10-15	100	20	507	8	1	0.2	0	10010
G341-159-3		G1001	0	0	0	2003-10-15	100	20	517	8	1	0.2	0	10010
G341-159-4		G1001	0	0	0	2003-10-15	100	20	505	8	1	0.2	0	10010
G341-159-5		G1001	0	0	0	2003-10-15	100	20	510	8	1	0.2	0	10010
G341-159-6		G1001	0	0	0	2003-10-15	100	20	505	8	1	0.2	0	10010
G341-159-7		G1001	0	0	0	2003-10-15	100	20	508	8	1	0.2	0	10010
G341-159-8		G1001	0	0	0	2003-10-15	100	20	507	8	1	0.2	0	10010
G341-159-9		G1001	0	0	0	2003-10-15	100	20	510	8	1	0.2	0	10010
LMB10010	LMB	G1001	0	0	0	2003-10-15	100	20	500	5	1	0.2	0	10010

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Paradigm Analytical Laboratories

EQB 3of5

Extract cleanup by modified method 3630/3620

Silica/florisil

	Sample Identification											
	Client ID	Project ID	Sample ID	Container ID	Train	CS Amt.* (µL)	Witness (initials)	Analyzed (%)	Analyst (initials)	Date	Method	Matrix
	N/A	N/A	LMB10010	A	1	0	N/A	100		15-Oct-03	8290	Water
A	G341	159	1	A	2	0	N/A	100		15-Oct-03	8290	Water
A	G341	159	2	A	3	0	N/A	100		15-Oct-03	8290	Water
A	G341	159	3	A	4	0	N/A	100		15-Oct-03	8290	Water
B	G341	159	4	A	5	0	N/A	100		15-Oct-03	8290	Water
B	G341	159	5	A	6	0	N/A	100		15-Oct-03	8290	Water
B	G341	159	6	A	7	0	N/A	100		15-Oct-03	8290	Water
B	G341	159	7	A	8	0	N/A	100		15-Oct-03	8290	Water
C	G341	159	8	A	9	0	N/A	100		15-Oct-03	8290	Water
C	G341	159	9	A	10	0	N/A	100		15-Oct-03	8290	Water
C	N/A	N/A	OPR10010	A	11	0	N/A	100		15-Oct-03	8290	Water
	N/A	N/A	OPRD10010	A	12	0	N/A	100		15-Oct-03	8290	Water

Item	Lot #'s	Conc. (ng/µL)
Hexane	CI346	
Methylene Chloride	CI119	
Acid Silica	SPL1-7	
Base Silica	7/18/03	
Silica	SPL1-1B	
Florisil	SPO2578	
Salt	42364305	
Tridecane	N/A	
Cleanup Std.	N/A	

Comments:

DC1.090203.6

* = to be entered in the Prep table.

Log Book: 15 Page: 014

EQB 4 of 5

Extract cleanup by modified method 3630/3620
Silica/florisil

	Sample Identification				Train	CS Amt.* (µL)	Witness (initials)	Analyzed (%)	Analyst (initials)	Date	Method	Matrix
	Client ID	Project ID	Sample ID	Container ID								
A	G341	159	10	A	1	0	N/A	100	MM	16-Oct-03	8290	Water
	G341	159	11	A	2	0	N/A	100		16-Oct-03	8290	Water
	G341	159	12	A	3	0	N/A	100		16-Oct-03	8290	Water
	G341	159	13	A	4	0	N/A	100		16-Oct-03	8290	Water
B	G341	159	14	A	5	0	N/A	100		16-Oct-03	8290	Water
	G341	159	15	A	6	0	N/A	100		16-Oct-03	8290	Water
	G341	159	16	A	7	0	N/A	100		16-Oct-03	8290	Water
	G341	159	17	A	8	0	N/A	100		16-Oct-03	8290	Water
C	G341	159	18	A	9	0	N/A	100		16-Oct-03	8290	Water
	G341	159	19	A	10	0	N/A	100		16-Oct-03	8290	Water
	G341	159	20	A	11	0	N/A	100	✓	16-Oct-03	8290	Water
	G296	180	1	A	12	0	N/A	100		16-Oct-03	8290	Water

Item	Lot #'s
Hexane	CI346
Methylene Chloride	CI119
Acid Silica	SPL1-7
Base Silica	7/18/03
Silica	SPL1-1B
Florisil	SPO2578
Salt	42364305
Tridecane	N/A
Cleanup Std.	N/A

Conc. (ng/µL)

Comments:

187

DC1.090203.6

* = to be entered in the Prep table.

Log Book: 15 Page: 015

Cleanup Observation Form

EQB 5of5
Reference: PCU Log

Log:	Page:
15	015

	Train					
	7	8	9	10	11	12
Silica	☒ Clear/Colorless ☐ _____ ___ ☐ _____ ___ ☐ _____ ___ Travel_____	☐ Clear/Colorless ☐ Brown 1 ☐ _____ ___ ☐ _____ ___ Travel 1	☒ Clear/Colorless ☐ _____ ___ ☐ _____ ___ ☐ _____ ___ Travel_____	☒ Clear/Colorless ☐ _____ ___ ☐ _____ ___ ☐ _____ ___ Travel_____	☐ _____ ___ ☐ _____ ___ ☐ _____ ___ Travel_____	☐ _____ ___ ☐ _____ ___ ☐ _____ ___ Travel_____
Acid	☒ Clear/Colorless ☐ _____ ___ ☐ _____ ___ ☐ _____ ___ Travel_____	☒ Clear/Colorless ☐ _____ ___ ☐ _____ ___ ☐ _____ ___ Travel_____	☒ Clear/Colorless ☐ _____ ___ ☐ _____ ___ ☐ _____ ___ Travel_____	☒ Clear/Colorless ☐ _____ ___ ☐ _____ ___ ☐ _____ ___ Travel_____	☒ Clear/Colorless ☐ _____ ___ ☐ _____ ___ ☐ _____ ___ Travel_____	☒ Clear/Colorless ☐ _____ ___ ☐ _____ ___ ☐ _____ ___ Travel_____
Base	☒ Clear/Colorless ☐ _____ ___ ☐ _____ ___ ☐ _____ ___ Travel_____	☒ Clear/Colorless ☐ _____ ___ ☐ _____ ___ ☐ _____ ___ Travel_____	☒ Clear/Colorless ☐ _____ ___ ☐ _____ ___ ☐ _____ ___ Travel_____	☒ Clear/Colorless ☐ _____ ___ ☐ _____ ___ ☐ _____ ___ Travel_____	☒ Clear/Colorless ☐ _____ ___ ☐ _____ ___ ☐ _____ ___ Travel_____	☒ Clear/Colorless ☐ _____ ___ ☐ _____ ___ ☐ _____ ___ Travel_____
Florisil	☒ Clear/Colorless ☐ _____ ___ ☐ _____ ___ ☐ _____ ___ Travel_____	☒ Clear/Colorless ☐ _____ ___ ☐ _____ ___ ☐ _____ ___ Travel_____	☒ Clear/Colorless ☐ _____ ___ ☐ _____ ___ ☐ _____ ___ Travel_____	☒ Clear/Colorless ☐ _____ ___ ☐ _____ ___ ☐ _____ ___ Travel_____	☒ Clear/Colorless ☐ _____ ___ ☐ _____ ___ ☐ _____ ___ Travel_____	☒ Clear/Colorless ☐ _____ ___ ☐ _____ ___ ☐ _____ ___ Travel_____
Extract	☒ Clear/Colorless ☐ _____ ___	☒ Clear/Colorless ☐ _____ ___	☒ Clear/Colorless ☐ _____ ___	☒ Clear/Colorless ☐ _____ ___	☒ Clear/Colorless ☐ _____ ___	☒ Clear/Colorless ☐ _____ ___
Sx	G341-159-16A	G341-159-17A	G341-159-18A	G341-159-19A	G341-159-20A	G296-180-1A
Comments						EB

Table 1. Concentration in ppt

PAL Project: G296-180

Analyte	LMB LMB10010-A_8290	EQB-4 G296-180-1A_8290	LMB LMB10007-A_8290	13SB9A G296-180-2A_8290	SBD9 G296-180-5A_8290
2,3,7,8-TCDD	(0.0100)	(0.0100)	(0.500)	(1.24)	(1.39)
1,2,3,7,8-PeCDD	(0.0500)	(0.0500)	(2.50)	[0.656]	(6.97)
1,2,3,4,7,8-HxCDD	(0.0500)	(0.0500)	(2.50)	0.735	[0.477]
1,2,3,6,7,8-HxCDD	(0.0500)	(0.0500)	(2.50)	2.24	1.04
1,2,3,7,8,9-HxCDD	(0.0500)	(0.0500)	(2.50)	2.33	[1.37]
1,2,3,4,6,7,8-HpCDD	(0.0500)	(0.0500)	(2.50)	50.0	40.6
OCDD	(0.100)	(0.100)	(5.00)	1520	2900
2,3,7,8-TCDF	(0.0100)	(0.0100)	(0.500)	0.842	0.220
1,2,3,7,8-PeCDF	(0.0500)	(0.0500)	(2.50)	0.450	(6.97)
2,3,4,7,8-PeCDF	(0.0500)	(0.0500)	(2.50)	0.574	(6.97)
1,2,3,4,7,8-HxCDF	(0.0500)	(0.0500)	(2.50)	0.681	[0.276]
1,2,3,6,7,8-HxCDF	(0.0500)	(0.0500)	(2.50)	0.534	0.243
2,3,4,6,7,8-HxCDF	(0.0500)	(0.0500)	(2.50)	0.494	(6.97)
1,2,3,7,8,9-HxCDF	(0.0500)	(0.0500)	(2.50)	(6.21)	(6.97)
1,2,3,4,6,7,8-HpCDF	(0.0500)	(0.0500)	(2.50)	5.11	2.14
1,2,3,4,7,8,9-HpCDF	(0.0500)	(0.0500)	(2.50)	[0.46]	(6.97)
OCDF	(0.100)	(0.100)	(5.00)	11.2	4.35
Total TCDDs	(0.0500)	(0.0500)	(2.50)	1.08	[0.399]
Total PeCDDs	(0.0500)	(0.0500)	(2.50)	3.82	2.57
Total HxCDDs	(0.0500)	(0.0500)	(2.50)	21.6	10.5
Total HpCDDs	(0.0500)	(0.0500)	(2.50)	96.8	93.9
Total TCDFs	(0.0500)	0.00768	(2.50)	7.11	1.07
Total PeCDFs	(0.0500)	(0.0500)	(2.50)	4.85	0.921
Total HxCDFs	(0.0500)	(0.0500)	(2.50)	8.31	2.18
Total HpCDFs	(0.0500)	(0.0500)	(2.50)	13.0	4.88
Total PCDD/Fs	0.0000	0.00768	0.0000	1690	3020
TEQ (ND=0)	0.0000	0.0000	0.0000	3.18	3.48
TEQ (ND=½)	0.00475	0.00461	0.196	3.43	3.89
TEQ w/EMPC (ND=0)	0.0000	0.0000	0.0000	3.51	3.69
TEQ w/EMPC (ND=½)	0.00475	0.00461	0.196	3.69	4.05

Note:
( ) = ND using DL value.
[ ] = EMPC value.

Table 2: Toxic Equivalency Factors

Analyte	World Health Organization	International-89	MADEP
2,3,7,8-TCDD	1	1	1
1,2,3,7,8-PeCDD	1	0.5	0.5
1,2,3,4,7,8-HxCDD	0.1	0.1	0.1
1,2,3,6,7,8-HxCDD	0.1	0.1	0.1
1,2,3,7,8,9-HxCDD	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDD	0.01	0.01	0.1
OCDD	0.0001	0.001	0.001
2,3,7,8-TCDF	0.1	0.1	0.1
1,2,3,7,8-PeCDF	0.05	0.05	0.5
2,3,4,7,8-PeCDF	0.5	0.5	0.5
1,2,3,4,7,8-HxCDF	0.1	0.1	0.1
1,2,3,6,7,8-HxCDF	0.1	0.1	0.1
2,3,4,6,7,8-HxCDF	0.1	0.1	0.1
1,2,3,7,8,9-HxCDF	0.1	0.1	0.1
1,2,3,4,6,7,8-HpCDF	0.01	0.01	0.1
1,2,3,4,7,8,9-HpCDF	0.01	0.01	0.1
OCDF	0.0001	0.001	0.001

G296-180

Radford Army Ammunition Plant
Chain Of Custody Record

№ 1142

Project Number	Project Name
09604 317	RFAAP

Project Contact (Name and Phone Number): Darren Rankin (804) 965 9000

Samplers: Brad Fehn / John Spagnolo

LAB: Paradigm

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	ANALYSES: TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
EQB-4	10/9/03 16:20	5 ✓		X	4	F	U	2							X								

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
[signature]	10/9/03 1800				
Relinquished by:	Date/time	Received by: (for lab) [signature]	Date/Time 10/10/03 1605		NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement

3.6°C

Radford Army Ammunition Plant
Chain Of Custody Record

G296-480

№ 1146

Project Number	Project Name
09604.317	RFAAP

Project Contact (Name and Phone Number): Darren Penne (804) 765 9000

Samplers: Brett Fisher / John Spayler

LAB: Paradigm

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
13589 A	10/9/03 1400	15		X	5	F	/	2							X								
5BD9	10/9/03	15		X	5	F	/	2							X								
13589A MS	10/9/03 1400	15		X	5	F	/	2							X								
13589A MSD	10/9/03 1400	15		X	5	P	/	2							X								

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Brett Fisher	10/9/03 1800				
Relinquished by:	Date/time	Received by: (for lab) Julie Johnson	Date/Time 10/10/03 1005 3.6°C	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

6

Paradigm Analytical Laboratories

Cust Proj ID: Radford Army Ammunition Plant
Client Name: URS Greiner Woodward Clyde

G296-180

Due Date: 2003-10-31 17:00:00
Login Date: 2003-10-10 11:40:16

Sample ID		Cust Sample ID	PRI	Date Collected	Date Received	Date Due	Matrix	LOC	DEPT	Report	Analysis	Status
G296-180-1	A	EQB-4	STD	2003-10-09 16:20:00	2003-10-10	2003-10-31 17:00:00	Water	W2	17	Full	8290	PR::NEED
	B							W2	17		8290	
G296-180-2	A	13SB9A	STD	2003-10-09 14:00:00	2003-10-10	2003-10-31 17:00:00	Soil	W2	17	Full	8290	PR::NEED
	B							W2	17		8290	
G296-180-3	A	13SB9A MS	STD	2003-10-09 14:00:00	2003-10-10	2003-10-31 17:00:00	Soil	W2	17	Full	8290	PR::NEED
	B							W2	17		8290	
G296-180-4	A	13SB9A MSD	STD	2003-10-09 14:00:00	2003-10-10	2003-10-31 17:00:00	Soil	W2	17	Full	8290	PR::NEED
	B							W2	17		8290	
G296-180-5	A	SBD9	STD	2003-10-09 00:00:00	2003-10-10	2003-10-31 17:00:00	Soil	W2	17	Full	8290	PR::NEED
	B							W2	17		8290	

Sample Receipt Checklist (SRC)

Paradigm Analytical Labs

Clie[illegible] **JRS Greiner Woodward Clyde** Lab Proj. ID: **G296-180**

Client Proj. ID: **Radford Army Ammunition Plant**

1. X Shipped
__ Hand De[illegible]ered
Notes: _____

2. __ Proper, f[illegible] and complete documentation
(unique sa[illegible]le identification on durable label with indelible ink, location [illegible] collection, date/time of collection, collector's name, pre[illegible]rvation type, sample type (method/matrix))
X Acceptab[illegible] documentation (but, incomplete)
__ Unacceptable documentation
Notes: _____

3. __ Custody Tape on Container
X No Custody Tape
Notes: _____

4. X Samples Intact*
(are in appropriate container, are not damaged, and do not show signs of contamination)
__ Samples Broken / Leaking
__ VOA Vials Checked for Air Bubbles
Notes: _____

5. X Chilled on Receipt* Actual Temp.(s) in °C: 3.6
__ Ambient on Receipt
__ Walk-in on Ice; Coming down to temp.
__ Received out of temperature protocol
Notes: _____

6. X Sufficient Sample Submitted
__ Insufficient Sample Submitted
Notes: _____

7. X Samples Preserved Correctly*
(see preservative checklist where applicable)
__ Improper Preservative(s)
__ None recommended (N/A)
Notes: _____

8. X Received Within Holding Time
__ Not Received Within Holding Time
__ N/A
Notes: _____

9. X No Discrepancies Noted
__ Discrepancies Noted
Notes: _____

Comments: _____

* = Rejection of sample is required when not marked; Contact client services immediately for a resolution.

Inspected and Logged in by: _____

DC27.091503.3 Date / Time: Fri-10/10/03 12:01

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.: H3J110144 **Fraction:** Perchlorate

Lab: STL-Knoxville **Project Name:** Radford SSP

Reviewer: Andrea_Sansom **Date:** February 19, 2004

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Inorganic Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: None.

Correctable Anomalies: None.

Comments: The chain of custody erroneously displayed the identification of the sample collected on 10/10/2003 at 1300 as 13SW1. The label on the sample container correctly displayed the identification of this sample as 13SW3. As directed by the client, the laboratory used the identification from the container label.

All data are usable for their intended purpose based on the data reviewed.

Signed: Andrea Sansom

Andrea Sansom

SAMPLE SUMMARY

H3J110144

WO #	SAMPLE#	CLIENT SAMPLE ID	SAMPLED DATE	SAMP TIME
F2C73	001	13SW3	10/10/03	13:00
F2C75	002	SWD1	10/10/03	13:00
F2C76	003	13SW2	10/10/03	14:00

NOTE(S):

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

URS

Client Sample ID: 13SW3

General Chemistry

Lot-Sample #...: H3J110144-001 **Work Order #...:** F2C73 **Matrix.....:** WG
Date Sampled...: 10/10/03 **Date Received..:** 10/11/03

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	ND	1.0	ug/L	KNOX 314.0 MOD	11/03-11/04/03	3309167

Dilution Factor: 1

URS

Client Sample ID: SWD1

General Chemistry

Lot-Sample #...: H3J110144-002 **Work Order #...:** F2C75 **Matrix.....:** WG
Date Sampled...: 10/10/03 **Date Received..:** 10/11/03

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	ND	1.0	ug/L	KNOX 314.0 MOD	11/03-11/04/03	3309167

Dilution Factor: 1

URS

Client Sample ID: 13SW2

General Chemistry

Lot-Sample #...: H3J110144-003 Work Order #...: F2C76 Matrix.....: WG
Date Sampled...: 10/10/03 Date Received..: 10/11/03

PARAMETER	RESULT	RL	UNITS	METHOD	PREPARATION-ANALYSIS DATE	PREP BATCH #
Perchlorate	ND	1.0	ug/L	KNOX 314.0 MOD	11/03-11/04/03	3309167

Dilution Factor: 1

DATA ASSESSMENT WORKSHEET

Reviewer: AS
Date: 2/18//2003
DV Level: **II** **III** **IV** (circle 1)
Review Document:

Perchlorate

EPA method - Modified for USEPA Region III Modifications to NFGs (Inorganic)

Project Name: Radford SSP
Project Number: 15291974.30000
Laboratory: STL-Knoxville
SDG No.: H3J110144
Test Name: Perchlorate
Method No.: E314.0

1.0 Laboratory Deliverables		**Yes**	**No**	**NA**
1.1a	Do Chain-of-Custody forms list all samples that were analyzed?	x		
1.1b	Do sample ID Numbers on COC match those in report?		x	
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		x	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. % solids	x		
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	x		
	Action: Resolve any discrepancies before proceding further.			

Notes:

2.0 Holding Times and Preservation		**Yes**	**No**	**NA**
2.1	Do sample collection, preservation, shipping, and storage condition meet the requirement of the relevant Project Controlling Documents (PCDs)?	x		
	Action: No chemical preservation required.			
2.2	Have technical holding times (28 days), determined from date of sampling to date of analysis (including dilution or reanalysis) been exceeded? If yes, apply J(+)/UJ(-) to all associated analytes.		x	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, apply J(+)/R(-) to all associated analytes.		x	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were required blanks (MB) prepared/submitted at the appropriate frequency? If not, note in DV report.	x		
3.2	Do any method blanks have positive results above the MDL? Action: If Yes, positive associated sample results less than 5X the concentration in the blank should be qualified "B" indicating the result is qualitatively suspect.		x	
3.3	After correcting for method blank contamination, do any field/equipment/trip blanks have positive results? If so, apply the same rules given above based on the highest blank value of those associated with the sample.			x

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are five standards included in the calibration curve? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	x		
4.2	Are all initial calibration correlation coefficients within the control limits (i.e., r > 0.99)? If No, apply "R" to all non-detects; "J" to positive results for all samples associated with the calibration.	x		
4.3	Was a instrument performance check (IPC) analyzed at the matrix conductivity threshold (MCT)? If no, verify that the sample chromatagrams do not display this interference.	x		
4.4	Is the $Pd_{A/H}$ < 25%, % recovery between 80-120%, and the retention time shift < 5%. If No, apply R to all results for sample that display this type of interference.	x		
4.5	Has a continuing calibration verification been analyzed prior and after every 10 samples and at the end of the analysis sequence? Control limit: $\leq \pm$ 15%. If No, apply "R" to all non-detects; "J*" to positive results for all samples associated with the calibration. Positive results are to be used only qualitatively.	x		

Notes:

5.0 Matrix Spikes		Yes	No	NA
5.1	Was a matrix spike analyzed at required frequency per the PCDs?	x		
5.2	Is the %R for the matrix spike and matrix spike duplicate outside the QC limits?		x	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

13SW2

6.0 Laboratory Control Samples (LCS/LCSDs)		Yes	No	NA
6.1	Were LCS analyzed at required frequency per the PCDs?	x		
6.2	Are there any LCS and/or LCSD recoveries outside the QC limits (i.e., 85-115%)?		x	
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
6.3	Are there any RPD for LCS/LCSD recoveries outside the QC limits (i.e., 15%)?		x	
	Action: If Yes, J(+) only.			

Notes:

7.0 Field Duplicates		Yes	No	NA
7.1	Was a field duplicate submitted/analyzed at an appropriate frequency of one per ten?	x		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
7.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	x		

Notes: SWD1 and 13SD3 are both non-detect

8.0 Laboratory Duplicates (matrix spike duplicate)		Yes	No	NA
8.1	Was a duplicate analyzed at the correct frequency?	x		
8.2	Are all analyte duplicate results within control limits? If No, J(+) only. Note in DV report any instance where one or another of the pair was positive while the other was negative.	x		

Notes:

9.0 Analyte Identification and Detection Limit Verification		Yes	No	NA
9.1	Do retention times in calibrations and samples fall within appropriately developed and applied windows? If not, look for uniform shifts. Failing that, flag all results "R" as qualitatively suspect.	x		
9.2	Verify quantitative results. Do manual calculations agree with reported values to within rounding error? If not, increase audit. If additional errors are found, require resubmission. Notify PM immediately.	x		
9.3	Do detection/reporting limits meet those required by the QAPP and were they properly adjusted for dilution factors and dry weight equivalent of wet weight aliquot)? If not, note affected sample Ids in DV report.	x		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit: 90%)	x		
10.1.1	Number of samples: 3			
10.1.2	Number of target compounds in each analysis: 1			
10.1.3	Number of results rejected and not reported: 0			
10.1.4	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

STL Knoxville
Perchlorate Analysis – Conductivity Readings
SOP KNOX-WC-0014, current revision

Date: ~~DFW~~ 11/3/08 **Analyst:** DFW **Conductivity Meter ID:** FISHER (MODEL 09-326-2)

QC Check	Conductance (uS/cm) at 25° C	Acceptance Criteria
Blank	0.43	< 1 uS/cm
Standard KCl Solution (ID: WC-820)	1410.	1380 - 1440 uS/cm
IPC - 4571	4170.	±10% of original conductance (4170.)

	Lot Number	Work Order Number	Conductance (uS/cm) at 25° C	
1	H3J220112	F244M	625.	(pH ~ 7)
2		F244Q	595.	(pH ~ 7)
3		F244T	575.	(pH ~ 7)
4		F244V	468.	(pH ~ 7)
5		F244W	482.	(pH ~ 7)
6		F244X	558.	(pH ~ 7)
7		F2440	711.	(pH ~ 7)
8		F2441	540.	(pH ~ 7)
9	H3J110144	F2C73	135.0	(pH ~ 7)
10		F2C75	135.1	(pH ~ 7)
11		F2C76	140.5	(pH ~ 7)
12	H3J300174	F3QP9	79.4	(pH ~ 6)
13		F3QQF	99.7	(pH ~ 6)
14		F3QQH	100.9	(pH ~ 6)
15	H3J310137	F3T7G	1.46	(pH ~ 6)
16		F3T7W	95.6	(pH ~ 6)
17		F3T7D	100.7	(pH ~ 6)
18				
19				
20				

STL KNOXVILLE
DX 320 IC Runlog

Analyst: DFW
Date: 11/4/03

(BLANK + LCS/LCSD
Sample Preparation Date: 11/3-4/03)

Schedule Number: K04P.SEQ
Method: EPA 314.0
(J31PCAL2.MTH)

Run No.	Lot Number	Sample ID	Matrix	Bench Dilution	Initial Wt / Vol Final Vol
1	IPC/MCT	IPC-4571	H2O	1.0	—
2	ICB/METHOD	BLANK	|	1.0	100mL/10mL
3	ICCS-4PPB	ICWS-4560	|	1.0	—
4	LFB/LCS	-4573	|	1.0	100mL/10.mL
5	" /LCSD	-4574	|	1.0	|
6	H3J110144	F2C73	|	1.0	|
7	|	F2C75	|	1.0	|
8	|	F2C76 (MS)	|	1.0	|
9	|	(MS)	|	1.0	|
10	|	(MSD)	|	1.0	|
11	CCV=50ppb	ICWS-4562	|	1.0	—
12	CCB	BLANK	|	1.0	—
13	H3J300174	F3QP9	|	1.0	100mL/10mL
14	|	F3QQF	|	1.0	|
15	|	F3QQH	|	1.0	|
16	H2J310137	F3T76	|	1.0	|
17	|	F3T7W	|	1.0	|
18	|	F3T70	|	1.0	|
19	|	(MS)	|	1.0	|
20	|	(MSD)	|	1.0	↓
21	CCV=100PPB	ICWS-4563	|	1.0	—
22	CCB	BLANK	↓	1.0	—
23					
24					
25					
26					
27					
28					
29					
30					
31					

Preventive Maintenance

Daily
- ✓ Check pump and gas pressure
- ✓ Check all lines for crimping, leaks and discoloration

As Needed
- ○ Change column and guard column
- ○ Change column and/or guard column bed support
- ○ Clean conductivity cell
- ○ De-gas pump head when flow is erratic

Other:
- Flow Rate = 1.00 mL/min
- Pressure = ~2415 PSI
- SRS = 300 mA
- Conductance = ~2.2 uS
- Eluent = Perc.-EI-653

MS/MSD Spike Information

Final Sample Volume = 100 ml. / Conc in 10mL

Compound	Spike ID/ppm	ml
Fluoride		
Chloride		
Nitrite-N		
Bromide		
Nitrate-N		
Phosphate-P		
Sulfate		
Perchlorate	ICWL-4558 / (10,000 ppb	0.10

Comments: IPC/MCT = IPC-4571 A/H=26.6 RT = 15.541
LFB/LCS = ICWS-4573 A/A=25.9

PROJECT NARRATIVE
H3J110144

The results reported herein are applicable to the samples submitted for analysis only.

This report shall not be reproduced except in full, without the written approval of the laboratory.

The original chain of custody documentation is included with this report.

Sample Receipt

The sample ID given on the label and the chain of custody did not match. The client was notified (A. Sansom, 10/14/03) and instructed the laboratory to use the ID on the label.

Quality Control

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

STL Knoxville maintains the following certifications, approvals and accreditations: Arkansas DEQ Cert. # 03-049-0, California DHS ELAP Cert. #2423, Colorado DPHE, Connecticut DPH Cert. #PH-0223, Florida DOH Cert. #E87177, Georgia DNR Cert. #906, Hawaii DOH, Illinois EPA Cert. # 000687, Indiana DOH Cert. #C-TN-02, Kansas DHE Cert. # E-10349, Kentucky DEP Lab ID #90101, Louisiana DEQ Cert. #03079, Louisiana DOHH Cert. #LA030024, Maryland DHMH Cert. #277, Massachusetts DEP Cert. #M-TN009, Michigan DEQ Lab ID #9933, New Jersey DEP Cert. #TN001, New York DOH Lab #10781, North Carolina DPH Lab ID #21705, North Carolina DEHNR Cert. #64, Oklahoma DEQ ID #9415, Pennsylvania DEP Cert. # 68-576, South Carolina DHEC Lab ID #84001001, Tennessee DOH Lab ID #02014, Utah DOH Cert. #QUAN3, Virginia DGS Lab ID #00165, Washington DOE Lab #C120, Wisconsin DNR Lab ID #998044300, US Army Corps of Engineers, Naval Facilities Engineering Service Center, US EPA Perchlorate Approval and USDA Soil Permit #S-46424. This list of approvals is subject to change and does not imply that laboratory certification is available for all parameters reported in this environmental sample data report.

#35101444

Radford Army Ammunition Plant
Chain Of Custody Record

Nº 1110

Project Number	Project Name
096043.17	RFAAP

Project Contact (Name and Phone Number): Tim Rea (804) 965 7000

Samplers: Brett Fisher / John Snyder

LAB: STL Knoxville

AIRBILL No:

Courier:

Field Sample ID	Date/Time (MM-DD-YY/HH:MM)	Turnaround Time (See Box #4)	Composite	Grab	Matrix Type (See Box #1)	Preservative (See Box #2)	Filtered or Unfiltered (See Box #3)	# of Containers	TCL Volatile Organic Compounds (8260B)	TCL Semivolatile Organic Compounds (8270C)	Polyaromatic Hydrocarbons (8310)	TCL Pesticides (8081A)	TCL Polychlorinated Biphenyl (8082)	Explosives (8330, 8332)	Dioxin/Furan(8290)	TAL Metals (Including Mercury)	Perchlorate (314.0)	TCLP (1311, FULL)	Ignitability (1010)	Corrosivity (9045C)	Reactivity	Paint Filter (9095B)	REMARKS (Include Other Required Test Methods, Sample Depth, Cautions, Observations)
135W1	10/10/03 1300	5		X	1	F	U	1									X						
SWD1	10/10/03	5		X	1	F	U	1									X						
135W2	10/10/03 1400	5		X	1	F	U	1									X						
135W2MS	10/10/03 1400	5		X	1	F	U	1									X						
135W2MSD	10/10/03 1400	5		X	1	F	U	1									X						
																							Rcvd temp. 3°C
																							Custody Seals intact
																							1 Cooler Fedex #
																							8329 4253 9647
																							MFH 10-11-03

Box #1
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil Sediment/Sludge
6. Trip Blank
7. Oil
8. Waste
9. Other _____

Box #2
A. HCl + Ice
B. HNO3 + Ice
C. NaOH + Ice
D. H2SO4 + Ice
E. Unpreserved
F. Ice Only
G. Other _____
H. NaHSO4 + Ice
I. ZnAc + NaOH + Ice

Box #3
F. Filtered
U. Unfiltered

Box #4
R. Rush - 3 Day
S. Standard 28 Day
T. Timely 14 Day
O. Other _____

Relinquished by:	Date/time	Received by:	Relinquished by:	Date/Time	Received by:
Brett Fisher	10/10/03 1800				
Relinquished by:	Date/time	Received by: (for lab) Matthew J. Howard	Date/Time 10-11-03, 09:15	NOTE: Analyses must be performed in accordance with the Quality Assurance Plan, the Work Order, and the executed Subcontract Agreement	

STL KNOXVILLE
SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

CLIENT: _____ PROJECT: _____ Lot No.: 143J110149

TO BE COMPLETED BY SAMPLE RECEIPT ASSOCIATE:

		YES	NO	NA
1.	Sample Receipt:			
a.	Do sample container labels match COC? (IDs, Dates, Times)	—	✓	—
b.	Is the cooler temperature within acceptance limits? (NOTE: North Carolina, 1668, 1613B: 0-4°C; VOST: 10°C)	✓	—	—
c.	Were samples received with correct chemical preservative (excluding Encore)?	✓	—	—
d.	Were custody seals present/intact on cooler and/or containers?	✓	—	
e.	Were all of the samples listed on the COC received?	✓	—	—
f.	Were all of the sample containers received intact?	✓	—	—
g.	Were containers received for VOAs received without headspace?	—	—	✓
h.	Were samples received in the appropriate containers?	✓	—	—
i.	Did you check for residual chlorine, if necessary?	—	—	✓
j.	Were samples received within 1/2 of the holding time?	✓	—	—
k.	Were samples screened for radioactivity?	—		✓
l.	For aqueous samples for SOG tests (i.e., 1613B, 1668A, 8290, LR PAHs), does the sample(s) have visible solids present?	—	—	✓
	If yes, was SOG staff notified?	—		✓
m.	Were client's sample documents (RFA/COC) received?	✓	—	—
n.	Has the RFA/COC been relinquished? (Signed, Dated, Timed)	✓	—	—
o.	Are test/parameters listed for each sample?	✓	—	—
p.	Is the matrix of the samples noted?	✓	—	—
q.	Is the date/time of sample collection noted?	✓	—	—
r.	Is the client and project name/No. identified?	✓	—	—
s.	Was the sampler identified on the RFA/COC?	✓	—	

SAMPLE RECEIVING ASSOCIATE: Matthew F. Howard DATE: 10-11-03

TO BE COMPLETED BY PROJECT MANAGER :

		YES	NO	NA
1.	Project manager "Sample Greet":			
a.	Quote number to be logged-in under 50903			
b.	Informed Login associates of special instructions ?	—	—	X

PROJECT MANAGER : jm DATE: 10/13/03

Client Sample ID	Analysis Requested	Condition (See Legend)	Comments/Action
135w1	314.0	19	Sample ID: 135w3 use label

☒ Client informed on 10/14/03 by email. Person contacted: A Sansom.
☑ Noted actions in comments section above.
☐ No action necessary; process as is.
Project Manager: jm Date: 10/14/03

STL KNOXVILLE
SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST
LEGEND

Lot No.: H3J160144

Item	Condition
Cooler:	1a Not received, COC available
	1b Leaking
	1c Other:_____
Temperature:	2a Temp Blank = _____
	2b Cooler Temp = _____
	(cooler temp should be used only if there is no temp blank)
Container:	3a Leaking
	3b Broken
	3c Extra
	3d No labels
	3e Headspace (VOA only)
	3f Other: _____
Samples:	4a Samples received but not on COC
	4b Samples not received but on COC
	4c Holding time expired
	4d Sample received with < ½ holding time remaining
	4e Sample preservative: _____
	4f Other: _____
Custody Seals:	5a None
	5b Not intact
	5c Other:_____
Chain of Custody (COC):	6a Not relinquished by client
	6b Incomplete information
	6c Other:_____
Container Labels:	(7a) Doesn't match COC
	7b Incomplete information
	7c Marking smeared
	7d Label torn
	7e Other:_____

Other (8): _____

_____

_____

_____

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	h	Holding time violation
h	Holding time violation	g	Dual column confirmation imprecision	k	Laboratory duplicate imprecision
i	Internal standard failure	h	Holding time violation	l	LCS recovery failure
j	Tuning failure or poor mass spectrometer performance	i	Internal standard failure	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

APPENDIX H.2.2
RCRA FACILITY INVESTIGATION SAMPLING
2008

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DATA VALIDATION REPORT - Level III Review

SDG No.: 36440-61 **Fraction:** SVOCs, Explosives, Nitroglycerin, PETN, Metals, & TOC

Lab: TriMatrix **Project Name:** Radford SWMU 13

Reviewer: Andrea Sansom **Date:** January 19, 2009

This report presents the findings of a review of the referenced data. The report consists of this summary, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the USEPA Region III Modifications to the National Functional Guidelines for Organic and Inorganic Data Review as pertains to the specifics of the analytical methods employed and provisions of the approved project-specific QAPP.

Major Anomalies: For the SVOC analyses, the laboratory control spike displayed a percent recovery less than the lower control limit of 25% for caprolactam at 15%. The associated equipment blank results were non-detect and were flagged R,l. The matrix spike pairs (MS/MSD) displayed the following percent recoveries outside the control limits:

Sample	Analyte	MS (%)	MSD (%)	Control Limits (%)	Relative Percent Difference	Control Limit (%)
13SB19C	Benzo(b)fluoranthene	**128**	**131**	45-115	2	30
	Butyl benzyl phthalate	**127**	**134**	50-125	5	
	Caprolactam	108	63	62-112	**52**	
	4,6-Dinitro-2-methylphenol	**0**	**0**	30-135	0	
	2,4-Dinitrophenol	**0**	**0**	15-130	0	
	Di-n-octyl phthalate	**133**	**146**	40-130	9	
	Bis(2-ethylhexyl)phthalate	**135**	**143**	45-125	6	
	Hexachlorocyclopentadiene	**0**	**0**	10-113	0	
	Hexachloroethane	**5**	**2**	35-110	**85**	
	4-Nitrophenol	**6**	**11**	15-140	**65**	
13SB17C	Benzo(a)pyrene	108	**112**	50-110	4	
	Benzo(b)fluoranthene	**127**	**126**	45-115	0.6	
	4-chloroaniline	**9**	18	10-95	**68**	
	Di-n-butylphthalate	**24**	90	55-110	**38**	
	3,3'-Dichlorobenzidine	25	34	10-130	**32**	
	Diethylphthalate	**132**	95	50-115	**32**	
	4,6-Dinitro-2-methylphenol	**1**	**0**	30-135	0	
	2,4-Dinitrophenol	**0**	**0**	15-130	0	
	Bis(2-ethylhexyl)phthalate	**130**	**128**	45-125	1	
	Hexachlorocyclopentadiene	**0**	**0**	10-113	0	
	Hexachloroethane	**8**	**6**	35-110	23	
	Indeno(1,2,3-cd)pyrene	**35**	**32**	40-120	9	
	3-Nitroaniline	**23**	34	25-110	**38**	
	4-Nitrophenol	**10**	**3**	15-140	**109**	
	Pentachlorophenol	52	32	25-120	**47**	
13SB19C	Di-n-butylphthalate	**125**	**140**	55-110	9	
	Bis(2-ethylhexyl)phthalate	**-94**	**-92**	45-125	2	
13SB17C	Di-n-butylphthalate	**124**	106	55-110	9	
	Bis(2-ethylhexyl)phthalate	**134**	**128**	45-125	4	

For the original extraction results, all soil field sample results for 4,6-dinitro-2-methylphenol, 2,4-dinitrophenol, hexachlorocyclopentadiene, hexachloroethane, and 4-nitrophenol were non-detect and were flagged R,m. For percent recoveries greater than the upper control limit, the positive parent sample results were flagged K,m, unless previously flagged for a blank detection; and, no data qualifying action was taken on non-detect parent samples. For percent recoveries less than the lower control limit, the positive parent sample results were flagged L,m while non-detect parent sample results were flagged UL,m. When the relative percent recovery was anomalous, the parent sample result was either non-detect or previously qualified, therefore no further data qualifying action was required. For the re-extraction results, all soil field sample results for di-n-butylphthalate and bis(2-ethylhexyl)phthalate were positive and were flagged K,m and J,m, respectively, unless previously flagged for a blank detection.

Minor Anomalies: For the SVOC analyses, the initial calibration 8L08004 displayed a relative standard deviation greater than the control limit of 15% for 2-nitrophenol at 16.95%. The associated field sample result was non-detect and data qualifying action was taken. The following continuing calibration displayed percent differences (%Ds) greater than the control limit of 20%:

Date	Time	Analyte	Percent Difference	Bias
11/26/08	0749	Benzaldehyde	20.1	-
		Caprolactam	22.3	
		2,4-Dinitrophenol	24.4	
12/01/08	1139	Atrazine	21.0	
		Caprolactam	24.5	
		2,4-Dinitrophenol	32.1	
		Hexachlorocyclopentadiene	28.9	
		4-Nitrophenol	20.4	
	1208	4-Nitroaniline	30.5	
12/09/08	0848	Caprolactam	22.7	
		Dibenzo(a,h)anthracene	24.3	+
		3,3'-Dichlorobenzidine	24.7	
		Bis(2-ethylhexyl)phthalate	20.8	-

For negative bias anomalies, the positive associated field sample results were flagged J,c while non-detects were flagged UJ,c, unless previously flagged for blank, laboratory control spike, or matrix spike anomalies. For the positive bias anomalies, associated positive field sample results were non-detect and no data qualifying action was required. The blanks displayed the following detections:

Blank Identifier	Extraction Batch #	Laboratory Sample #	Analyte	Result	Units	Lab Qualifier
EQBK-1	0813364	0811328-05	Anthracene	0.031	µg/L	J
			Benzo(a)anthracene	0.083		JB
			Benzo(a)pyrene	0.083		J
			Benzo(b)fluoranthene	0.062		J
			Benzo(g,h,i)perylene	0.031		J
			Benzo(k)fluoranthene	0.083		JB
			Butyl Benzyl Phthalate	0.042		J
			Carbazole	0.16		J
			Chrysene	0.094		JB
			Dibenz(a,h)anthracene	0.042		J

Blank Identifier	Extraction Batch #	Laboratory Sample #	Analyte	Result	Units	Lab Qualifier
EQBK-1	0813364	0811328-05	Diethyl Phthalate	0.073	µg/L	JB
			Fluoranthene	0.052		J
			Indeno(1,2,3-cd)pyrene	0.042		J
			Isophorone	0.11		JB
			Phenanthrene	0.042		J
			Pyrene	0.052		J
EQBK-5		0811328-13	Acetophenone	0.052		JB
			Benzo(a)anthracene	0.042		JB
			Benzo(a)pyrene	0.042		J
			Benzo(k)fluoranthene	0.042		JB
			Chrysene	0.021		JB
			Diethyl Phthalate	0.062		JB
			Isophorone	0.11		JB
			Naphthalene	0.062		J
EQBK-6		0811331-01	Acetophenone	0.065		JB
			Benzo(a)pyrene	0.033		J
			Diethyl Phthalate	0.065		JB
			Isophorone	0.12		JB
Method Blank		0813364-BL	1,1'-Biphenyl	0.020		JB
			Acetophenone	0.080		JB
			Benzo(a)anthracene	0.040		JB
			Benzo(k)fluoranthene	0.040		JB
			Chrysene	0.030		JB
			Diethyl Phthalate	0.040		JB
			Isophorone	0.090		JB
Method Blank	0813821	0813821-BL	Benzo(a)anthracene	1.7	µg/kg	JB
			Benzo(a)pyrene	2.0		JB
			Benzo(b)fluoranthene	1.7		JB
			Benzo(g,h,i)perylene	1.0		JB
			Benzo(k)fluoranthene	2.0		JB
			Bis(2-ethylhexyl)phthalate	340		B
			Butyl Benzyl Phthalate	14		JB
			Carbazole	3.7		JB
			Chrysene	1.7		JB
			Diethyl Phthalate	1.3		JB
			Di-n-butyl Phthalate	110		JB
			Fluoranthene	3.3		JB
			Isophorone	1.7		JB
			Pyrene	3.0		JB
Re-extraction Method Blank	0813821	0813821-BL	Acetophenone	3.0		JB
			Benzo(a)anthracene	1.7		JB
			Benzo(a)pyrene	1.3		JB
			Benzo(b)fluoranthene	1.3		JB
			Benzo(g,h,i)perylene	1.0		JB
			Bis(2-ethylhexyl)phthalate	6.3		JB
			Carbazole	0.67		JB
			Chrysene	1.3		JB
			Diethyl Phthalate	2.7		JB

Blank Identifier	Extraction Batch #	Laboratory Sample #	Analyte	Result	Units	Lab Qualifier
Re-extraction Method Blank	0813821	0813821-BL	Di-n-butyl Phthalate	9.0	µg/kg	JB
			Isophorone	2.7		JB
			N-Nitroso-diphenylamine	2.7		JB
			Pyrene	1.3		JB

Positive associated field sample results less than five times the method blank concentrations (or ten times for phthalates), were flagged B,z. Positive associated field sample results less than five times the equipment blank concentrations (or ten times for phthalates), were flagged B,x; qualified equipment blank detections were not used to assess field contamination. The laboratory control spike for batch 0813821 displayed percent recoveries greater than the upper control limits for di-n-butylphthalate at 163% and bis(2-ethylhexyl)phthalate at 136%. Positive associated field sample results were flagged J,l, unless previously flagged for blank detections. Positive field sample results that exceeded the initial calibration range were flagged J,q. These samples were re-analyzed at appropriate dilutions with acceptable results for data use. The field duplicate pair (13SB15A / DUP-13) displayed differences greater than two times the reporting limit for 2,4-dinitrotoluene, diethylphthalate, di-n-butylphthalate, and n-nitroso-diphenylamine. These field duplicate results were flagged J,f, unless previously flagged.

The re-extraction for bis(2-ethylhexyl)phthalate and di-n-butylphthalate occurred after the 14 day holding had expired on the 17th, 18th or 19th day after sample collection. Sample 13SB20A and 13SB17A displayed internal standard area counts less than the lower control limit of 50% only during the analyses from this re-extraction. The initial analysis on 12/08/09 of the re-extraction of field sample 13SB20A displayed one base/neutral surrogate percent recovery greater than the upper control limit of 105% for 2-fluorobiphenyl at 106%. The associated field sample results were positive and previously flagged for blank detections or matrix spike anomalies and no further data qualifying action was taken.

For the explosive analyses, the matrix spike performed on field sample 13SB19C displayed a percent recovery greater than the upper control limit of 120% for 2,6-dinitrotoluene at 125%. The matrix spike duplicate performed on field sample 13SB17C displayed a percent recovery greater than the upper control limit of 125% for 2,4-dinitrotoluene at 168%. This matrix spike pair also displayed a relative percent difference greater than the control limit of 30% for 2,4-dinitrotoluene at 38%. Since the associated parent sample results were non-detect, no data qualifying action was taken. The dual column precision exceeded the control limit of 40% in sample 13SB13A for 2,4,6-trinitrotoluene at 44.7%, sample 13SB15A for 2,6-dinitrotoluene at 55.2%, and sample 13SB13C for nitroglycerin at 83.8%. These results were flagged J,g. The higher of the two reported results should be used for data interpretation.

For the metals analyses, the blanks displayed the following detections:

Date	Sample	Method	Element	Result	Units
11/24/2008	8112407-CCB2	6010B	Aluminum	-0.039	mg/L
	0813643-BL		Zinc	0.53	mg/kg
	8112407-CCB3		Iron	0.019	mg/L
	0813708-BL		Zinc	2.1	mg/kg
	8112407-CCB4		Aluminum	-0.028	mg/L
			Iron	0.012	

Date	Sample	Method	Element	Result	Units
11/24/2008	812407-CCB5	6010B	Aluminum	-0.034	mg/L
			Iron	0.010	
	0813708-BL		Calcium	59	mg/kg
			Iron	2.3	
	8112407-CCB6		Aluminum	-0.036	mg/L
			Iron	0.011	
			Magnesium	-0.029	
	8112407-CCB8		Aluminum	-0.025	
11/25/2008	8112508-CCB2		Calcium	-83	µg/L
	EQBK-1		Calcium	220	
	EQBK-1		Potassium	98	
	EQBK-6		Calcium	96	
	EQBK-6		Iron	13	
	8112508-CCB3		Calcium	-87	
			Potassium	62	
12/1/2008	8120139-CCB2	6020A	Arsenic	0.052	µg/L
	EQBK-1		Barium	0.27	
			Copper	1.3	
			Lead	0.62	
			Manganese	0.83	
			Nickel	0.4	
			Zinc	18	
	EQBK-5		Manganese	0.4	
			Zinc	12	
	EQBK-6		Chromium	0.37	
			Copper	0.46	
			Manganese	0.95	
			Zinc	16	
	8120103-CCB3		Chromium	-0.090	

All associated soil field sample results were positive and greater than five times the absolute value of the instrument blank or method blank detections; therefore, no data qualifying action was required. Associated positive equipment blank results for calcium or chromium were flagged L,o and non-detects were flagged UL,o. The positive equipment blank EQBK-1 detection for potassium was flagged B,o. This detection was used to assess field contamination. The associated positive soil field sample results for barium, calcium, chromium, copper, iron, lead, manganese, nickel, and zinc were greater than five times the equipment blank detections and no data qualifying action was required. All soil field samples displayed concentrations of the interfering elements at approximate concentrations found in the interelement interference check samples (ICS). The ICS associated with the soil data displayed positive detections greater than 2 times the method detection limit for the unspiked elements aluminum, copper, nickel, and zinc. The associated field sample results for aluminum, copper, nickel, and zinc were greater than five times the ICS detections and no data qualifying action was taken. The ICS associated with the equipment blank data displayed negative detections with absolute values greater than 2 times method detection limit for unspiked elements selenium and magnesium and positive detections for barium, cadmium, chromium, copper, manganese, nickel, and potassium. Since the equipment blanks did not contain interfering elements approximate to the concentrations found ion the ICS, no data qualifying action was

required. The matrix spike pairs displayed the following percent recoveries outside the established control limits:

Sample	Digestion Batch	Analyte	MS (%)	MSD (%)	Control Limits (%)	4xRule
13SB17C	0813708 0813780	Aluminum	**2010**	**2510**	80-120	X
		Arsenic	81	**79**		-
		Barium	117	**141**		-
		Beryllium	**75**	**77**		-
		Iron	**-83**	**6110**		X
		Lead	**121**	91		X
		Manganese	97	**304**		X
		Selenium	**73**	**70**		-
		Zinc	117	**140**		X
13SB19C	0813643 0813642	Aluminum	**1870**	**1560**		X
		Calcium	**123**	**128**		-
		Iron	**2860**	**-1640**		X
		Lead	114	**67**		-
		Manganese	81	**-64**		X
		Zinc	**77**	**-21**		X

The associated field sample results in digestion batch 0813708 were positive for barium and were flagged K,m. The associated field sample results in digestion batch 0813708 were non-detect for beryllium and were flagged UL,m. The associated field sample results in digestion batch 0813643 were positive for calcium and were flagged K,m. The associated field sample results in digestion batch 0813780 were positive for arsenic and selenium and were flagged L,m. The serial dilution performed on sample 13SB17C displayed a percent difference greater than the control limit of 10% for aluminum at 11.0% in digestion batch 081378 and nickel in digestion batch 0813780. The associated field sample results were positive and were flagged J,s.

Correctable Anomalies: None.

Comments: One cooler was received at the laboratory with a temperature greater than the upper control limit of 6°C for cooler #2173 at 7.0°C. Since the temperature was less than 20°C, no data qualifying action was taken.

No anomalies were encountered if a given fraction was not mentioned. Except for data flagged R, all data are usable, as qualified, for their intended purpose based on the data reviewed.

Signed: Andrea Sansom

Andrea Sansom

Radford SWMU13 WPA023
36440-61

Laboratory Sample Identification	Field Sample Identification	Date Sampled	Parameters Requested
0811328-01	13SB13A	11/12/2008	SVOC, Explosives, Metals, & TOC
0811328-03	13SB21C	11/12/2008	SVOC, Explosives, & Metals
0811328-02	13SB13C	11/12/2008	SVOC, Explosives, & Metals
0811328-04	13SB14A	11/12/2008	SVOC, Explosives, & Metals
0811328-06	13SB20A	11/12/2008	SVOC, Explosives, & Metals
0811328-05	EQBK-1	11/12/2008	SVOC, Explosives, & Metals
0811328-07	13SB20C	11/12/2008	SVOC, Explosives, Metals, & TOC
0811328-08	13SB22A	11/12/2008	SVOC, Explosives, & Metals
0811328-09	13SB22C	11/12/2008	SVOC, Explosives, & Metals
0811328-10	13SB21A	11/12/2008	SVOC, Explosives, & Metals
0811328-11	13SB18A	11/13/2008	SVOC, Explosives, Metals, & TOC
0811328-12	13SB18C	11/13/2008	SVOC, Explosives, & Metals
0811328-13	EQBK-5	11/13/2008	SVOC, Explosives, & Metals
0811328-14	13SB19A	11/13/2008	SVOC, Explosives, & Metals
0811328-15	13SB19C	11/13/2008	SVOC, Explosives, & Metals
0811331-01	EQBK-6	11/14/2008	SVOC, Explosives, & Metals
0811331-02	13SB17A	11/14/2008	SVOC, Explosives, & Metals
0811331-03	13SB17C	11/14/2008	SVOC, Explosives, & Metals
0811331-04	13SB16A	11/14/2008	SVOC, Explosives, & Metals
0811331-05	13SB16C	11/14/2008	SVOC, Explosives, Metals, & TOC
0811331-06	13SB15A	11/14/2008	SVOC, Explosives, Metals, & TOC
0811331-07	DUP-13	11/14/2008	SVOC, Explosives, Metals, & TOC

Radford SWMU13 WPA023

Duplicate Statistics

13SB15A/DUP-13

	Units	RL	5xRL	Sample Conc		Duplicate Conc		%RPD	Delta	2xRL	Pass/ Fail
GC/MS Semi-volatiles 8270C											
2,4-Dinitrotoluene	ug/kg	190	950	26	J	6900		198%	**6874**	760	**Fail**
2,6-Dinitrotoluene	ug/kg	190	950	27	JB	570	B	182%	**543**	760	Pass
2-Methylnaphthalene	ug/kg	190	950	1.1	J	1.1	J	0.0%	**0**	760	Pass
Benzo(a)anthracene	ug/kg	19	95	9.3	JB	9.7	JB	4.2%	**0.4**	76	Pass
Benzo(a)pyrene	ug/kg	19	95	10	JB	7.8	JB	24.7%	**2.2**	76	Pass
Benzo(b)fluoranthene	ug/kg	19	95	18	JB	18	JB	0.0%	**0**	76	Pass
Benzo(g,h,i)perylene	ug/kg	74	370	8.5	JB	4.8	JB	55.6%	**3.7**	296	Pass
Benzo(k)fluoranthene	ug/kg	19	95	6.7	JB	5.9	JB	12.7%	**0.8**	76	Pass
Bis(2-ethylhexyl) Phthalate	ug/kg	190	950	270	B	300	B	10.5%	**30**	760	Pass
Butyl Benzyl Phthalate	ug/kg	190	950	4.1	JB	36	JB	159%	**31.9**	760	Pass
Carbazole	ug/kg	190	950	5.2	JB	190	U	189%	**184.8**	760	Pass
Chrysene	ug/kg	19	95	9.6	JB	7.1	JB	29.9%	**2.5**	76	Pass
Diethyl Phthalate	ug/kg	190	950	450	B	2600	BE	141%	**2150**	760	**Fail**
Dimethyl Phthalate	ug/kg	190	950	7.4	J	20	J	92.0%	**12.6**	760	Pass
Di-n-butyl Phthalate	ug/kg	190	950	410	B	6600	BE	177%	**6190**	760	**Fail**
Fluoranthene	ug/kg	19	95	13	JB	14	JB	7.4%	**1**	76	Pass
Indeno(1,2,3-cd)pyrene	ug/kg	74	370	3.3	J	2.6	J	23.7%	**0.7**	296	Pass
Isophorone	ug/kg	190	950	4.4	JB	4.5	JB	2.2%	**0.1**	760	Pass
N-Nitroso-diphenylamine	ug/kg	190	950	120	JB	1000	BE	157%	**880**	760	**Fail**
Phenanthrene	ug/kg	19	95	6.3	J	5.6	J	11.8%	**0.7**	76	Pass
Pyrene	ug/kg	19	95	13	JB	14	JB	7.4%	**1**	76	Pass
SW846 Explosives 8330/8332											
1,3,5-Trinitrobenzene	ug/kg	2.5	12.5	0.36	J	2.5	U	150%	**2.14**	10	Pass
2,4,6-Trinitrotoluene	ug/kg	2.5	12.5	0.45	J	2.5	U	139%	**2.05**	10	Pass
2,6-Dinitrotoluene	ug/kg	2.5	12.5	0.68	J	2.5	U	114%	**1.82**	10	Pass
Octahydro-1,3,5,7-tetranitro-1,3,5	ug/kg	2.5	12.5	0.25	J	2.5	U	164%	**2.25**	10	Pass
Nitroglycerin	ug/kg	5	25	0.54	J	5	U	161%	**4.46**	20	Pass
SW846 Metals 6020A/6010B/7471A											
Aluminum	mg/kg	10	50	11000		9700		**12.6%**	1300	40	Pass
Barium	mg/kg	1	5	110		99		**10.5%**	11	4	Pass
Calcium	mg/kg	50	250	6300		5500		**13.6%**	800	200	Pass
Chromium	mg/kg	5	25	18		18		0.0%	**0**	20	Pass
Cobalt	mg/kg	2	10	7.6		7.2		5.4%	**0.4**	8	Pass
Iron	mg/kg	10	50	18000	B	17000	B	**5.7%**	1000	40	Pass
Magnesium	mg/kg	50	250	4000		3800		**5.1%**	200	200	Pass
Manganese	mg/kg	1	5	470		440		**6.6%**	30	4	Pass
Potassium	mg/kg	50	250	1500		1500		**0.0%**	0	200	Pass
Sodium	mg/kg	100	500	46	J	42	J	9.1%	**4**	400	Pass
Zinc	mg/kg	5	25	280	B	290	B	**3.5%**	10	20	Pass
Antimony	mg/kg	0.2	1	0.27		0.35		25.8%	**0.08**	0.8	Pass
Arsenic	mg/kg	0.2	1	1.3		1.3		**0.0%**	0	0.8	Pass
Copper	mg/kg	0.2	1	19		24		**23.3%**	5	0.8	Pass
Lead	mg/kg	1	5	180		220		**20.0%**	40	4	Pass
Nickel	mg/kg	0.1	0.5	10		11		**9.5%**	1	0.4	Pass
Selenium	mg/kg	0.3	1.5	0.18	J	0.15	J	18.2%	**0.03**	1.2	Pass
Silver	mg/kg	0.1	0.5	0.043	J	0.037	J	15.0%	**0.006**	0.4	Pass
Thallium	mg/kg	0.1	0.5	0.17		0.17		0.0%	**0**	0.4	Pass
Vanadium	mg/kg	0.1	0.5	22		21		**4.7%**	1	0.4	Pass
Mercury	mg/kg	0.05	0.25	0.038	J	0.041	J	7.6%	**0.003**	0.2	Pass
General Chemistry											
Carbon, Total Organic	%	0.2	1	1		1.2		18%	0.2	0.8	Pass
Solids, Percent	%			90		90		**0.0%**	0	0	Pass

Control limit [sample]>5xRL use 60% for organics and 35% for metals
[sample]<5xRL use Delta<2xRL

URS

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

EQBK-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Water Laboratory ID: 0811328-05 File ID: 81132805.D

Sampled: 11/12/08 17:00 Prepared: 11/18/08 08:38 Analyzed: 11/26/08 09:39

Solids: Preparation: 3510C Liquid-Liquid Extr Initial/Final: 960 mL / 1 mL

QC Batch: 0813364 Sequence: 8120138 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q	
83-32-9	Acenaphthene	1	0.50	0.50	0.013	U	
208-96-8	Acenaphthylene	1	0.50	0.50	0.012	U	
98-86-2	Acetophenone	1	5.0	5.0	0.043	U	
120-12-7	Anthracene	1	0.031	0.50	0.014	J	
1912-24-9	Atrazine	1	5.0	5.0	0.026	U	
100-52-7	Benzaldehyde	1	5.0	5.0	0.051	U	UJc
56-55-3	Benzo(a)anthracene	1	0.083	0.50	0.037	J	B,2
50-32-8	Benzo(a)pyrene	1	0.083	0.50	0.023	J	
205-99-2	Benzo(b)fluoranthene	1	0.062	0.50	0.040	J	
207-08-9	Benzo(k)fluoranthene	1	0.083	0.50	0.036	J	B,2
191-24-2	Benzo(g,h,i)perylene	1	0.031	0.50	0.022	J	
92-52-4	1,1'-Biphenyl	1	5.0	5.0	0.015	U	
101-55-3	4-Bromophenyl Phenyl Ether	1	5.0	5.0	0.026	U	
85-68-7	Butyl Benzyl Phthalate	1	0.042	5.0	0.029	J	
105-60-2	Caprolactam	1	5.0	5.0	0.14	U	R,1
86-74-8	Carbazole	1	0.16	5.0	0.018	J	
59-50-7	4-Chloro-3-methylphenol	1	5.0	5.0	0.021	U	
106-47-8	4-Chloroaniline	1	5.0	5.0	0.021	U	
111-91-1	Bis(2-chloroethoxy)methane	1	5.0	5.0	0.016	U	
111-44-4	Bis(2-chloroethyl) Ether	1	5.0	5.0	0.016	U	
108-60-1	Bis(2-chloroisopropyl) Ether	1	5.0	5.0	0.047	U	
91-58-7	2-Chloronaphthalene	1	5.0	5.0	0.012	U	
95-57-8	2-Chlorophenol	1	5.0	5.0	0.016	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	1	5.0	5.0	0.016	U	
218-01-9	Chrysene	1	0.094	0.50	0.020	J	B,2
53-70-3	Dibenz(a,h)anthracene	1	0.042	0.50	0.026	J	
132-64-9	Dibenzofuran	1	5.0	5.0	0.016	U	
84-74-2	Di-n-butyl Phthalate	1	5.0	5.0	0.38	U	
91-94-1	3,3'-Dichlorobenzidine	1	5.0	5.0	0.21	U	
120-83-2	2,4-Dichlorophenol	1	5.0	5.0	0.015	U	
84-66-2	Diethyl Phthalate	1	0.073	5.0	0.034	J	B,2
105-67-9	2,4-Dimethylphenol	1	5.0	5.0	0.33	U	
131-11-3	Dimethyl Phthalate	1	5.0	5.0	0.016	U	
534-52-1	4,6-Dinitro-2-methylphenol	1	5.0	5.0	0.12	U	
51-28-5	2,4-Dinitrophenol	1	5.0	5.0	1.5	U	UJc
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.21	U	
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.050	U	
117-84-0	Di-n-octyl Phthalate	1	5.0	5.0	0.34	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	5.0	5.0	0.41	U	
206-44-0	Fluoranthene	1	0.052	0.50	0.016	J	
86-73-7	Fluorene	1	0.50	0.50	0.011	U	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

EQBK-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Water Laboratory ID: 0811328-05 File ID: 81132805.D

Sampled: 11/12/08 17:00 Prepared: 11/18/08 08:38 Analyzed: 11/26/08 09:39

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 960 mL / 1 mL

QC Batch: 0813364 Sequence: 8120138 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
118-74-1	Hexachlorobenzene	1	5.0	5.0	0.019	U
87-68-3	Hexachlorobutadiene	1	5.0	5.0	0.018	U
77-47-4	Hexachlorocyclopentadiene	1	5.0	5.0	0.13	U
67-72-1	Hexachloroethane	1	5.0	5.0	0.038	U
193-39-5	Indeno(1,2,3-cd)pyrene	1	0.042	0.50	0.014	J
78-59-1	Isophorone	1	0.11	5.0	0.031	J
91-57-6	2-Methylnaphthalene	1	5.0	5.0	0.015	U
95-48-7	2-Methylphenol	1	5.0	5.0	0.14	U
106-44-5	4-Methylphenol	1	5.0	5.0	0.16	U
91-20-3	Naphthalene	1	0.50	0.50	0.023	U
88-74-4	2-Nitroaniline	1	5.0	5.0	0.12	U
99-09-2	3-Nitroaniline	1	5.0	5.0	0.13	U
100-01-6	4-Nitroaniline	1	5.0	5.0	0.14	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.026	U
100-02-7	4-Nitrophenol	1	5.0	5.0	1.3	U
88-75-5	2-Nitrophenol	1	5.0	5.0	0.026	U
86-30-6	N-Nitroso-diphenylamine	1	5.0	5.0	0.019	U
621-64-7	N-Nitroso-di-n-propylamine	1	5.0	5.0	0.030	U
87-86-5	Pentachlorophenol	1	5.0	5.0	0.19	U
85-01-8	Phenanthrene	1	0.042	0.50	0.015	J
108-95-2	Phenol	1	5.0	5.0	0.028	U
129-00-0	Pyrene	1	0.052	0.50	0.047	J
95-94-3	1,2,4,5-Tetrachlorobenzene	1	5.0	5.0	0.024	U
58-90-2	2,3,4,6-Tetrachlorophenol	1	5.0	5.0	0.16	U
88-06-2	2,4,6-Trichlorophenol	1	5.0	5.0	0.027	U
95-95-4	2,4,5-Trichlorophenol	1	5.0	5.0	0.11	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
2-Fluorophenol	21.0	13.0	62	20 - 110	
Phenol-d6	21.2	8.68	41	10 - 115	
Nitrobenzene-d5	10.6	9.73	92	40 - 110	
2-Fluorobiphenyl	10.5	8.81	84	50 - 110	
2,4,6-Tribromophenol	21.4	19.9	93	40 - 125	
o-Terphenyl	10.4	11.0	105	50 - 135	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	96160	4.99	93113	4.99	
Naphthalene-d8	371859	6.48	361517	6.48	
Acenaphthene-d10	213733	8.48	218183	8.49	
Phenanthrene-d10	291764	10.14	311094	10.14	
Chrysene-d12	253369	13.08	252432	13.08	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

EQBK-5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Water Laboratory ID: 0811328-13 File ID: 81132813.D

Sampled: 11/13/08 16:00 Prepared: 11/18/08 08:38 Analyzed: 11/26/08 10:07

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 960 mL / 1 mL

QC Batch: 0813364 Sequence: 8120138 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q	
83-32-9	Acenaphthene	1	0.50	0.50	0.013	U	
208-96-8	Acenaphthylene	1	0.50	0.50	0.012	U	
98-86-2	Acetophenone	1	0.052	5.0	0.043	J	B,2
120-12-7	Anthracene	1	0.50	0.50	0.014	U	
1912-24-9	Atrazine	1	5.0	5.0	0.026	U	
100-52-7	Benzaldehyde	1	5.0	5.0	0.051	U	V5,c
56-55-3	Benzo(a)anthracene	1	0.042	0.50	0.037	J	B,2
50-32-8	Benzo(a)pyrene	1	0.042	0.50	0.023	J	
205-99-2	Benzo(b)fluoranthene	1	0.50	0.50	0.040	U	
207-08-9	Benzo(k)fluoranthene	1	0.042	0.50	0.036	J	B,2
191-24-2	Benzo(g,h,i)perylene	1	0.50	0.50	0.022	U	
92-52-4	1,1'-Biphenyl	1	5.0	5.0	0.015	U	
101-55-3	4-Bromophenyl Phenyl Ether	1	5.0	5.0	0.026	U	
85-68-7	Butyl Benzyl Phthalate	1	5.0	5.0	0.029	U	
105-60-2	Caprolactam	1	5.0	5.0	0.14	U	K1
86-74-8	Carbazole	1	5.0	5.0	0.018	U	
59-50-7	4-Chloro-3-methylphenol	1	5.0	5.0	0.021	U	
106-47-8	4-Chloroaniline	1	5.0	5.0	0.021	U	
111-91-1	Bis(2-chloroethoxy)methane	1	5.0	5.0	0.016	U	
111-44-4	Bis(2-chloroethyl) Ether	1	5.0	5.0	0.016	U	
108-60-1	Bis(2-chloroisopropyl) Ether	1	5.0	5.0	0.047	U	
91-58-7	2-Chloronaphthalene	1	5.0	5.0	0.012	U	
95-57-8	2-Chlorophenol	1	5.0	5.0	0.016	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	1	5.0	5.0	0.016	U	
218-01-9	Chrysene	1	0.021	0.50	0.020	J	B,2
53-70-3	Dibenz(a,h)anthracene	1	0.50	0.50	0.026	U	
132-64-9	Dibenzofuran	1	5.0	5.0	0.016	U	
84-74-2	Di-n-butyl Phthalate	1	5.0	5.0	0.38	U	
91-94-1	3,3'-Dichlorobenzidine	1	5.0	5.0	0.21	U	
120-83-2	2,4-Dichlorophenol	1	5.0	5.0	0.015	U	
84-66-2	Diethyl Phthalate	1	0.062	5.0	0.034	J	B,2
105-67-9	2,4-Dimethylphenol	1	5.0	5.0	0.33	U	
131-11-3	Dimethyl Phthalate	1	5.0	5.0	0.016	U	
534-52-1	4,6-Dinitro-2-methylphenol	1	5.0	5.0	0.12	U	
51-28-5	2,4-Dinitrophenol	1	5.0	5.0	1.5	U	V5,c
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.21	U	
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.050	U	
117-84-0	Di-n-octyl Phthalate	1	5.0	5.0	0.34	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	5.0	5.0	0.41	U	
206-44-0	Fluoranthene	1	0.50	0.50	0.016	U	
86-73-7	Fluorene	1	0.50	0.50	0.011	U	

: 08761

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

EQBK-5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Water Laboratory ID: 0811328-13 File ID: 81132813.D

Sampled: 11/13/08 16:00 Prepared: 11/18/08 08:38 Analyzed: 11/26/08 10:07

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 960 mL / 1 mL

QC Batch: 0813364 Sequence: 8120138 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
118-74-1	Hexachlorobenzene	1	5.0	5.0	0.019	U
87-68-3	Hexachlorobutadiene	1	5.0	5.0	0.018	U
77-47-4	Hexachlorocyclopentadiene	1	5.0	5.0	0.13	U
67-72-1	Hexachloroethane	1	5.0	5.0	0.038	U
193-39-5	Indeno(1,2,3-cd)pyrene	1	0.50	0.50	0.014	U
78-59-1	Isophorone	1	0.11	5.0	0.031	J
91-57-6	2-Methylnaphthalene	1	5.0	5.0	0.015	U
95-48-7	2-Methylphenol	1	5.0	5.0	0.14	U
106-44-5	4-Methylphenol	1	5.0	5.0	0.16	U
91-20-3	Naphthalene	1	0.062	0.50	0.023	J
88-74-4	2-Nitroaniline	1	5.0	5.0	0.12	U
99-09-2	3-Nitroaniline	1	5.0	5.0	0.13	U
100-01-6	4-Nitroaniline	1	5.0	5.0	0.14	U
98-95-3	Nitrobenzene	1	5.0	5.0	0.026	U
100-02-7	4-Nitrophenol	1	5.0	5.0	1.3	U
88-75-5	2-Nitrophenol	1	5.0	5.0	0.026	U
86-30-6	N-Nitroso-diphenylamine	1	5.0	5.0	0.019	U
621-64-7	N-Nitroso-di-n-propylamine	1	5.0	5.0	0.030	U
87-86-5	Pentachlorophenol	1	5.0	5.0	0.19	U
85-01-8	Phenanthrene	1	0.50	0.50	0.015	U
108-95-2	Phenol	1	5.0	5.0	0.028	U
129-00-0	Pyrene	1	0.50	0.50	0.047	U
95-94-3	1,2,4,5-Tetrachlorobenzene	1	5.0	5.0	0.024	U
58-90-2	2,3,4,6-Tetrachlorophenol	1	5.0	5.0	0.16	U
88-06-2	2,4,6-Trichlorophenol	1	5.0	5.0	0.027	U
95-95-4	2,4,5-Trichlorophenol	1	5.0	5.0	0.11	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
2-Fluorophenol	21.0	13.7	65	20 - 110	
Phenol-d6	21.2	9.14	43	10 - 115	
Nitrobenzene-d5	10.6	9.96	94	40 - 110	
2-Fluorobiphenyl	10.5	9.77	93	50 - 110	
2,4,6-Tribromophenol	21.4	20.5	96	40 - 125	
o-Terphenyl	10.4	11.9	114	50 - 135	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	89784	4.99	93113	4.99	
Naphthalene-d8	361610	6.48	361517	6.48	
Acenaphthene-d10	212950	8.48	218183	8.49	
Phenanthrene-d10	294230	10.13	311094	10.14	
Chrysene-d12	252445	13.08	252432	13.08	

: 66752

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

EQBK-6

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Water Laboratory ID: 0811331-01 File ID: 81133101.D

Sampled: 11/14/08 15:20 Prepared: 11/18/08 08:38 Analyzed: 11/26/08 10:35

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 920 mL / 1 mL

QC Batch: 0813364 Sequence: 8120138 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q	
83-32-9	Acenaphthene	1	0.54	0.54	0.014	U	
208-96-8	Acenaphthylene	1	0.54	0.54	0.013	U	
98-86-2	Acetophenone	1	0.065	5.4	0.046	J	B,Z
120-12-7	Anthracene	1	0.54	0.54	0.015	U	
1912-24-9	Atrazine	1	5.4	5.4	0.028	U	
100-52-7	Benzaldehyde	1	5.4	5.4	0.056	U	U,C
56-55-3	Benzo(a)anthracene	1	0.54	0.54	0.041	U	
50-32-8	Benzo(a)pyrene	1	0.033	0.54	0.025	J	
205-99-2	Benzo(b)fluoranthene	1	0.54	0.54	0.043	U	
207-08-9	Benzo(k)fluoranthene	1	0.54	0.54	0.039	U	
191-24-2	Benzo(g,h,i)perylene	1	0.54	0.54	0.024	U	
92-52-4	1,1'-Biphenyl	1	5.4	5.4	0.016	U	
101-55-3	4-Bromophenyl Phenyl Ether	1	5.4	5.4	0.028	U	
85-68-7	Butyl Benzyl Phthalate	1	5.4	5.4	0.032	U	
105-60-2	Caprolactam	1	5.4	5.4	0.15	U	B,I
86-74-8	Carbazole	1	5.4	5.4	0.020	U	
59-50-7	4-Chloro-3-methylphenol	1	5.4	5.4	0.023	U	
106-47-8	4-Chloroaniline	1	5.4	5.4	0.022	U	
111-91-1	Bis(2-chloroethoxy)methane	1	5.4	5.4	0.018	U	
111-44-4	Bis(2-chloroethyl) Ether	1	5.4	5.4	0.017	U	
108-60-1	Bis(2-chloroisopropyl) Ether	1	5.4	5.4	0.051	U	
91-58-7	2-Chloronaphthalene	1	5.4	5.4	0.013	U	
95-57-8	2-Chlorophenol	1	5.4	5.4	0.018	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	1	5.4	5.4	0.017	U	
218-01-9	Chrysene	1	0.54	0.54	0.022	U	
53-70-3	Dibenz(a,h)anthracene	1	0.54	0.54	0.028	U	
132-64-9	Dibenzofuran	1	5.4	5.4	0.018	U	
84-74-2	Di-n-butyl Phthalate	1	5.4	5.4	0.41	U	
91-94-1	3,3'-Dichlorobenzidine	1	5.4	5.4	0.23	U	
120-83-2	2,4-Dichlorophenol	1	5.4	5.4	0.016	U	
84-66-2	Diethyl Phthalate	1	0.065	5.4	0.037	J	B,Z
105-67-9	2,4-Dimethylphenol	1	5.4	5.4	0.36	U	
131-11-3	Dimethyl Phthalate	1	5.4	5.4	0.017	U	
534-52-1	4,6-Dinitro-2-methylphenol	1	5.4	5.4	0.13	U	
51-28-5	2,4-Dinitrophenol	1	5.4	5.4	1.6	U	U,C
121-14-2	2,4-Dinitrotoluene	1	5.4	5.4	0.23	U	
606-20-2	2,6-Dinitrotoluene	1	5.4	5.4	0.054	U	
117-84-0	Di-n-octyl Phthalate	1	5.4	5.4	0.37	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	5.4	5.4	0.45	U	
206-44-0	Fluoranthene	1	0.54	0.54	0.017	U	
86-73-7	Fluorene	1	0.54	0.54	0.012	U	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

EQBK-6

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Water Laboratory ID: 0811331-01 File ID: 81133101.D

Sampled: 11/14/08 15:20 Prepared: 11/18/08 08:38 Analyzed: 11/26/08 10:35

Solids: Preparation: 3510C Liquid-Liquid Ext Initial/Final: 920 mL / 1 mL

QC Batch: 0813364 Sequence: 8120138 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
118-74-1	Hexachlorobenzene	1	5.4	5.4	0.021	U
87-68-3	Hexachlorobutadiene	1	5.4	5.4	0.019	U
77-47-4	Hexachlorocyclopentadiene	1	5.4	5.4	0.14	U
67-72-1	Hexachloroethane	1	5.4	5.4	0.041	U
193-39-5	Indeno(1,2,3-cd)pyrene	1	0.54	0.54	0.015	U
78-59-1	Isophorone	1	0.12	5.4	0.033	J
91-57-6	2-Methylnaphthalene	1	5.4	5.4	0.017	U
95-48-7	2-Methylphenol	1	5.4	5.4	0.16	U
106-44-5	4-Methylphenol	1	5.4	5.4	0.17	U
91-20-3	Naphthalene	1	0.54	0.54	0.025	U
88-74-4	2-Nitroaniline	1	5.4	5.4	0.12	U
99-09-2	3-Nitroaniline	1	5.4	5.4	0.14	U
100-01-6	4-Nitroaniline	1	5.4	5.4	0.16	U
98-95-3	Nitrobenzene	1	5.4	5.4	0.028	U
100-02-7	4-Nitrophenol	1	5.4	5.4	1.4	U
88-75-5	2-Nitrophenol	1	5.4	5.4	0.029	U
86-30-6	N-Nitroso-diphenylamine	1	5.4	5.4	0.021	U
621-64-7	N-Nitroso-di-n-propylamine	1	5.4	5.4	0.032	U
87-86-5	Pentachlorophenol	1	5.4	5.4	0.20	U
85-01-8	Phenanthrene	1	0.54	0.54	0.016	U
108-95-2	Phenol	1	5.4	5.4	0.030	U
129-00-0	Pyrene	1	0.54	0.54	0.051	U
95-94-3	1,2,4,5-Tetrachlorobenzene	1	5.4	5.4	0.026	U
58-90-2	2,3,4,6-Tetrachlorophenol	1	5.4	5.4	0.18	U
88-06-2	2,4,6-Trichlorophenol	1	5.4	5.4	0.029	U
95-95-4	2,4,5-Trichlorophenol	1	5.4	5.4	0.12	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
2-Fluorophenol	22.0	13.1	60	20 - 110	
Phenol-d6	22.2	9.00	41	10 - 115	
Nitrobenzene-d5	11.1	9.72	88	40 - 110	
2-Fluorobiphenyl	11.0	9.24	84	50 - 110	
2,4,6-Tribromophenol	22.3	19.8	89	40 - 125	
o-Terphenyl	10.9	11.5	105	50 - 135	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	107170	4.99	93113	4.99	
Naphthalene-d8	413313	6.48	361517	6.48	
Acenaphthene-d10	241064	8.48	218183	8.49	
Phenanthrene-d10	321426	10.14	311094	10.14	
Chrysene-d12	261896	13.08	252432	13.08	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB13A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-01 File ID: 81132801.D

Sampled: 11/12/08 10:00 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 12:00

Solids: 88.77 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
83-32-9	Acenaphthene	1	19	19	1.8	U	
208-96-8	Acenaphthylene	1	1.5	19	1.1	J	
98-86-2	Acetophenone	1	3.8	190	3.1	J	
120-12-7	Anthracene	1	19	19	2.9	U	
1912-24-9	Atrazine	1	190	190	1.7	U	
100-52-7	Benzaldehyde	1	190	190	30	U	UJ,c
56-55-3	Benzo(a)anthracene	1	14	19	1.1	J	
50-32-8	Benzo(a)pyrene	1	15	19	1.3	J	B,Z
205-99-2	Benzo(b)fluoranthene	1	20	19	1.1		
207-08-9	Benzo(k)fluoranthene	1	7.1	19	1.5	J	B,Z
191-24-2	Benzo(g,h,i)perylene	1	13	75	1.0	J	
92-52-4	1,1'-Biphenyl	1	190	190	1.0	U	
101-55-3	4-Bromophenyl Phenyl Ether	1	190	190	1.4	U	
85-68-7	Butyl Benzyl Phthalate	1	22	190	1.1	J	B,Z
105-60-2	Caprolactam	1	370	370	26	U	UJ,c
86-74-8	Carbazole	1	7.9	190	0.56	J	B,Z
59-50-7	4-Chloro-3-methylphenol	1	190	190	2.4	U	
106-47-8	4-Chloroaniline	1	190	190	22	U	
111-91-1	Bis(2-chloroethoxy)methane	1	190	190	0.94	U	
111-44-4	Bis(2-chloroethyl) Ether	1	190	190	1.2	U	
108-60-1	Bis(2-chloroisopropyl) Ether	1	190	190	1.3	U	
91-58-7	2-Chloronaphthalene	1	190	190	1.3	U	
95-57-8	2-Chlorophenol	1	190	190	0.67	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	1	190	190	0.50	U	
218-01-9	Chrysene	1	12	19	0.81	J	
53-70-3	Dibenz(a,h)anthracene	1	75	75	4.1	U	
132-64-9	Dibenzofuran	1	190	190	1.7	U	
~~84-74-2~~	~~Di-n-butyl Phthalate~~ See DL	1	~~1000~~	~~190~~	~~2.7~~	~~E~~	B,Z
91-94-1	3,3'-Dichlorobenzidine	1	370	370	88	U	
120-83-2	2,4-Dichlorophenol	1	6.8	190	2.4	J	
~~84-66-2~~	~~Diethyl Phthalate~~ See DL	1	~~1200~~	~~190~~	~~0.42~~	~~E~~	B,M
105-67-9	2,4-Dimethylphenol	1	190	190	6.4	U	
131-11-3	Dimethyl Phthalate	1	500	190	0.87		
534-52-1	4,6-Dinitro-2-methylphenol	1	190	190	4.1	U	B,M
51-28-5	2,4-Dinitrophenol	1	370	370	37	U	B,M
121-14-2	2,4-Dinitrotoluene	1	100	190	4.6	J	
606-20-2	2,6-Dinitrotoluene	1	27	190	2.6	J	
117-84-0	Di-n-octyl Phthalate	1	190	190	11	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	360	190	2.2	B	B,Z
206-44-0	Fluoranthene	1	15	19	1.7	J	B,Z
86-73-7	Fluorene	1	19	19	1.8	U	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB13A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-01 File ID: 81132801.D

Sampled: 11/12/08 10:00 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 12:00

Solids: 88.77 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
118-74-1	Hexachlorobenzene	1	190	190	3.8	U	
87-68-3	Hexachlorobutadiene	1	190	190	1.2	U	
77-47-4	Hexachlorocyclopentadiene	1	190	190	2.8	U	R,M
67-72-1	Hexachloroethane	1	190	190	0.88	U	R,M
193-39-5	Indeno(1,2,3-cd)pyrene	1	11	75	2.5	J	
78-59-1	Isophorone	1	2.6	190	0.95	J	B,Z
91-57-6	2-Methylnaphthalene	1	1.1	190	0.83	J	
95-48-7	2-Methylphenol	1	190	190	2.5	U	
106-44-5	4-Methylphenol	1	190	190	1.5	U	
91-20-3	Naphthalene	1	19	19	2.1	U	
88-74-4	2-Nitroaniline	1	190	190	2.6	U	
99-09-2	3-Nitroaniline	1	190	190	12	U	
100-01-6	4-Nitroaniline	1	190	190	26	U	
98-95-3	Nitrobenzene	1	190	190	2.2	U	
100-02-7	4-Nitrophenol	1	370	370	13	U	R,M
88-75-5	2-Nitrophenol	1	190	190	8.0	U	
86-30-6	N-Nitroso-diphenylamine	1	96	190	0.83	J	
621-64-7	N-Nitroso-di-n-propylamine	1	190	190	1.4	U	
87-86-5	Pentachlorophenol	1	370	370	4.1	U	
85-01-8	Phenanthrene	1	6.4	19	2.5	J	B,X
108-95-2	Phenol	1	190	190	5.6	U	
129-00-0	Pyrene	1	14	19	0.63	J	B,Z
95-94-3	1,2,4,5-Tetrachlorobenzene	1	190	190	1.2	U	
58-90-2	2,3,4,6-Tetrachlorophenol	1	190	190	4.2	U	
88-06-2	2,4,6-Trichlorophenol	1	190	190	1.5	U	
95-95-4	2,4,5-Trichlorophenol	1	190	190	3.7	U	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	759	712	94	35 - 105	
Phenol-d6	766	581	76	40 - 100	
Nitrobenzene-d5	383	323	84	35 - 100	
2-Fluorobiphenyl	379	367	97	45 - 105	
2,4,6-Tribromophenol	770	698	91	35 - 125	
o-Terphenyl	376	407	108	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	110048	5.01	93113	4.99	
Naphthalene-d8	441552	6.48	361517	6.48	
Acenaphthene-d10	265694	8.48	218183	8.49	
Phenanthrene-d10	350309	10.14	311094	10.14	
Chrysene-d12	255985	13.08	252432	13.08	

ORGANIC ANALYSIS DATA SHEET

USEPA-8270C

13SB13A

Use only Di-n-butyl phthalate & Diethyl phthalate from this solution 1/30/09

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-01RE1 File ID: 81132801.D

Sampled: 11/12/08 10:00 Prepared: 11/22/08 08:36 Analyzed: 12/01/08 15:26

Solids: 88.77 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120219 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
83-32-9	Acenaphthene	2	38	38	3.6	U	
208-96-8	Acenaphthylene	2	38	38	2.3	U	
98-86-2	Acetophenone	2	380	380	6.2	U	
120-12-7	Anthracene	2	38	38	5.7	U	
1912-24-9	Atrazine	2	380	380	3.4	U	U,C
100-52-7	Benzaldehyde	2	380	380	59	U	
56-55-3	Benzo(a)anthracene	2	9.8	38	2.1	J	B,Z
50-32-8	Benzo(a)pyrene	2	14	38	2.6	J	B,Z
205-99-2	Benzo(b)fluoranthene	2	17	38	2.2	J	B,Z
207-08-9	Benzo(k)fluoranthene	2	8.3	38	3.0	J	B,Z
191-24-2	Benzo(g,h,i)perylene	2	11	150	2.0	J	B,Z
92-52-4	1,1'-Biphenyl	2	380	380	2.0	U	
101-55-3	4-Bromophenyl Phenyl Ether	2	380	380	2.9	U	
85-68-7	Butyl Benzyl Phthalate	2	16	380	2.3	J	B,Z
105-60-2	Caprolactam	2	740	740	52	U	U,C
86-74-8	Carbazole	2	380	380	1.1	U	
59-50-7	4-Chloro-3-methylphenol	2	380	380	4.7	U	
106-47-8	4-Chloroaniline	2	380	380	44	U	
111-91-1	Bis(2-chloroethoxy)methane	2	380	380	1.9	U	
111-44-4	Bis(2-chloroethyl) Ether	2	380	380	2.4	U	
108-60-1	Bis(2-chloroisopropyl) Ether	2	380	380	2.5	U	
91-58-7	2-Chloronaphthalene	2	380	380	2.6	U	
95-57-8	2-Chlorophenol	2	380	380	1.3	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	2	380	380	1.0	U	
218-01-9	Chrysene	2	9.0	38	1.6	J	B,Z
53-70-3	Dibenz(a,h)anthracene	2	150	150	8.2	U	
132-64-9	Dibenzofuran	2	380	380	3.4	U	
84-74-2	Di-n-butyl Phthalate	2	1000	380	5.3		B,Z
91-94-1	3,3'-Dichlorobenzidine	2	740	740	180	U	
120-83-2	2,4-Dichlorophenol	2	380	380	4.9	U	
84-66-2	Diethyl Phthalate	2	1100	380	0.84		
105-67-9	2,4-Dimethylphenol	2	380	380	13	U	
131-11-3	Dimethyl Phthalate	2	480	380	1.7		
534-52-1	4,6-Dinitro-2-methylphenol	2	380	380	8.2	U	R,M
51-28-5	2,4-Dinitrophenol	2	740	740	75	U	R,M
121-14-2	2,4-Dinitrotoluene	2	82	380	9.1	J	
606-20-2	2,6-Dinitrotoluene	2	25	380	5.1	J	
117-84-0	Di-n-octyl Phthalate	2	380	380	22	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	2	350	380	4.4	JB	B,Z
206-44-0	Fluoranthene	2	12	38	3.5	J	B,Z
86-73-7	Fluorene	2	38	38	3.6	U	

: 08217

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB13A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-01RE1 File ID: 81132801.D

Sampled: 11/12/08 10:00 Prepared: 11/22/08 08:36 Analyzed: 12/01/08 15:26

Solids: 88.77 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120219 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
118-74-1	Hexachlorobenzene	2	380	380	7.6	U	
87-68-3	Hexachlorobutadiene	2	380	380	2.4	U	
77-47-4	Hexachlorocyclopentadiene	2	380	380	5.6	U	R,M
67-72-1	Hexachloroethane	2	380	380	1.8	U	R,M
193-39-5	Indeno(1,2,3-cd)pyrene	2	14	150	5.0	J	B,X
78-59-1	Isophorone	2	4.5	380	1.9	J	B,Z
91-57-6	2-Methylnaphthalene	2	380	380	1.7	U	
95-48-7	2-Methylphenol	2	380	380	5.0	U	
106-44-5	4-Methylphenol	2	380	380	2.9	U	
91-20-3	Naphthalene	2	38	38	4.2	U	
88-74-4	2-Nitroaniline	2	380	380	5.2	U	
99-09-2	3-Nitroaniline	2	380	380	25	U	
100-01-6	4-Nitroaniline	2	380	380	52	U	V,C
98-95-3	Nitrobenzene	2	380	380	4.5	U	
100-02-7	4-Nitrophenol	2	740	740	25	U	R,M
88-75-5	2-Nitrophenol	2	380	380	16	U	
86-30-6	N-Nitroso-diphenylamine	2	100	380	1.7	J	
621-64-7	N-Nitroso-di-n-propylamine	2	380	380	2.7	U	
87-86-5	Pentachlorophenol	2	740	740	8.3	U	
85-01-8	Phenanthrene	2	5.3	38	5.0	J	B,X
108-95-2	Phenol	2	380	380	11	U	
129-00-0	Pyrene	2	14	38	1.3	J	B,Z
95-94-3	1,2,4,5-Tetrachlorobenzene	2	380	380	2.4	U	
58-90-2	2,3,4,6-Tetrachlorophenol	2	380	380	8.4	U	
88-06-2	2,4,6-Trichlorophenol	2	380	380	3.0	U	
95-95-4	2,4,5-Trichlorophenol	2	380	380	7.4	U	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	759	683	90	35 - 105	
Phenol-d6	766	658	86	40 - 100	
Nitrobenzene-d5	383	329	86	35 - 100	
2-Fluorobiphenyl	379	366	97	45 - 105	
2,4,6-Tribromophenol	770	559	73	35 - 125	
o-Terphenyl	376	404	108	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	108852	4.93	93113	4.99	
Naphthalene-d8	423599	6.41	361517	6.48	
Acenaphthene-d10	253156	8.41	218183	8.49	
Phenanthrene-d10	322798	10.07	311094	10.14	
Chrysene-d12	214511	13	252432	13.08	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB13A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-01RE2 File ID: 0811328-01re1.D

Sampled: 11/12/08 10:00 Prepared: 12/01/08 08:36 Analyzed: 12/06/08 17:19

Solids: 88.77 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120828 Calibration: 8L08004 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
84-74-2	Di-n-butyl Phthalate	1	270	190	2.7	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	280	190	2.2	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	759	727	96	35 - 105	
Phenol-d6	766	722	94	40 - 100	
Nitrobenzene-d5	383	365	95	35 - 100	
2-Fluorobiphenyl	379	361	95	45 - 105	
2,4,6-Tribromophenol	770	774	101	35 - 125	
o-Terphenyl	376	374	100	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	98337	7.681	89832	7.675	
Naphthalene-d8	395029	10.385	358337	10.397	
Acenaphthene-d10	212226	14.489	202249	14.5	
Phenanthrene-d10	233868	17.916	271682	17.916	
Chrysene-d12	90846	21.53	164712	21.535	
Perylene-d12	68756	23.202	125756	23.202	

* Values outside of QC limits

Do not use
AS 1/20/09

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB13C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-02 File ID: 81132802.D

Sampled: 11/12/08 10:18 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 12:29

Solids: 89.66 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
83-32-9	Acenaphthene	1	19	19	1.8	U	
208-96-8	Acenaphthylene	1	19	19	1.1	U	
98-86-2	Acetophenone	1	3.7	190	3.1	J	
120-12-7	Anthracene	1	19	19	2.8	U	
1912-24-9	Atrazine	1	190	190	1.7	U	
100-52-7	Benzaldehyde	1	190	190	29	U	V5,c
56-55-3	Benzo(a)anthracene	1	7.4	19	1.1	J	B,z
50-32-8	Benzo(a)pyrene	1	9.7	19	1.3	J	B,z
205-99-2	Benzo(b)fluoranthene	1	14	19	1.1	J	
207-08-9	Benzo(k)fluoranthene	1	4.8	19	1.5	J	B,z
191-24-2	Benzo(g,h,i)perylene	1	8.9	75	1.0	J	
92-52-4	1,1'-Biphenyl	1	190	190	1.0	U	
101-55-3	4-Bromophenyl Phenyl Ether	1	190	190	1.4	U	
85-68-7	Butyl Benzyl Phthalate	1	7.4	190	1.1	J	B,z
105-60-2	Caprolactam	1	370	370	26	U	V5,c
86-74-8	Carbazole	1	4.1	190	0.56	J	B,z
59-50-7	4-Chloro-3-methylphenol	1	190	190	2.3	U	
106-47-8	4-Chloroaniline	1	190	190	22	U	
111-91-1	Bis(2-chloroethoxy)methane	1	190	190	0.93	U	
111-44-4	Bis(2-chloroethyl) Ether	1	190	190	1.2	U	
108-60-1	Bis(2-chloroisopropyl) Ether	1	190	190	1.2	U	
91-58-7	2-Chloronaphthalene	1	190	190	1.3	U	
95-57-8	2-Chlorophenol	1	190	190	0.66	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	1	190	190	0.50	U	
218-01-9	Chrysene	1	7.1	19	0.81	J	B,z
53-70-3	Dibenz(a,h)anthracene	1	75	75	4.1	U	
132-64-9	Dibenzofuran	1	190	190	1.7	U	
84-74-2	Di-n-butyl Phthalate	1	320	190	2.6		B,z
91-94-1	3,3'-Dichlorobenzidine	1	370	370	87	U	
120-83-2	2,4-Dichlorophenol	1	190	190	2.4	U	
84-66-2	Diethyl Phthalate	1	230	190	0.41		
105-67-9	2,4-Dimethylphenol	1	190	190	6.3	U	
131-11-3	Dimethyl Phthalate	1	31	190	0.86	J	
534-52-1	4,6-Dinitro-2-methylphenol	1	190	190	4.1	U	R,M
51-28-5	2,4-Dinitrophenol	1	370	370	37	U	R,M
121-14-2	2,4-Dinitrotoluene	1	16	190	4.5	J	
606-20-2	2,6-Dinitrotoluene	1	16	190	2.5	J	
117-84-0	Di-n-octyl Phthalate	1	190	190	11	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	230	190	2.2	B	B,z
206-44-0	Fluoranthene	1	10	19	1.7	J	B,z
86-73-7	Fluorene	1	19	19	1.8	U	

: 00287

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB13C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-02 File ID: 81132802.D

Sampled: 11/12/08 10:18 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 12:29

Solids: 89.66 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
118-74-1	Hexachlorobenzene	1	190	190	3.8	U	
87-68-3	Hexachlorobutadiene	1	190	190	1.2	U	
77-47-4	Hexachlorocyclopentadiene	1	190	190	2.8	U	R,M
67-72-1	Hexachloroethane	1	190	190	0.87	U	R,M
193-39-5	Indeno(1,2,3-cd)pyrene	1	8.2	75	2.5	J	
78-59-1	Isophorone	1	2.6	190	0.94	J	B,Z
91-57-6	2-Methylnaphthalene	1	190	190	0.83	U	
95-48-7	2-Methylphenol	1	190	190	2.5	U	
106-44-5	4-Methylphenol	1	190	190	1.4	U	
91-20-3	Naphthalene	1	19	19	2.1	U	
88-74-4	2-Nitroaniline	1	190	190	2.6	U	
99-09-2	3-Nitroaniline	1	190	190	12	U	
100-01-6	4-Nitroaniline	1	190	190	26	U	
98-95-3	Nitrobenzene	1	190	190	2.2	U	
100-02-7	4-Nitrophenol	1	370	370	12	U	R,M
88-75-5	2-Nitrophenol	1	190	190	7.9	U	
86-30-6	N-Nitroso-diphenylamine	1	58	190	0.82	J	
621-64-7	N-Nitroso-di-n-propylamine	1	190	190	1.4	U	
87-86-5	Pentachlorophenol	1	370	370	4.1	U	
85-01-8	Phenanthrene	1	5.9	19	2.5	J	B,X
108-95-2	Phenol	1	190	190	5.5	U	
129-00-0	Pyrene	1	11	19	0.62	J	B,Z
95-94-3	1,2,4,5-Tetrachlorobenzene	1	190	190	1.2	U	
58-90-2	2,3,4,6-Tetrachlorophenol	1	190	190	4.2	U	
88-06-2	2,4,6-Trichlorophenol	1	190	190	1.5	U	
95-95-4	2,4,5-Trichlorophenol	1	190	190	3.7	U	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	751	675	90	35 - 105	
Phenol-d6	758	595	78	40 - 100	
Nitrobenzene-d5	379	321	85	35 - 100	
2-Fluorobiphenyl	376	356	95	45 - 105	
2,4,6-Tribromophenol	762	696	91	35 - 125	
o-Terphenyl	372	407	109	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	119617	5.01	93113	4.99	
Naphthalene-d8	463916	6.48	361517	6.48	
Acenaphthene-d10	284032	8.48	218183	8.49	
Phenanthrene-d10	386890	10.14	311094	10.14	
Chrysene-d12	284261	13.08	252432	13.08	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB13C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-02RE1 File ID: 0811328-02re1.D

Sampled: 11/12/08 10:18 Prepared: 12/01/08 08:36 Analyzed: 12/06/08 17:53

Solids: 89.66 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120828 Calibration: 8L08004 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
84-74-2	Di-n-butyl Phthalate	1	140	190	2.6	J	K,m
117-81-7	Bis(2-ethylhexyl) Phthalate	1	500	190	2.2		J,m

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	751	711	95	35 - 105	
Phenol-d6	758	715	94	40 - 100	
Nitrobenzene-d5	379	364	96	35 - 100	
2-Fluorobiphenyl	376	365	97	45 - 105	
2,4,6-Tribromophenol	762	827	108	35 - 125	
o-Terphenyl	372	383	103	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	103921	7.681	89832	7.675	
Naphthalene-d8	414718	10.385	358337	10.397	
Acenaphthene-d10	225723	14.489	202249	14.5	
Phenanthrene-d10	258633	17.916	271682	17.916	
Chrysene-d12	115332	21.53	164712	21.535	
Perylene-d12	94455	23.202	125756	23.202	

* Values outside of QC limits

DC not used
KS 1/20/09

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB21C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-03 File ID: 81132803.D

Sampled: 11/12/08 12:26 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 12:58

Solids: 76.80 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
83-32-9	Acenaphthene	1	22	22	2.1	U	
208-96-8	Acenaphthylene	1	22	22	1.3	U	
98-86-2	Acetophenone	1	220	220	3.6	U	
120-12-7	Anthracene	1	22	22	3.3	U	
1912-24-9	Atrazine	1	220	220	1.9	U	
100-52-7	Benzaldehyde	1	220	220	34	U	U,c
56-55-3	Benzo(a)anthracene	1	6.9	22	1.2	J	B,Z
50-32-8	Benzo(a)pyrene	1	9.1	22	1.5	J	B,Z
205-99-2	Benzo(b)fluoranthene	1	13	22	1.3	J	B,Z
207-08-9	Benzo(k)fluoranthene	1	6.9	22	1.7	J	B,Z
191-24-2	Benzo(g,h,i)perylene	1	9.5	87	1.2	J	
92-52-4	1,1'-Biphenyl	1	220	220	1.2	U	
101-55-3	4-Bromophenyl Phenyl Ether	1	220	220	1.7	U	
85-68-7	Butyl Benzyl Phthalate	1	6.5	220	1.3	J	B,Z
105-60-2	Caprolactam	1	430	430	30	U	U,c
86-74-8	Carbazole	1	4.3	220	0.65	J	B,Z
59-50-7	4-Chloro-3-methylphenol	1	220	220	2.7	U	
106-47-8	4-Chloroaniline	1	220	220	26	U	
111-91-1	Bis(2-chloroethoxy)methane	1	220	220	1.1	U	
111-44-4	Bis(2-chloroethyl) Ether	1	220	220	1.4	U	
108-60-1	Bis(2-chloroisopropyl) Ether	1	220	220	1.5	U	
91-58-7	2-Chloronaphthalene	1	220	220	1.5	U	
95-57-8	2-Chlorophenol	1	220	220	0.78	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	1	220	220	0.58	U	
218-01-9	Chrysene	1	13	22	0.94	J	
53-70-3	Dibenz(a,h)anthracene	1	87	87	4.8	U	
132-64-9	Dibenzofuran	1	220	220	2.0	U	
84-74-2	Di-n-butyl Phthalate	1	250	220	3.1		B,Z
91-94-1	3,3´-Dichlorobenzidine	1	430	430	100	U	
120-83-2	2,4-Dichlorophenol	1	220	220	2.8	U	
84-66-2	Diethyl Phthalate	1	4.8	220	0.48	J	B,Z
105-67-9	2,4-Dimethylphenol	1	220	220	7.4	U	
131-11-3	Dimethyl Phthalate	1	220	220	1.0	U	
534-52-1	4,6-Dinitro-2-methylphenol	1	220	220	4.7	U	R,m
51-28-5	2,4-Dinitrophenol	1	430	430	43	U	R,m
121-14-2	2,4-Dinitrotoluene	1	220	220	5.3	U	
606-20-2	2,6-Dinitrotoluene	1	220	220	3.0	U	
117-84-0	Di-n-octyl Phthalate	1	220	220	13	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	15	220	2.5	JB	B,Z
206-44-0	Fluoranthene	1	6.1	22	2.0	J	B,Z
86-73-7	Fluorene	1	22	22	2.1	U	

000325

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB21C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-03 File ID: 81132803.D

Sampled: 11/12/08 12:26 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 12:58

Solids: 76.80 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
118-74-1	Hexachlorobenzene	1	220	220	4.4	U	
87-68-3	Hexachlorobutadiene	1	220	220	1.4	U	
77-47-4	Hexachlorocyclopentadiene	1	220	220	3.3	U	Lm
67-72-1	Hexachloroethane	1	220	220	1.0	U	Lm
193-39-5	Indeno(1,2,3-cd)pyrene	1	8.7	87	2.9	J	Bx
78-59-1	Isophorone	1	3.0	220	1.1	J	Bz
91-57-6	2-Methylnaphthalene	1	1.3	220	0.96	J	
95-48-7	2-Methylphenol	1	220	220	2.9	U	
106-44-5	4-Methylphenol	1	220	220	1.7	U	
91-20-3	Naphthalene	1	22	22	2.4	U	
88-74-4	2-Nitroaniline	1	220	220	3.0	U	
99-09-2	3-Nitroaniline	1	220	220	14	U	
100-01-6	4-Nitroaniline	1	220	220	30	U	
98-95-3	Nitrobenzene	1	220	220	2.6	U	
100-02-7	4-Nitrophenol	1	430	430	15	U	Lm
88-75-5	2-Nitrophenol	1	220	220	9.2	U	
86-30-6	N-Nitroso-diphenylamine	1	220	220	0.96	U	
621-64-7	N-Nitroso-di-n-propylamine	1	220	220	1.6	U	
87-86-5	Pentachlorophenol	1	430	430	4.8	U	
85-01-8	Phenanthrene	1	3.5	22	2.9	J	Bz
108-95-2	Phenol	1	220	220	6.4	U	
129-00-0	Pyrene	1	5.6	22	0.72	J	Bz
95-94-3	1,2,4,5-Tetrachlorobenzene	1	220	220	1.4	U	
58-90-2	2,3,4,6-Tetrachlorophenol	1	220	220	4.9	U	
88-06-2	2,4,6-Trichlorophenol	1	220	220	1.7	U	
95-95-4	2,4,5-Trichlorophenol	1	220	220	4.3	U	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	877	772	88	35 - 105	
Phenol-d6	885	757	85	40 - 100	
Nitrobenzene-d5	443	368	83	35 - 100	
2-Fluorobiphenyl	438	392	90	45 - 105	
2,4,6-Tribromophenol	890	734	83	35 - 125	
o-Terphenyl	434	437	101	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	107655	5.01	93113	4.99	
Naphthalene-d8	429329	6.48	361517	6.48	
Acenaphthene-d10	253867	8.48	218183	8.49	
Phenanthrene-d10	343780	10.14	311094	10.14	
Chrysene-d12	251883	13.08	252432	13.08	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB21C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-03RE1 File ID: 0811328-03re1.D

Sampled: 11/12/08 12:26 Prepared: 12/01/08 08:36 Analyzed: 12/06/08 18:28

Solids: 76.80 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120828 Calibration: 8L08004 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
84-74-2	Di-n-butyl Phthalate	1	13	220	3.1	J
117-81-7	Bis(2-ethylhexyl) Phthalate	1	15	220	2.5	J

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	877	723	82	35 - 105	
Phenol-d6	885	732	83	40 - 100	
Nitrobenzene-d5	443	363	82	35 - 100	
2-Fluorobiphenyl	438	361	82	45 - 105	
2,4,6-Tribromophenol	890	743	83	35 - 125	
o-Terphenyl	434	362	83	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	115346	7.681	89832	7.675	
Naphthalene-d8	468193	10.385	358337	10.397	
Acenaphthene-d10	261828	14.489	202249	14.5	
Phenanthrene-d10	326918	17.916	271682	17.916	
Chrysene-d12	187389	21.53	164712	21.535	
Perylene-d12	150340	23.203	125756	23.202	

* Values outside of QC limits

Do not use
1/22/09

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB14A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-04 File ID: 81132804.D

Sampled: 11/12/08 16:00 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 13:27

Solids: 94.24 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
83-32-9	Acenaphthene	1	18	18	1.7	U	
208-96-8	Acenaphthylene	1	18	18	1.1	U	
98-86-2	Acetophenone	1	180	180	2.9	U	
120-12-7	Anthracene	1	18	18	2.7	U	
1912-24-9	Atrazine	1	180	180	1.6	U	
100-52-7	Benzaldehyde	1	180	180	28	U	
56-55-3	Benzo(a)anthracene	1	2.8	18	1.0	J	
50-32-8	Benzo(a)pyrene	1	3.5	18	1.2	J	
205-99-2	Benzo(b)fluoranthene	1	4.6	18	1.0	J	
207-08-9	Benzo(k)fluoranthene	1	2.1	18	1.4	J	
191-24-2	Benzo(g,h,i)perylene	1	5.7	71	0.95	J	
92-52-4	1,1'-Biphenyl	1	180	180	0.95	U	
101-55-3	4-Bromophenyl Phenyl Ether	1	180	180	1.3	U	
85-68-7	Butyl Benzyl Phthalate	1	4.6	180	1.1	J	
105-60-2	Caprolactam	1	350	350	24	U	
86-74-8	Carbazole	1	3.2	180	0.53	J	
59-50-7	4-Chloro-3-methylphenol	1	180	180	2.2	U	
106-47-8	4-Chloroaniline	1	180	180	21	U	
111-91-1	Bis(2-chloroethoxy)methane	1	180	180	0.89	U	
111-44-4	Bis(2-chloroethyl) Ether	1	180	180	1.1	U	
108-60-1	Bis(2-chloroisopropyl) Ether	1	180	180	1.2	U	
91-58-7	2-Chloronaphthalene	1	180	180	1.2	U	
95-57-8	2-Chlorophenol	1	180	180	0.63	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	1	180	180	0.48	U	
218-01-9	Chrysene	1	4.2	18	0.77	J	
53-70-3	Dibenz(a,h)anthracene	1	71	71	3.9	U	
132-64-9	Dibenzofuran	1	180	180	1.6	U	
84-74-2	Di-n-butyl Phthalate	1	65	180	2.5	J	
91-94-1	3,3´-Dichlorobenzidine	1	350	350	83	U	
120-83-2	2,4-Dichlorophenol	1	180	180	2.3	U	
84-66-2	Diethyl Phthalate	1	55	180	0.39	J	
105-67-9	2,4-Dimethylphenol	1	180	180	6.0	U	
131-11-3	Dimethyl Phthalate	1	180	180	0.82	U	
534-52-1	4,6-Dinitro-2-methylphenol	1	180	180	3.9	U	
51-28-5	2,4-Dinitrophenol	1	350	350	35	U	
121-14-2	2,4-Dinitrotoluene	1	13	180	4.3	J	
606-20-2	2,6-Dinitrotoluene	1	180	180	2.4	U	
117-84-0	Di-n-octyl Phthalate	1	180	180	10	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	24	180	2.1	JB	
206-44-0	Fluoranthene	1	3.9	18	1.6	J	
86-73-7	Fluorene	1	18	18	1.7	U	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB14A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-04 File ID: 81132804.D

Sampled: 11/12/08 16:00 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 13:27

Solids: 94.24 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
118-74-1	Hexachlorobenzene	1	180	180	3.6	U	
87-68-3	Hexachlorobutadiene	1	180	180	1.1	U	
77-47-4	Hexachlorocyclopentadiene	1	180	180	2.7	U	R,M
67-72-1	Hexachloroethane	1	180	180	0.83	U	R,M
193-39-5	Indeno(1,2,3-cd)pyrene	1	5.3	71	2.4	J	B,X
78-59-1	Isophorone	1	2.5	180	0.89	J	B,Z
91-57-6	2-Methylnaphthalene	1	180	180	0.79	U	
95-48-7	2-Methylphenol	1	180	180	2.4	U	
106-44-5	4-Methylphenol	1	180	180	1.4	U	
91-20-3	Naphthalene	1	18	18	2.0	U	
88-74-4	2-Nitroaniline	1	180	180	2.4	U	
99-09-2	3-Nitroaniline	1	180	180	12	U	
100-01-6	4-Nitroaniline	1	180	180	24	U	
98-95-3	Nitrobenzene	1	180	180	2.1	U	
100-02-7	4-Nitrophenol	1	350	350	12	U	R,M
88-75-5	2-Nitrophenol	1	180	180	7.5	U	
86-30-6	N-Nitroso-diphenylamine	1	20	180	0.78	J	
621-64-7	N-Nitroso-di-n-propylamine	1	180	180	1.3	U	
87-86-5	Pentachlorophenol	1	350	350	3.9	U	
85-01-8	Phenanthrene	1	18	18	2.4	U	
108-95-2	Phenol	1	180	180	5.3	U	
129-00-0	Pyrene	1	4.2	18	0.59	J	B,Z
95-94-3	1,2,4,5-Tetrachlorobenzene	1	180	180	1.1	U	
58-90-2	2,3,4,6-Tetrachlorophenol	1	180	180	4.0	U	
88-06-2	2,4,6-Trichlorophenol	1	180	180	1.4	U	
95-95-4	2,4,5-Trichlorophenol	1	180	180	3.5	U	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	714	659	92	35 - 105	
Phenol-d6	722	568	79	40 - 100	
Nitrobenzene-d5	361	311	86	35 - 100	
2-Fluorobiphenyl	357	349	98	45 - 105	
2,4,6-Tribromophenol	725	623	86	35 - 125	
o-Terphenyl	354	376	106	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	106029	5	93113	4.99	
Naphthalene-d8	421913	6.48	361517	6.48	
Acenaphthene-d10	243403	8.49	218183	8.49	
Phenanthrene-d10	319488	10.14	311094	10.14	
Chrysene-d12	227245	13.09	252432	13.08	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB14A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-04RE1 File ID: 0811328-04re1.D

Sampled: 11/12/08 16:00 Prepared: 12/01/08 08:36 Analyzed: 12/06/08 19:02

Solids: 94.24 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120828 Calibration: 8L08004 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
84-74-2	Di-n-butyl Phthalate	1	77	180	2.5	J
117-81-7	Bis(2-ethylhexyl) Phthalate	1	24	180	2.1	J

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	714	630	88	35 - 105	
Phenol-d6	722	634	88	40 - 100	
Nitrobenzene-d5	361	323	89	35 - 100	
2-Fluorobiphenyl	357	320	90	45 - 105	
2,4,6-Tribromophenol	725	620	86	35 - 125	
o-Terphenyl	354	344	97	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	96571	7.681	89832	7.675	
Naphthalene-d8	386689	10.385	358337	10.397	
Acenaphthene-d10	213193	14.489	202249	14.5	
Phenanthrene-d10	224569	17.916	271682	17.916	
Chrysene-d12	92193	21.53	164712	21.535	
Perylene-d12	72972	23.202	125756	23.202	

* Values outside of QC limits

Do not use
1/22/09

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB20A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-06 File ID: 81132806.D

Sampled: 11/12/08 14:34 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 13:55

Solids: 84.47 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
83-32-9	Acenaphthene	1	5.5	20	1.9	J	
208-96-8	Acenaphthylene	1	5.1	20	1.2	J	
98-86-2	Acetophenone	1	3.9	200	3.3	J	
120-12-7	Anthracene	1	19	20	3.0	J	
1912-24-9	Atrazine	1	200	200	1.8	U	
100-52-7	Benzaldehyde	1	200	200	31	U	UJ
56-55-3	Benzo(a)anthracene	1	120	20	1.1		
50-32-8	Benzo(a)pyrene	1	100	20	1.4		
205-99-2	Benzo(b)fluoranthene	1	180	20	1.2		
207-08-9	Benzo(k)fluoranthene	1	55	20	1.6		
191-24-2	Benzo(g,h,i)perylene	1	83	79	1.1		
92-52-4	1,1'-Biphenyl	1	1.6	200	1.1	J	
101-55-3	4-Bromophenyl Phenyl Ether	1	200	200	1.5	U	
85-68-7	Butyl Benzyl Phthalate	1	7.5	200	1.2	J	B
105-60-2	Caprolactam	1	390	390	27	U	UJ
86-74-8	Carbazole	1	11	200	0.59	J	B
59-50-7	4-Chloro-3-methylphenol	1	200	200	2.5	U	
106-47-8	4-Chloroaniline	1	200	200	23	U	
111-91-1	Bis(2-chloroethoxy)methane	1	200	200	0.99	U	
111-44-4	Bis(2-chloroethyl) Ether	1	200	200	1.3	U	
108-60-1	Bis(2-chloroisopropyl) Ether	1	200	200	1.3	U	
91-58-7	2-Chloronaphthalene	1	200	200	1.4	U	
95-57-8	2-Chlorophenol	1	200	200	0.71	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	1	200	200	0.53	U	
218-01-9	Chrysene	1	140	20	0.85		
53-70-3	Dibenz(a,h)anthracene	1	35	79	4.3	J	
132-64-9	Dibenzofuran	1	3.6	200	1.8	J	
84-74-2	Di-n-butyl Phthalate	1	71	200	2.8	J	B
91-94-1	3,3´-Dichlorobenzidine	1	390	390	93	U	
120-83-2	2,4-Dichlorophenol	1	200	200	2.6	U	
84-66-2	Diethyl Phthalate	1	56	200	0.44	J	
105-67-9	2,4-Dimethylphenol	1	200	200	6.7	U	
131-11-3	Dimethyl Phthalate	1	200	200	0.91	U	
534-52-1	4,6-Dinitro-2-methylphenol	1	200	200	4.3	U	R,M
51-28-5	2,4-Dinitrophenol	1	390	390	39	U	R,M
121-14-2	2,4-Dinitrotoluene	1	200	200	4.8	U	
606-20-2	2,6-Dinitrotoluene	1	200	200	2.7	U	
117-84-0	Di-n-octyl Phthalate	1	200	200	12	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	46	200	2.3	JB	B
206-44-0	Fluoranthene	1	170	20	1.8		
86-73-7	Fluorene	1	5.9	20	1.9	J	

08126

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB20A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-06 File ID: 81132806.D

Sampled: 11/12/08 14:34 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 13:55

Solids: 84.47 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
118-74-1	Hexachlorobenzene	1	200	200	4.0	U	
87-68-3	Hexachlorobutadiene	1	200	200	1.3	U	
77-47-4	Hexachlorocyclopentadiene	1	200	200	3.0	U	R,M
67-72-1	Hexachloroethane	1	200	200	0.92	U	R,M
193-39-5	Indeno(1,2,3-cd)pyrene	1	74	79	2.6	J	
78-59-1	Isophorone	1	3.6	200	1.0	J	B,J
91-57-6	2-Methylnaphthalene	1	5.1	200	0.88	J	
95-48-7	2-Methylphenol	1	200	200	2.6	U	
106-44-5	4-Methylphenol	1	200	200	1.5	U	
91-20-3	Naphthalene	1	4.7	20	2.2	J	
88-74-4	2-Nitroaniline	1	200	200	2.7	U	
99-09-2	3-Nitroaniline	1	200	200	13	U	
100-01-6	4-Nitroaniline	1	200	200	27	U	
98-95-3	Nitrobenzene	1	200	200	2.4	U	
100-02-7	4-Nitrophenol	1	390	390	13	U	R,M
88-75-5	2-Nitrophenol	1	200	200	8.4	U	
86-30-6	N-Nitroso-diphenylamine	1	18	200	0.87	J	
621-64-7	N-Nitroso-di-n-propylamine	1	200	200	1.4	U	
87-86-5	Pentachlorophenol	1	390	390	4.4	U	
85-01-8	Phenanthrene	1	69	20	2.6		
108-95-2	Phenol	1	200	200	5.9	U	
129-00-0	Pyrene	1	150	20	0.66		
95-94-3	1,2,4,5-Tetrachlorobenzene	1	200	200	1.2	U	
58-90-2	2,3,4,6-Tetrachlorophenol	1	200	200	4.4	U	
88-06-2	2,4,6-Trichlorophenol	1	200	200	1.6	U	
95-95-4	2,4,5-Trichlorophenol	1	200	200	3.9	U	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	797	752	94	35 - 105	
Phenol-d6	805	603	75	40 - 100	
Nitrobenzene-d5	402	352	87	35 - 100	
2-Fluorobiphenyl	399	403	101	45 - 105	
2,4,6-Tribromophenol	809	734	91	35 - 125	
o-Terphenyl	395	423	107	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	107769	5.01	93113	4.99	
Naphthalene-d8	420223	6.48	361517	6.48	
Acenaphthene-d10	248080	8.49	218183	8.49	
Phenanthrene-d10	329855	10.15	311094	10.14	
Chrysene-d12	244824	13.09	252432	13.08	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB20A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0811328-06RE1
File ID: 0811328-06re1.D
Sampled: 11/12/08 14:34
Prepared: 12/01/08 08:36
Analyzed: 12/08/08 11:55
Solids: 84.47
Preparation: 3550B Sonication
Initial/Final: 30 g / 1 mL
QC Batch: 0813821
Sequence: 8120947
Calibration: 8L08004
Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
84-74-2	Di-n-butyl Phthalate	1	27	200	2.8	J
117-81-7	Bis(2-ethylhexyl) Phthalate	1	65	200	2.3	J

B2 TPM

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	797	762	96	35 - 105	
Phenol-d6	805	745	93	40 - 100	
Nitrobenzene-d5	402	397	99	35 - 100	
2-Fluorobiphenyl	399	423	106	45 - 105	*
2,4,6-Tribromophenol	809	824	102	35 - 125	
o-Terphenyl	395	439	111	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	61899	7.553	89832	7.675	
Naphthalene-d8	235973	10.258	358337	10.397	
Acenaphthene-d10	124473	14.355	202249	14.5	
Phenanthrene-d10	134307	17.8	271682	17.916	*
Chrysene-d12	52433	21.449	164712	21.535	*
Perylene-d12	47384	23.092	125756	23.202	*

* Values outside of QC limits

Do not use
dm 12/2/09

: 08468

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB20A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-06RE2 File ID: 0811328-06re1 2x.D

Sampled: 11/12/08 14:34 Prepared: 12/01/08 08:36 Analyzed: 12/09/08 11:09

Solids: 84.47 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120925 Calibration: 8L08004 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
84-74-2	Di-n-butyl Phthalate	2	32	400	5.6	J
117-81-7	Bis(2-ethylhexyl) Phthalate	2	61	400	4.6	J

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	797	773	97	35 - 105	
Phenol-d6	805	762	95	40 - 100	
Nitrobenzene-d5	402	368	91	35 - 100	
2-Fluorobiphenyl	399	361	91	45 - 105	
2,4,6-Tribromophenol	809	808	100	35 - 125	
o-Terphenyl	395	332	84	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	75887	7.377	89832	7.675	
Naphthalene-d8	318656	10.076	358337	10.397	
Acenaphthene-d10	185395	14.168	202249	14.5	
Phenanthrene-d10	206247	17.636	271682	17.916	
Chrysene-d12	97768	21.325	164712	21.535	
Perylene-d12	87201	22.922	125756	23.202	

* Values outside of QC limits

Do not use
12/10/09

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB20C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-07 File ID: 81132807.D

Sampled: 11/12/08 14:49 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 14:25

Solids: 81.43 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
83-32-9	Acenaphthene	1	2.9	21	2.0	J	
208-96-8	Acenaphthylene	1	2.9	21	1.2	J	
98-86-2	Acetophenone	1	210	210	3.4	U	
120-12-7	Anthracene	1	8.2	21	3.1	J	
1912-24-9	Atrazine	1	210	210	1.8	U	
100-52-7	Benzaldehyde	1	210	210	32	U	U5,c
56-55-3	Benzo(a)anthracene	1	29	21	1.2		
50-32-8	Benzo(a)pyrene	1	35	21	1.4		
205-99-2	Benzo(b)fluoranthene	1	54	21	1.2		
207-08-9	Benzo(k)fluoranthene	1	23	21	1.6		
191-24-2	Benzo(g,h,i)perylene	1	23	82	1.1	J	
92-52-4	1,1'-Biphenyl	1	210	210	1.1	U	
101-55-3	4-Bromophenyl Phenyl Ether	1	210	210	1.6	U	
85-68-7	Butyl Benzyl Phthalate	1	5.7	210	1.2	J	B,c
105-60-2	Caprolactam	1	410	410	28	U	U5,c
86-74-8	Carbazole	1	7.0	210	0.61	J	B,z
59-50-7	4-Chloro-3-methylphenol	1	210	210	2.6	U	
106-47-8	4-Chloroaniline	1	210	210	24	U	
111-91-1	Bis(2-chloroethoxy)methane	1	210	210	1.0	U	
111-44-4	Bis(2-chloroethyl) Ether	1	210	210	1.3	U	
108-60-1	Bis(2-chloroisopropyl) Ether	1	210	210	1.4	U	
91-58-7	2-Chloronaphthalene	1	210	210	1.4	U	
95-57-8	2-Chlorophenol	1	210	210	0.73	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	1	210	210	0.55	U	
218-01-9	Chrysene	1	33	21	0.89		
53-70-3	Dibenz(a,h)anthracene	1	7.4	82	4.5	J	B,x
132-64-9	Dibenzofuran	1	2.0	210	1.9	J	
84-74-2	Di-n-butyl Phthalate	1	32	210	2.9	J	B,z
91-94-1	3,3'-Dichlorobenzidine	1	410	410	96	U	
120-83-2	2,4-Dichlorophenol	1	210	210	2.7	U	
84-66-2	Diethyl Phthalate	1	14	210	0.46	J	B,z
105-67-9	2,4-Dimethylphenol	1	210	210	7.0	U	
131-11-3	Dimethyl Phthalate	1	210	210	0.95	U	
534-52-1	4,6-Dinitro-2-methylphenol	1	210	210	4.5	U	R,m
51-28-5	2,4-Dinitrophenol	1	410	410	41	U	R,m
121-14-2	2,4-Dinitrotoluene	1	210	210	5.0	U	
606-20-2	2,6-Dinitrotoluene	1	210	210	2.8	U	
117-84-0	Di-n-octyl Phthalate	1	210	210	12	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	25	210	2.4	JB	B,z
206-44-0	Fluoranthene	1	37	21	1.9		
86-73-7	Fluorene	1	2.5	21	2.0	J	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB20C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-07 File ID: 81132807.D

Sampled: 11/12/08 14:49 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 14:25

Solids: 81.43 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
118-74-1	Hexachlorobenzene	1	210	210	4.1	U	
87-68-3	Hexachlorobutadiene	1	210	210	1.3	U	
77-47-4	Hexachlorocyclopentadiene	1	210	210	3.1	U	R_{1m}
67-72-1	Hexachloroethane	1	210	210	0.96	U	R_{1m}
193-39-5	Indeno(1,2,3-cd)pyrene	1	24	82	2.7	J	
78-59-1	Isophorone	1	3.3	210	1.0	J	B_{12}
91-57-6	2-Methylnaphthalene	1	1.6	210	0.91	J	
95-48-7	2-Methylphenol	1	210	210	2.7	U	
106-44-5	4-Methylphenol	1	210	210	1.6	U	
91-20-3	Naphthalene	1	2.5	21	2.3	J	
88-74-4	2-Nitroaniline	1	210	210	2.8	U	
99-09-2	3-Nitroaniline	1	210	210	14	U	
100-01-6	4-Nitroaniline	1	210	210	28	U	
98-95-3	Nitrobenzene	1	210	210	2.4	U	
100-02-7	4-Nitrophenol	1	410	410	14	U	R_{1m}
88-75-5	2-Nitrophenol	1	210	210	8.7	U	
86-30-6	N-Nitroso-diphenylamine	1	16	210	0.90	J	
621-64-7	N-Nitroso-di-n-propylamine	1	210	210	1.5	U	
87-86-5	Pentachlorophenol	1	410	410	4.5	U	
85-01-8	Phenanthrene	1	23	21	2.7		
108-95-2	Phenol	1	210	210	6.1	U	
129-00-0	Pyrene	1	34	21	0.68		
95-94-3	1,2,4,5-Tetrachlorobenzene	1	210	210	1.3	U	
58-90-2	2,3,4,6-Tetrachlorophenol	1	210	210	4.6	U	
88-06-2	2,4,6-Trichlorophenol	1	210	210	1.6	U	
95-95-4	2,4,5-Trichlorophenol	1	210	210	4.0	U	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	827	774	94	35 - 105	
Phenol-d6	835	690	83	40 - 100	
Nitrobenzene-d5	418	370	89	35 - 100	
2-Fluorobiphenyl	413	399	97	45 - 105	
2,4,6-Tribromophenol	839	680	81	35 - 125	
o-Terphenyl	409	427	104	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	99221	5.01	93113	4.99	
Naphthalene-d8	401532	6.49	361517	6.48	
Acenaphthene-d10	235979	8.49	218183	8.49	
Phenanthrene-d10	317082	10.15	311094	10.14	
Chrysene-d12	224985	13.09	252432	13.08	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB20C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-07RE1 File ID: 0811328-07re1.D

Sampled: 11/12/08 14:49 Prepared: 12/01/08 08:36 Analyzed: 12/06/08 20:11

Solids: 81.43 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120828 Calibration: 8L08004 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
84-74-2	Di-n-butyl Phthalate	1	27	210	2.9	J
117-81-7	Bis(2-ethylhexyl) Phthalate	1	22	210	2.4	J

B,Z
B,Z

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	827	760	92	35 - 105	
Phenol-d6	835	768	92	40 - 100	
Nitrobenzene-d5	418	379	91	35 - 100	
2-Fluorobiphenyl	413	390	94	45 - 105	
2,4,6-Tribromophenol	839	897	107	35 - 125	
o-Terphenyl	409	407	99	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	101279	7.681	89832	7.675	
Naphthalene-d8	415768	10.391	358337	10.397	
Acenaphthene-d10	222079	14.494	202249	14.5	
Phenanthrene-d10	255490	17.916	271682	17.916	
Chrysene-d12	118587	21.53	164712	21.535	
Perylene-d12	93814	23.208	125756	23.202	

* Values outside of QC limits

Do not use
AR 1/22/09

080521

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB22A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-08 File ID: 81132808.D

Sampled: 11/12/08 13:20 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 14:54

Solids: 84.78 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
83-32-9	Acenaphthene	1	3.5	20	1.9	J	
208-96-8	Acenaphthylene	1	3.5	20	1.2	J	
98-86-2	Acetophenone	1	3.5	200	3.3	J	
120-12-7	Anthracene	1	11	20	3.0	J	
1912-24-9	Atrazine	1	200	200	1.8	U	
100-52-7	Benzaldehyde	1	200	200	31	U	V5c
56-55-3	Benzo(a)anthracene	1	110	20	1.1		
50-32-8	Benzo(a)pyrene	1	83	20	1.4		
205-99-2	Benzo(b)fluoranthene	1	180	20	1.2		
207-08-9	Benzo(k)fluoranthene	1	42	20	1.6		
191-24-2	Benzo(g,h,i)perylene	1	63	79	1.1	J	
92-52-4	1,1'-Biphenyl	1	2.0	200	1.1	J	
101-55-3	4-Bromophenyl Phenyl Ether	1	200	200	1.5	U	
85-68-7	Butyl Benzyl Phthalate	1	17	200	1.2	J	B,Z
105-60-2	Caprolactam	1	390	390	27	U	B,Z
86-74-8	Carbazole	1	9.4	200	0.59	J	B,Z
59-50-7	4-Chloro-3-methylphenol	1	200	200	2.5	U	
106-47-8	4-Chloroaniline	1	200	200	23	U	
111-91-1	Bis(2-chloroethoxy)methane	1	200	200	0.99	U	
111-44-4	Bis(2-chloroethyl) Ether	1	200	200	1.3	U	
108-60-1	Bis(2-chloroisopropyl) Ether	1	200	200	1.3	U	
91-58-7	2-Chloronaphthalene	1	200	200	1.4	U	
95-57-8	2-Chlorophenol	1	200	200	0.70	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	1	200	200	0.53	U	
218-01-9	Chrysene	1	95	20	0.85		
53-70-3	Dibenz(a,h)anthracene	1	20	79	4.3	J	
132-64-9	Dibenzofuran	1	3.9	200	1.8	J	
84-74-2	Di-n-butyl Phthalate	1	250	200	2.8		B,Z
91-94-1	3,3'-Dichlorobenzidine	1	390	390	92	U	
120-83-2	2,4-Dichlorophenol	1	200	200	2.5	U	
84-66-2	Diethyl Phthalate	1	37	200	0.44	J	
105-67-9	2,4-Dimethylphenol	1	200	200	6.7	U	
131-11-3	Dimethyl Phthalate	1	200	200	0.91	U	
534-52-1	4,6-Dinitro-2-methylphenol	1	200	200	4.3	U	R,M
51-28-5	2,4-Dinitrophenol	1	390	390	39	U	R,M
121-14-2	2,4-Dinitrotoluene	1	200	200	4.8	U	
606-20-2	2,6-Dinitrotoluene	1	200	200	2.7	U	
117-84-0	Di-n-octyl Phthalate	1	200	200	12	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	440	200	2.3	B	B,Z
206-44-0	Fluoranthene	1	140	20	1.8		
86-73-7	Fluorene	1	4.7	20	1.9	J	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB22A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-08 File ID: 81132808.D

Sampled: 11/12/08 13:20 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 14:54

Solids: 84.78 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
118-74-1	Hexachlorobenzene	1	200	200	4.0	U	
87-68-3	Hexachlorobutadiene	1	200	200	1.3	U	
77-47-4	Hexachlorocyclopentadiene	1	200	200	2.9	U	RM
67-72-1	Hexachloroethane	1	200	200	0.92	U	RM
193-39-5	Indeno(1,2,3-cd)pyrene	1	56	79	2.6	J	
78-59-1	Isophorone	1	3.1	200	0.99	J	B,2
91-57-6	2-Methylnaphthalene	1	5.5	200	0.87	J	
95-48-7	2-Methylphenol	1	200	200	2.6	U	
106-44-5	4-Methylphenol	1	200	200	1.5	U	
91-20-3	Naphthalene	1	5.9	20	2.2	J	
88-74-4	2-Nitroaniline	1	200	200	2.7	U	
99-09-2	3-Nitroaniline	1	200	200	13	U	
100-01-6	4-Nitroaniline	1	200	200	27	U	
98-95-3	Nitrobenzene	1	200	200	2.3	U	
100-02-7	4-Nitrophenol	1	390	390	13	U	RM
88-75-5	2-Nitrophenol	1	200	200	8.4	U	
86-30-6	N-Nitroso-diphenylamine	1	17	200	0.87	J	
621-64-7	N-Nitroso-di-n-propylamine	1	200	200	1.4	U	
87-86-5	Pentachlorophenol	1	390	390	4.3	U	
85-01-8	Phenanthrene	1	60	20	2.6		
108-95-2	Phenol	1	200	200	5.8	U	
129-00-0	Pyrene	1	130	20	0.65		
95-94-3	1,2,4,5-Tetrachlorobenzene	1	200	200	1.2	U	
58-90-2	2,3,4,6-Tetrachlorophenol	1	200	200	4.4	U	
88-06-2	2,4,6-Trichlorophenol	1	200	200	1.6	U	
95-95-4	2,4,5-Trichlorophenol	1	200	200	3.9	U	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	794	723	91	35 - 105	
Phenol-d6	802	705	88	40 - 100	
Nitrobenzene-d5	401	357	89	35 - 100	
2-Fluorobiphenyl	397	384	97	45 - 105	
2,4,6-Tribromophenol	806	707	88	35 - 125	
o-Terphenyl	393	392	100	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	106474	5	93113	4.99	
Naphthalene-d8	417277	6.49	361517	6.48	
Acenaphthene-d10	251693	8.49	218183	8.49	
Phenanthrene-d10	342232	10.15	311094	10.14	
Chrysene-d12	247758	13.1	252432	13.08	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB22A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, W@ 008

Matrix: Soil Laboratory ID: 0811328-08RE1 File ID: 81132808.D

Sampled: 11/12/08 13:20 Prepared: 12/01/08 08:36 Analyzed: 12/07/08 13:58

Solids: 84.78 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120820 Calibration: 8L08002 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
84-74-2	Di-n-butyl Phthalate	1	540	200	2.8	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	770	200	2.3	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	794	798	100	35 - 105	
Phenol-d6	802	758	95	40 - 100	
Nitrobenzene-d5	401	374	93	35 - 100	
2-Fluorobiphenyl	397	419	105	45 - 105	
2,4,6-Tribromophenol	806	722	90	35 - 125	
o-Terphenyl	393	385	98	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	786610	7.56	576509	7.85	
Naphthalene-d8	2912332	10.27	2103574	10.59	
Acenaphthene-d10	1657511	14.37	1148967	14.7	
Phenanthrene-d10	2154275	17.83	1863437	18.09	
Chrysene-d12	1748252	21.48	1611285	21.66	
Perylene-d12	1891103	23.16	1765509	23.42	

* Values outside of QC limits

Do not use
12/19/08

: 00570

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB22C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-09 File ID: 81132809.D

Sampled: 11/12/08 13:25 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 15:24

Solids: 71.80 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
83-32-9	Acenaphthene	1	12	24	2.3	J	
208-96-8	Acenaphthylene	1	21	24	1.4	J	
98-86-2	Acetophenone	1	240	240	3.8	U	
120-12-7	Anthracene	1	180	24	3.5		
1912-24-9	Atrazine	1	240	240	2.1	U	
100-52-7	Benzaldehyde	1	240	240	36	U	VJ,c
56-55-3	Benzo(a)anthracene	1	480	24	1.3		
50-32-8	Benzo(a)pyrene	1	290	24	1.6		
205-99-2	Benzo(b)fluoranthene	1	630	24	1.4		
207-08-9	Benzo(k)fluoranthene	1	160	24	1.9		
191-24-2	Benzo(g,h,i)perylene	1	170	93	1.2		
92-52-4	1,1'-Biphenyl	1	8.8	240	1.2	J	
101-55-3	4-Bromophenyl Phenyl Ether	1	240	240	1.8	U	
85-68-7	Butyl Benzyl Phthalate	1	18	240	1.4	J	B,Z
105-60-2	Caprolactam	1	460	460	32	U	VJ,c
86-74-8	Carbazole	1	14	240	0.69	J	B,Z
59-50-7	4-Chloro-3-methylphenol	1	240	240	2.9	U	
106-47-8	4-Chloroaniline	1	240	240	27	U	
111-91-1	Bis(2-chloroethoxy)methane	1	240	240	1.2	U	
111-44-4	Bis(2-chloroethyl) Ether	1	240	240	1.5	U	
108-60-1	Bis(2-chloroisopropyl) Ether	1	240	240	1.6	U	
91-58-7	2-Chloronaphthalene	1	240	240	1.6	U	
95-57-8	2-Chlorophenol	1	240	240	0.83	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	1	240	240	0.62	U	
218-01-9	Chrysene	1	570	24	1.0		
53-70-3	Dibenz(a,h)anthracene	1	41	93	5.1	J	
132-64-9	Dibenzofuran	1	24	240	2.1	J	
84-74-2	Di-n-butyl Phthalate	1	100	240	3.3	J	
91-94-1	3,3'-Dichlorobenzidine	1	460	460	110	U	
120-83-2	2,4-Dichlorophenol	1	240	240	3.0	U	
84-66-2	Diethyl Phthalate	1	81	240	0.52	J	
105-67-9	2,4-Dimethylphenol	1	240	240	7.9	U	
131-11-3	Dimethyl Phthalate	1	240	240	1.1	U	
534-52-1	4,6-Dinitro-2-methylphenol	1	240	240	5.1	U	R,M
51-28-5	2,4-Dinitrophenol	1	460	460	46	U	R,M
121-14-2	2,4-Dinitrotoluene	1	240	240	5.7	U	
606-20-2	2,6-Dinitrotoluene	1	240	240	3.2	U	
117-84-0	Di-n-octyl Phthalate	1	240	240	14	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	130	240	2.7	JB	
206-44-0	Fluoranthene	1	130	24	2.1		
86-73-7	Fluorene	1	33	24	2.3		

ORGANIC ANALYSIS DATA SHEET

USEPA-8270C

13SB22C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-09 File ID: 81132809.D

Sampled: 11/12/08 13:25 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 15:24

Solids: 71.80 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
118-74-1	Hexachlorobenzene	1	240	240	4.7	U	
87-68-3	Hexachlorobutadiene	1	240	240	1.5	U	
77-47-4	Hexachlorocyclopentadiene	1	240	240	3.5	U	R,M
67-72-1	Hexachloroethane	1	240	240	1.1	U	R,M
193-39-5	Indeno(1,2,3-cd)pyrene	1	130	93	3.1		
78-59-1	Isophorone	1	2.8	240	1.2	J	B,Z
91-57-6	2-Methylnaphthalene	1	19	240	1.0	J	
95-48-7	2-Methylphenol	1	240	240	3.1	U	
106-44-5	4-Methylphenol	1	240	240	1.8	U	
91-20-3	Naphthalene	1	22	24	2.6	J	
88-74-4	2-Nitroaniline	1	240	240	3.2	U	
99-09-2	3-Nitroaniline	1	240	240	15	U	
100-01-6	4-Nitroaniline	1	240	240	32	U	
98-95-3	Nitrobenzene	1	240	240	2.8	U	
100-02-7	4-Nitrophenol	1	460	460	16	U	R,M
88-75-5	2-Nitrophenol	1	240	240	9.9	U	
86-30-6	N-Nitroso-diphenylamine	1	25	240	1.0	J	
621-64-7	N-Nitroso-di-n-propylamine	1	240	240	1.7	U	
87-86-5	Pentachlorophenol	1	460	460	5.1	U	
85-01-8	Phenanthrene	1	140	24	3.1		
108-95-2	Phenol	1	240	240	6.9	U	
129-00-0	Pyrene	1	260	24	0.77		
95-94-3	1,2,4,5-Tetrachlorobenzene	1	240	240	1.5	U	
58-90-2	2,3,4,6-Tetrachlorophenol	1	240	240	5.2	U	
88-06-2	2,4,6-Trichlorophenol	1	240	240	1.8	U	
95-95-4	2,4,5-Trichlorophenol	1	240	240	4.6	U	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	938	883	94	35 - 105	
Phenol-d6	947	891	94	40 - 100	
Nitrobenzene-d5	474	435	92	35 - 100	
2-Fluorobiphenyl	469	476	101	45 - 105	
2,4,6-Tribromophenol	952	932	98	35 - 125	
o-Terphenyl	464	490	106	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	105615	5	93113	4.99	
Naphthalene-d8	428779	6.48	361517	6.48	
Acenaphthene-d10	258502	8.49	218183	8.49	
Phenanthrene-d10	357465	10.15	311094	10.14	
Chrysene-d12	291425	13.1	252432	13.08	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB22C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-09RE1 File ID: 0811328-09re1.D

Sampled: 11/12/08 13:25 Prepared: 12/01/08 08:36 Analyzed: 12/06/08 21:20

Solids: 71.80 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120828 Calibration: 8L08004 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
84-74-2	Di-n-butyl Phthalate	1	47	240	3.3	J	B,2
117-81-7	Bis(2-ethylhexyl) Phthalate	1	39	240	2.7	J	B,2

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	938	831	89	35 - 105	
Phenol-d6	947	836	88	40 - 100	
Nitrobenzene-d5	474	413	87	35 - 100	
2-Fluorobiphenyl	469	437	93	45 - 105	
2,4,6-Tribromophenol	952	1030	108	35 - 125	
o-Terphenyl	464	454	98	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	97294	7.681	89832	7.675	
Naphthalene-d8	389942	10.391	358337	10.397	
Acenaphthene-d10	210486	14.494	202249	14.5	
Phenanthrene-d10	235492	17.916	271682	17.916	
Chrysene-d12	104094	21.535	164712	21.535	
Perylene-d12	73974	23.214	125756	23.202	

* Values outside of QC limits

Do not use
AA 1/20/09

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB21A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-10 File ID: 81132810.D

Sampled: 11/12/08 12:21 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 15:53

Solids: 76.82 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
83-32-9	Acenaphthene	1	22	22	2.1	U	
208-96-8	Acenaphthylene	1	2.6	22	1.3	J	
98-86-2	Acetophenone	1	220	220	3.6	U	
120-12-7	Anthracene	1	6.5	22	3.3	J	B,X
1912-24-9	Atrazine	1	220	220	1.9	U	
100-52-7	Benzaldehyde	1	220	220	34	U	U,J-
56-55-3	Benzo(a)anthracene	1	17	22	1.2	J	
50-32-8	Benzo(a)pyrene	1	28	22	1.5		
205-99-2	Benzo(b)fluoranthene	1	47	22	1.3		
207-08-9	Benzo(k)fluoranthene	1	21	22	1.7	J	
191-24-2	Benzo(g,h,i)perylene	1	15	87	1.2	J	
92-52-4	1,1'-Biphenyl	1	220	220	1.2	U	
101-55-3	4-Bromophenyl Phenyl Ether	1	220	220	1.7	U	
85-68-7	Butyl Benzyl Phthalate	1	10	220	1.3	J	B,Z-
105-60-2	Caprolactam	1	430	430	30	U	U,J-
86-74-8	Carbazole	1	4.8	220	0.65	J	B,Z
59-50-7	4-Chloro-3-methylphenol	1	220	220	2.7	U	
106-47-8	4-Chloroaniline	1	220	220	26	U	
111-91-1	Bis(2-chloroethoxy)methane	1	220	220	1.1	U	
111-44-4	Bis(2-chloroethyl) Ether	1	220	220	1.4	U	
108-60-1	Bis(2-chloroisopropyl) Ether	1	220	220	1.5	U	
91-58-7	2-Chloronaphthalene	1	220	220	1.5	U	
95-57-8	2-Chlorophenol	1	220	220	0.78	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	1	220	220	0.58	U	
218-01-9	Chrysene	1	29	22	0.94		
53-70-3	Dibenz(a,h)anthracene	1	8.2	87	4.8	J	B,X
132-64-9	Dibenzofuran	1	220	220	2.0	U	
84-74-2	Di-n-butyl Phthalate	1	97	220	3.1	J	B,Z
91-94-1	3,3'-Dichlorobenzidine	1	430	430	100	U	
120-83-2	2,4-Dichlorophenol	1	220	220	2.8	U	
84-66-2	Diethyl Phthalate	1	4.3	220	0.48	J	B,Z
105-67-9	2,4-Dimethylphenol	1	220	220	7.4	U	
131-11-3	Dimethyl Phthalate	1	220	220	1.0	U	
534-52-1	4,6-Dinitro-2-methylphenol	1	220	220	4.7	U	R,M
51-28-5	2,4-Dinitrophenol	1	430	430	43	U	R,M
121-14-2	2,4-Dinitrotoluene	1	220	220	5.3	U	
606-20-2	2,6-Dinitrotoluene	1	220	220	3.0	U	
117-84-0	Di-n-octyl Phthalate	1	220	220	13	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	30	220	2.5	JB	B,Z
206-44-0	Fluoranthene	1	21	22	2.0	J	B,Z
86-73-7	Fluorene	1	22	22	2.1	U	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB21A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-10 File ID: 81132810.D

Sampled: 11/12/08 12:21 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 15:53

Solids: 76.82 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
118-74-1	Hexachlorobenzene	1	220	220	4.4	U	
87-68-3	Hexachlorobutadiene	1	220	220	1.4	U	
77-47-4	Hexachlorocyclopentadiene	1	220	220	3.3	U	R,M
67-72-1	Hexachloroethane	1	220	220	1.0	U	R,M
193-39-5	Indeno(1,2,3-cd)pyrene	1	17	87	2.9	J	
78-59-1	Isophorone	1	220	220	1.1	U	
91-57-6	2-Methylnaphthalene	1	220	220	0.96	U	
95-48-7	2-Methylphenol	1	220	220	2.9	U	
106-44-5	4-Methylphenol	1	220	220	1.7	U	
91-20-3	Naphthalene	1	22	22	2.4	U	
88-74-4	2-Nitroaniline	1	220	220	3.0	U	
99-09-2	3-Nitroaniline	1	220	220	14	U	
100-01-6	4-Nitroaniline	1	220	220	30	U	
98-95-3	Nitrobenzene	1	220	220	2.6	U	
100-02-7	4-Nitrophenol	1	430	430	15	U	R,M
88-75-5	2-Nitrophenol	1	220	220	9.2	U	
86-30-6	N-Nitroso-diphenylamine	1	220	220	0.96	U	
621-64-7	N-Nitroso-di-n-propylamine	1	220	220	1.6	U	
87-86-5	Pentachlorophenol	1	430	430	4.8	U	
85-01-8	Phenanthrene	1	12	22	2.9	J	
108-95-2	Phenol	1	220	220	6.4	U	
129-00-0	Pyrene	1	18	22	0.72	J	B,Z
95-94-3	1,2,4,5-Tetrachlorobenzene	1	220	220	1.4	U	
58-90-2	2,3,4,6-Tetrachlorophenol	1	220	220	4.9	U	
88-06-2	2,4,6-Trichlorophenol	1	220	220	1.7	U	
95-95-4	2,4,5-Trichlorophenol	1	220	220	4.3	U	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	876	758	87	35 - 105	
Phenol-d6	885	752	85	40 - 100	
Nitrobenzene-d5	443	383	86	35 - 100	
2-Fluorobiphenyl	438	407	93	45 - 105	
2,4,6-Tribromophenol	890	732	82	35 - 125	
o-Terphenyl	434	492	114	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	111360	5.01	93113	4.99	
Naphthalene-d8	444846	6.49	361517	6.48	
Acenaphthene-d10	262989	8.49	218183	8.49	
Phenanthrene-d10	330147	10.16	311094	10.14	
Chrysene-d12	264043	13.1	252432	13.08	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB21A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-10RE1 File ID: 0811328-10re1.D

Sampled: 11/12/08 12:21 Prepared: 12/01/08 08:36 Analyzed: 12/06/08 21:54

Solids: 76.82 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120828 Calibration: 8L08004 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
84-74-2	Di-n-butyl Phthalate	1	16	220	3.1	J
117-81-7	Bis(2-ethylhexyl) Phthalate	1	22	220	2.5	J

B2
B2

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	876	797	91	35 - 105	
Phenol-d6	885	803	91	40 - 100	
Nitrobenzene-d5	443	408	92	35 - 100	
2-Fluorobiphenyl	438	402	92	45 - 105	
2,4,6-Tribromophenol	890	823	92	35 - 125	
o-Terphenyl	434	415	96	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	99729	7.686	89832	7.675	
Naphthalene-d8	402270	10.391	358337	10.397	
Acenaphthene-d10	227669	14.494	202249	14.5	
Phenanthrene-d10	270340	17.922	271682	17.916	
Chrysene-d12	130392	21.535	164712	21.535	
Perylene-d12	104596	23.208	125756	23.202	

* Values outside of QC limits

Do not use
Alex 1/20/09

00671

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB18A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-11 File ID: 81132811.D

Sampled: 11/13/08 15:21 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 16:22

Solids: 81.46 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
83-32-9	Acenaphthene	1	21	21	2.0	U	
208-96-8	Acenaphthylene	1	18	21	1.2	J	
98-86-2	Acetophenone	1	210	210	3.4	U	
120-12-7	Anthracene	1	12	21	3.1	J	
1912-24-9	Atrazine	1	210	210	1.8	U	
100-52-7	Benzaldehyde	1	210	210	32	U	UJ, c
56-55-3	Benzo(a)anthracene	1	74	21	1.2		
50-32-8	Benzo(a)pyrene	1	51	21	1.4		
205-99-2	Benzo(b)fluoranthene	1	68	21	1.2		
207-08-9	Benzo(k)fluoranthene	1	24	21	1.6		
191-24-2	Benzo(g,h,i)perylene	1	21	82	1.1	J	
92-52-4	1,1'-Biphenyl	1	210	210	1.1	U	
101-55-3	4-Bromophenyl Phenyl Ether	1	210	210	1.6	U	
85-68-7	Butyl Benzyl Phthalate	1	5.7	210	1.2	J	B2
105-60-2	Caprolactam	1	410	410	28	U	UJ, c
86-74-8	Carbazole	1	5.3	210	0.61	J	B2
59-50-7	4-Chloro-3-methylphenol	1	210	210	2.6	U	
106-47-8	4-Chloroaniline	1	210	210	24	U	
111-91-1	Bis(2-chloroethoxy)methane	1	210	210	1.0	U	
111-44-4	Bis(2-chloroethyl) Ether	1	210	210	1.3	U	
108-60-1	Bis(2-chloroisopropyl) Ether	1	210	210	1.4	U	
91-58-7	2-Chloronaphthalene	1	210	210	1.4	U	
95-57-8	2-Chlorophenol	1	210	210	0.73	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	1	210	210	0.55	U	
218-01-9	Chrysene	1	81	21	0.89		
53-70-3	Dibenz(a,h)anthracene	1	10	82	4.5	J	
132-64-9	Dibenzofuran	1	210	210	1.9	U	
84-74-2	Di-n-butyl Phthalate	1	92	210	2.9	J	B2
91-94-1	3,3'-Dichlorobenzidine	1	410	410	96	U	
120-83-2	2,4-Dichlorophenol	1	210	210	2.7	U	
84-66-2	Diethyl Phthalate	1	1.2	210	0.46	J	B2
105-67-9	2,4-Dimethylphenol	1	210	210	7.0	U	
131-11-3	Dimethyl Phthalate	1	210	210	0.95	U	
534-52-1	4,6-Dinitro-2-methylphenol	1	210	210	4.5	U	R, M
51-28-5	2,4-Dinitrophenol	1	410	410	41	U	R, M
121-14-2	2,4-Dinitrotoluene	1	210	210	5.0	U	
606-20-2	2,6-Dinitrotoluene	1	210	210	2.8	U	
117-84-0	Di-n-octyl Phthalate	1	210	210	12	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	18	210	2.4	JB	B2
206-44-0	Fluoranthene	1	99	21	1.9		
86-73-7	Fluorene	1	6.5	21	2.0	J	

: 00679

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB18A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-11 File ID: 81132811.D

Sampled: 11/13/08 15:21 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 16:22

Solids: 81.46 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
118-74-1	Hexachlorobenzene	1	210	210	4.1	U	
87-68-3	Hexachlorobutadiene	1	210	210	1.3	U	
77-47-4	Hexachlorocyclopentadiene	1	210	210	3.1	U	RM
67-72-1	Hexachloroethane	1	210	210	0.96	U	RM
193-39-5	Indeno(1,2,3-cd)pyrene	1	20	82	2.7	J	
78-59-1	Isophorone	1	2.5	210	1.0	J	BJ2
91-57-6	2-Methylnaphthalene	1	1.2	210	0.91	J	
95-48-7	2-Methylphenol	1	210	210	2.7	U	
106-44-5	4-Methylphenol	1	210	210	1.6	U	
91-20-3	Naphthalene	1	21	21	2.3	U	
88-74-4	2-Nitroaniline	1	210	210	2.8	U	
99-09-2	3-Nitroaniline	1	210	210	14	U	
100-01-6	4-Nitroaniline	1	210	210	28	U	
98-95-3	Nitrobenzene	1	210	210	2.4	U	
100-02-7	4-Nitrophenol	1	410	410	14	U	RM
88-75-5	2-Nitrophenol	1	210	210	8.7	U	
86-30-6	N-Nitroso-diphenylamine	1	17	210	0.90	J	
621-64-7	N-Nitroso-di-n-propylamine	1	210	210	1.5	U	
87-86-5	Pentachlorophenol	1	410	410	4.5	U	
85-01-8	Phenanthrene	1	60	21	2.7		
108-95-2	Phenol	1	210	210	6.1	U	
129-00-0	Pyrene	1	150	21	0.68		
95-94-3	1,2,4,5-Tetrachlorobenzene	1	210	210	1.3	U	
58-90-2	2,3,4,6-Tetrachlorophenol	1	210	210	4.6	U	
88-06-2	2,4,6-Trichlorophenol	1	210	210	1.6	U	
95-95-4	2,4,5-Trichlorophenol	1	210	210	4.0	U	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	827	728	88	35 - 105	
Phenol-d6	835	699	84	40 - 100	
Nitrobenzene-d5	417	367	88	35 - 100	
2-Fluorobiphenyl	413	402	97	45 - 105	
2,4,6-Tribromophenol	839	620	74	35 - 125	
o-Terphenyl	409	442	108	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	107288	5.01	93113	4.99	
Naphthalene-d8	422818	6.49	361517	6.48	
Acenaphthene-d10	250659	8.49	218183	8.49	
Phenanthrene-d10	332496	10.16	311094	10.14	
Chrysene-d12	244447	13.1	252432	13.08	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB18A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-11RE1 File ID: 0811328-11re1.D

Sampled: 11/13/08 15:21 Prepared: 12/01/08 08:36 Analyzed: 12/06/08 22:28

Solids: 81.46 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120828 Calibration: 8L08004 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
84-74-2	Di-n-butyl Phthalate	1	9.8	210	2.9	J
117-81-7	Bis(2-ethylhexyl) Phthalate	1	14	210	2.4	J

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	827	758	92	35 - 105	
Phenol-d6	835	761	91	40 - 100	
Nitrobenzene-d5	417	381	91	35 - 100	
2-Fluorobiphenyl	413	385	93	45 - 105	
2,4,6-Tribromophenol	839	687	82	35 - 125	
o-Terphenyl	409	412	101	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	97310	7.687	89832	7.675	
Naphthalene-d8	401759	10.397	358337	10.397	
Acenaphthene-d10	221873	14.494	202249	14.5	
Phenanthrene-d10	265648	17.922	271682	17.916	
Chrysene-d12	133265	21.535	164712	21.535	
Perylene-d12	106263	23.208	125756	23.202	

* Values outside of QC limits

Do not use
AM 1/26/09

00715

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB18C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-12 File ID: 81132812.D

Sampled: 11/13/08 15:29 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 16:51

Solids: 80.33 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
83-32-9	Acenaphthene	1	21	21	2.0	U	
208-96-8	Acenaphthylene	1	4.1	21	1.3	J	
98-86-2	Acetophenone	1	3.7	210	3.4	J	
120-12-7	Anthracene	1	21	21	3.2	U	
1912-24-9	Atrazine	1	210	210	1.9	U	
100-52-7	Benzaldehyde	1	210	210	33	U	
56-55-3	Benzo(a)anthracene	1	12	21	1.2	J	
50-32-8	Benzo(a)pyrene	1	10	21	1.4	J	
205-99-2	Benzo(b)fluoranthene	1	10	21	1.2	J	
207-08-9	Benzo(k)fluoranthene	1	7.1	21	1.7	J	
191-24-2	Benzo(g,h,i)perylene	1	5.4	83	1.1	J	
92-52-4	1,1'-Biphenyl	1	210	210	1.1	U	
101-55-3	4-Bromophenyl Phenyl Ether	1	210	210	1.6	U	
85-68-7	Butyl Benzyl Phthalate	1	3.3	210	1.3	J	
105-60-2	Caprolactam	1	410	410	29	U	
86-74-8	Carbazole	1	210	210	0.62	U	
59-50-7	4-Chloro-3-methylphenol	1	210	210	2.6	U	
106-47-8	4-Chloroaniline	1	210	210	24	U	
111-91-1	Bis(2-chloroethoxy)methane	1	210	210	1.0	U	
111-44-4	Bis(2-chloroethyl) Ether	1	210	210	1.3	U	
108-60-1	Bis(2-chloroisopropyl) Ether	1	210	210	1.4	U	
91-58-7	2-Chloronaphthalene	1	210	210	1.4	U	
95-57-8	2-Chlorophenol	1	210	210	0.74	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	1	210	210	0.56	U	
218-01-9	Chrysene	1	14	21	0.90	J	
53-70-3	Dibenz(a,h)anthracene	1	83	83	4.5	U	
132-64-9	Dibenzofuran	1	210	210	1.9	U	
84-74-2	Di-n-butyl Phthalate	1	90	210	2.9	J	
91-94-1	3,3´-Dichlorobenzidine	1	410	410	98	U	
120-83-2	2,4-Dichlorophenol	1	210	210	2.7	U	
84-66-2	Diethyl Phthalate	1	1.2	210	0.46	J	
105-67-9	2,4-Dimethylphenol	1	210	210	7.1	U	
131-11-3	Dimethyl Phthalate	1	210	210	0.96	U	
534-52-1	4,6-Dinitro-2-methylphenol	1	210	210	4.5	U	
51-28-5	2,4-Dinitrophenol	1	410	410	41	U	
121-14-2	2,4-Dinitrotoluene	1	210	210	5.1	U	
606-20-2	2,6-Dinitrotoluene	1	210	210	2.8	U	
117-84-0	Di-n-octyl Phthalate	1	210	210	12	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	16	210	2.4	JB	
206-44-0	Fluoranthene	1	16	21	1.9	J	
86-73-7	Fluorene	1	21	21	2.0	U	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB18C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-12 File ID: 81132812.D

Sampled: 11/13/08 15:29 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 16:51

Solids: 80.33 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
118-74-1	Hexachlorobenzene	1	210	210	4.2	U	
87-68-3	Hexachlorobutadiene	1	210	210	1.3	U	
77-47-4	Hexachlorocyclopentadiene	1	210	210	3.1	U	RM
67-72-1	Hexachloroethane	1	210	210	0.97	U	RM
193-39-5	Indeno(1,2,3-cd)pyrene	1	3.3	83	2.8	J	
78-59-1	Isophorone	1	2.5	210	1.0	J	BJ2
91-57-6	2-Methylnaphthalene	1	210	210	0.92	U	
95-48-7	2-Methylphenol	1	210	210	2.8	U	
106-44-5	4-Methylphenol	1	210	210	1.6	U	
91-20-3	Naphthalene	1	21	21	2.3	U	
88-74-4	2-Nitroaniline	1	210	210	2.9	U	
99-09-2	3-Nitroaniline	1	210	210	14	U	
100-01-6	4-Nitroaniline	1	210	210	29	U	
98-95-3	Nitrobenzene	1	210	210	2.5	U	
100-02-7	4-Nitrophenol	1	410	410	14	U	RM
88-75-5	2-Nitrophenol	1	210	210	8.8	U	
86-30-6	N-Nitroso-diphenylamine	1	210	210	0.92	U	
621-64-7	N-Nitroso-di-n-propylamine	1	210	210	1.5	U	
87-86-5	Pentachlorophenol	1	410	410	4.6	U	
85-01-8	Phenanthrene	1	8.3	21	2.8	J	
108-95-2	Phenol	1	210	210	6.2	U	
129-00-0	Pyrene	1	23	21	0.69		
95-94-3	1,2,4,5-Tetrachlorobenzene	1	210	210	1.3	U	
58-90-2	2,3,4,6-Tetrachlorophenol	1	210	210	4.7	U	
88-06-2	2,4,6-Trichlorophenol	1	210	210	1.6	U	
95-95-4	2,4,5-Trichlorophenol	1	210	210	4.1	U	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	838	744	89	35 - 105	
Phenol-d6	846	707	83	40 - 100	
Nitrobenzene-d5	423	373	88	35 - 100	
2-Fluorobiphenyl	419	410	98	45 - 105	
2,4,6-Tribromophenol	851	778	91	35 - 125	
o-Terphenyl	415	448	108	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	104477	5.01	93113	4.99	
Naphthalene-d8	413203	6.49	361517	6.48	
Acenaphthene-d10	250028	8.49	218183	8.49	
Phenanthrene-d10	333824	10.16	311094	10.14	
Chrysene-d12	251250	13.1	252432	13.08	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB18C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-12RE1 File ID: 0811328-12re1.D

Sampled: 11/13/08 15:29 Prepared: 12/01/08 08:36 Analyzed: 12/06/08 23:02

Solids: 80.33 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120828 Calibration: 8L08004 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
84-74-2	Di-n-butyl Phthalate	1	10	210	2.9	J
117-81-7	Bis(2-ethylhexyl) Phthalate	1	11	210	2.4	J

B 2
B 2

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	838	786	94	35 - 105	
Phenol-d6	846	777	92	40 - 100	
Nitrobenzene-d5	423	401	95	35 - 100	
2-Fluorobiphenyl	419	413	99	45 - 105	
2,4,6-Tribromophenol	851	825	97	35 - 125	
o-Terphenyl	415	437	105	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	96605	7.687	89832	7.675	
Naphthalene-d8	379928	10.397	358337	10.397	
Acenaphthene-d10	213042	14.495	202249	14.5	
Phenanthrene-d10	244795	17.922	271682	17.916	
Chrysene-d12	115203	21.536	164712	21.535	
Perylene-d12	90507	23.214	125756	23.202	

* Values outside of QC limits

: 087534

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB19A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-14 File ID: 81132814.D

Sampled: 11/13/08 12:22 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 17:20

Solids: 67.63 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
83-32-9	Acenaphthene	1	25	25	2.4	U	
208-96-8	Acenaphthylene	1	2.0	25	1.5	J	
98-86-2	Acetophenone	1	250	250	4.1	U	
120-12-7	Anthracene	1	25	25	3.8	U	
1912-24-9	Atrazine	1	250	250	2.2	U	
100-52-7	Benzaldehyde	1	250	250	39	U	UJ,c
56-55-3	Benzo(a)anthracene	1	3.5	25	1.4	J	B,z
50-32-8	Benzo(a)pyrene	1	2.5	25	1.7	J	B,z
205-99-2	Benzo(b)fluoranthene	1	3.5	25	1.5	J	B,z
207-08-9	Benzo(k)fluoranthene	1	25	25	2.0	U	
191-24-2	Benzo(g,h,i)perylene	1	2.5	99	1.3	J	B,z
92-52-4	1,1'-Biphenyl	1	250	250	1.3	U	
101-55-3	4-Bromophenyl Phenyl Ether	1	250	250	1.9	U	
85-68-7	Butyl Benzyl Phthalate	1	3.9	250	1.5	J	B,z
105-60-2	Caprolactam	1	490	490	34	U	UJ,c
86-74-8	Carbazole	1	250	250	0.74	U	
59-50-7	4-Chloro-3-methylphenol	1	250	250	3.1	U	
106-47-8	4-Chloroaniline	1	250	250	29	U	
111-91-1	Bis(2-chloroethoxy)methane	1	250	250	1.2	U	
111-44-4	Bis(2-chloroethyl) Ether	1	250	250	1.6	U	
108-60-1	Bis(2-chloroisopropyl) Ether	1	250	250	1.7	U	
91-58-7	2-Chloronaphthalene	1	250	250	1.7	U	
95-57-8	2-Chlorophenol	1	250	250	0.88	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	1	250	250	0.66	U	
218-01-9	Chrysene	1	3.0	25	1.1	J	B,z
53-70-3	Dibenz(a,h)anthracene	1	99	99	5.4	U	
132-64-9	Dibenzofuran	1	250	250	2.2	U	
84-74-2	Di-n-butyl Phthalate	1	120	250	3.5	J	B,z
91-94-1	3,3'-Dichlorobenzidine	1	490	490	120	U	
120-83-2	2,4-Dichlorophenol	1	250	250	3.2	U	
84-66-2	Diethyl Phthalate	1	2.0	250	0.55	J	B,z
105-67-9	2,4-Dimethylphenol	1	250	250	8.4	U	
131-11-3	Dimethyl Phthalate	1	250	250	1.1	U	
534-52-1	4,6-Dinitro-2-methylphenol	1	250	250	5.4	U	Rm
51-28-5	2,4-Dinitrophenol	1	490	490	49	U	Rm
121-14-2	2,4-Dinitrotoluene	1	250	250	6.0	U	
606-20-2	2,6-Dinitrotoluene	1	250	250	3.4	U	
117-84-0	Di-n-octyl Phthalate	1	250	250	15	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	15	250	2.9	JB	B,z
206-44-0	Fluoranthene	1	3.9	25	2.3	J	B,z
86-73-7	Fluorene	1	25	25	2.4	U	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB19A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-14 File ID: 81132814.D

Sampled: 11/13/08 12:22 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 17:20

Solids: 67.63 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
118-74-1	Hexachlorobenzene	1	250	250	5.0	U	
87-68-3	Hexachlorobutadiene	1	250	250	1.6	U	
77-47-4	Hexachlorocyclopentadiene	1	250	250	3.7	U	R,M
67-72-1	Hexachloroethane	1	250	250	1.2	U	R,M
193-39-5	Indeno(1,2,3-cd)pyrene	1	99	99	3.3	U	
78-59-1	Isophorone	1	4.9	250	1.2	J	B,Z
91-57-6	2-Methylnaphthalene	1	250	250	1.1	U	
95-48-7	2-Methylphenol	1	250	250	3.3	U	
106-44-5	4-Methylphenol	1	250	250	1.9	U	
91-20-3	Naphthalene	1	25	25	2.8	U	
88-74-4	2-Nitroaniline	1	250	250	3.4	U	
99-09-2	3-Nitroaniline	1	250	250	16	U	
100-01-6	4-Nitroaniline	1	250	250	34	U	
98-95-3	Nitrobenzene	1	250	250	2.9	U	
100-02-7	4-Nitrophenol	1	490	490	17	U	R,M
88-75-5	2-Nitrophenol	1	250	250	10	U	
86-30-6	N-Nitroso-diphenylamine	1	250	250	1.1	U	
621-64-7	N-Nitroso-di-n-propylamine	1	250	250	1.8	U	
87-86-5	Pentachlorophenol	1	490	490	5.4	U	
85-01-8	Phenanthrene	1	25	25	3.3	U	
108-95-2	Phenol	1	250	250	7.3	U	
129-00-0	Pyrene	1	3.0	25	0.82	J	B,Z
95-94-3	1,2,4,5-Tetrachlorobenzene	1	250	250	1.6	U	
58-90-2	2,3,4,6-Tetrachlorophenol	1	250	250	5.5	U	
88-06-2	2,4,6-Trichlorophenol	1	250	250	2.0	U	
95-95-4	2,4,5-Trichlorophenol	1	250	250	4.9	U	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	996	924	93	35 - 105	
Phenol-d6	1010	900	90	40 - 100	
Nitrobenzene-d5	503	465	92	35 - 100	
2-Fluorobiphenyl	498	492	99	45 - 105	
2,4,6-Tribromophenol	1010	957	95	35 - 125	
o-Terphenyl	493	534	108	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	105885	5.01	93113	4.99	
Naphthalene-d8	418418	6.49	361517	6.48	
Acenaphthene-d10	252939	8.49	218183	8.49	
Phenanthrene-d10	334774	10.16	311094	10.14	
Chrysene-d12	262334	13.1	252432	13.08	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB19A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-14RE1 File ID: 0811328-14re1.D

Sampled: 11/13/08 12:22 Prepared: 12/01/08 08:36 Analyzed: 12/06/08 23:36

Solids: 67.63 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120828 Calibration: 8L08004 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
84-74-2	Di-n-butyl Phthalate	1	200	250	3.5	J
117-81-7	Bis(2-ethylhexyl) Phthalate	1	120	250	2.9	J

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	996	888	89	35 - 105	
Phenol-d6	1010	863	86	40 - 100	
Nitrobenzene-d5	503	457	91	35 - 100	
2-Fluorobiphenyl	498	446	90	45 - 105	
2,4,6-Tribromophenol	1010	977	97	35 - 125	
o-Terphenyl	493	447	91	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	99140	7.686	89832	7.675	
Naphthalene-d8	389038	10.391	358337	10.397	
Acenaphthene-d10	218093	14.494	202249	14.5	
Phenanthrene-d10	257400	17.922	271682	17.916	
Chrysene-d12	103260	21.535	164712	21.535	
Perylene-d12	77091	23.214	125756	23.202	

* Values outside of QC limits

Do not use
12/2/09

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB19C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-15 File ID: 81132815.D

Sampled: 11/13/08 12:27 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 17:48

Solids: 76.14 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
83-32-9	Acenaphthene	1	22	22	2.1	U	
208-96-8	Acenaphthylene	1	22	22	1.3	U	
98-86-2	Acetophenone	1	220	220	3.6	U	
120-12-7	Anthracene	1	22	22	3.3	U	
1912-24-9	Atrazine	1	220	220	2.0	U	
100-52-7	Benzaldehyde	1	220	220	34	U	UJc
56-55-3	Benzo(a)anthracene	1	1.8	22	1.2	J	B,2
50-32-8	Benzo(a)pyrene	1	22	22	1.5	U	
205-99-2	Benzo(b)fluoranthene	1	22	22	1.3	U	
207-08-9	Benzo(k)fluoranthene	1	22	22	1.7	U	
191-24-2	Benzo(g,h,i)perylene	1	88	88	1.2	U	
92-52-4	1,1'-Biphenyl	1	220	220	1.2	U	
101-55-3	4-Bromophenyl Phenyl Ether	1	220	220	1.7	U	
85-68-7	Butyl Benzyl Phthalate	1	3.9	220	1.3	J	B,2
105-60-2	Caprolactam	1	430	430	30	U	UJc
86-74-8	Carbazole	1	220	220	0.65	U	
59-50-7	4-Chloro-3-methylphenol	1	220	220	2.7	U	
106-47-8	4-Chloroaniline	1	220	220	26	U	
111-91-1	Bis(2-chloroethoxy)methane	1	220	220	1.1	U	
111-44-4	Bis(2-chloroethyl) Ether	1	220	220	1.4	U	
108-60-1	Bis(2-chloroisopropyl) Ether	1	220	220	1.5	U	
91-58-7	2-Chloronaphthalene	1	220	220	1.5	U	
95-57-8	2-Chlorophenol	1	220	220	0.78	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	1	220	220	0.59	U	
218-01-9	Chrysene	1	1.3	22	0.95	J	B,2
53-70-3	Dibenz(a,h)anthracene	1	88	88	4.8	U	
132-64-9	Dibenzofuran	1	220	220	2.0	U	
84-74-2	Di-n-butyl Phthalate	1	110	220	3.1	J	B,2
91-94-1	3,3'-Dichlorobenzidine	1	430	430	100	U	
120-83-2	2,4-Dichlorophenol	1	220	220	2.8	U	
84-66-2	Diethyl Phthalate	1	1.3	220	0.49	J	B,2
105-67-9	2,4-Dimethylphenol	1	220	220	7.4	U	
131-11-3	Dimethyl Phthalate	1	220	220	1.0	U	
534-52-1	4,6-Dinitro-2-methylphenol	1	220	220	4.8	U	L,M
51-28-5	2,4-Dinitrophenol	1	430	430	43	U	L,M
121-14-2	2,4-Dinitrotoluene	1	220	220	5.3	U	
606-20-2	2,6-Dinitrotoluene	1	220	220	3.0	U	
117-84-0	Di-n-octyl Phthalate	1	220	220	13	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	15	220	2.6	JB	B,2
206-44-0	Fluoranthene	1	22	22	2.0	U	
86-73-7	Fluorene	1	22	22	2.1	U	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB19C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-15 File ID: 81132815.D

Sampled: 11/13/08 12:27 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 17:48

Solids: 76.14 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
118-74-1	Hexachlorobenzene	1	220	220	4.4	U	
87-68-3	Hexachlorobutadiene	1	220	220	1.4	U	
77-47-4	Hexachlorocyclopentadiene	1	220	220	3.3	U	R,M
67-72-1	Hexachloroethane	1	220	220	1.0	U	R,M
193-39-5	Indeno(1,2,3-cd)pyrene	1	88	88	2.9	U	
78-59-1	Isophorone	1	3.5	220	1.1	J	B,Z
91-57-6	2-Methylnaphthalene	1	220	220	0.97	U	
95-48-7	2-Methylphenol	1	220	220	2.9	U	
106-44-5	4-Methylphenol	1	220	220	1.7	U	
91-20-3	Naphthalene	1	22	22	2.5	U	
88-74-4	2-Nitroaniline	1	220	220	3.0	U	
99-09-2	3-Nitroaniline	1	220	220	14	U	
100-01-6	4-Nitroaniline	1	220	220	30	U	
98-95-3	Nitrobenzene	1	220	220	2.6	U	
100-02-7	4-Nitrophenol	1	430	430	15	U	R,M
88-75-5	2-Nitrophenol	1	220	220	9.3	U	
86-30-6	N-Nitroso-diphenylamine	1	220	220	0.97	U	
621-64-7	N-Nitroso-di-n-propylamine	1	220	220	1.6	U	
87-86-5	Pentachlorophenol	1	430	430	4.8	U	
85-01-8	Phenanthrene	1	22	22	2.9	U	
108-95-2	Phenol	1	220	220	6.5	U	
129-00-0	Pyrene	1	1.3	22	0.73	J	B,Z
95-94-3	1,2,4,5-Tetrachlorobenzene	1	220	220	1.4	U	
58-90-2	2,3,4,6-Tetrachlorophenol	1	220	220	4.9	U	
88-06-2	2,4,6-Trichlorophenol	1	220	220	1.7	U	
95-95-4	2,4,5-Trichlorophenol	1	220	220	4.3	U	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	884	817	92	35 - 105	
Phenol-d6	893	788	88	40 - 100	
Nitrobenzene-d5	447	380	85	35 - 100	
2-Fluorobiphenyl	442	422	95	45 - 105	
2,4,6-Tribromophenol	898	850	95	35 - 125	
o-Terphenyl	438	492	112	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	123144	5.01	93113	4.99	
Naphthalene-d8	508577	6.49	361517	6.48	
Acenaphthene-d10	317693	8.49	218183	8.49	
Phenanthrene-d10	448493	10.16	311094	10.14	
Chrysene-d12	335893	13.1	252432	13.08	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB19C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-15RE1 File ID: 0811328-15re1.D

Sampled: 11/13/08 12:27 Prepared: 12/01/08 08:36 Analyzed: 12/07/08 00:11

Solids: 76.14 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120828 Calibration: 8L08004 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
84-74-2	Di-n-butyl Phthalate	1	160	220	3.1	J
117-81-7	Bis(2-ethylhexyl) Phthalate	1	990	220	2.6	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	884	780	88	35 - 105	
Phenol-d6	893	774	87	40 - 100	
Nitrobenzene-d5	447	400	90	35 - 100	
2-Fluorobiphenyl	442	415	94	45 - 105	
2,4,6-Tribromophenol	898	1010	113	35 - 125	
o-Terphenyl	438	426	97	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	101402	7.687	89832	7.675	
Naphthalene-d8	402155	10.397	358337	10.397	
Acenaphthene-d10	220180	14.495	202249	14.5	
Phenanthrene-d10	250769	17.922	271682	17.916	
Chrysene-d12	96499	21.535	164712	21.535	
Perylene-d12	72160	23.214	125756	23.202	

* Values outside of QC limits

Do not use
[illegible] 1/12/09

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB17A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-02 File ID: 81133102.D

Sampled: 11/14/08 10:05 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 19:13

Solids: 74.49 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
83-32-9	Acenaphthene	1	3.1	23	2.2	J	
208-96-8	Acenaphthylene	1	3.6	23	1.4	J	
98-86-2	Acetophenone	1	230	230	3.7	U	
120-12-7	Anthracene	1	11	23	3.4	J	
1912-24-9	Atrazine	1	230	230	2.0	U	
100-52-7	Benzaldehyde	1	230	230	35	U	
56-55-3	Benzo(a)anthracene	1	130	23	1.3		
50-32-8	Benzo(a)pyrene	1	80	23	1.6		
205-99-2	Benzo(b)fluoranthene	1	190	23	1.3		
207-08-9	Benzo(k)fluoranthene	1	54	23	1.8		
191-24-2	Benzo(g,h,i)perylene	1	47	90	1.2	J	
92-52-4	1,1'-Biphenyl	1	230	230	1.2	U	
101-55-3	4-Bromophenyl Phenyl Ether	1	230	230	1.7	U	
85-68-7	Butyl Benzyl Phthalate	1	8.1	230	1.4	J	
105-60-2	Caprolactam	1	440	440	31	U	
86-74-8	Carbazole	1	13	230	0.67	J	
59-50-7	4-Chloro-3-methylphenol	1	230	230	2.8	U	
106-47-8	4-Chloroaniline	1	230	230	26	U	
111-91-1	Bis(2-chloroethoxy)methane	1	230	230	1.1	U	
111-44-4	Bis(2-chloroethyl) Ether	1	230	230	1.4	U	
108-60-1	Bis(2-chloroisopropyl) Ether	1	230	230	1.5	U	
91-58-7	2-Chloronaphthalene	1	230	230	1.5	U	
95-57-8	2-Chlorophenol	1	230	230	0.80	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	1	230	230	0.60	U	
218-01-9	Chrysene	1	99	23	0.97		
53-70-3	Dibenz(a,h)anthracene	1	12	90	4.9	J	
132-64-9	Dibenzofuran	1	2.2	230	2.0	J	
84-74-2	Di-n-butyl Phthalate	1	170	230	3.2	J	
91-94-1	3,3'-Dichlorobenzidine	1	440	440	110	U	
120-83-2	2,4-Dichlorophenol	1	230	230	2.9	U	
84-66-2	Diethyl Phthalate	1	12	230	0.50	J	
105-67-9	2,4-Dimethylphenol	1	230	230	7.6	U	
131-11-3	Dimethyl Phthalate	1	230	230	1.0	U	
534-52-1	4,6-Dinitro-2-methylphenol	1	230	230	4.9	U	
51-28-5	2,4-Dinitrophenol	1	440	440	44	U	
121-14-2	2,4-Dinitrotoluene	1	230	230	5.5	U	
606-20-2	2,6-Dinitrotoluene	1	230	230	3.1	U	
117-84-0	Di-n-octyl Phthalate	1	230	230	13	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	33	230	2.6	JB	
206-44-0	Fluoranthene	1	160	23	2.1		
86-73-7	Fluorene	1	4.9	23	2.2	J	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB17A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-02 File ID: 81133102.D

Sampled: 11/14/08 10:05 Prepared: 11/22/08 08:36 Analyzed: 11/26/08 19:13

Solids: 74.49 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120153 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
118-74-1	Hexachlorobenzene	1	230	230	4.5	U	
87-68-3	Hexachlorobutadiene	1	230	230	1.4	U	
77-47-4	Hexachlorocyclopentadiene	1	230	230	3.4	U	R_{VM}
67-72-1	Hexachloroethane	1	230	230	1.0	U	R_{VM}
193-39-5	Indeno(1,2,3-cd)pyrene	1	44	90	3.0	J	
78-59-1	Isophorone	1	4.0	230	1.1	J	BJ2
91-57-6	2-Methylnaphthalene	1	2.7	230	0.99	J	
95-48-7	2-Methylphenol	1	230	230	3.0	U	
106-44-5	4-Methylphenol	1	230	230	1.7	U	
91-20-3	Naphthalene	1	3.1	23	2.5	J	
88-74-4	2-Nitroaniline	1	230	230	3.1	U	
99-09-2	3-Nitroaniline	1	230	230	15	U	
100-01-6	4-Nitroaniline	1	230	230	31	U	
98-95-3	Nitrobenzene	1	230	230	2.7	U	
100-02-7	4-Nitrophenol	1	440	440	15	U	R_{VM}
88-75-5	2-Nitrophenol	1	230	230	9.5	U	
86-30-6	N-Nitroso-diphenylamine	1	20	230	0.99	J	
621-64-7	N-Nitroso-di-n-propylamine	1	230	230	1.6	U	
87-86-5	Pentachlorophenol	1	440	440	4.9	U	
85-01-8	Phenanthrene	1	66	23	3.0		
108-95-2	Phenol	1	230	230	6.6	U	
129-00-0	Pyrene	1	170	23	0.75		
95-94-3	1,2,4,5-Tetrachlorobenzene	1	230	230	1.4	U	
58-90-2	2,3,4,6-Tetrachlorophenol	1	230	230	5.0	U	
88-06-2	2,4,6-Trichlorophenol	1	230	230	1.8	U	
95-95-4	2,4,5-Trichlorophenol	1	230	230	4.4	U	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	904	717	79	35 - 105	
Phenol-d6	913	711	78	40 - 100	
Nitrobenzene-d5	456	347	76	35 - 100	
2-Fluorobiphenyl	452	394	87	45 - 105	
2,4,6-Tribromophenol	917	818	89	35 - 125	
o-Terphenyl	448	405	90	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	107927	4.99	93113	4.99	
Naphthalene-d8	438940	6.49	361517	6.48	
Acenaphthene-d10	267563	8.5	218183	8.49	
Phenanthrene-d10	348335	10.16	311094	10.14	
Chrysene-d12	225142	13.12	252432	13.08	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB17A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0811331-02RE1
File ID: 0811331-02re1.D
Sampled: 11/14/08 10:05
Prepared: 12/01/08 08:36
Analyzed: 12/08/08 12:30
Solids: 74.49
Preparation: 3550B Sonication
Initial/Final: 30 g / 1 mL
QC Batch: 0813821
Sequence: 8120947
Calibration: 8L08004
Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
84-74-2	Di-n-butyl Phthalate	1	170	230	3.2	J
117-81-7	Bis(2-ethylhexyl) Phthalate	1	35	230	2.6	J

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	904	808	89	35 - 105	
Phenol-d6	913	810	89	40 - 100	
Nitrobenzene-d5	456	426	93	35 - 100	
2-Fluorobiphenyl	452	443	98	45 - 105	
2,4,6-Tribromophenol	917	898	98	35 - 125	
o-Terphenyl	448	395	88	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	56603	7.553	89832	7.675	
Naphthalene-d8	219870	10.258	358337	10.397	
Acenaphthene-d10	120856	14.355	202249	14.5	
Phenanthrene-d10	141456	17.806	271682	17.916	
Chrysene-d12	53535	21.449	164712	21.535	*
Perylene-d12	42780	23.092	125756	23.202	*

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB17A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-02RE2 File ID: 0811331-02re1 4x.D

Sampled: 11/14/08 10:05 Prepared: 12/01/08 08:36 Analyzed: 12/09/08 14:04

Solids: 74.49 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120925 Calibration: 8L08004 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
84-74-2	Di-n-butyl Phthalate	4	190	910	13	J
117-81-7	Bis(2-ethylhexyl) Phthalate	4	39	910	10	J

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	904	689	76	35 - 105	D
Phenol-d6	913	655	72	40 - 100	D
Nitrobenzene-d5	456	297	65	35 - 100	D
2-Fluorobiphenyl	452	362	80	45 - 105	D
2,4,6-Tribromophenol	917	635	69	35 - 125	D
o-Terphenyl	448	311	70	30 - 125	D

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	78730	7.377	89832	7.675	
Naphthalene-d8	318303	10.082	358337	10.397	
Acenaphthene-d10	185031	14.168	202249	14.5	
Phenanthrene-d10	214825	17.636	271682	17.916	
Chrysene-d12	104824	21.331	164712	21.535	
Perylene-d12	87126	22.928	125756	23.202	

* Values outside of QC limits

Do not use
12/19/08

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB17C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-03 File ID: 81133103.D

Sampled: 11/14/08 10:15 Prepared: 11/22/08 08:36 Analyzed: 12/01/08 15:55

Solids: 84.26 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120219 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
83-32-9	Acenaphthene	1	20	20	1.9	U	
208-96-8	Acenaphthylene	1	20	20	1.2	U	
98-86-2	Acetophenone	1	3.6	200	3.3	J	
120-12-7	Anthracene	1	20	20	3.0	U	
1912-24-9	Atrazine	1	200	200	1.8	U	VJc
100-52-7	Benzaldehyde	1	200	200	31	U	
56-55-3	Benzo(a)anthracene	1	17	20	1.1	J	
50-32-8	Benzo(a)pyrene	1	23	20	1.4		K,M
205-99-2	Benzo(b)fluoranthene	1	38	20	1.2		K,M
207-08-9	Benzo(k)fluoranthene	1	13	20	1.6	J	
191-24-2	Benzo(g,h,i)perylene	1	27	80	1.1	J	
92-52-4	1,1'-Biphenyl	1	200	200	1.1	U	
101-55-3	4-Bromophenyl Phenyl Ether	1	200	200	1.5	U	
85-68-7	Butyl Benzyl Phthalate	1	4.4	200	1.2	J	BZ
105-60-2	Caprolactam	1	390	390	27	U	VJc
86-74-8	Carbazole	1	200	200	0.59	U	
59-50-7	4-Chloro-3-methylphenol	1	200	200	2.5	U	
106-47-8	4-Chloroaniline	1	200	200	23	U	K,M
111-91-1	Bis(2-chloroethoxy)methane	1	200	200	0.99	U	
111-44-4	Bis(2-chloroethyl) Ether	1	200	200	1.3	U	
108-60-1	Bis(2-chloroisopropyl) Ether	1	200	200	1.3	U	
91-58-7	2-Chloronaphthalene	1	200	200	1.4	U	
95-57-8	2-Chlorophenol	1	200	200	0.71	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	1	200	200	0.53	U	
218-01-9	Chrysene	1	18	20	0.86	J	
53-70-3	Dibenz(a,h)anthracene	1	7.1	80	4.3	J	
132-64-9	Dibenzofuran	1	200	200	1.8	U	
84-74-2	Di-n-butyl Phthalate	1	430	200	2.8		BZ
91-94-1	3,3´-Dichlorobenzidine	1	390	390	93	U	
120-83-2	2,4-Dichlorophenol	1	200	200	2.6	U	
84-66-2	Diethyl Phthalate	1	17	200	0.44	J	K,M
105-67-9	2,4-Dimethylphenol	1	200	200	6.7	U	
131-11-3	Dimethyl Phthalate	1	1.2	200	0.91	J	
534-52-1	4,6-Dinitro-2-methylphenol	1	200	200	4.3	U	R,M
51-28-5	2,4-Dinitrophenol	1	390	390	39	U	R,M
121-14-2	2,4-Dinitrotoluene	1	38	200	4.8	J	
606-20-2	2,6-Dinitrotoluene	1	200	200	2.7	U	
117-84-0	Di-n-octyl Phthalate	1	200	200	12	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	38	200	2.3	JB	BZ
206-44-0	Fluoranthene	1	21	20	1.8		
86-73-7	Fluorene	1	20	20	1.9	U	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB17C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-03 File ID: 81133103.D

Sampled: 11/14/08 10:15 Prepared: 11/22/08 08:36 Analyzed: 12/01/08 15:55

Solids: 84.26 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120219 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
118-74-1	Hexachlorobenzene	1	200	200	4.0	U	
87-68-3	Hexachlorobutadiene	1	200	200	1.3	U	
77-47-4	Hexachlorocyclopentadiene	1	200	200	3.0	U	RM
67-72-1	Hexachloroethane	1	200	200	0.92	U	RM
193-39-5	Indeno(1,2,3-cd)pyrene	1	21	80	2.6	J	LqM
78-59-1	Isophorone	1	5.1	200	1.0	J	B2
91-57-6	2-Methylnaphthalene	1	1.6	200	0.88	J	
95-48-7	2-Methylphenol	1	200	200	2.6	U	
106-44-5	4-Methylphenol	1	200	200	1.5	U	
91-20-3	Naphthalene	1	2.4	20	2.2	J	
88-74-4	2-Nitroaniline	1	200	200	2.7	U	
99-09-2	3-Nitroaniline	1	200	200	13	U	VqM
100-01-6	4-Nitroaniline	1	200	200	27	U	U5c
98-95-3	Nitrobenzene	1	200	200	2.4	U	
100-02-7	4-Nitrophenol	1	390	390	13	U	RM
88-75-5	2-Nitrophenol	1	200	200	8.4	U	
86-30-6	N-Nitroso-diphenylamine	1	37	200	0.87	J	
621-64-7	N-Nitroso-di-n-propylamine	1	200	200	1.4	U	
87-86-5	Pentachlorophenol	1	390	390	4.4	U	
85-01-8	Phenanthrene	1	11	20	2.6	J	
108-95-2	Phenol	1	200	200	5.9	U	
129-00-0	Pyrene	1	23	20	0.66		
95-94-3	1,2,4,5-Tetrachlorobenzene	1	200	200	1.2	U	
58-90-2	2,3,4,6-Tetrachlorophenol	1	200	200	4.5	U	
88-06-2	2,4,6-Trichlorophenol	1	200	200	1.6	U	
95-95-4	2,4,5-Trichlorophenol	1	200	200	3.9	U	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	799	718	90	35 - 105	
Phenol-d6	807	699	87	40 - 100	
Nitrobenzene-d5	403	351	87	35 - 100	
2-Fluorobiphenyl	400	377	94	45 - 105	
2,4,6-Tribromophenol	811	661	82	35 - 125	
o-Terphenyl	396	435	110	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	123595	4.92	93113	4.99	
Naphthalene-d8	477951	6.41	361517	6.48	
Acenaphthene-d10	294638	8.41	218183	8.49	
Phenanthrene-d10	366295	10.07	311094	10.14	
Chrysene-d12	241912	13.01	252432	13.08	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0811331-03RE1
File ID: 0811331-03re1.D
Sampled: 11/14/08 10:15
Prepared: 12/01/08 08:36
Analyzed: 12/07/08 01:19
Solids: 84.26
Preparation: 3550B Sonication
Initial/Final: 30 g / 1 mL
QC Batch: 0813821
Sequence: 8120828
Calibration: 8L08004
Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
84-74-2	Di-n-butyl Phthalate	1	400	200	2.8	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	36	200	2.3	J

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	799	637	80	35 - 105	
Phenol-d6	807	638	79	40 - 100	
Nitrobenzene-d5	403	325	81	35 - 100	
2-Fluorobiphenyl	400	344	86	45 - 105	
2,4,6-Tribromophenol	811	666	82	35 - 125	
o-Terphenyl	396	360	91	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	103858	7.687	89832	7.675	
Naphthalene-d8	411677	10.397	358337	10.397	
Acenaphthene-d10	228158	14.5	202249	14.5	
Phenanthrene-d10	245183	17.928	271682	17.916	
Chrysene-d12	93773	21.541	164712	21.535	
Perylene-d12	68581	23.22	125756	23.202	

* Values outside of QC limits

Do not use
1/26/09

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB16A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-04 File ID: 81133104.D

Sampled: 11/14/08 13:00 Prepared: 11/22/08 08:36 Analyzed: 12/01/08 16:23

Solids: 81.57 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120219 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
83-32-9	Acenaphthene	1	3.7	21	2.0	J	
208-96-8	Acenaphthylene	1	2.9	21	1.2	J	
98-86-2	Acetophenone	1	3.7	210	3.4	J	
120-12-7	Anthracene	1	14	21	3.1	J	
1912-24-9	Atrazine	1	210	210	1.8	U	UJ,c
100-52-7	Benzaldehyde	1	210	210	32	U	
56-55-3	Benzo(a)anthracene	1	86	21	1.2		
50-32-8	Benzo(a)pyrene	1	69	21	1.4		
205-99-2	Benzo(b)fluoranthene	1	140	21	1.2		
207-08-9	Benzo(k)fluoranthene	1	35	21	1.6		
191-24-2	Benzo(g,h,i)perylene	1	59	82	1.1	J	
92-52-4	1,1'-Biphenyl	1	2.0	210	1.1	J	
101-55-3	4-Bromophenyl Phenyl Ether	1	210	210	1.6	U	
85-68-7	Butyl Benzyl Phthalate	1	4.9	210	1.2	J	B,2
105-60-2	Caprolactam	1	400	400	28	U	UJ,c
86-74-8	Carbazole	1	7.8	210	0.61	J	B,2
59-50-7	4-Chloro-3-methylphenol	1	210	210	2.6	U	
106-47-8	4-Chloroaniline	1	210	210	24	U	
111-91-1	Bis(2-chloroethoxy)methane	1	210	210	1.0	U	
111-44-4	Bis(2-chloroethyl) Ether	1	210	210	1.3	U	
108-60-1	Bis(2-chloroisopropyl) Ether	1	210	210	1.4	U	
91-58-7	2-Chloronaphthalene	1	210	210	1.4	U	
95-57-8	2-Chlorophenol	1	210	210	0.73	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	1	210	210	0.55	U	
218-01-9	Chrysene	1	68	21	0.89		
53-70-3	Dibenz(a,h)anthracene	1	23	82	4.5	J	
132-64-9	Dibenzofuran	1	3.7	210	1.9	J	
84-74-2	Di-n-butyl Phthalate	1	150	210	2.9	J	B,2
91-94-1	3,3´-Dichlorobenzidine	1	400	400	96	U	
120-83-2	2,4-Dichlorophenol	1	210	210	2.6	U	
84-66-2	Diethyl Phthalate	1	140	210	0.46	J	
105-67-9	2,4-Dimethylphenol	1	210	210	7.0	U	
131-11-3	Dimethyl Phthalate	1	210	210	0.94	U	
534-52-1	4,6-Dinitro-2-methylphenol	1	210	210	4.5	U	R,M
51-28-5	2,4-Dinitrophenol	1	400	400	41	U	R,M
121-14-2	2,4-Dinitrotoluene	1	6.9	210	5.0	J	
606-20-2	2,6-Dinitrotoluene	1	210	210	2.8	U	
117-84-0	Di-n-octyl Phthalate	1	210	210	12	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	50	210	2.4	JB	B,2
206-44-0	Fluoranthene	1	81	21	1.9		
86-73-7	Fluorene	1	2.5	21	2.0	J	

: 000566

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB16A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-04 File ID: 81133104.D

Sampled: 11/14/08 13:00 Prepared: 11/22/08 08:36 Analyzed: 12/01/08 16:23

Solids: 81.57 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120219 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
118-74-1	Hexachlorobenzene	1	210	210	4.1	U	
87-68-3	Hexachlorobutadiene	1	210	210	1.3	U	
77-47-4	Hexachlorocyclopentadiene	1	210	210	3.1	U	R, M
67-72-1	Hexachloroethane	1	210	210	0.95	U	R, M
193-39-5	Indeno(1,2,3-cd)pyrene	1	50	82	2.7	J	
78-59-1	Isophorone	1	3.3	210	1.0	J	B, Z
91-57-6	2-Methylnaphthalene	1	6.1	210	0.91	J	
95-48-7	2-Methylphenol	1	210	210	2.7	U	
106-44-5	4-Methylphenol	1	210	210	1.6	U	
91-20-3	Naphthalene	1	8.2	21	2.3	J	
88-74-4	2-Nitroaniline	1	210	210	2.8	U	
99-09-2	3-Nitroaniline	1	210	210	13	U	
100-01-6	4-Nitroaniline	1	210	210	28	U	UJ, C
98-95-3	Nitrobenzene	1	210	210	2.4	U	
100-02-7	4-Nitrophenol	1	400	400	14	U	R, M
88-75-5	2-Nitrophenol	1	210	210	8.7	U	
86-30-6	N-Nitroso-diphenylamine	1	22	210	0.90	J	
621-64-7	N-Nitroso-di-n-propylamine	1	210	210	1.5	U	
87-86-5	Pentachlorophenol	1	400	400	4.5	U	
85-01-8	Phenanthrene	1	41	21	2.7		
108-95-2	Phenol	1	210	210	6.1	U	
129-00-0	Pyrene	1	81	21	0.68		
95-94-3	1,2,4,5-Tetrachlorobenzene	1	210	210	1.3	U	
58-90-2	2,3,4,6-Tetrachlorophenol	1	210	210	4.6	U	
88-06-2	2,4,6-Trichlorophenol	1	210	210	1.6	U	
95-95-4	2,4,5-Trichlorophenol	1	210	210	4.0	U	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	825	683	83	35 - 105	
Phenol-d6	834	659	79	40 - 100	
Nitrobenzene-d5	417	324	78	35 - 100	
2-Fluorobiphenyl	413	354	86	45 - 105	
2,4,6-Tribromophenol	838	639	76	35 - 125	
o-Terphenyl	409	394	96	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	123942	4.92	93113	4.99	
Naphthalene-d8	497208	6.41	361517	6.48	
Acenaphthene-d10	320538	8.41	218183	8.49	
Phenanthrene-d10	416837	10.07	311094	10.14	
Chrysene-d12	307115	13.02	252432	13.08	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB16A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0811331-04RE1
File ID: 81133104.D
Sampled: 11/14/08 13:00
Prepared: 12/01/08 08:36
Analyzed: 12/07/08 15:07
Solids: 81.57
Preparation: 3550B Sonication
Initial/Final: 30 g / 1 mL
QC Batch: 0813821
Sequence: 8120820
Calibration: 8L08002
Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
84-74-2	Di-n-butyl Phthalate	1	290	210	2.9	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	190	210	2.4	J

KJM
TJM

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	825	826	100	35 - 105	
Phenol-d6	834	779	93	40 - 100	
Nitrobenzene-d5	417	402	96	35 - 100	
2-Fluorobiphenyl	413	435	105	45 - 105	
2,4,6-Tribromophenol	838	747	89	35 - 125	
o-Terphenyl	409	414	101	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	774305	7.56	576509	7.85	
Naphthalene-d8	2938070	10.27	2103574	10.59	
Acenaphthene-d10	1700773	14.38	1148967	14.7	
Phenanthrene-d10	2357493	17.84	1863437	18.09	
Chrysene-d12	1998067	21.49	1611285	21.66	
Perylene-d12	1937728	23.18	1765509	23.42	

* Values outside of QC limits

Do not use
AS 1/12/09

01086

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB16C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-05 File ID: 81133105.D

Sampled: 11/14/08 13:08 Prepared: 11/22/08 08:36 Analyzed: 12/01/08 16:51

Solids: 80.70 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120219 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
83-32-9	Acenaphthene	1	2.5	21	2.0	J	
208-96-8	Acenaphthylene	1	2.5	21	1.3	J	
98-86-2	Acetophenone	1	4.5	210	3.4	J	
120-12-7	Anthracene	1	7.8	21	3.1	J	
1912-24-9	Atrazine	1	210	210	1.8	U	UJ,c
100-52-7	Benzaldehyde	1	210	210	32	U	
56-55-3	Benzo(a)anthracene	1	62	21	1.2		
50-32-8	Benzo(a)pyrene	1	53	21	1.4		
205-99-2	Benzo(b)fluoranthene	1	120	21	1.2		
207-08-9	Benzo(k)fluoranthene	1	34	21	1.6		
191-24-2	Benzo(g,h,i)perylene	1	45	83	1.1	J	
92-52-4	1,1'-Biphenyl	1	1.7	210	1.1	J	
101-55-3	4-Bromophenyl Phenyl Ether	1	210	210	1.6	U	
85-68-7	Butyl Benzyl Phthalate	1	4.1	210	1.3	J	B,z
105-60-2	Caprolactam	1	410	410	28	U	UJ,c
86-74-8	Carbazole	1	6.6	210	0.62	J	B,z
59-50-7	4-Chloro-3-methylphenol	1	210	210	2.6	U	
106-47-8	4-Chloroaniline	1	210	210	24	U	
111-91-1	Bis(2-chloroethoxy)methane	1	210	210	1.0	U	
111-44-4	Bis(2-chloroethyl) Ether	1	210	210	1.3	U	
108-60-1	Bis(2-chloroisopropyl) Ether	1	210	210	1.4	U	
91-58-7	2-Chloronaphthalene	1	210	210	1.4	U	
95-57-8	2-Chlorophenol	1	210	210	0.74	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	1	210	210	0.56	U	
218-01-9	Chrysene	1	51	21	0.89		
53-70-3	Dibenz(a,h)anthracene	1	13	83	4.5	J	
132-64-9	Dibenzofuran	1	3.3	210	1.9	J	
84-74-2	Di-n-butyl Phthalate	1	290	210	2.9		B,z
91-94-1	3,3'-Dichlorobenzidine	1	410	410	97	U	
120-83-2	2,4-Dichlorophenol	1	210	210	2.7	U	
84-66-2	Diethyl Phthalate	1	31	210	0.46	J	
105-67-9	2,4-Dimethylphenol	1	210	210	7.0	U	
131-11-3	Dimethyl Phthalate	1	210	210	0.95	U	
534-52-1	4,6-Dinitro-2-methylphenol	1	210	210	4.5	U	L,n
51-28-5	2,4-Dinitrophenol	1	410	410	41	U	L,n
121-14-2	2,4-Dinitrotoluene	1	69	210	5.0	J	
606-20-2	2,6-Dinitrotoluene	1	210	210	2.8	U	
117-84-0	Di-n-octyl Phthalate	1	210	210	12	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	43	210	2.4	JB	B,z
206-44-0	Fluoranthene	1	58	21	1.9		
86-73-7	Fluorene	1	3.3	21	2.0	J	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB16C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-05 File ID: 81133105.D

Sampled: 11/14/08 13:08 Prepared: 11/22/08 08:36 Analyzed: 12/01/08 16:51

Solids: 80.70 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120219 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
118-74-1	Hexachlorobenzene	1	210	210	4.2	U
87-68-3	Hexachlorobutadiene	1	210	210	1.3	U
77-47-4	Hexachlorocyclopentadiene	1	210	210	3.1	U
67-72-1	Hexachloroethane	1	210	210	0.96	U
193-39-5	Indeno(1,2,3-cd)pyrene	1	32	83	2.8	J
78-59-1	Isophorone	1	4.5	210	1.0	J
91-57-6	2-Methylnaphthalene	1	4.1	210	0.92	J
95-48-7	2-Methylphenol	1	210	210	2.8	U
106-44-5	4-Methylphenol	1	210	210	1.6	U
91-20-3	Naphthalene	1	5.4	21	2.3	J
88-74-4	2-Nitroaniline	1	210	210	2.8	U
99-09-2	3-Nitroaniline	1	210	210	14	U
100-01-6	4-Nitroaniline	1	210	210	28	U
98-95-3	Nitrobenzene	1	210	210	2.5	U
100-02-7	4-Nitrophenol	1	410	410	14	U
88-75-5	2-Nitrophenol	1	210	210	8.8	U
86-30-6	N-Nitroso-diphenylamine	1	47	210	0.91	J
621-64-7	N-Nitroso-di-n-propylamine	1	210	210	1.5	U
87-86-5	Pentachlorophenol	1	410	410	4.6	U
85-01-8	Phenanthrene	1	27	21	2.8	
108-95-2	Phenol	1	210	210	6.1	U
129-00-0	Pyrene	1	68	21	0.69	
95-94-3	1,2,4,5-Tetrachlorobenzene	1	210	210	1.3	U
58-90-2	2,3,4,6-Tetrachlorophenol	1	210	210	4.6	U
88-06-2	2,4,6-Trichlorophenol	1	210	210	1.6	U
95-95-4	2,4,5-Trichlorophenol	1	210	210	4.1	U

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	834	730	87	35 - 105	
Phenol-d6	843	705	84	40 - 100	
Nitrobenzene-d5	421	341	81	35 - 100	
2-Fluorobiphenyl	417	379	91	45 - 105	
2,4,6-Tribromophenol	847	697	82	35 - 125	
o-Terphenyl	413	399	97	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	116795	4.93	93113	4.99	
Naphthalene-d8	476181	6.42	361517	6.48	
Acenaphthene-d10	289232	8.42	218183	8.49	
Phenanthrene-d10	387386	10.08	311094	10.14	
Chrysene-d12	265071	13.02	252432	13.08	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB16C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0811331-05RE1
File ID: 81133105.D
Sampled: 11/14/08 13:08
Prepared: 12/01/08 08:36
Analyzed: 12/06/08 20:44
Solids: 80.70
Preparation: 3550B Sonication
Initial/Final: 30 g / 1 mL
QC Batch: 0813821
Sequence: 8120815
Calibration: 8L08002
Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
84-74-2	Di-n-butyl Phthalate	1	300	210	2.9	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	640	210	2.4	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	834	836	100	35 - 105	
Phenol-d6	843	809	96	40 - 100	
Nitrobenzene-d5	421	399	95	35 - 100	
2-Fluorobiphenyl	417	431	103	45 - 105	
2,4,6-Tribromophenol	847	759	90	35 - 125	
o-Terphenyl	413	404	98	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	798508	7.52	576509	7.85	
Naphthalene-d8	2940505	10.23	2103574	10.59	
Acenaphthene-d10	1634790	14.34	1148967	14.7	
Phenanthrene-d10	2246165	17.79	1863437	18.09	
Chrysene-d12	1878139	21.45	1611285	21.66	
Perylene-d12	2078368	23.12	1765509	23.42	

* Values outside of QC limits

Do not use
AB 1/20/09

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB15A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-06 File ID: 81133106.D

Sampled: 11/14/08 12:53 Prepared: 11/22/08 08:36 Analyzed: 12/01/08 17:19

Solids: 90.06 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120219 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
83-32-9	Acenaphthene	1	19	19	1.8	U	
208-96-8	Acenaphthylene	1	19	19	1.1	U	
98-86-2	Acetophenone	1	190	190	3.1	U	
120-12-7	Anthracene	1	19	19	2.8	U	
1912-24-9	Atrazine	1	190	190	1.7	U	UJc
100-52-7	Benzaldehyde	1	190	190	29	U	
56-55-3	Benzo(a)anthracene	1	9.3	19	1.0	J	B2
50-32-8	Benzo(a)pyrene	1	10	19	1.3	J	B2
205-99-2	Benzo(b)fluoranthene	1	18	19	1.1	J	
207-08-9	Benzo(k)fluoranthene	1	6.7	19	1.5	J	B2
191-24-2	Benzo(g,h,i)perylene	1	8.5	74	1.0	J	
92-52-4	1,1'-Biphenyl	1	190	190	0.99	U	
101-55-3	4-Bromophenyl Phenyl Ether	1	190	190	1.4	U	
85-68-7	Butyl Benzyl Phthalate	1	4.1	190	1.1	J	B2
105-60-2	Caprolactam	1	370	370	25	U	UJc
86-74-8	Carbazole	1	5.2	190	0.55	J	B2
59-50-7	4-Chloro-3-methylphenol	1	190	190	2.3	U	
106-47-8	4-Chloroaniline	1	190	190	22	U	
111-91-1	Bis(2-chloroethoxy)methane	1	190	190	0.93	U	
111-44-4	Bis(2-chloroethyl) Ether	1	190	190	1.2	U	
108-60-1	Bis(2-chloroisopropyl) Ether	1	190	190	1.2	U	
91-58-7	2-Chloronaphthalene	1	190	190	1.3	U	
95-57-8	2-Chlorophenol	1	190	190	0.66	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	1	190	190	0.50	U	
218-01-9	Chrysene	1	9.6	19	0.80	J	
53-70-3	Dibenz(a,h)anthracene	1	74	74	4.1	U	
132-64-9	Dibenzofuran	1	190	190	1.7	U	
84-74-2	Di-n-butyl Phthalate	1	410	190	2.6		B2
91-94-1	3,3'-Dichlorobenzidine	1	370	370	87	U	
120-83-2	2,4-Dichlorophenol	1	190	190	2.4	U	
84-66-2	Diethyl Phthalate	1	450	190	0.41		J+
105-67-9	2,4-Dimethylphenol	1	190	190	6.3	U	
131-11-3	Dimethyl Phthalate	1	7.4	190	0.85	J	
534-52-1	4,6-Dinitro-2-methylphenol	1	190	190	4.0	U	R,M
51-28-5	2,4-Dinitrophenol	1	370	370	37	U	R,M
121-14-2	2,4-Dinitrotoluene	1	26	190	4.5	J	J+
606-20-2	2,6-Dinitrotoluene	1	27	190	2.5	J	
117-84-0	Di-n-octyl Phthalate	1	190	190	11	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	270	190	2.2	B	B2
206-44-0	Fluoranthene	1	13	19	1.7	J	B2
86-73-7	Fluorene	1	19	19	1.8	U	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB15A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-06 File ID: 81133106.D

Sampled: 11/14/08 12:53 Prepared: 11/22/08 08:36 Analyzed: 12/01/08 17:19

Solids: 90.06 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120219 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
118-74-1	Hexachlorobenzene	1	190	190	3.7	U	
87-68-3	Hexachlorobutadiene	1	190	190	1.2	U	
77-47-4	Hexachlorocyclopentadiene	1	190	190	2.8	U	RM
67-72-1	Hexachloroethane	1	190	190	0.86	U	RM
193-39-5	Indeno(1,2,3-cd)pyrene	1	3.3	74	2.5	J	
78-59-1	Isophorone	1	4.4	190	0.93	J	B2
91-57-6	2-Methylnaphthalene	1	1.1	190	0.82	J	
95-48-7	2-Methylphenol	1	190	190	2.5	U	
106-44-5	4-Methylphenol	1	190	190	1.4	U	
91-20-3	Naphthalene	1	19	19	2.1	U	
88-74-4	2-Nitroaniline	1	190	190	2.6	U	
99-09-2	3-Nitroaniline	1	190	190	12	U	
100-01-6	4-Nitroaniline	1	190	190	26	U	UL
98-95-3	Nitrobenzene	1	190	190	2.2	U	
100-02-7	4-Nitrophenol	1	370	370	12	U	RM
88-75-5	2-Nitrophenol	1	190	190	7.9	U	
86-30-6	N-Nitroso-diphenylamine	1	120	190	0.82	J	J,F
621-64-7	N-Nitroso-di-n-propylamine	1	190	190	1.4	U	
87-86-5	Pentachlorophenol	1	370	370	4.1	U	
85-01-8	Phenanthrene	1	6.3	19	2.5	J	
108-95-2	Phenol	1	190	190	5.5	U	
129-00-0	Pyrene	1	13	19	0.62	J	B2
95-94-3	1,2,4,5-Tetrachlorobenzene	1	190	190	1.2	U	
58-90-2	2,3,4,6-Tetrachlorophenol	1	190	190	4.2	U	
88-06-2	2,4,6-Trichlorophenol	1	190	190	1.5	U	
95-95-4	2,4,5-Trichlorophenol	1	190	190	3.7	U	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	748	631	84	35 - 105	
Phenol-d6	755	593	79	40 - 100	
Nitrobenzene-d5	378	296	79	35 - 100	
2-Fluorobiphenyl	374	333	89	45 - 105	
2,4,6-Tribromophenol	759	610	80	35 - 125	
o-Terphenyl	370	370	100	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	117996	4.93	93113	4.99	
Naphthalene-d8	481736	6.42	361517	6.48	
Acenaphthene-d10	294093	8.42	218183	8.49	
Phenanthrene-d10	395724	10.08	311094	10.14	
Chrysene-d12	276600	13.02	252432	13.08	

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

13SB15A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0811331-06RE1
File ID: 81133106.D
Sampled: 11/14/08 12:53
Prepared: 12/01/08 08:36
Analyzed: 12/06/08 21:18
Solids: 90.06
Preparation: 3550B Sonication
Initial/Final: 30 g / 1 mL
QC Batch: 0813821
Sequence: 8120815
Calibration: 8L08002
Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
84-74-2	Di-n-butyl Phthalate	1	630	190	2.6	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	350	190	2.2	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	748	673	90	35 - 105	
Phenol-d6	755	655	87	40 - 100	
Nitrobenzene-d5	378	336	89	35 - 100	
2-Fluorobiphenyl	374	372	99	45 - 105	
2,4,6-Tribromophenol	759	653	86	35 - 125	
o-Terphenyl	370	340	92	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	834038	7.54	576509	7.85	
Naphthalene-d8	3058245	10.24	2103574	10.59	
Acenaphthene-d10	1654482	14.34	1148967	14.7	
Phenanthrene-d10	2259525	17.8	1863437	18.09	
Chrysene-d12	1869520	21.45	1611285	21.66	
Perylene-d12	1922312	23.12	1765509	23.42	

* Values outside of QC limits

Do not use
A 12/19/08

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

DUP-13

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-07 File ID: 81133107.D

Sampled: 11/14/08 00:00 Prepared: 11/22/08 08:36 Analyzed: 12/01/08 17:48

Solids: 89.76 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120219 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
83-32-9	Acenaphthene	1	19	19	1.8	U	
208-96-8	Acenaphthylene	1	19	19	1.1	U	
98-86-2	Acetophenone	1	190	190	3.1	U	
120-12-7	Anthracene	1	19	19	2.8	U	
1912-24-9	Atrazine	1	190	190	1.7	U	UJ,c
100-52-7	Benzaldehyde	1	190	190	29	U	
56-55-3	Benzo(a)anthracene	1	9.7	19	1.1	J	
50-32-8	Benzo(a)pyrene	1	7.8	19	1.3	J	B,z
205-99-2	Benzo(b)fluoranthene	1	18	19	1.1	J	
207-08-9	Benzo(k)fluoranthene	1	5.9	19	1.5	J	B,z
191-24-2	Benzo(g,h,i)perylene	1	4.8	75	1.0	J	B,z
92-52-4	1,1'-Biphenyl	1	190	190	1.0	U	
101-55-3	4-Bromophenyl Phenyl Ether	1	190	190	1.4	U	
85-68-7	Butyl Benzyl Phthalate	1	36	190	1.1	J	B,z
105-60-2	Caprolactam	1	370	370	26	U	UJ,c
86-74-8	Carbazole	1	190	190	0.55	U	
59-50-7	4-Chloro-3-methylphenol	1	190	190	2.3	U	
106-47-8	4-Chloroaniline	1	190	190	22	U	
111-91-1	Bis(2-chloroethoxy)methane	1	190	190	0.93	U	
111-44-4	Bis(2-chloroethyl) Ether	1	190	190	1.2	U	
108-60-1	Bis(2-chloroisopropyl) Ether	1	190	190	1.2	U	
91-58-7	2-Chloronaphthalene	1	190	190	1.3	U	
95-57-8	2-Chlorophenol	1	190	190	0.66	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	1	190	190	0.50	U	
218-01-9	Chrysene	1	7.1	19	0.80	J	B,z
53-70-3	Dibenz(a,h)anthracene	1	75	75	4.1	U	
132-64-9	Dibenzofuran	1	190	190	1.7	U	
~~84-74-2~~	~~Di-n-butyl Phthalate~~	1	~~6600~~	~~190~~	2.6	E	J,1
91-94-1	3,3'-Dichlorobenzidine	1	370	370	87	U	
120-83-2	2,4-Dichlorophenol	1	190	190	2.4	U	
~~84-66-2~~	~~Diethyl Phthalate~~	1	~~2600~~	~~190~~	0.41	E	J,1
105-67-9	2,4-Dimethylphenol	1	190	190	6.3	U	
131-11-3	Dimethyl Phthalate	1	20	190	0.86	J	
534-52-1	4,6-Dinitro-2-methylphenol	1	190	190	4.1	U	Rm
51-28-5	2,4-Dinitrophenol	1	370	370	37	U	Rm
~~121-14-2~~	~~2,4-Dinitrotoluene~~	1	~~6900~~	~~190~~	4.5	E	J,1
606-20-2	2,6-Dinitrotoluene	1	570	190	2.5		
117-84-0	Di-n-octyl Phthalate	1	190	190	11	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	300	190	2.2	B	B,z
206-44-0	Fluoranthene	1	14	19	1.7	J	B,z
86-73-7	Fluorene	1	19	19	1.8	U	

01186

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

DUP-13

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-07 File ID: 81133107.D

Sampled: 11/14/08 00:00 Prepared: 11/22/08 08:36 Analyzed: 12/01/08 17:48

Solids: 89.76 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120219 Calibration: 8L01007 Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
118-74-1	Hexachlorobenzene	1	190	190	3.8	U	
87-68-3	Hexachlorobutadiene	1	190	190	1.2	U	
77-47-4	Hexachlorocyclopentadiene	1	190	190	2.8	U	R,M
67-72-1	Hexachloroethane	1	190	190	0.87	U	R,M
193-39-5	Indeno(1,2,3-cd)pyrene	1	2.6	75	2.5	J	
78-59-1	Isophorone	1	4.5	190	0.94	J	B,Z
91-57-6	2-Methylnaphthalene	1	1.1	190	0.82	J	
95-48-7	2-Methylphenol	1	190	190	2.5	U	
106-44-5	4-Methylphenol	1	190	190	1.4	U	
91-20-3	Naphthalene	1	19	19	2.1	U	
88-74-4	2-Nitroaniline	1	190	190	2.6	U	
99-09-2	3-Nitroaniline	1	190	190	12	U	
100-01-6	4-Nitroaniline	1	190	190	26	U	L,T,C
98-95-3	Nitrobenzene	1	190	190	2.2	U	
100-02-7	4-Nitrophenol	1	370	370	12	U	R,M
88-75-5	2-Nitrophenol	1	190	190	7.9	U	
~~86-30-6~~	~~N-Nitroso-diphenylamine~~ See 3520 12/17	1	1000	190	0.82	E	J,Q
621-64-7	N-Nitroso-di-n-propylamine	1	190	190	1.4	U	
87-86-5	Pentachlorophenol	1	370	370	4.1	U	
85-01-8	Phenanthrene	1	5.6	19	2.5	J	
108-95-2	Phenol	1	190	190	5.5	U	
129-00-0	Pyrene	1	14	19	0.62	J	B,Z
95-94-3	1,2,4,5-Tetrachlorobenzene	1	190	190	1.2	U	
58-90-2	2,3,4,6-Tetrachlorophenol	1	190	190	4.2	U	
88-06-2	2,4,6-Trichlorophenol	1	190	190	1.5	U	
95-95-4	2,4,5-Trichlorophenol	1	190	190	3.7	U	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	750	624	83	35 - 105	
Phenol-d6	758	571	75	40 - 100	
Nitrobenzene-d5	379	310	82	35 - 100	
2-Fluorobiphenyl	375	329	88	45 - 105	
2,4,6-Tribromophenol	761	609	80	35 - 125	
o-Terphenyl	371	369	99	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	126077	4.93	93113	4.99	
Naphthalene-d8	502936	6.42	361517	6.48	
Acenaphthene-d10	322134	8.42	218183	8.49	
Phenanthrene-d10	427574	10.08	311094	10.14	
Chrysene-d12	298503	13.03	252432	13.08	

ORGANIC ANALYSIS DATA SHEET

USEPA-8270C

DUP-13

Use only "A" compounds from this DF 20 AL 4/20/09

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-07RE1 File ID: 0811331-07 20x.D

Sampled: 11/14/08 00:00 Prepared: 11/22/08 08:36 Analyzed: 12/09/08 10:34

Solids: 89.76 Preparation: 3550B Sonication Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120925 Calibration: 8L08004 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
83-32-9	Acenaphthene	20	380	380	36	U	
208-96-8	Acenaphthylene	20	380	380	23	U	
98-86-2	Acetophenone	20	3800	3800	61	U	
120-12-7	Anthracene	20	380	380	57	U	
1912-24-9	Atrazine	20	3800	3800	33	U	
100-52-7	Benzaldehyde	20	3800	3800	580	U	
56-55-3	Benzo(a)anthracene	20	30	380	21	J	B,2
50-32-8	Benzo(a)pyrene	20	380	380	26	U	
205-99-2	Benzo(b)fluoranthene	20	380	380	22	U	
207-08-9	Benzo(k)fluoranthene	20	380	380	30	U	
191-24-2	Benzo(g,h,i)perylene	20	1500	1500	20	U	
92-52-4	1,1'-Biphenyl	20	3800	3800	20	U	
101-55-3	4-Bromophenyl Phenyl Ether	20	3800	3800	28	U	
85-68-7	Butyl Benzyl Phthalate	20	3800	3800	23	U	
105-60-2	Caprolactam	20	7400	7400	510	U	U,2
86-74-8	Carbazole	20	3800	3800	11	U	
59-50-7	4-Chloro-3-methylphenol	20	3800	3800	47	U	
106-47-8	4-Chloroaniline	20	3800	3800	440	U	
111-91-1	Bis(2-chloroethoxy)methane	20	3800	3800	19	U	
111-44-4	Bis(2-chloroethyl) Ether	20	3800	3800	24	U	
108-60-1	Bis(2-chloroisopropyl) Ether	20	3800	3800	25	U	
91-58-7	2-Chloronaphthalene	20	3800	3800	26	U	
95-57-8	2-Chlorophenol	20	3800	3800	13	U	
7005-72-3	4-Chlorophenyl Phenyl Ether	20	3800	3800	10	U	
218-01-9	Chrysene	20	22	380	16	J	B,2
53-70-3	Dibenz(a,h)anthracene	20	1500	1500	81	U	
132-64-9	Dibenzofuran	20	3800	3800	34	U	
A 84-74-2	Di-n-butyl Phthalate	20	12000	3800	53		J,1
91-94-1	3,3´-Dichlorobenzidine	20	7400	7400	1700	U	
120-83-2	2,4-Dichlorophenol	20	3800	3800	48	U	
A 84-66-2	Diethyl Phthalate	20	2900	3800	8.3	J	J,1
105-67-9	2,4-Dimethylphenol	20	3800	3800	130	U	
131-11-3	Dimethyl Phthalate	20	3800	3800	17	U	
534-52-1	4,6-Dinitro-2-methylphenol	20	3800	3800	81	U	
51-28-5	2,4-Dinitrophenol	20	7400	7400	740	U	
A 121-14-2	2,4-Dinitrotoluene	20	7600	3800	90		J,1
606-20-2	2,6-Dinitrotoluene	20	590	3800	51	J	
117-84-0	Di-n-octyl Phthalate	20	3800	3800	220	U	
117-81-7	Bis(2-ethylhexyl) Phthalate	20	190	3800	43	JB	B,2
206-44-0	Fluoranthene	20	380	380	34	U	
86-73-7	Fluorene	20	45	380	36	J	

01110

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

DUP-13

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-07RE1 File ID: 0811331-07 20x.D

Sampled: 11/14/08 00:00 Prepared: 11/22/08 08:36 Analyzed: 12/09/08 10:34

Solids: 89.76 Preparation: 3550B Sonication Extract Initial/Final: 30 g / 1 mL

QC Batch: 0813821 Sequence: 8120925 Calibration: 8L08004 Instrument: 308

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q	
118-74-1	Hexachlorobenzene	20	3800	3800	75	U	
87-68-3	Hexachlorobutadiene	20	3800	3800	24	U	
77-47-4	Hexachlorocyclopentadiene	20	3800	3800	56	U	R,M
67-72-1	Hexachloroethane	20	3800	3800	17	U	R,M
193-39-5	Indeno(1,2,3-cd)pyrene	20	1500	1500	50	U	
78-59-1	Isophorone	20	3800	3800	19	U	
91-57-6	2-Methylnaphthalene	20	3800	3800	16	U	
95-48-7	2-Methylphenol	20	3800	3800	50	U	
106-44-5	4-Methylphenol	20	3800	3800	29	U	
91-20-3	Naphthalene	20	380	380	42	U	
88-74-4	2-Nitroaniline	20	3800	3800	51	U	
99-09-2	3-Nitroaniline	20	3800	3800	250	U	
100-01-6	4-Nitroaniline	20	3800	3800	510	U	
98-95-3	Nitrobenzene	20	3800	3800	44	U	
100-02-7	4-Nitrophenol	20	7400	7400	250	U	R,M
88-75-5	2-Nitrophenol	20	3800	3800	160	U	
86-30-6	N-Nitroso-diphenylamine	20	1100	3800	16	J	J+
621-64-7	N-Nitroso-di-n-propylamine	20	3800	3800	27	U	
87-86-5	Pentachlorophenol	20	7400	7400	82	U	
85-01-8	Phenanthrene	20	380	380	50	U	
108-95-2	Phenol	20	3800	3800	110	U	
129-00-0	Pyrene	20	15	380	12	J	BJ
95-94-3	1,2,4,5-Tetrachlorobenzene	20	3800	3800	23	U	
58-90-2	2,3,4,6-Tetrachlorophenol	20	3800	3800	84	U	
88-06-2	2,4,6-Trichlorophenol	20	3800	3800	29	U	
95-95-4	2,4,5-Trichlorophenol	20	3800	3800	73	U	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	74928	7.372	89832	7.675	
Naphthalene-d8	293368	10.082	358337	10.397	
Acenaphthene-d10	166006	14.168	202249	14.5	
Phenanthrene-d10	213471	17.636	271682	17.916	
Chrysene-d12	169799	21.325	164712	21.535	
Perylene-d12	166488	22.917	125756	23.202	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8270C

DUP-13

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0811331-07RE2
File ID: 81133107.D
Sampled: 11/14/08 00:00
Prepared: 12/01/08 08:36
Analyzed: 12/06/08 21:52
Solids: 89.76
Preparation: 3550B Sonication
Initial/Final: 30 g / 1 mL
QC Batch: 0813821
Sequence: 8120815
Calibration: 8L08002
Instrument: 195

CAS No.	Analyte	Dilution	CONC. (ug/kg dry)	MRL	MDL	Q
84-74-2	Di-n-butyl Phthalate	1	820	190	2.6	
117-81-7	Bis(2-ethylhexyl) Phthalate	1	320	190	2.2	

System Monitoring Compound	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC.	QC Limits	Q
2-Fluorophenol	750	661	88	35 - 105	
Phenol-d6	758	624	82	40 - 100	
Nitrobenzene-d5	379	329	87	35 - 100	
2-Fluorobiphenyl	375	363	97	45 - 105	
2,4,6-Tribromophenol	761	627	82	35 - 125	
o-Terphenyl	371	319	86	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	793539	7.53	576509	7.85	
Naphthalene-d8	2897695	10.24	2103574	10.59	
Acenaphthene-d10	1590558	14.34	1148967	14.7	
Phenanthrene-d10	2183479	17.8	1863437	18.09	
Chrysene-d12	1912315	21.45	1611285	21.66	
Perylene-d12	1898912	23.12	1765509	23.42	

* Values outside of QC limits

Do not use
AM 1/20/09

081255

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

13SB13A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-01 File ID: data012-0

Sampled: 11/12/08 10:00 Prepared: 11/24/08 07:16 Analyzed: 11/26/08 18:23

Solids: 88.77 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813554 Sequence: 8113001 Calibration: 8K30001 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.074	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	3.0	2.5	0.15	
121-14-2	2,4-Dinitrotoluene	1	0.17	2.5	0.10	J
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.20	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	2.5	2.5	0.048	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	2.5	2.5	0.065	U
98-95-3	ne (Tetryl) Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	0.72	2.5	0.066	J
	7-tetrazocine					

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.05	82	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

13SB13A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-01RE1 File ID: EXa006-0

Sampled: 11/12/08 10:00 Prepared: 11/24/08 07:16 Analyzed: 12/02/08 17:42

Solids: 88.77 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813554 Sequence: 8120311 Calibration: 8L02003 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.074	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	1.9	2.5	0.15	J
121-14-2	2,4-Dinitrotoluene	1	0.14	2.5	0.10	J
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.20	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	2.5	2.5	0.048	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	2.5	2.5	0.065	U
98-95-3	ne (Tetryl) Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	0.59	2.5	0.066	J
	7-tetrazocine					

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	1.99	80	57 - 139	

* Values outside of QC limits

Do not use
12/2/08

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

13SB13C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-02 File ID: data013-0

Sampled: 11/12/08 10:18 Prepared: 11/24/08 07:16 Analyzed: 11/26/08 19:01

Solids: 89.66 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813554 Sequence: 8113001 Calibration: 8K30001 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.074	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	1.3	2.5	0.15	J
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.10	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.20	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	2.5	2.5	0.048	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	2.5	2.5	0.065	U
98-95-3	ne (Tetryl) Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	0.79	2.5	0.066	J
	7-tetrazocine					

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.51	100	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

13SB13C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-02RE1 File ID: EXa007-0

Sampled: 11/12/08 10:18 Prepared: 11/24/08 07:16 Analyzed: 12/02/08 18:32

Solids: 89.66 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813554 Sequence: 8120311 Calibration: 8L02003 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.074	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	0.90	2.5	0.15	J
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.10	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.20	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	2.5	2.5	0.048	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	2.5	2.5	0.065	U
98-95-3	ne (Tetryl) Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	0.64	2.5	0.066	J
	7-tetrazocine					

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.11	84	57 - 139	

* Values outside of QC limits

Do not use
A 1/27/09

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

13SB21C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-03 File ID: data014-0

Sampled: 11/12/08 12:26 Prepared: 11/24/08 07:16 Analyzed: 11/26/08 19:39

Solids: 76.80 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813554 Sequence: 8113001 Calibration: 8K30001 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.074	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.15	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.10	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.20	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	2.5	2.5	0.048	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	2.5	2.5	0.065	U
98-95-3	ne (Tetryl) Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	2.5	2.5	0.066	U
	7-tetrazocine					

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.45	98	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

13SB14A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-04 File ID: data015-0

Sampled: 11/12/08 16:00 Prepared: 11/24/08 07:16 Analyzed: 11/26/08 20:17

Solids: 94.24 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813554 Sequence: 8113001 Calibration: 8K30001 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.074	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	0.23	2.5	0.15	J
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.10	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.20	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	2.5	2.5	0.048	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	2.5	2.5	0.065	U
98-95-3	ne (Tetryl) Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	2.5	2.5	0.066	U
	7-tetrazocine					

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.45	98	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

13SB14A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-04RE1 File ID: EXa008-0

Sampled: 11/12/08 16:00 Prepared: 11/24/08 07:16 Analyzed: 12/02/08 19:20

Solids: 94.24 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813554 Sequence: 8120311 Calibration: 8L02003 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.074	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	0.21	2.5	0.15	J
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.10	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.20	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	2.5	2.5	0.048	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	2.5	2.5	0.065	U
98-95-3	ne (Tetryl) Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	2.5	2.5	0.066	U
	7-tetrazocine					

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.31	92	57 - 139	

* Values outside of QC limits

Do not use
TB, 1/29/09

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

EQBK-1

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Water Laboratory ID: 0811328-05 File ID: data007-0

Sampled: 11/12/08 17:00 Prepared: 11/19/08 07:18 Analyzed: 11/24/08 17:11

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0813556 Sequence: 8112552 Calibration: 8K25017 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	5.0	5.0	0.092	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	5.0	5.0	0.15	U
98-95-3	ne (Tetryl) Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	5.0	5.0	0.20	U
	7-tetrazocine					

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	3.25	2.48	76	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

13SB20A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-06 File ID: data016-0

Sampled: 11/12/08 14:34 Prepared: 11/24/08 07:16 Analyzed: 11/26/08 20:55

Solids: 84.47 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813554 Sequence: 8113001 Calibration: 8K30001 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.074	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.15	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.10	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.20	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	2.5	2.5	0.048	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	2.5	2.5	0.065	U
98-95-3	ne (Tetryl) Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	2.5	2.5	0.066	U
	7-tetrazocine					

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.57	103	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

13SB20C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-07 File ID: data017-0

Sampled: 11/12/08 14:49 Prepared: 11/24/08 07:16 Analyzed: 11/26/08 21:33

Solids: 81.43 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813554 Sequence: 8113001 Calibration: 8K30001 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.074	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.15	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.10	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.20	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	2.5	2.5	0.048	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	2.5	2.5	0.065	U
98-95-3	ne (Tetryl) Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	2.5	2.5	0.066	U
	7-tetrazocine					

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.66	106	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

13SB22A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-08 File ID: data018-0

Sampled: 11/12/08 13:20 Prepared: 11/24/08 07:16 Analyzed: 11/26/08 22:12

Solids: 84.78 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813554 Sequence: 8113001 Calibration: 8K30001 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.074	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.15	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.10	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.20	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	2.5	2.5	0.048	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	2.5	2.5	0.065	U
98-95-3	ne (Tetryl) Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	2.5	2.5	0.066	U
	7-tetrazocine					

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.55	102	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

13SB22C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-09 File ID: data019-0

Sampled: 11/12/08 13:25 Prepared: 11/24/08 07:16 Analyzed: 11/26/08 22:50

Solids: 71.80 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813554 Sequence: 8113001 Calibration: 8K30001 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.074	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.15	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.10	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.20	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	2.5	2.5	0.048	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	2.5	2.5	0.065	U
98-95-3	ne (Tetryl) Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	2.5	2.5	0.066	U
	7-tetrazocine					

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.39	96	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

13SB21A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-10 File ID: data021-0

Sampled: 11/12/08 12:21 Prepared: 11/24/08 07:16 Analyzed: 11/27/08 00:06

Solids: 76.82 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813554 Sequence: 8113001 Calibration: 8K30001 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.074	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.15	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.10	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.20	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	2.5	2.5	0.048	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	2.5	2.5	0.065	U
98-95-3	ne (Tetryl) Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	2.5	2.5	0.066	U
	7-tetrazocine					

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.39	96	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

13SB18A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-11 File ID: data022-0

Sampled: 11/13/08 15:21 Prepared: 11/24/08 07:16 Analyzed: 11/27/08 00:44

Solids: 81.46 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813554 Sequence: 8113001 Calibration: 8K30001 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.074	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.15	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.10	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.20	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	2.5	2.5	0.048	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	2.5	2.5	0.065	U
98-95-3	ne (Tetryl) Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	2.5	2.5	0.066	U
	7-tetrazocine					

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.63	105	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

13SB18C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-12 File ID: data023-0

Sampled: 11/13/08 15:29 Prepared: 11/24/08 07:16 Analyzed: 11/27/08 01:22

Solids: 80.33 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813554 Sequence: 8113001 Calibration: 8K30001 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.074	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.15	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.10	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.20	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	2.5	2.5	0.048	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	2.5	2.5	0.065	U
98-95-3	ne (Tetryl) Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	2.5	2.5	0.066	U
	7-tetrazocine					

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.61	104	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

EQBK-5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Water Laboratory ID: 0811328-13 File ID: data008-0

Sampled: 11/13/08 16:00 Prepared: 11/19/08 07:18 Analyzed: 11/24/08 17:49

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0813556 Sequence: 8112552 Calibration: 8K25017 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	5.0	5.0	0.092	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	5.0	5.0	0.15	U
98-95-3	ne (Tetryl) Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	5.0	5.0	0.20	U
	7-tetrazocine					

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	3.25	2.46	76	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

13SB19A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-14 File ID: data024-0

Sampled: 11/13/08 12:22 Prepared: 11/24/08 07:16 Analyzed: 11/27/08 02:00

Solids: 67.63 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813554 Sequence: 8113001 Calibration: 8K30001 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.074	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.15	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.10	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.20	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	2.5	2.5	0.048	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	2.5	2.5	0.065	U
98-95-3	ne (Tetryl) Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	2.5	2.5	0.066	U
	7-tetrazocine					

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.62	105	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

13SB19C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-15 File ID: data025-0

Sampled: 11/13/08 12:27 Prepared: 11/24/08 07:16 Analyzed: 11/27/08 02:38

Solids: 76.14 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813554 Sequence: 8113001 Calibration: 8K30001 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.074	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.15	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.10	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.20	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	2.5	2.5	0.048	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	2.5	2.5	0.065	U
98-95-3	ne (Tetryl) Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	2.5	2.5	0.066	U
	7-tetrazocine					

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.63	105	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

EQBK-6

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Water Laboratory ID: 0811331-01 File ID: data009-0

Sampled: 11/14/08 15:20 Prepared: 11/19/08 07:18 Analyzed: 11/24/08 18:29

Solids: Preparation: 8330 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0813556 Sequence: 8112552 Calibration: 8K25017 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	5.0	5.0	0.045	U
99-65-0	1,3-Dinitrobenzene	1	5.0	5.0	0.071	U
118-96-7	2,4,6-Trinitrotoluene	1	5.0	5.0	0.10	U
121-14-2	2,4-Dinitrotoluene	1	5.0	5.0	0.092	U
606-20-2	2,6-Dinitrotoluene	1	5.0	5.0	0.16	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	5.0	5.0	0.24	U
88-72-2	2-Nitrotoluene	1	5.0	5.0	0.28	U
99-08-1	3-Nitrotoluene	1	5.0	5.0	0.17	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	5.0	5.0	0.22	U
99-99-0	4-Nitrotoluene	1	5.0	5.0	0.49	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	5.0	5.0	0.092	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	5.0	5.0	0.15	U
98-95-3	ne (Tetryl) Nitrobenzene	1	5.0	5.0	0.15	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	5.0	5.0	0.20	U
	7-tetrazocine					

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
4-Nitroaniline	3.25	2.10	65	29 - 138	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

13SB17A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-02 File ID: data026-0

Sampled: 11/14/08 10:05 Prepared: 11/24/08 07:16 Analyzed: 11/27/08 03:16

Solids: 74.49 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813554 Sequence: 8113001 Calibration: 8K30001 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.074	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.15	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.10	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.20	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	2.5	2.5	0.048	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	2.5	2.5	0.065	U
98-95-3	ne (Tetryl) Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	2.5	2.5	0.066	U
	7-tetrazocine					

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.44	98	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

13SB17C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-03 File ID: data027-0

Sampled: 11/14/08 10:15 Prepared: 11/24/08 07:16 Analyzed: 11/27/08 03:54

Solids: 84.26 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813554 Sequence: 8113001 Calibration: 8K30001 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.074	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.15	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.10	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.20	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	2.5	2.5	0.048	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	2.5	2.5	0.065	U
98-95-3	ne (Tetryl) Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	2.5	2.5	0.066	U
	7-tetrazocine					

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.80	112	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

13SB16A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-04 File ID: data028-0

Sampled: 11/14/08 13:00 Prepared: 11/24/08 07:16 Analyzed: 11/27/08 04:32

Solids: 81.57 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813554 Sequence: 8113001 Calibration: 8K30001 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.074	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.15	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.10	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.20	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	2.5	2.5	0.048	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	2.5	2.5	0.065	U
98-95-3	ne (Tetryl) Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	2.5	2.5	0.066	U
	7-tetrazocine					

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.51	100	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

13SB16C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-05 File ID: data029-0

Sampled: 11/14/08 13:08 Prepared: 11/24/08 07:16 Analyzed: 11/27/08 05:11

Solids: 80.70 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813554 Sequence: 8113001 Calibration: 8K30001 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.074	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.15	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.10	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.20	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	2.5	2.5	0.048	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	2.5	2.5	0.065	U
98-95-3	ne (Tetryl) Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	2.5	2.5	0.066	U
	7-tetrazocine					

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.48	99	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

13SB15A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-06 File ID: data030-0

Sampled: 11/14/08 12:53 Prepared: 11/24/08 07:16 Analyzed: 11/27/08 05:49

Solids: 90.06 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813554 Sequence: 8113001 Calibration: 8K30001 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	0.36	2.5	0.074	J
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	0.45	2.5	0.15	J
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.10	U
606-20-2	2,6-Dinitrotoluene	1	0.68	2.5	0.20	J
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	2.5	2.5	0.048	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	2.5	2.5	0.065	U
98-95-3	ne (Tetryl) Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	0.25	2.5	0.066	J
	7-tetrazocine					

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.47	99	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

13SB15A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-06RE1 File ID: EXa009-0

Sampled: 11/14/08 12:53 Prepared: 11/24/08 07:16 Analyzed: 12/02/08 20:08

Solids: 90.06 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813554 Sequence: 8120311 Calibration: 8L02003 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	0.26	2.5	0.074	J
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	0.34	2.5	0.15	J
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.10	U
606-20-2	2,6-Dinitrotoluene	1	0.38	2.5	0.20	J
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	2.5	2.5	0.048	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	2.5	2.5	0.065	U
98-95-3	ne (Tetryl) Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	0.23	2.5	0.066	J
	7-tetrazocine					

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.34	94	57 - 139	

* Values outside of QC limits

Do not use
AS 1/22/09

ORGANIC ANALYSIS DATA SHEET
USEPA-8330

DUP-13

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-07 File ID: data032-0

Sampled: 11/14/08 00:00 Prepared: 11/24/08 07:16 Analyzed: 11/27/08 07:05

Solids: 89.76 Preparation: 8330 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813554 Sequence: 8113001 Calibration: 8K30001 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
99-35-4	1,3,5-Trinitrobenzene	1	2.5	2.5	0.074	U
99-65-0	1,3-Dinitrobenzene	1	2.5	2.5	0.076	U
118-96-7	2,4,6-Trinitrotoluene	1	2.5	2.5	0.15	U
121-14-2	2,4-Dinitrotoluene	1	2.5	2.5	0.10	U
606-20-2	2,6-Dinitrotoluene	1	2.5	2.5	0.20	U
35572-78-2	2-Amino-4,6-dinitrotoluene	1	2.5	2.5	0.22	U
88-72-2	2-Nitrotoluene	1	2.5	2.5	0.17	U
99-08-1	3-Nitrotoluene	1	2.5	2.5	0.21	U
1946-51-0	4-Amino-2,6-dinitrotoluene	1	2.5	2.5	0.30	U
99-99-0	4-Nitrotoluene	1	2.5	2.5	0.20	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-tria	1	2.5	2.5	0.048	U
479-45-8	zine (RDX) Methyl-2,4,6-trinitrophenylnitrami	1	2.5	2.5	0.065	U
98-95-3	ne (Tetryl) Nitrobenzene	1	2.5	2.5	0.030	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,	1	2.5	2.5	0.066	U
	7-tetrazocine					

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
4-Nitroaniline	2.50	2.64	106	57 - 139	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

13SB13A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-01 File ID: data005-0

Sampled: 11/12/08 10:00 Prepared: 11/24/08 07:17 Analyzed: 11/25/08 08:38

Solids: 88.77 Preparation: 8332 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813555 Sequence: 8112590 Calibration: 8K24006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.39	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.23	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
1-Nitronaphthalene	2.48	2.83	114	50 - 150	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

13SB13C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-02 File ID: data006-0

Sampled: 11/12/08 10:18 Prepared: 11/24/08 07:17 Analyzed: 11/25/08 08:56

Solids: 89.66 Preparation: 8332 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813555 Sequence: 8112590 Calibration: 8K24006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
55-63-0	Nitroglycerin	1	21	5.0	0.39	
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.23	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
1-Nitronaphthalene	2.48	2.82	114	50 - 150	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

13SB13C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-02RE1 File ID: NGa018-0

Sampled: 11/12/08 10:18 Prepared: 11/24/08 07:17 Analyzed: 12/03/08 00:47

Solids: 89.66 Preparation: 8332 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813555 Sequence: 8120233 Calibration: 8L03001 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
55-63-0	Nitroglycerin	1	8.6	5.0	0.39	
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.23	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
1-Nitronaphthalene	2.48	1.54	62	50 - 150	

* Values outside of QC limits

Do not use
AS 1/29/09

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

13SB21C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-03 File ID: data007-0

Sampled: 11/12/08 12:26 Prepared: 11/24/08 07:17 Analyzed: 11/25/08 09:13

Solids: 76.80 Preparation: 8332 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813555 Sequence: 8112590 Calibration: 8K24006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.39	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.23	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
1-Nitronaphthalene	2.48	2.82	114	50 - 150	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

13SB14A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0811328-04
File ID: data010-0
Sampled: 11/12/08 16:00
Prepared: 11/24/08 07:17
Analyzed: 11/25/08 10:05
Solids: 94.24
Preparation: 8332 Extraction
Initial/Final: 2 g / 20 mL
QC Batch: 0813555
Sequence: 8112590
Calibration: 8K24006
Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.39	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.23	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
1-Nitronaphthalene	2.48	2.84	114	50 - 150	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

EQBK-1

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Water
Laboratory ID: 0811328-05
File ID: NPa014-0
Sampled: 11/12/08 17:00
Prepared: 11/19/08 07:19
Analyzed: 11/21/08 19:49
Solids:
Preparation: 8332 Extraction
Initial/Final: 770 mL / 10 mL
QC Batch: 0813557
Sequence: 8112470
Calibration: 8K24006
Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
55-63-0	Nitroglycerin	1	10	10	1.2	U
78-11-5	Pentaerythritol Tetranitrate	1	10	10	1.2	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
1-Nitronaphthalene	3.22	3.27	102	50 - 150	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

13SB20A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-06 File ID: data011-0

Sampled: 11/12/08 14:34 Prepared: 11/24/08 07:17 Analyzed: 11/25/08 10:23

Solids: 84.47 Preparation: 8332 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813555 Sequence: 8112590 Calibration: 8K24006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.39	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.23	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
1-Nitronaphthalene	2.48	2.84	114	50 - 150	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

13SB20C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0811328-07
File ID: data012-0
Sampled: 11/12/08 14:49
Prepared: 11/24/08 07:17
Analyzed: 11/25/08 10:40
Solids: 81.43
Preparation: 8332 Extraction
Initial/Final: 2 g / 20 mL
QC Batch: 0813555
Sequence: 8112590
Calibration: 8K24006
Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.39	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.23	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
1-Nitronaphthalene	2.48	2.82	114	50 - 150	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

13SB22A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0811328-08
File ID: data014-0
Sampled: 11/12/08 13:20
Prepared: 11/24/08 07:17
Analyzed: 11/25/08 11:15
Solids: 84.78
Preparation: 8332 Extraction
Initial/Final: 2 g / 20 mL
QC Batch: 0813555
Sequence: 8112590
Calibration: 8K24006
Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.39	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.23	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
1-Nitronaphthalene	2.48	2.80	113	50 - 150	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

13SB22C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0811328-09
File ID: data015-0
Sampled: 11/12/08 13:25
Prepared: 11/24/08 07:17
Analyzed: 11/25/08 11:32
Solids: 71.80
Preparation: 8332 Extraction
Initial/Final: 2 g / 20 mL
QC Batch: 0813555
Sequence: 8112590
Calibration: 8K24006
Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.39	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.23	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
1-Nitronaphthalene	2.48	2.83	114	50 - 150	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

13SB21A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0811328-10
File ID: data016-0
Sampled: 11/12/08 12:21
Prepared: 11/24/08 07:17
Analyzed: 11/25/08 11:49
Solids: 76.82
Preparation: 8332 Extraction
Initial/Final: 2 g / 20 mL
QC Batch: 0813555
Sequence: 8112590
Calibration: 8K24006
Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.39	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.23	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
1-Nitronaphthalene	2.48	2.84	115	50 - 150	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

13SB18A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0811328-11
File ID: data017-0
Sampled: 11/13/08 15:21
Prepared: 11/24/08 07:17
Analyzed: 11/25/08 12:06
Solids: 81.46
Preparation: 8332 Extraction
Initial/Final: 2 g / 20 mL
QC Batch: 0813555
Sequence: 8112590
Calibration: 8K24006
Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.39	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.23	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
1-Nitronaphthalene	2.48	2.83	114	50 - 150	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

13SB18C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-12 File ID: data018-0

Sampled: 11/13/08 15:29 Prepared: 11/24/08 07:17 Analyzed: 11/25/08 12:24

Solids: 80.33 Preparation: 8332 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813555 Sequence: 8112590 Calibration: 8K24006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.39	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.23	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
1-Nitronaphthalene	2.48	2.84	114	50 - 150	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

EQBK-5

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Water Laboratory ID: 0811328-13 File ID: NPa015-0

Sampled: 11/13/08 16:00 Prepared: 11/19/08 07:19 Analyzed: 11/21/08 20:06

Solids: Preparation: 8332 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0813557 Sequence: 8112470 Calibration: 8K24006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
55-63-0	Nitroglycerin	1	10	10	1.2	U
78-11-5	Pentaerythritol Tetranitrate	1	10	10	1.2	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
1-Nitronaphthalene	3.22	3.29	102	50 - 150	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

13SB19A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0811328-14
File ID: data019-0
Sampled: 11/13/08 12:22
Prepared: 11/24/08 07:17
Analyzed: 11/25/08 12:41
Solids: 67.63
Preparation: 8332 Extraction
Initial/Final: 2 g / 20 mL
QC Batch: 0813555
Sequence: 8112590
Calibration: 8K24006
Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.39	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.23	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
1-Nitronaphthalene	2.48	2.80	113	50 - 150	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

13SB19C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811328-15 File ID: data020-0

Sampled: 11/13/08 12:27 Prepared: 11/24/08 07:17 Analyzed: 11/25/08 12:58

Solids: 76.14 Preparation: 8332 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813555 Sequence: 8112590 Calibration: 8K24006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.39	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.23	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
1-Nitronaphthalene	2.48	2.82	114	50 - 150	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

EQBK-6

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Water Laboratory ID: 0811331-01 File ID: NPa016-0

Sampled: 11/14/08 15:20 Prepared: 11/19/08 07:19 Analyzed: 11/21/08 20:23

Solids: Preparation: 8332 Extraction Initial/Final: 770 mL / 10 mL

QC Batch: 0813557 Sequence: 8112470 Calibration: 8K24006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (ug/L)	MRL	MDL	Q
55-63-0	Nitroglycerin	1	10	10	1.2	U
78-11-5	Pentaerythritol Tetranitrate	1	10	10	1.2	U

System Monitoring Compound	ADDED (ug/L)	CONC (ug/L)	% REC.	QC Limits	Q
1-Nitronaphthalene	3.22	3.21	100	50 - 150	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

13SB17A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0811331-02
File ID: data021-0
Sampled: 11/14/08 10:05
Prepared: 11/24/08 07:17
Analyzed: 11/25/08 13:16
Solids: 74.49
Preparation: 8332 Extraction
Initial/Final: 2 g / 20 mL
QC Batch: 0813555
Sequence: 8112590
Calibration: 8K24006
Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.39	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.23	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
1-Nitronaphthalene	2.48	2.81	113	50 - 150	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0811331-03
File ID: data022-0
Sampled: 11/14/08 10:15
Prepared: 11/24/08 07:17
Analyzed: 11/25/08 13:33
Solids: 84.26
Preparation: 8332 Extraction
Initial/Final: 2 g / 20 mL
QC Batch: 0813555
Sequence: 8112590
Calibration: 8K24006
Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.39	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.23	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
1-Nitronaphthalene	2.48	2.84	114	50 - 150	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

13SB16A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-04 File ID: data023-0

Sampled: 11/14/08 13:00 Prepared: 11/24/08 07:17 Analyzed: 11/25/08 13:50

Solids: 81.57 Preparation: 8332 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813555 Sequence: 8112590 Calibration: 8K24006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.39	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.23	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
1-Nitronaphthalene	2.48	2.82	114	50 - 150	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

13SB16C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-05 File ID: data025-0

Sampled: 11/14/08 13:08 Prepared: 11/24/08 07:17 Analyzed: 11/25/08 14:25

Solids: 80.70 Preparation: 8332 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813555 Sequence: 8112590 Calibration: 8K24006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.39	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.23	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
1-Nitronaphthalene	2.48	2.83	114	50 - 150	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

13SB15A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-06 File ID: data026-0

Sampled: 11/14/08 12:53 Prepared: 11/24/08 07:17 Analyzed: 11/25/08 14:42

Solids: 90.06 Preparation: 8332 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813555 Sequence: 8112590 Calibration: 8K24006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.39	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.23	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
1-Nitronaphthalene	2.48	2.82	114	50 - 150	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET
USEPA-8332

DUP-13

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil Laboratory ID: 0811331-07 File ID: data027-0

Sampled: 11/14/08 00:00 Prepared: 11/24/08 07:17 Analyzed: 11/25/08 14:59

Solids: 89.76 Preparation: 8332 Extraction Initial/Final: 2 g / 20 mL

QC Batch: 0813555 Sequence: 8112590 Calibration: 8K24006 Instrument: 221

CAS No.	Analyte	Dilution	CONC. (mg/kg dry	MRL	MDL	Q
55-63-0	Nitroglycerin	1	5.0	5.0	0.39	U
78-11-5	Pentaerythritol Tetranitrate	1	5.0	5.0	0.23	U

System Monitoring Compound	ADDED (mg/kg dry	CONC (mg/kg dry	% REC.	QC Limits	Q
1-Nitronaphthalene	2.48	2.82	114	50 - 150	

* Values outside of QC limits

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

EQBK-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water
Sampled: 11/12/08 17:00
Solids: 0.00
Laboratory ID: 0811328-05

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3020A Digestion
Prepared: 11/20/08 07:30
Initial/Final: 25 mL / 125 mL
QC Batch: 0813681

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	3.0	ug/L	1	3.0	0.32	U	12/01/08 12:27
7440-38-2	Arsenic, Total	3.0	ug/L	1	3.0	0.24	U	12/01/08 12:27
7440-39-3	Barium, Total	0.27	ug/L	1	2.0	0.23	J	12/01/08 10:14
7440-41-7	Beryllium, Total	2.0	ug/L	1	2.0	0.23	U	12/01/08 10:14
7440-43-9	Cadmium, Total	0.20	ug/L	1	0.20	0.056	U	12/01/08 10:14
7440-47-3	Chromium, Total	2.0	ug/L	1	2.0	0.33	U	12/01/08 10:14
7440-48-4	Cobalt, Total	1.0	ug/L	1	1.0	0.050	U	12/01/08 12:27
7440-50-8	Copper, Total	1.3	ug/L	1	1.0	0.29		12/01/08 10:14
7439-92-1	Lead, Total	0.62	ug/L	1	1.0	0.29	J	12/01/08 10:14
7439-96-5	Manganese, Total	0.83	ug/L	1	3.0	0.30	J	12/01/08 10:14
7440-02-0	Nickel, Total	0.40	ug/L	1	2.0	0.35	J	12/01/08 10:14
7782-49-2	Selenium, Total	3.0	ug/L	1	3.0	0.30	U	12/01/08 10:14
7440-22-4	Silver, Total	0.50	ug/L	1	0.50	0.061	U	12/01/08 10:14
7440-28-0	Thallium, Total	0.20	ug/L	1	0.20	0.050	U	12/01/08 10:14
7440-62-2	Vanadium, Total	5.0	ug/L	1	5.0	0.27	U	12/01/08 12:27
7440-66-6	Zinc, Total	18	ug/L	1	10	1.8		12/01/08 10:14

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

EQBK-5

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water
Sampled: 11/13/08 16:00
Solids: 0.00
Laboratory ID: 0811328-13

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3020A Digestion
Prepared: 11/20/08 07:30
Initial/Final: 25 mL / 125 mL
QC Batch: 0813681

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	3.0	ug/L	1	3.0	0.32	U	12/01/08 12:30
7440-38-2	Arsenic, Total	3.0	ug/L	1	3.0	0.24	U	12/01/08 12:30
7440-39-3	Barium, Total	2.0	ug/L	1	2.0	0.23	U	12/01/08 10:20
7440-41-7	Beryllium, Total	2.0	ug/L	1	2.0	0.23	U	12/01/08 10:20
7440-43-9	Cadmium, Total	0.20	ug/L	1	0.20	0.056	U	12/01/08 10:20
7440-47-3	Chromium, Total	2.0	ug/L	1	2.0	0.33	U	12/01/08 10:20
7440-48-4	Cobalt, Total	1.0	ug/L	1	1.0	0.050	U	12/01/08 12:30
7440-50-8	Copper, Total	1.0	ug/L	1	1.0	0.29	U	12/01/08 10:20
7439-92-1	Lead, Total	1.0	ug/L	1	1.0	0.29	U	12/01/08 10:20
7439-96-5	Manganese, Total	0.40	ug/L	1	3.0	0.30	J	12/01/08 10:20
7440-02-0	Nickel, Total	2.0	ug/L	1	2.0	0.35	U	12/01/08 10:20
7782-49-2	Selenium, Total	3.0	ug/L	1	3.0	0.30	U	12/01/08 10:20
7440-22-4	Silver, Total	0.50	ug/L	1	0.50	0.061	U	12/01/08 10:20
7440-28-0	Thallium, Total	0.20	ug/L	1	0.20	0.050	U	12/01/08 10:20
7440-62-2	Vanadium, Total	5.0	ug/L	1	5.0	0.27	U	12/01/08 12:30
7440-66-6	Zinc, Total	12	ug/L	1	10	1.8		12/01/08 10:20

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

EQBK-6

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water
Sampled: 11/14/08 15:20
Solids: 0.00
Laboratory ID: 0811331-01

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3020A Digestion
Prepared: 11/20/08 07:30
Initial/Final: 25 mL / 125 mL
QC Batch: 0813681

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	3.0	ug/L	1	3.0	0.32	U	12/01/08 12:33
7440-38-2	Arsenic, Total	3.0	ug/L	1	3.0	0.24	U	12/01/08 12:33
7440-39-3	Barium, Total	2.0	ug/L	1	2.0	0.23	U	12/01/08 10:25
7440-41-7	Beryllium, Total	2.0	ug/L	1	2.0	0.23	U	12/01/08 10:25
7440-43-9	Cadmium, Total	0.20	ug/L	1	0.20	0.056	U	12/01/08 10:25
7440-47-3	Chromium, Total	0.37	ug/L	1	2.0	0.33	J	12/01/08 10:25
7440-48-4	Cobalt, Total	1.0	ug/L	1	1.0	0.050	U	12/01/08 12:33
7440-50-8	Copper, Total	0.46	ug/L	1	1.0	0.29	J	12/01/08 10:25
7439-92-1	Lead, Total	1.0	ug/L	1	1.0	0.29	U	12/01/08 10:25
7439-96-5	Manganese, Total	0.95	ug/L	1	3.0	0.30	J	12/01/08 10:25
7440-02-0	Nickel, Total	2.0	ug/L	1	2.0	0.35	U	12/01/08 10:25
7782-49-2	Selenium, Total	3.0	ug/L	1	3.0	0.30	U	12/01/08 10:25
7440-22-4	Silver, Total	0.50	ug/L	1	0.50	0.061	U	12/01/08 10:25
7440-28-0	Thallium, Total	0.20	ug/L	1	0.20	0.050	U	12/01/08 10:25
7440-62-2	Vanadium, Total	5.0	ug/L	1	5.0	0.27	U	12/01/08 12:33
7440-66-6	Zinc, Total	16	ug/L	1	10	1.8		12/01/08 10:25

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB13A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 10:00
Solids: 88.77
Laboratory ID: 0811328-01

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5004 g / 250 mL
QC Batch: 0813642

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total	1.7	mg/kg dry wt.	1	0.20	0.026		11/24/08 12:43
7440-50-8	Copper, Total	13	mg/kg dry wt.	1	0.20	0.027		11/24/08 12:43
7439-92-1	Lead, Total	200	mg/kg dry wt.	5	1.0	0.12		11/24/08 14:36
7440-02-0	Nickel, Total	12	mg/kg dry wt.	1	0.10	0.035		11/24/08 12:43
7782-49-2	Selenium, Total	0.24	mg/kg dry wt.	1	0.30	0.028	J	11/24/08 12:43
7440-22-4	Silver, Total	0.057	mg/kg dry wt.	1	0.10	0.0093	J	11/24/08 12:43
7440-28-0	Thallium, Total	0.43	mg/kg dry wt.	1	0.10	0.0068		11/24/08 12:43
7440-62-2	Vanadium, Total	22	mg/kg dry wt.	1	0.10	0.032		11/24/08 16:38

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB13A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 10:00
Solids: 88.77
Laboratory ID: 0811328-01

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 09:00
Initial/Final: 0.5001 g / 250 mL
QC Batch: 0813766

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.43	mg/kg dry wt.	1	0.20	0.026		11/25/08 14:22

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB13C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 10:18
Solids: 89.66
Laboratory ID: 0811328-02

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5002 g / 250 mL
QC Batch: 0813642

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total	1.3	mg/kg dry wt.	1	0.20	0.026		11/24/08 12:46
7440-50-8	Copper, Total	9.2	mg/kg dry wt.	1	0.20	0.027		11/24/08 12:46
7439-92-1	Lead, Total	140	mg/kg dry wt.	5	1.0	0.12		11/24/08 14:39
7440-02-0	Nickel, Total	10	mg/kg dry wt.	1	0.10	0.035		11/24/08 12:46
7782-49-2	Selenium, Total	0.16	mg/kg dry wt.	1	0.30	0.028	J	11/24/08 12:46
7440-22-4	Silver, Total	0.049	mg/kg dry wt.	1	0.10	0.0093	J	11/24/08 12:46
7440-28-0	Thallium, Total	0.30	mg/kg dry wt.	1	0.10	0.0068		11/24/08 12:46
7440-62-2	Vanadium, Total	18	mg/kg dry wt.	1	0.10	0.032		11/24/08 16:40

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB13C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 10:18
Solids: 89.66
Laboratory ID: 0811328-02

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 09:00
Initial/Final: 0.5002 g / 250 mL
QC Batch: 0813766

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.20	mg/kg dry wt.	1	0.20	0.026		11/25/08 14:24

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB21C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 12:26
Solids: 76.80
Laboratory ID: 0811328-03

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5001 g / 250 mL
QC Batch: 0813642

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total	4.8	mg/kg dry wt.	1	0.20	0.026		11/24/08 12:49
7440-50-8	Copper, Total	20	mg/kg dry wt.	1	0.20	0.027		11/24/08 12:49
7439-92-1	Lead, Total	290	mg/kg dry wt.	10	2.0	0.24		11/24/08 14:41
7440-02-0	Nickel, Total	22	mg/kg dry wt.	1	0.10	0.035		11/24/08 12:49
7782-49-2	Selenium, Total	0.27	mg/kg dry wt.	1	0.30	0.028	J	11/24/08 12:49
7440-22-4	Silver, Total	0.20	mg/kg dry wt.	1	0.10	0.0093		11/24/08 12:49
7440-28-0	Thallium, Total	1.6	mg/kg dry wt.	1	0.10	0.0068		11/24/08 12:49
7440-62-2	Vanadium, Total	35	mg/kg dry wt.	1	0.10	0.032		11/24/08 16:42

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB21C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 12:26
Solids: 76.80
Laboratory ID: 0811328-03

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 09:00
Initial/Final: 0.5002 g / 250 mL
QC Batch: 0813766

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	2.5	mg/kg dry wt.	1	0.20	0.026		11/25/08 14:26

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB14A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 16:00
Solids: 94.24
Laboratory ID: 0811328-04

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.4998 g / 250 mL
QC Batch: 0813642

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total	2.0	mg/kg dry wt.	1	0.20	0.026		11/24/08 12:52
7440-50-8	Copper, Total	31	mg/kg dry wt.	1	0.20	0.027		11/24/08 12:52
7439-92-1	Lead, Total	160	mg/kg dry wt.	5	1.0	0.12		11/24/08 14:43
7440-02-0	Nickel, Total	14	mg/kg dry wt.	1	0.10	0.035		11/24/08 12:52
7782-49-2	Selenium, Total	0.25	mg/kg dry wt.	1	0.30	0.028	J	11/24/08 12:52
7440-22-4	Silver, Total	0.055	mg/kg dry wt.	1	0.10	0.0093	J	11/24/08 12:52
7440-28-0	Thallium, Total	0.16	mg/kg dry wt.	1	0.10	0.0068		11/24/08 12:52
7440-62-2	Vanadium, Total	23	mg/kg dry wt.	1	0.10	0.032		11/24/08 16:44

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

I3SB14A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 16:00
Solids: 94.24
Laboratory ID: 0811328-04

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 09:00
Initial/Final: 0.4995 g / 250 mL
QC Batch: 0813766

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.57	mg/kg dry wt.	1	0.20	0.026		11/25/08 14:28

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB20A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 14:34
Solids: 84.47
Laboratory ID: 0811328-06

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5004 g / 250 mL
QC Batch: 0813642

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total	1.8	mg/kg dry wt.	1	0.20	0.026		11/24/08 12:55
7440-50-8	Copper, Total	16	mg/kg dry wt.	1	0.20	0.027		11/24/08 12:55
7439-92-1	Lead, Total	85	mg/kg dry wt.	2	0.40	0.047		11/24/08 14:45
7440-02-0	Nickel, Total	12	mg/kg dry wt.	1	0.10	0.035		11/24/08 12:55
7782-49-2	Selenium, Total	0.39	mg/kg dry wt.	1	0.30	0.028		11/24/08 12:55
7440-22-4	Silver, Total	0.093	mg/kg dry wt.	1	0.10	0.0093	J	11/24/08 12:55
7440-28-0	Thallium, Total	0.32	mg/kg dry wt.	1	0.10	0.0068		11/24/08 12:55
7440-62-2	Vanadium, Total	26	mg/kg dry wt.	1	0.10	0.032		11/24/08 16:46

INORGANIC ANALYSIS DATA SHEET

USEPA-6020A

13SB20A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 14:34
Solids: 84.47
Laboratory ID: 0811328-06

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 09:00
Initial/Final: 0.4996 g / 250 mL
QC Batch: 0813766

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.32	mg/kg dry wt.	1	0.20	0.026		11/25/08 14:30

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB20C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 14:49
Solids: 81.43
Laboratory ID: 0811328-07

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5005 g / 250 mL
QC Batch: 0813642

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total	4.3	mg/kg dry wt.	1	0.20	0.026		11/24/08 12:58
7440-50-8	Copper, Total	23	mg/kg dry wt.	1	0.20	0.027		11/24/08 12:58
7439-92-1	Lead, Total	210	mg/kg dry wt.	5	1.0	0.12		11/24/08 14:48
7440-02-0	Nickel, Total	17	mg/kg dry wt.	1	0.10	0.035		11/24/08 12:58
7782-49-2	Selenium, Total	0.87	mg/kg dry wt.	1	0.30	0.028		11/24/08 12:58
7440-22-4	Silver, Total	0.15	mg/kg dry wt.	1	0.10	0.0093		11/24/08 12:58
7440-28-0	Thallium, Total	0.55	mg/kg dry wt.	1	0.10	0.0068		11/24/08 12:58
7440-62-2	Vanadium, Total	34	mg/kg dry wt.	1	0.10	0.032		11/24/08 16:48

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB20C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 14:49
Solids: 81.43
Laboratory ID: 0811328-07

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 09:00
Initial/Final: 0.4997 g / 250 mL
QC Batch: 0813766

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.40	mg/kg dry wt.	1	0.20	0.026		11/25/08 14:32

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB22A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:20
Solids: 84.78
Laboratory ID: 0811328-08

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5005 g / 250 mL
QC Batch: 0813642

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total	1.9	mg/kg dry wt.	1	0.20	0.026		11/24/08 13:01
7440-50-8	Copper, Total	15	mg/kg dry wt.	1	0.20	0.027		11/24/08 13:01
7439-92-1	Lead, Total	140	mg/kg dry wt.	5	1.0	0.12		11/24/08 14:50
7440-02-0	Nickel, Total	11	mg/kg dry wt.	1	0.10	0.035		11/24/08 13:01
7782-49-2	Selenium, Total	0.32	mg/kg dry wt.	1	0.30	0.028		11/24/08 13:01
7440-22-4	Silver, Total	0.097	mg/kg dry wt.	1	0.10	0.0093	J	11/24/08 13:01
7440-28-0	Thallium, Total	0.29	mg/kg dry wt.	1	0.10	0.0068		11/24/08 13:01
7440-62-2	Vanadium, Total	21	mg/kg dry wt.	1	0.10	0.032		11/24/08 16:50

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB22A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:20
Solids: 84.78
Laboratory ID: 0811328-08

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 09:00
Initial/Final: 0.4997 g / 250 mL
QC Batch: 0813766

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.83	mg/kg dry wt.	1	0.20	0.026		11/25/08 14:34

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB22C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:25
Solids: 71.80
Laboratory ID: 0811328-09

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5004 g / 250 mL
QC Batch: 0813642

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total	3.5	mg/kg dry wt.	1	0.20	0.026		11/24/08 13:04
7440-50-8	Copper, Total	39	mg/kg dry wt.	1	0.20	0.027		11/24/08 13:04
7439-92-1	Lead, Total	150	mg/kg dry wt.	5	1.0	0.12		11/24/08 14:52
7440-02-0	Nickel, Total	16	mg/kg dry wt.	1	0.10	0.035		11/24/08 13:04
7782-49-2	Selenium, Total	0.66	mg/kg dry wt.	1	0.30	0.028		11/24/08 13:04
7440-22-4	Silver, Total	0.12	mg/kg dry wt.	1	0.10	0.0093		11/24/08 13:04
7440-28-0	Thallium, Total	0.51	mg/kg dry wt.	1	0.10	0.0068		11/24/08 13:04
7440-62-2	Vanadium, Total	36	mg/kg dry wt.	1	0.10	0.032		11/24/08 16:52

L/M

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB22C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:25
Solids: 71.80
Laboratory ID: 0811328-09

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 09:00
Initial/Final: 0.5003 g / 250 mL
QC Batch: 0813766

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.39	mg/kg dry wt.	1	0.20	0.026		11/25/08 14:36

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB21A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 12:21
Solids: 76.82
Laboratory ID: 0811328-10

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.4998 g / 250 mL
QC Batch: 0813642

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total	2.8	mg/kg dry wt.	1	0.20	0.026		11/24/08 13:13
7440-50-8	Copper, Total	31	mg/kg dry wt.	1	0.20	0.027		11/24/08 13:13
7439-92-1	Lead, Total	110	mg/kg dry wt.	5	1.0	0.12		11/24/08 14:54
7440-02-0	Nickel, Total	22	mg/kg dry wt.	1	0.10	0.035		11/24/08 13:13
7782-49-2	Selenium, Total	0.66	mg/kg dry wt.	1	0.30	0.028		11/24/08 13:13
7440-22-4	Silver, Total	0.11	mg/kg dry wt.	1	0.10	0.0093		11/24/08 13:13
7440-28-0	Thallium, Total	0.46	mg/kg dry wt.	1	0.10	0.0068		11/24/08 13:13
7440-62-2	Vanadium, Total	59	mg/kg dry wt.	2	0.20	0.063		11/24/08 16:58

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB21A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 12:21
Solids: 76.82
Laboratory ID: 0811328-10

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 09:00
Initial/Final: 0.4996 g / 250 mL
QC Batch: 0813766

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	2.9	mg/kg dry wt.	1	0.20	0.026		11/25/08 14:45

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB18A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 15:21
Solids: 81.46
Laboratory ID: 0811328-11

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5002 g / 250 mL
QC Batch: 0813642

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total	0.98	mg/kg dry wt.	1	0.20	0.026		11/24/08 13:16
7440-50-8	Copper, Total	260	mg/kg dry wt.	10	2.0	0.27		11/24/08 15:55
7439-92-1	Lead, Total	220	mg/kg dry wt.	5	1.0	0.12		11/24/08 15:03
7440-02-0	Nickel, Total	9.5	mg/kg dry wt.	1	0.10	0.035		11/24/08 13:16
7782-49-2	Selenium, Total	0.25	mg/kg dry wt.	1	0.30	0.028	J	11/24/08 13:16
7440-22-4	Silver, Total	0.088	mg/kg dry wt.	1	0.10	0.0093	J	11/24/08 13:16
7440-28-0	Thallium, Total	0.18	mg/kg dry wt.	1	0.10	0.0068		11/24/08 13:16
7440-62-2	Vanadium, Total	24	mg/kg dry wt.	1	0.10	0.032		11/24/08 17:00

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB18A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 15:21
Solids: 81.46
Laboratory ID: 0811328-11

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 09:00
Initial/Final: 0.5002 g / 250 mL
QC Batch: 0813766

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.32	mg/kg dry wt.	1	0.20	0.026		11/25/08 14:47

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB18C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 15:29
Solids: 80.33
Laboratory ID: 0811328-12

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5005 g / 250 mL
QC Batch: 0813642

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total	0.56	mg/kg dry wt.	1	0.20	0.026		11/24/08 13:18
7440-50-8	Copper, Total	75	mg/kg dry wt.	2	0.40	0.053		11/24/08 15:08
7439-92-1	Lead, Total	130	mg/kg dry wt.	5	1.0	0.12		11/24/08 15:06
7440-02-0	Nickel, Total	7.4	mg/kg dry wt.	1	0.10	0.035		11/24/08 13:18
7782-49-2	Selenium, Total	0.043	mg/kg dry wt.	1	0.30	0.028	J	11/24/08 13:18
7440-22-4	Silver, Total	0.047	mg/kg dry wt.	1	0.10	0.0093	J	11/24/08 13:18
7440-28-0	Thallium, Total	0.10	mg/kg dry wt.	1	0.10	0.0068		11/24/08 13:18
7440-62-2	Vanadium, Total	16	mg/kg dry wt.	1	0.10	0.032		11/24/08 17:02

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB18C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 15:29
Solids: 80.33
Laboratory ID: 0811328-12

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 09:00
Initial/Final: 0.5005 g / 250 mL
QC Batch: 0813766

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.11	mg/kg dry wt.	1	0.20	0.026	J	11/25/08 14:49

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB19A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 12:22
Solids: 67.63
Laboratory ID: 0811328-14

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5002 g / 250 mL
QC Batch: 0813642

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total	5.6	mg/kg dry wt.	1	0.20	0.026		11/24/08 13:21
7440-50-8	Copper, Total	20	mg/kg dry wt.	1	0.20	0.027		11/24/08 13:21
7439-92-1	Lead, Total	440	mg/kg dry wt.	10	2.0	0.24		11/24/08 15:10
7440-02-0	Nickel, Total	19	mg/kg dry wt.	1	0.10	0.035		11/24/08 13:21
7782-49-2	Selenium, Total	0.49	mg/kg dry wt.	1	0.30	0.028		11/24/08 13:21
7440-22-4	Silver, Total	0.16	mg/kg dry wt.	1	0.10	0.0093		11/24/08 13:21
7440-28-0	Thallium, Total	3.5	mg/kg dry wt.	1	0.10	0.0068		11/24/08 13:21
7440-62-2	Vanadium, Total	40	mg/kg dry wt.	1	0.10	0.032		11/24/08 17:04

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB19A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 12:22
Solids: 67.63
Laboratory ID: 0811328-14

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 09:00
Initial/Final: 0.5001 g / 250 mL
QC Batch: 0813766

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.51	mg/kg dry wt.	1	0.20	0.026		11/25/08 14:51

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB19C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 12:27
Solids: 76.14
Laboratory ID: 0811328-15

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5 g / 250 mL
QC Batch: 0813642

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total	0.71	mg/kg dry wt.	1	0.20	0.026		11/24/08 13:24
7440-50-8	Copper, Total	4.4	mg/kg dry wt.	1	0.20	0.027		11/24/08 13:24
7439-92-1	Lead, Total	44	mg/kg dry wt.	2	0.40	0.047		11/24/08 15:12
7440-02-0	Nickel, Total	7.8	mg/kg dry wt.	1	0.10	0.035		11/24/08 13:24
7782-49-2	Selenium, Total	0.16	mg/kg dry wt.	1	0.30	0.028	J	11/24/08 13:24
7440-22-4	Silver, Total	0.030	mg/kg dry wt.	1	0.10	0.0093	J	11/24/08 13:24
7440-28-0	Thallium, Total	0.30	mg/kg dry wt.	1	0.10	0.0068		11/24/08 13:24
7440-62-2	Vanadium, Total	13	mg/kg dry wt.	1	0.10	0.032		11/24/08 17:06

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB19C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 12:27
Solids: 76.14
Laboratory ID: 0811328-15

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 09:00
Initial/Final: 0.4999 g / 250 mL
QC Batch: 0813766

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.20	mg/kg dry wt.	1	0.20	0.026	U	11/25/08 14:53

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB17A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 10:05
Solids: 74.49
Laboratory ID: 0811331-02

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.4999 g / 250 mL
QC Batch: 0813780

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-38-2	Arsenic, Total	2.2	mg/kg dry wt.	1	0.20	0.026		11/24/08 13:54	J,m
7440-50-8	Copper, Total	21	mg/kg dry wt.	1	0.20	0.027		11/24/08 13:54	
7439-92-1	Lead, Total	65	mg/kg dry wt.	2	0.40	0.047		11/24/08 15:24	
7440-02-0	Nickel, Total	17	mg/kg dry wt.	1	0.10	0.035		11/24/08 13:54	J,s
7782-49-2	Selenium, Total	0.48	mg/kg dry wt.	1	0.30	0.028		11/24/08 13:54	J,m
7440-22-4	Silver, Total	0.13	mg/kg dry wt.	1	0.10	0.0093		11/24/08 13:54	
7440-28-0	Thallium, Total	0.42	mg/kg dry wt.	1	0.10	0.0068		11/24/08 13:54	
7440-62-2	Vanadium, Total	37	mg/kg dry wt.	1	0.10	0.032		11/24/08 17:25	

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB17A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 10:05
Solids: 74.49
Laboratory ID: 0811331-02

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 10:30
Initial/Final: 0.4998 g / 250 mL
QC Batch: 0813767

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.37	mg/kg dry wt.	1	0.20	0.026		11/25/08 15:22

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 10:15
Solids: 84.26
Laboratory ID: 0811331-03

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5002 g / 250 mL
QC Batch: 0813780

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total	1.5	mg/kg dry wt.	1	0.20	0.026		11/24/08 13:57
7440-50-8	Copper, Total	16	mg/kg dry wt.	1	0.20	0.027		11/24/08 13:57
7439-92-1	Lead, Total	120	mg/kg dry wt.	5	1.0	0.12		11/24/08 15:35
7440-02-0	Nickel, Total	9.8	mg/kg dry wt.	1	0.10	0.035		11/24/08 13:57
7782-49-2	Selenium, Total	0.14	mg/kg dry wt.	1	0.30	0.028	J	11/24/08 13:57
7440-22-4	Silver, Total	0.066	mg/kg dry wt.	1	0.10	0.0093	J	11/24/08 13:57
7440-28-0	Thallium, Total	0.29	mg/kg dry wt.	1	0.10	0.0068		11/24/08 13:57
7440-62-2	Vanadium, Total	21	mg/kg dry wt.	1	0.10	0.032		11/24/08 17:27

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 10:15
Solids: 84.26
Laboratory ID: 0811331-03

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 10:30
Initial/Final: 0.5003 g / 250 mL
QC Batch: 0813767

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.18	mg/kg dry wt.	1	0.20	0.026	J	11/25/08 15:24

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB16A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:00
Solids: 81.57
Laboratory ID: 0811331-04

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5002 g / 250 mL
QC Batch: 0813780

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total	2.3	mg/kg dry wt.	1	0.20	0.026		11/24/08 14:12
7440-50-8	Copper, Total	19	mg/kg dry wt.	1	0.20	0.027		11/24/08 14:12
7439-92-1	Lead, Total	190	mg/kg dry wt.	5	1.0	0.12		11/24/08 15:46
7440-02-0	Nickel, Total	12	mg/kg dry wt.	1	0.10	0.035		11/24/08 14:12
7782-49-2	Selenium, Total	0.23	mg/kg dry wt.	1	0.30	0.028	J	11/24/08 14:12
7440-22-4	Silver, Total	0.11	mg/kg dry wt.	1	0.10	0.0093		11/24/08 14:12
7440-28-0	Thallium, Total	0.38	mg/kg dry wt.	1	0.10	0.0068		11/24/08 14:12
7440-62-2	Vanadium, Total	27	mg/kg dry wt.	1	0.10	0.032		11/24/08 17:37

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB16A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:00
Solids: 81.57
Laboratory ID: 0811331-04

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 10:30
Initial/Final: 0.5004 g / 250 mL
QC Batch: 0813767

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.37	mg/kg dry wt.	1	0.20	0.026		11/25/08 15:39

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB16C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:08
Solids: 80.70
Laboratory ID: 0811331-05

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5005 g / 250 mL
QC Batch: 0813780

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7440-38-2	Arsenic, Total	2.9	mg/kg dry wt.	1	0.20	0.026		11/24/08 14:15	L7M
7440-50-8	Copper, Total	24	mg/kg dry wt.	1	0.20	0.027		11/24/08 14:15	
7439-92-1	Lead, Total	200	mg/kg dry wt.	5	1.0	0.12		11/24/08 15:48	
7440-02-0	Nickel, Total	14	mg/kg dry wt.	1	0.10	0.035		11/24/08 14:15	J/S
7782-49-2	Selenium, Total	0.50	mg/kg dry wt.	1	0.30	0.028		11/24/08 14:15	L7M
7440-22-4	Silver, Total	0.11	mg/kg dry wt.	1	0.10	0.0093		11/24/08 14:15	
7440-28-0	Thallium, Total	0.43	mg/kg dry wt.	1	0.10	0.0068		11/24/08 14:15	
7440-62-2	Vanadium, Total	29	mg/kg dry wt.	1	0.10	0.032		11/24/08 17:39	

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB16C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:08
Solids: 80.70
Laboratory ID: 0811331-05

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 10:30
Initial/Final: 0.5002 g / 250 mL
QC Batch: 0813767

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.42	mg/kg dry wt.	1	0.20	0.026		11/25/08 15:41

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB15A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 12:53
Solids: 90.06
Laboratory ID: 0811331-06

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5001 g / 250 mL
QC Batch: 0813780

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total	1.3	mg/kg dry wt.	1	0.20	0.026		11/24/08 14:18
7440-50-8	Copper, Total	19	mg/kg dry wt.	1	0.20	0.027		11/24/08 14:18
7439-92-1	Lead, Total	180	mg/kg dry wt.	5	1.0	0.12		11/24/08 15:51
7440-02-0	Nickel, Total	10	mg/kg dry wt.	1	0.10	0.035		11/24/08 14:18
7782-49-2	Selenium, Total	0.18	mg/kg dry wt.	1	0.30	0.028	J	11/24/08 14:18
7440-22-4	Silver, Total	0.043	mg/kg dry wt.	1	0.10	0.0093	J	11/24/08 14:18
7440-28-0	Thallium, Total	0.17	mg/kg dry wt.	1	0.10	0.0068		11/24/08 14:18
7440-62-2	Vanadium, Total	22	mg/kg dry wt.	1	0.10	0.032		11/24/08 17:41

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

13SB15A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 12:53
Solids: 90.06
Laboratory ID: 0811331-06

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 10:30
Initial/Final: 0.4997 g / 250 mL
QC Batch: 0813767

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.27	mg/kg dry wt.	1	0.20	0.026		11/25/08 15:43

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

DUP-13

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 00:00
Solids: 89.76
Laboratory ID: 0811331-07

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5004 g / 250 mL
QC Batch: 0813780

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-38-2	Arsenic, Total	1.3	mg/kg dry wt.	1	0.20	0.026		11/24/08 14:27
7440-50-8	Copper, Total	24	mg/kg dry wt.	1	0.20	0.027		11/24/08 14:27
7439-92-1	Lead, Total	220	mg/kg dry wt.	5	1.0	0.12		11/24/08 15:53
7440-02-0	Nickel, Total	11	mg/kg dry wt.	1	0.10	0.035		11/24/08 14:27
7782-49-2	Selenium, Total	0.15	mg/kg dry wt.	1	0.30	0.028	J	11/24/08 14:27
7440-22-4	Silver, Total	0.037	mg/kg dry wt.	1	0.10	0.0093	J	11/24/08 14:27
7440-28-0	Thallium, Total	0.17	mg/kg dry wt.	1	0.10	0.0068		11/24/08 14:27
7440-62-2	Vanadium, Total	21	mg/kg dry wt.	1	0.10	0.032		11/24/08 17:47

INORGANIC ANALYSIS DATA SHEET
USEPA-6020A

DUP-13

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 00:00
Solids: 89.76
Laboratory ID: 0811331-07

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 10:30
Initial/Final: 0.5 g / 250 mL
QC Batch: 0813767

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-36-0	Antimony, Total	0.35	mg/kg dry wt.	1	0.20	0.026		11/25/08 15:52

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

EQBK-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water
Sampled: 11/12/08 17:00
Solids: 0.00
Laboratory ID: 0811328-05

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3010A Digestion
Prepared: 11/20/08 07:30
Initial/Final: 25 mL / 25 mL
QC Batch: 0813680

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7429-90-5	Aluminum, Total	50	ug/L	1	50	20	U	11/26/08 13:42	
7440-70-2	Calcium, Total	220	ug/L	1	500	69	J	11/25/08 11:15	Lc
7439-89-6	Iron, Total	20	ug/L	1	20	9.6	U	11/25/08 11:15	
7439-95-4	Magnesium, Total	500	ug/L	1	500	63	U	11/25/08 11:15	
7440-09-7	Potassium, Total	98	ug/L	1	200	62	J	11/25/08 11:15	Bc
7440-23-5	Sodium, Total	500	ug/L	1	500	210	U	11/25/08 11:15	

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

EQBK-5

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water
Sampled: 11/13/08 16:00
Solids: 0.00
Laboratory ID: 0811328-13

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3010A Digestion
Prepared: 11/20/08 07:30
Initial/Final: 25 mL / 25 mL
QC Batch: 0813680

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	50	ug/L	1	50	20	U	11/26/08 13:46
7440-70-2	Calcium, Total	500	ug/L	1	500	69	U	11/25/08 11:19
7439-89-6	Iron, Total	20	ug/L	1	20	9.6	U	11/25/08 11:19
7439-95-4	Magnesium, Total	500	ug/L	1	500	63	U	11/25/08 11:19
7440-09-7	Potassium, Total	200	ug/L	1	200	62	U	11/25/08 11:19
7440-23-5	Sodium, Total	500	ug/L	1	500	210	U	11/25/08 11:19

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

EQBK-6

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water
Sampled: 11/14/08 15:20
Solids: 0.00
Laboratory ID: 0811331-01

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3010A Digestion
Prepared: 11/20/08 07:30
Initial/Final: 25 mL / 25 mL
QC Batch: 0813680

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	50	ug/L	1	50	20	U	11/26/08 13:50
7440-70-2	Calcium, Total	96	ug/L	1	500	69	J	11/25/08 11:35
7439-89-6	Iron, Total	13	ug/L	1	20	9.6	J	11/25/08 11:35
7439-95-4	Magnesium, Total	500	ug/L	1	500	63	U	11/25/08 11:35
7440-09-7	Potassium, Total	200	ug/L	1	200	62	U	11/25/08 11:35
7440-23-5	Sodium, Total	500	ug/L	1	500	210	U	11/25/08 11:35

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB13A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 10:00
Solids: 88.77
Laboratory ID: 0811328-01

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0813643

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	10000	mg/kg dry wt.	1	10	2.0		11/24/08 09:03
7440-39-3	Barium, Total	130	mg/kg dry wt.	1	1.0	0.33		11/24/08 09:03
7440-41-7	Beryllium, Total	1.0	mg/kg dry wt.	1	1.0	0.061	U	11/24/08 09:04
7440-43-9	Cadmium, Total	0.87	mg/kg dry wt.	1	2.0	0.45	J	11/24/08 09:05
7440-70-2	Calcium, Total	1800	mg/kg dry wt.	1	50	9.8		11/24/08 09:04
7440-47-3	Chromium, Total	18	mg/kg dry wt.	1	5.0	0.80		11/24/08 09:05
7440-48-4	Cobalt, Total	8.5	mg/kg dry wt.	1	2.0	0.53		11/24/08 09:05
7439-89-6	Iron, Total	27000	mg/kg dry wt.	1	10	0.98		11/24/08 09:03
7439-95-4	Magnesium, Total	2500	mg/kg dry wt.	1	50	2.8		11/24/08 09:04
7439-96-5	Manganese, Total	830	mg/kg dry wt.	1	1.0	0.18		11/24/08 09:04
7440-09-7	Potassium, Total	1100	mg/kg dry wt.	1	50	14		11/24/08 09:04
7440-23-5	Sodium, Total	35	mg/kg dry wt.	1	100	18	J	11/24/08 09:04
7440-66-6	Zinc, Total	480	mg/kg dry wt.	1	5.0	0.49		11/24/08 09:04

KM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB13C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 10:18
Solids: 89.66
Laboratory ID: 0811328-02

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0813643

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	8800	mg/kg dry wt.	1	10	2.0		11/24/08 09:08
7440-39-3	Barium, Total	110	mg/kg dry wt.	1	1.0	0.33		11/24/08 09:08
7440-41-7	Beryllium, Total	1.0	mg/kg dry wt.	1	1.0	0.061	U	11/24/08 09:08
7440-43-9	Cadmium, Total	0.62	mg/kg dry wt.	1	2.0	0.45	J	11/24/08 09:09
7440-70-2	Calcium, Total	1600	mg/kg dry wt.	1	50	9.8		11/24/08 09:08
7440-47-3	Chromium, Total	16	mg/kg dry wt.	1	5.0	0.80		11/24/08 09:09
7440-48-4	Cobalt, Total	7.7	mg/kg dry wt.	1	2.0	0.53		11/24/08 09:09
7439-89-6	Iron, Total	20000	mg/kg dry wt.	1	10	0.98		11/24/08 09:08
7439-95-4	Magnesium, Total	2300	mg/kg dry wt.	1	50	2.8		11/24/08 09:08
7439-96-5	Manganese, Total	710	mg/kg dry wt.	1	1.0	0.18		11/24/08 09:08
7440-09-7	Potassium, Total	1100	mg/kg dry wt.	1	50	14		11/24/08 09:08
7440-23-5	Sodium, Total	34	mg/kg dry wt.	1	100	18	J	11/24/08 09:08
7440-66-6	Zinc, Total	330	mg/kg dry wt.	1	5.0	0.49		11/24/08 09:09

K, M

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB21C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 12:26
Solids: 76.80
Laboratory ID: 0811328-03

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813643

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	16000	mg/kg dry wt.	1	10	2.0		11/24/08 09:12
7440-39-3	Barium, Total	170	mg/kg dry wt.	1	1.0	0.33		11/24/08 09:12
7440-41-7	Beryllium, Total	1.0	mg/kg dry wt.	1	1.0	0.061	U	11/24/08 09:12
7440-43-9	Cadmium, Total	2.8	mg/kg dry wt.	1	2.0	0.45		11/24/08 09:13
7440-70-2	Calcium, Total	1100	mg/kg dry wt.	1	50	9.8		11/24/08 09:12
7440-47-3	Chromium, Total	22	mg/kg dry wt.	1	5.0	0.80		11/24/08 09:13
7440-48-4	Cobalt, Total	24	mg/kg dry wt.	1	2.0	0.53		11/24/08 09:13
7439-89-6	Iron, Total	87000	mg/kg dry wt.	100	1000	98		11/24/08 11:47
7439-95-4	Magnesium, Total	2000	mg/kg dry wt.	1	50	2.8		11/24/08 09:12
7439-96-5	Manganese, Total	1500	mg/kg dry wt.	1	1.0	0.18		11/24/08 09:12
7440-09-7	Potassium, Total	1100	mg/kg dry wt.	1	50	14		11/24/08 09:12
7440-23-5	Sodium, Total	27	mg/kg dry wt.	1	100	18	J	11/24/08 09:12
7440-66-6	Zinc, Total	1100	mg/kg dry wt.	1	5.0	0.49		11/24/08 09:13

K,Ki

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB14A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 16:00
Solids: 94.24
Laboratory ID: 0811328-04

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0813643

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	11000	mg/kg dry wt.	1	10	2.0		11/24/08 09:16
7440-39-3	Barium, Total	90	mg/kg dry wt.	1	1.0	0.33		11/24/08 09:16
7440-41-7	Beryllium, Total	1.0	mg/kg dry wt.	1	1.0	0.061	U	11/24/08 09:16
7440-43-9	Cadmium, Total	0.63	mg/kg dry wt.	1	2.0	0.45	J	11/24/08 09:17
7440-70-2	Calcium, Total	110000	mg/kg dry wt.	100	5000	980		11/24/08 11:51
7440-47-3	Chromium, Total	18	mg/kg dry wt.	1	5.0	0.80		11/24/08 09:17
7440-48-4	Cobalt, Total	7.0	mg/kg dry wt.	1	2.0	0.53		11/24/08 09:17
7439-89-6	Iron, Total	16000	mg/kg dry wt.	1	10	0.98		11/24/08 09:16
7439-95-4	Magnesium, Total	25000	mg/kg dry wt.	1	50	2.8		11/24/08 09:16
7439-96-5	Manganese, Total	380	mg/kg dry wt.	1	1.0	0.18		11/24/08 09:16
7440-09-7	Potassium, Total	2900	mg/kg dry wt.	1	50	14		11/24/08 09:16
7440-23-5	Sodium, Total	100	mg/kg dry wt.	1	100	18		11/24/08 09:16
7440-66-6	Zinc, Total	520	mg/kg dry wt.	1	5.0	0.49		11/24/08 09:16

KM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB20A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 14:34
Solids: 84.47
Laboratory ID: 0811328-06

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813643

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	12000	mg/kg dry wt.	1	10	2.0		11/24/08 09:19
7440-39-3	Barium, Total	120	mg/kg dry wt.	1	1.0	0.33		11/24/08 09:19
7440-41-7	Beryllium, Total	1.0	mg/kg dry wt.	1	1.0	0.061	U	11/24/08 09:20
7440-43-9	Cadmium, Total	0.73	mg/kg dry wt.	1	2.0	0.45	J	11/24/08 09:21
7440-70-2	Calcium, Total	3000	mg/kg dry wt.	1	50	9.8		11/24/08 09:20
7440-47-3	Chromium, Total	23	mg/kg dry wt.	1	5.0	0.80		11/24/08 09:21
7440-48-4	Cobalt, Total	11	mg/kg dry wt.	1	2.0	0.53		11/24/08 09:21
7439-89-6	Iron, Total	28000	mg/kg dry wt.	1	10	0.98		11/24/08 09:19
7439-95-4	Magnesium, Total	3600	mg/kg dry wt.	1	50	2.8		11/24/08 09:20
7439-96-5	Manganese, Total	940	mg/kg dry wt.	1	1.0	0.18		11/24/08 09:20
7440-09-7	Potassium, Total	1900	mg/kg dry wt.	1	50	14		11/24/08 09:20
7440-23-5	Sodium, Total	36	mg/kg dry wt.	1	100	18	J	11/24/08 09:20
7440-66-6	Zinc, Total	300	mg/kg dry wt.	1	5.0	0.49		11/24/08 09:20

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB20C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 14:49
Solids: 81.43
Laboratory ID: 0811328-07

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0813643

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	19000	mg/kg dry wt.	1	10	2.0		11/24/08 09:23
7440-39-3	Barium, Total	190	mg/kg dry wt.	1	1.0	0.33		11/24/08 09:23
7440-41-7	Beryllium, Total	1.0	mg/kg dry wt.	1	1.0	0.061	U	11/24/08 09:24
7440-43-9	Cadmium, Total	1.8	mg/kg dry wt.	1	2.0	0.45	J	11/24/08 09:25
7440-70-2	Calcium, Total	2100	mg/kg dry wt.	1	50	9.8		11/24/08 09:24
7440-47-3	Chromium, Total	24	mg/kg dry wt.	1	5.0	0.80		11/24/08 09:25
7440-48-4	Cobalt, Total	18	mg/kg dry wt.	1	2.0	0.53		11/24/08 09:25
7439-89-6	Iron, Total	46000	mg/kg dry wt.	100	1000	98		11/24/08 11:56
7439-95-4	Magnesium, Total	3400	mg/kg dry wt.	1	50	2.8		11/24/08 09:24
7439-96-5	Manganese, Total	1600	mg/kg dry wt.	1	1.0	0.18		11/24/08 09:24
7440-09-7	Potassium, Total	1400	mg/kg dry wt.	1	50	14		11/24/08 09:24
7440-23-5	Sodium, Total	49	mg/kg dry wt.	1	100	18	J	11/24/08 09:24
7440-66-6	Zinc, Total	680	mg/kg dry wt.	1	5.0	0.49		11/24/08 09:24

$K_{,M}$

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB22A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:20
Solids: 84.78
Laboratory ID: 0811328-08

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5003 g / 50 mL
QC Batch: 0813643

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	10000	mg/kg dry wt.	1	10	2.0		11/24/08 09:28
7440-39-3	Barium, Total	100	mg/kg dry wt.	1	1.0	0.33		11/24/08 09:28
7440-41-7	Beryllium, Total	1.0	mg/kg dry wt.	1	1.0	0.061	U	11/24/08 09:28
7440-43-9	Cadmium, Total	0.74	mg/kg dry wt.	1	2.0	0.45	J	11/24/08 09:29
7440-70-2	Calcium, Total	2000	mg/kg dry wt.	1	50	9.8		11/24/08 09:28
7440-47-3	Chromium, Total	21	mg/kg dry wt.	1	5.0	0.80		11/24/08 09:29
7440-48-4	Cobalt, Total	9.9	mg/kg dry wt.	1	2.0	0.53		11/24/08 09:29
7439-89-6	Iron, Total	29000	mg/kg dry wt.	1	10	0.98		11/24/08 09:28
7439-95-4	Magnesium, Total	2800	mg/kg dry wt.	1	50	2.8		11/24/08 09:28
7439-96-5	Manganese, Total	950	mg/kg dry wt.	1	1.0	0.18		11/24/08 09:28
7440-09-7	Potassium, Total	1400	mg/kg dry wt.	1	50	14		11/24/08 09:28
7440-23-5	Sodium, Total	41	mg/kg dry wt.	1	100	18	J	11/24/08 09:28
7440-66-6	Zinc, Total	340	mg/kg dry wt.	1	5.0	0.49		11/24/08 09:29

02636

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB22C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:25
Solids: 71.80
Laboratory ID: 0811328-09

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.4998 g / 50 mL
QC Batch: 0813643

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	20000	mg/kg dry wt.	1	10	2.0		11/24/08 09:32
7440-39-3	Barium, Total	160	mg/kg dry wt.	1	1.0	0.33		11/24/08 09:32
7440-41-7	Beryllium, Total	1.0	mg/kg dry wt.	1	1.0	0.061	U	11/24/08 09:33
7440-43-9	Cadmium, Total	1.3	mg/kg dry wt.	1	2.0	0.45	J	11/24/08 09:33
7440-70-2	Calcium, Total	7000	mg/kg dry wt.	1	50	9.8		11/24/08 09:32
7440-47-3	Chromium, Total	26	mg/kg dry wt.	1	5.0	0.80		11/24/08 09:33
7440-48-4	Cobalt, Total	16	mg/kg dry wt.	1	2.0	0.53		11/24/08 09:33
7439-89-6	Iron, Total	39000	mg/kg dry wt.	1	10	0.98		11/24/08 09:32
7439-95-4	Magnesium, Total	6200	mg/kg dry wt.	1	50	2.8		11/24/08 09:32
7439-96-5	Manganese, Total	1200	mg/kg dry wt.	1	1.0	0.18		11/24/08 09:33
7440-09-7	Potassium, Total	1600	mg/kg dry wt.	1	50	14		11/24/08 09:32
7440-23-5	Sodium, Total	61	mg/kg dry wt.	1	100	18	J	11/24/08 09:32
7440-66-6	Zinc, Total	570	mg/kg dry wt.	1	5.0	0.49		11/24/08 09:33

KM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB21A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 12:21
Solids: 76.82
Laboratory ID: 0811328-10

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5003 g / 50 mL
QC Batch: 0813643

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	35000	mg/kg dry wt.	1	10	2.0		11/24/08 09:44
7440-39-3	Barium, Total	210	mg/kg dry wt.	1	1.0	0.33		11/24/08 09:44
7440-41-7	Beryllium, Total	1.0	mg/kg dry wt.	1	1.0	0.061	U	11/24/08 09:45
7440-43-9	Cadmium, Total	1.4	mg/kg dry wt.	1	2.0	0.45	J	11/24/08 09:46
7440-70-2	Calcium, Total	1900	mg/kg dry wt.	1	50	9.8		11/24/08 09:44
7440-47-3	Chromium, Total	39	mg/kg dry wt.	1	5.0	0.80		11/24/08 09:46
7440-48-4	Cobalt, Total	19	mg/kg dry wt.	1	2.0	0.53		11/24/08 09:46
7439-89-6	Iron, Total	41000	mg/kg dry wt.	1	10	0.98		11/24/08 09:44
7439-95-4	Magnesium, Total	4500	mg/kg dry wt.	1	50	2.8		11/24/08 09:44
7439-96-5	Manganese, Total	1200	mg/kg dry wt.	1	1.0	0.18		11/24/08 09:45
7440-09-7	Potassium, Total	2400	mg/kg dry wt.	1	50	14		11/24/08 09:44
7440-23-5	Sodium, Total	67	mg/kg dry wt.	1	100	18	J	11/24/08 09:44
7440-66-6	Zinc, Total	380	mg/kg dry wt.	1	5.0	0.49		11/24/08 09:45

INORGANIC ANALYSIS DATA SHEET

USEPA-6010B

13SB18A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 15:21
Solids: 81.46
Laboratory ID: 0811328-11

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813643

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	10000	mg/kg dry wt.	1	10	2.0		11/24/08 09:48
7440-39-3	Barium, Total	87	mg/kg dry wt.	1	1.0	0.33		11/24/08 09:48
7440-41-7	Beryllium, Total	1.0	mg/kg dry wt.	1	1.0	0.061	U	11/24/08 09:49
7440-43-9	Cadmium, Total	1.1	mg/kg dry wt.	1	2.0	0.45	J	11/24/08 09:50
7440-70-2	Calcium, Total	1100	mg/kg dry wt.	1	50	9.8		11/24/08 09:49
7440-47-3	Chromium, Total	18	mg/kg dry wt.	1	5.0	0.80		11/24/08 09:50
7440-48-4	Cobalt, Total	7.7	mg/kg dry wt.	1	2.0	0.53		11/24/08 09:50
7439-89-6	Iron, Total	16000	mg/kg dry wt.	1	10	0.98		11/24/08 09:48
7439-95-4	Magnesium, Total	2200	mg/kg dry wt.	1	50	2.8		11/24/08 09:49
7439-96-5	Manganese, Total	470	mg/kg dry wt.	1	1.0	0.18		11/24/08 09:49
7440-09-7	Potassium, Total	1200	mg/kg dry wt.	1	50	14		11/24/08 09:49
7440-23-5	Sodium, Total	43	mg/kg dry wt.	1	100	18	J	11/24/08 09:49
7440-66-6	Zinc, Total	660	mg/kg dry wt.	1	5.0	0.49		11/24/08 09:49

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB18C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 15:29
Solids: 80.33
Laboratory ID: 0811328-12

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813643

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	7200	mg/kg dry wt.	1	10	2.0		11/24/08 09:52
7440-39-3	Barium, Total	62	mg/kg dry wt.	1	1.0	0.33		11/24/08 09:52
7440-41-7	Beryllium, Total	1.0	mg/kg dry wt.	1	1.0	0.061	U	11/24/08 09:53
7440-43-9	Cadmium, Total	0.51	mg/kg dry wt.	1	2.0	0.45	J	11/24/08 09:53
7440-70-2	Calcium, Total	1200	mg/kg dry wt.	1	50	9.8		11/24/08 09:52
7440-47-3	Chromium, Total	13	mg/kg dry wt.	1	5.0	0.80		11/24/08 09:53
7440-48-4	Cobalt, Total	5.4	mg/kg dry wt.	1	2.0	0.53		11/24/08 09:53
7439-89-6	Iron, Total	11000	mg/kg dry wt.	1	10	0.98		11/24/08 09:52
7439-95-4	Magnesium, Total	2000	mg/kg dry wt.	1	50	2.8		11/24/08 09:52
7439-96-5	Manganese, Total	150	mg/kg dry wt.	1	1.0	0.18		11/24/08 09:53
7440-09-7	Potassium, Total	920	mg/kg dry wt.	1	50	14		11/24/08 09:52
7440-23-5	Sodium, Total	42	mg/kg dry wt.	1	100	18	J	11/24/08 09:52
7440-66-6	Zinc, Total	360	mg/kg dry wt.	1	5.0	0.49		11/24/08 09:53

KM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB19A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 12:22
Solids: 67.63
Laboratory ID: 0811328-14

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0813643

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	23000	mg/kg dry wt.	1	10	2.0		11/24/08 09:56
7440-39-3	Barium, Total	290	mg/kg dry wt.	1	1.0	0.33		11/24/08 09:56
7440-41-7	Beryllium, Total	1.0	mg/kg dry wt.	1	1.0	0.061	U	11/24/08 09:57
7440-43-9	Cadmium, Total	2.6	mg/kg dry wt.	1	2.0	0.45		11/24/08 09:57
7440-70-2	Calcium, Total	2200	mg/kg dry wt.	1	50	9.8		11/24/08 09:56
7440-47-3	Chromium, Total	26	mg/kg dry wt.	1	5.0	0.80		11/24/08 09:57
7440-48-4	Cobalt, Total	16	mg/kg dry wt.	1	2.0	0.53		11/24/08 09:57
7439-89-6	Iron, Total	78000	mg/kg dry wt.	100	1000	98		11/24/08 12:00
7439-95-4	Magnesium, Total	3300	mg/kg dry wt.	1	50	2.8		11/24/08 09:56
7439-96-5	Manganese, Total	2200	mg/kg dry wt.	1	1.0	0.18		11/24/08 09:57
7440-09-7	Potassium, Total	2100	mg/kg dry wt.	1	50	14		11/24/08 09:56
7440-23-5	Sodium, Total	43	mg/kg dry wt.	1	100	18	J	11/24/08 09:56
7440-66-6	Zinc, Total	1600	mg/kg dry wt.	1	5.0	0.49		11/24/08 09:57

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB19C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 12:27
Solids: 76.14
Laboratory ID: 0811328-15

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0813643

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	4900	mg/kg dry wt.	25	250	51		11/24/08 12:18
7440-39-3	Barium, Total	54	mg/kg dry wt.	1	1.0	0.33		11/24/08 10:00
7440-41-7	Beryllium, Total	1.0	mg/kg dry wt.	1	1.0	0.061	U	11/24/08 10:01
7440-43-9	Cadmium, Total	2.0	mg/kg dry wt.	1	2.0	0.45	U	11/24/08 10:01
7440-70-2	Calcium, Total	1200	mg/kg dry wt.	1	50	9.8		11/24/08 10:00
7440-47-3	Chromium, Total	10	mg/kg dry wt.	1	5.0	0.80		11/24/08 10:01
7440-48-4	Cobalt, Total	4.7	mg/kg dry wt.	1	2.0	0.53		11/24/08 10:01
7439-89-6	Iron, Total	10000	mg/kg dry wt.	200	2000	200		11/24/08 12:04
7439-95-4	Magnesium, Total	1500	mg/kg dry wt.	1	50	2.8		11/24/08 10:00
7439-96-5	Manganese, Total	220	mg/kg dry wt.	1	1.0	0.18		11/24/08 10:01
7440-09-7	Potassium, Total	600	mg/kg dry wt.	1	50	14		11/24/08 10:00
7440-23-5	Sodium, Total	41	mg/kg dry wt.	1	100	18	J	11/24/08 10:00
7440-66-6	Zinc, Total	160	mg/kg dry wt.	1	5.0	0.49		11/24/08 10:01

KM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB17A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 10:05
Solids: 74.49
Laboratory ID: 0811331-02

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0813708

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	21000	mg/kg dry wt.	1	10	2.0		11/24/08 10:37
7440-39-3	Barium, Total	180	mg/kg dry wt.	1	1.0	0.33		11/24/08 10:37
7440-41-7	Beryllium, Total	1.0	mg/kg dry wt.	1	1.0	0.061	U	11/24/08 10:38
7440-43-9	Cadmium, Total	0.84	mg/kg dry wt.	1	2.0	0.45	J	11/24/08 10:39
7440-70-2	Calcium, Total	4600	mg/kg dry wt.	1	50	9.8	B	11/24/08 10:38
7440-47-3	Chromium, Total	32	mg/kg dry wt.	1	5.0	0.80		11/24/08 10:39
7440-48-4	Cobalt, Total	16	mg/kg dry wt.	1	2.0	0.53		11/24/08 10:39
7439-89-6	Iron, Total	33000	mg/kg dry wt.	1	10	0.98		11/24/08 10:37
7439-95-4	Magnesium, Total	4800	mg/kg dry wt.	1	50	2.8		11/24/08 10:38
7439-96-5	Manganese, Total	1300	mg/kg dry wt.	1	1.0	0.18		11/24/08 10:38
7440-09-7	Potassium, Total	2500	mg/kg dry wt.	1	50	14		11/24/08 10:38
7440-23-5	Sodium, Total	52	mg/kg dry wt.	1	100	18	J	11/24/08 10:38
7440-66-6	Zinc, Total	260	mg/kg dry wt.	1	5.0	0.49		11/24/08 10:39

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INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 10:15
Solids: 84.26
Laboratory ID: 0811331-03

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4998 g / 50 mL
QC Batch: 0813708

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	10000	mg/kg dry wt.	100	1000	200		11/24/08 12:52
7440-39-3	Barium, Total	95	mg/kg dry wt.	1	1.0	0.33		11/24/08 10:41
7440-41-7	Beryllium, Total	1.0	mg/kg dry wt.	1	1.0	0.061	U	11/24/08 10:42
7440-43-9	Cadmium, Total	0.51	mg/kg dry wt.	1	2.0	0.45	J	11/24/08 10:43
7440-70-2	Calcium, Total	2100	mg/kg dry wt.	1	50	9.8	B	11/24/08 10:42
7440-47-3	Chromium, Total	19	mg/kg dry wt.	1	5.0	0.80		11/24/08 10:43
7440-48-4	Cobalt, Total	8.0	mg/kg dry wt.	1	2.0	0.53		11/24/08 10:43
7439-89-6	Iron, Total	24000	mg/kg dry wt.	500	5000	490		11/24/08 12:39
7439-95-4	Magnesium, Total	2400	mg/kg dry wt.	1	50	2.8		11/24/08 10:42
7439-96-5	Manganese, Total	720	mg/kg dry wt.	1	1.0	0.18		11/24/08 10:42
7440-09-7	Potassium, Total	1200	mg/kg dry wt.	1	50	14		11/24/08 10:42
7440-23-5	Sodium, Total	44	mg/kg dry wt.	1	100	18	J	11/24/08 10:42
7440-66-6	Zinc, Total	270	mg/kg dry wt.	10	50	4.9		11/24/08 13:06

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB16A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:00
Solids: 81.57
Laboratory ID: 0811331-04

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0813708

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	12000	mg/kg dry wt.	1	10	2.0		11/24/08 11:01
7440-39-3	Barium, Total	140	mg/kg dry wt.	1	1.0	0.33		11/24/08 11:01
7440-41-7	Beryllium, Total	1.0	mg/kg dry wt.	1	1.0	0.061	U	11/24/08 11:02
7440-43-9	Cadmium, Total	1.0	mg/kg dry wt.	1	2.0	0.45	J	11/24/08 11:02
7440-70-2	Calcium, Total	2000	mg/kg dry wt.	1	50	9.8	B	11/24/08 11:01
7440-47-3	Chromium, Total	22	mg/kg dry wt.	1	5.0	0.80		11/24/08 11:02
7440-48-4	Cobalt, Total	12	mg/kg dry wt.	1	2.0	0.53		11/24/08 11:02
7439-89-6	Iron, Total	33000	mg/kg dry wt.	1	10	0.98		11/24/08 11:01
7439-95-4	Magnesium, Total	2900	mg/kg dry wt.	1	50	2.8		11/24/08 11:01
7439-96-5	Manganese, Total	1300	mg/kg dry wt.	1	1.0	0.18		11/24/08 11:02
7440-09-7	Potassium, Total	1600	mg/kg dry wt.	1	50	14		11/24/08 11:01
7440-23-5	Sodium, Total	40	mg/kg dry wt.	1	100	18	J	11/24/08 11:01
7440-66-6	Zinc, Total	430	mg/kg dry wt.	1	5.0	0.49		11/24/08 11:02

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB16C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:08
Solids: 80.70
Laboratory ID: 0811331-05

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813708

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	13000	mg/kg dry wt.	1	10	2.0		11/24/08 11:05
7440-39-3	Barium, Total	130	mg/kg dry wt.	1	1.0	0.33		11/24/08 11:05
7440-41-7	Beryllium, Total	1.0	mg/kg dry wt.	1	1.0	0.061	U	11/24/08 11:06
7440-43-9	Cadmium, Total	0.93	mg/kg dry wt.	1	2.0	0.45	J	11/24/08 11:06
7440-70-2	Calcium, Total	2400	mg/kg dry wt.	1	50	9.8	B	11/24/08 11:05
7440-47-3	Chromium, Total	22	mg/kg dry wt.	1	5.0	0.80		11/24/08 11:06
7440-48-4	Cobalt, Total	11	mg/kg dry wt.	1	2.0	0.53		11/24/08 11:06
7439-89-6	Iron, Total	33000	mg/kg dry wt.	1	10	0.98		11/24/08 11:05
7439-95-4	Magnesium, Total	2900	mg/kg dry wt.	1	50	2.8		11/24/08 11:05
7439-96-5	Manganese, Total	1300	mg/kg dry wt.	1	1.0	0.18		11/24/08 11:06
7440-09-7	Potassium, Total	1500	mg/kg dry wt.	1	50	14		11/24/08 11:05
7440-23-5	Sodium, Total	48	mg/kg dry wt.	1	100	18	J	11/24/08 11:05
7440-66-6	Zinc, Total	410	mg/kg dry wt.	1	5.0	0.49		11/24/08 11:06

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB15A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 12:53
Solids: 90.06
Laboratory ID: 0811331-06

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0813708

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	11000	mg/kg dry wt.	1	10	2.0		11/24/08 11:09
7440-39-3	Barium, Total	110	mg/kg dry wt.	1	1.0	0.33		11/24/08 11:09
7440-41-7	Beryllium, Total	1.0	mg/kg dry wt.	1	1.0	0.061	U	11/24/08 11:10
7440-43-9	Cadmium, Total	2.0	mg/kg dry wt.	1	2.0	0.45	U	11/24/08 11:10
7440-70-2	Calcium, Total	6300	mg/kg dry wt.	1	50	9.8	B	11/24/08 11:09
7440-47-3	Chromium, Total	18	mg/kg dry wt.	1	5.0	0.80		11/24/08 11:10
7440-48-4	Cobalt, Total	7.6	mg/kg dry wt.	1	2.0	0.53		11/24/08 11:10
7439-89-6	Iron, Total	18000	mg/kg dry wt.	1	10	0.98		11/24/08 11:09
7439-95-4	Magnesium, Total	4000	mg/kg dry wt.	1	50	2.8		11/24/08 11:09
7439-96-5	Manganese, Total	470	mg/kg dry wt.	1	1.0	0.18		11/24/08 11:10
7440-09-7	Potassium, Total	1500	mg/kg dry wt.	1	50	14		11/24/08 11:09
7440-23-5	Sodium, Total	46	mg/kg dry wt.	1	100	18	J	11/24/08 11:09
7440-66-6	Zinc, Total	280	mg/kg dry wt.	1	5.0	0.49		11/24/08 11:10

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INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DUP-13

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 00:00
Solids: 89.76
Laboratory ID: 0811331-07

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0813708

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7429-90-5	Aluminum, Total	9700	mg/kg dry wt.	1	10	2.0		11/24/08 11:22
7440-39-3	Barium, Total	99	mg/kg dry wt.	1	1.0	0.33		11/24/08 11:22
7440-41-7	Beryllium, Total	1.0	mg/kg dry wt.	1	1.0	0.061	U	11/24/08 11:22
7440-43-9	Cadmium, Total	2.0	mg/kg dry wt.	1	2.0	0.45	U	11/24/08 11:23
7440-70-2	Calcium, Total	5500	mg/kg dry wt.	1	50	9.8	B	11/24/08 11:22
7440-47-3	Chromium, Total	18	mg/kg dry wt.	1	5.0	0.80		11/24/08 11:23
7440-48-4	Cobalt, Total	7.2	mg/kg dry wt.	1	2.0	0.53		11/24/08 11:23
7439-89-6	Iron, Total	17000	mg/kg dry wt.	1	10	0.98		11/24/08 11:22
7439-95-4	Magnesium, Total	3800	mg/kg dry wt.	1	50	2.8		11/24/08 11:22
7439-96-5	Manganese, Total	440	mg/kg dry wt.	1	1.0	0.18		11/24/08 11:22
7440-09-7	Potassium, Total	1500	mg/kg dry wt.	1	50	14		11/24/08 11:22
7440-23-5	Sodium, Total	42	mg/kg dry wt.	1	100	18	J	11/24/08 11:22
7440-66-6	Zinc, Total	290	mg/kg dry wt.	1	5.0	0.49		11/24/08 11:22

INORGANIC ANALYSIS DATA SHEET
USEPA-7470A

EQBK-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water
Sampled: 11/12/08 17:00
Solids: 0.00
Laboratory ID: 0811328-05

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 7470A Digestion - Total
Prepared: 11/19/08 14:00
Initial/Final: 30 mL / 30 mL
QC Batch: 0813648

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.20	ug/L	1	0.20	0.043	U	11/20/08 12:38

INORGANIC ANALYSIS DATA SHEET
USEPA-7470A

EQBK-5

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water
Sampled: 11/13/08 16:00
Solids: 0.00
Laboratory ID: 0811328-13

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 7470A Digestion - Total
Prepared: 11/19/08 14:00
Initial/Final: 30 mL / 30 mL
QC Batch: 0813648

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.20	ug/L	1	0.20	0.043	U	11/20/08 12:43

INORGANIC ANALYSIS DATA SHEET
USEPA-7470A

EQBK-6

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water
Sampled: 11/14/08 15:20
Solids: 0.00
Laboratory ID: 0811331-01

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 7470A Digestion - Total
Prepared: 11/19/08 14:00
Initial/Final: 30 mL / 30 mL
QC Batch: 0813648

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.20	ug/L	1	0.20	0.043	U	11/20/08 12:49

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

13SB13A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 10:00
Solids: 88.77
Laboratory ID: 0811328-01

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 7471A Mercury Digestion
Prepared: 11/18/08 10:30
Initial/Final: 0.3002 g / 50 mL
QC Batch: 0813602

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.032	mg/kg dry wt.	1	0.050	0.0093	J	11/19/08 13:13

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

13SB13C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 10:18
Solids: 89.66
Laboratory ID: 0811328-02

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 7471A Mercury Digestion
Prepared: 11/18/08 10:30
Initial/Final: 0.2996 g / 50 mL
QC Batch: 0813602

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.022	mg/kg dry wt.	1	0.050	0.0093	J	11/19/08 13:18

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

13SB21C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 12:26
Solids: 76.80
Laboratory ID: 0811328-03

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 7471A Mercury Digestion
Prepared: 11/18/08 10:30
Initial/Final: 0.2999 g / 50 mL
QC Batch: 0813602

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.093	mg/kg dry wt.	1	0.050	0.0093		11/19/08 13:23

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

13SB14A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 16:00
Solids: 94.24
Laboratory ID: 0811328-04

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 7471A Mercury Digestion
Prepared: 11/18/08 10:30
Initial/Final: 0.3002 g / 50 mL
QC Batch: 0813602

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.020	mg/kg dry wt.	1	0.050	0.0093	J	11/19/08 13:28

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

13SB20A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 14:34
Solids: 84.47
Laboratory ID: 0811328-06

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 7471A Mercury Digestion
Prepared: 11/18/08 10:30
Initial/Final: 0.3005 g / 50 mL
QC Batch: 0813602

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.037	mg/kg dry wt.	1	0.050	0.0093	J	11/19/08 14:56

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

13SB20C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 14:49
Solids: 81.43
Laboratory ID: 0811328-07

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 7471A Mercury Digestion
Prepared: 11/18/08 10:30
Initial/Final: 0.3001 g / 50 mL
QC Batch: 0813602

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.095	mg/kg dry wt.	1	0.050	0.0093		11/19/08 13:54

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

13SB22A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:20
Solids: 84.78
Laboratory ID: 0811328-08

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 7471A Mercury Digestion
Prepared: 11/18/08 10:30
Initial/Final: 0.2996 g / 50 mL
QC Batch: 0813602

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.039	mg/kg dry wt.	1	0.050	0.0093	J	11/19/08 13:59

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

13SB22C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:25
Solids: 71.80
Laboratory ID: 0811328-09

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 7471A Mercury Digestion
Prepared: 11/18/08 10:30
Initial/Final: 0.3001 g / 50 mL
QC Batch: 0813602

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.22	mg/kg dry wt.	1	0.050	0.0093		11/19/08 14:04

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

13SB21A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 12:21
Solids: 76.82
Laboratory ID: 0811328-10

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 7471A Mercury Digestion
Prepared: 11/18/08 10:30
Initial/Final: 0.3005 g / 50 mL
QC Batch: 0813602

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.14	mg/kg dry wt.	1	0.050	0.0093		11/19/08 14:10

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

13SB18A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 15:21
Solids: 81.46
Laboratory ID: 0811328-11

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 7471A Mercury Digestion
Prepared: 11/18/08 10:30
Initial/Final: 0.3001 g / 50 mL
QC Batch: 0813602

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.11	mg/kg dry wt.	1	0.050	0.0093		11/19/08 14:15

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

13SB18C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 15:29
Solids: 80.33
Laboratory ID: 0811328-12

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 7471A Mercury Digestion
Prepared: 11/18/08 10:30
Initial/Final: 0.3003 g / 50 mL
QC Batch: 0813602

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.039	mg/kg dry wt.	1	0.050	0.0093	J	11/19/08 14:20

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

13SB19A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 12:22
Solids: 67.63
Laboratory ID: 0811328-14

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 7471A Mercury Digestion
Prepared: 11/18/08 10:30
Initial/Final: 0.3001 g / 50 mL
QC Batch: 0813602

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.069	mg/kg dry wt.	1	0.050	0.0093		11/19/08 14:25

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

13SB19C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 12:27
Solids: 76.14
Laboratory ID: 0811328-15

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 7471A Mercury Digestion
Prepared: 11/18/08 10:30
Initial/Final: 0.3003 g / 50 mL
QC Batch: 0813602

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.050	mg/kg dry wt.	1	0.050	0.0093	U	11/19/08 14:30

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

13SB17A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 10:05
Solids: 74.49
Laboratory ID: 0811331-02

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 7471A Mercury Digestion
Prepared: 11/25/08 14:00
Initial/Final: 0.3003 g / 50 mL
QC Batch: 0813957

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.054	mg/kg dry wt.	1	0.050	0.0093		11/26/08 08:19

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 10:15
Solids: 84.26
Laboratory ID: 0811331-03

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 7471A Mercury Digestion
Prepared: 11/25/08 14:00
Initial/Final: 0.2997 g / 50 mL
QC Batch: 0813957

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.27	mg/kg dry wt.	1	0.050	0.0093		11/26/08 08:23

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

13SB16A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:00
Solids: 81.57
Laboratory ID: 0811331-04

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 7471A Mercury Digestion
Prepared: 11/25/08 14:00
Initial/Final: 0.2997 g / 50 mL
QC Batch: 0813957

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.073	mg/kg dry wt.	1	0.050	0.0093		11/26/08 08:51

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

13SB16C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:08
Solids: 80.70
Laboratory ID: 0811331-05

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 7471A Mercury Digestion
Prepared: 11/25/08 14:00
Initial/Final: 0.3004 g / 50 mL
QC Batch: 0813957

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.073	mg/kg dry wt.	1	0.050	0.0093		11/26/08 08:55

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

13SB15A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 12:53
Solids: 90.06
Laboratory ID: 0811331-06

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 7471A Mercury Digestion
Prepared: 11/25/08 14:00
Initial/Final: 0.2997 g / 50 mL
QC Batch: 0813957

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.038	mg/kg dry wt.	1	0.050	0.0093	J	11/26/08 09:00

INORGANIC ANALYSIS DATA SHEET
USEPA-7471A

DUP-13

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 00:00
Solids: 89.76
Laboratory ID: 0811331-07

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 7471A Mercury Digestion
Prepared: 11/25/08 14:00
Initial/Final: 0.3001 g / 50 mL
QC Batch: 0813957

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-97-6	Mercury, Total	0.041	mg/kg dry wt.	1	0.050	0.0093	J	11/26/08 09:05

INORGANIC ANALYSIS DATA SHEET
MSA 29-3.5.2

13SB13A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 10:00
Solids: 88.77
Laboratory ID: 0811328-01

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: Method-Specific Preparation
Prepared: 11/26/08 10:16
Initial/Final: 1 g / 1 mL
QC Batch: 0814041

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-44-0	Carbon, Total Organic	0.63	%	1	0.20	0.0080		11/26/08 10:20

INORGANIC ANALYSIS DATA SHEET
MSA 29-3.5.2

13SB20C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 14:49
Solids: 81.43
Laboratory ID: 0811328-07

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: Method-Specific Preparation
Prepared: 11/26/08 10:16
Initial/Final: 0.74 g / 0.74 mL
QC Batch: 0814041

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-44-0	Carbon, Total Organic	0.75	%	1	0.20	0.0080		11/26/08 10:20

INORGANIC ANALYSIS DATA SHEET
MSA 29-3.5.2

13SB18A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 15:21
Solids: 81.46
Laboratory ID: 0811328-11

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: Method-Specific Preparation
Prepared: 11/26/08 10:16
Initial/Final: 0.99 g / 0.99 mL
QC Batch: 0814041

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-44-0	Carbon, Total Organic	0.47	%	1	0.20	0.0080		11/26/08 10:20

INORGANIC ANALYSIS DATA SHEET

MSA 29-3.5.2

13SB16C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:08
Solids: 80.70
Laboratory ID: 0811331-05

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: Method-Specific Preparation
Prepared: 11/26/08 10:16
Initial/Final: 0.36 g / 0.36 mL
QC Batch: 0814041

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-44-0	Carbon, Total Organic	1.5	%	1	0.20	0.0080		11/26/08 10:20

INORGANIC ANALYSIS DATA SHEET

MSA 29-3.5.2

13SB15A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 12:53
Solids: 90.06
Laboratory ID: 0811331-06

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: Method-Specific Preparation
Prepared: 11/26/08 10:16
Initial/Final: 0.85 g / 0.85 mL
QC Batch: 0814041

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-44-0	Carbon, Total Organic	1.0	%	1	0.20	0.0080		11/26/08 10:20

INORGANIC ANALYSIS DATA SHEET

MSA 29-3.5.2

DUP-13

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 00:00
Solids: 89.76
Laboratory ID: 0811331-07

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: Method-Specific Preparation
Prepared: 11/26/08 10:16
Initial/Final: 0.63 g / 0.63 mL
QC Batch: 0814041

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7440-44-0	Carbon, Total Organic	1.2	%	1	0.20	0.0080		11/26/08 10:20

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

13SB13A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 10:00
Solids: 88.77
Laboratory ID: 0811328-01

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: General Inorganic Prep
Prepared: 11/25/08 13:16
Initial/Final: 10 g / 10 mL
QC Batch: 0813888

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	89	%	1	0.1	0.1		11/25/08 13:16

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

13SB13C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 10:18
Solids: 89.66
Laboratory ID: 0811328-02

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: General Inorganic Prep
Prepared: 11/25/08 13:16
Initial/Final: 10 g / 10 mL
QC Batch: 0813888

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	90	%	1	0.1	0.1		11/25/08 13:16

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

13SB21C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 12:26
Solids: 76.80
Laboratory ID: 0811328-03

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: General Inorganic Prep
Prepared: 11/25/08 13:16
Initial/Final: 10 g / 10 mL
QC Batch: 0813888

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	77	%	1	0.1	0.1		11/25/08 13:16

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

13SB14A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 16:00
Solids: 94.24
Laboratory ID: 0811328-04

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: General Inorganic Prep
Prepared: 11/25/08 13:16
Initial/Final: 10 g / 10 mL
QC Batch: 0813888

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	94	%	1	0.1	0.1		11/25/08 13:16

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

13SB20A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 14:34
Solids: 84.47
Laboratory ID: 0811328-06

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: General Inorganic Prep
Prepared: 11/25/08 13:16
Initial/Final: 10 g / 10 mL
QC Batch: 0813888

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	84	%	1	0.1	0.1		11/25/08 13:16

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

13SB20C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 14:49
Solids: 81.43
Laboratory ID: 0811328-07

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: General Inorganic Prep
Prepared: 11/25/08 13:16
Initial/Final: 10 g / 10 mL
QC Batch: 0813888

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	81	%	1	0.1	0.1		11/25/08 13:16

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

13SB22A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:20
Solids: 84.78
Laboratory ID: 0811328-08

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: General Inorganic Prep
Prepared: 11/25/08 13:16
Initial/Final: 10 g / 10 mL
QC Batch: 0813888

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	85	%	1	0.1	0.1		11/25/08 13:16

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

13SB22C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:25
Solids: 71.80
Laboratory ID: 0811328-09

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: General Inorganic Prep
Prepared: 11/25/08 13:16
Initial/Final: 10 g / 10 mL
QC Batch: 0813888

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	72	%	1	0.1	0.1		11/25/08 13:16

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

13SB21A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 12:21
Solids: 76.82
Laboratory ID: 0811328-10

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: General Inorganic Prep
Prepared: 11/25/08 13:16
Initial/Final: 10 g / 10 mL
QC Batch: 0813888

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	77	%	1	0.1	0.1		11/25/08 13:16

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

13SB18A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 15:21
Solids: 81.46
Laboratory ID: 0811328-11

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: General Inorganic Prep
Prepared: 11/25/08 13:16
Initial/Final: 10 g / 10 mL
QC Batch: 0813888

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	81	%	1	0.1	0.1		11/25/08 13:16

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

13SB18C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 15:29
Solids: 80.33
Laboratory ID: 0811328-12

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: General Inorganic Prep
Prepared: 11/25/08 13:16
Initial/Final: 10 g / 10 mL
QC Batch: 0813888

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	80	%	1	0.1	0.1		11/25/08 13:16

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

13SB19A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 12:22
Solids: 67.63
Laboratory ID: 0811328-14

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: General Inorganic Prep
Prepared: 11/25/08 13:16
Initial/Final: 10 g / 10 mL
QC Batch: 0813888

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	68	%	1	0.1	0.1		11/25/08 13:16

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

13SB19C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 12:27
Solids: 76.14
Laboratory ID: 0811328-15

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: General Inorganic Prep
Prepared: 11/25/08 13:16
Initial/Final: 10 g / 10 mL
QC Batch: 0813888

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	76	%	1	0.1	0.1		11/25/08 13:16

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

13SB17A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 10:05
Solids: 74.49
Laboratory ID: 0811331-02

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: General Inorganic Prep
Prepared: 11/25/08 13:16
Initial/Final: 10 g / 10 mL
QC Batch: 0813888

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	74	%	1	0.1	0.1		11/25/08 13:16

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 10:15
Solids: 84.26
Laboratory ID: 0811331-03

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: General Inorganic Prep
Prepared: 11/25/08 13:16
Initial/Final: 10 g / 10 mL
QC Batch: 0813888

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	84	%	1	0.1	0.1		11/25/08 13:16

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

13SB16A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:00
Solids: 81.57
Laboratory ID: 0811331-04

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: General Inorganic Prep
Prepared: 11/25/08 13:16
Initial/Final: 10 g / 10 mL
QC Batch: 0813888

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	82	%	1	0.1	0.1		11/25/08 13:16

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

13SB16C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:08
Solids: 80.70
Laboratory ID: 0811331-05

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: General Inorganic Prep
Prepared: 11/25/08 13:16
Initial/Final: 10 g / 10 mL
QC Batch: 0813888

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	81	%	1	0.1	0.1		11/25/08 13:16

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

13SB15A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 12:53
Solids: 90.06
Laboratory ID: 0811331-06

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: General Inorganic Prep
Prepared: 11/25/08 13:16
Initial/Final: 10 g / 10 mL
QC Batch: 0813888

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	90	%	1	0.1	0.1		11/25/08 13:16

INORGANIC ANALYSIS DATA SHEET
USEPA-3550B

DUP-13

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 00:00
Solids: 89.76
Laboratory ID: 0811331-07

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: General Inorganic Prep
Prepared: 11/25/08 13:16
Initial/Final: 10 g / 10 mL
QC Batch: 0813888

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
	Percent Solids	90	%	1	0.1	0.1		11/25/08 13:16

DATA VALIDATION WORKSHEET

Semivolatile Organic Analysis

Reviewer: Andrea Sansom
Date: 1/19/2009
DV Level: II III IV
Review Document:
X NFG - Region III Modifications
X Project QAPP/SAP

Project Name: Radford SWMU41
Project Number: 11656367.30000
Laboratory: TriMatrix
SDG No.: 36440-61
Test Name: SVOC
Method No.: 8270C

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
1.4	Do sample preservation, collection and storage condition meet method requirement?		X	
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 20 °C), then flag all positive results with a "L" and all non-detects "UL".			
1.5	Do any soil samples contain more than 50% water?		X	
	If any sample analyzed as a soil, other than TCLP, contains % moisture greater than 50%, noted in the DV			

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Were sample preserved as specified in the method or project QAPP?	X		
2.2	Have any technical holding times, determined from date of sampling to date of analysis, been exceeded? If yes, L(+)/UL(-). For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).	X		
2.3	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, L(+)/R(-) .		X	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	X		
3.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, positive sample results should be reported and qualified "B", if the concentration of the compound in the sample is less than or equal to 5 times (or 10 times for the common phthalate contaminants) the amount in the associated blank.	X		
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.	X		
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, noted in the Dv report.	X		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgement to determine the effect on the data and note in the reviewer narrative.	X		
4.3	Has a continuing calibration standard been analyzed for every 12 hours of sample analysis per instrument?	X		
4.4	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: $\geq$0.99, %RSD $\leq$ 15%, ICV %D < 30%, and CCV %D $\leq$ 20%.		X	
	For initial Calibration: for %RSD > $\pm$ 15%, but < $\pm$ 50%, J(+) only. for %RSD > $\pm$ 50%, but < $\pm$ 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 20% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >20%, J(+).			
4.5	Do any SPCC compounds have an RRF < 0.05? (n-nitroso-di-n-propylamine, hexachlorocyclopentadiene, 2,4-dinitrophenol, & 4-nitrophenol) If yes, J(+)/R(-).		X	

Notes:

5.0 GC/MS Instrument Performance Check		Yes	No	NA
5.1	Are GC/MS Tuning and Mass Calibration forms present for decafluorotriphenylphosphine (DFTPP)?	X		
5.2	Are DFTPP enchanced bar graph spectrum and mass/charge (m/z) listing provided for each 12-hour shift?	X		
	If DFTPP was analyzed simultaneously with any calibration standard or blank, the instrument performance check (IPC) is rejected "R" as well as all associated data.			
5.3	Have all samples been analyzed within twelve hours of the DFTPP tune?	X		
	If twelve hours have elapsed according to the system clock, and the laboratory had analyzed standards, blanks, field samples or QC samples after twelve (12) hours, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
5.4	Have ion abundance criteria for DFTPP been met for each instrument used?	X		
	If the DFTPP criteria were not met prior to the analyses of the standards, blanks, field samples and QC samples, all standards, blanks, field samples and QC samples are rejected "R".			

Notes:

6.0 Surrogate Recovery		Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
6.2	Are surrogate recoveries within acceptance criteria not to exceed 10-150% for all samples and method blanks?	X		
6.3	If No in Section 6.2, are these sample(s) or method blank(s) reanalyzed?		X	
	If any two base/neutral or acid fraction are out of specification, or if any one base/neutral or acid extractable surrogate has a recovery of less than 10%, then there should be a reanalysis to confirm that the non-compliance is because of sample matrix effects rather than laboratory deficiencies.			
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? (recoveries may be diluted out.)		X	
	1 or more <10% / 2 or 3 high/low / 2 or 3 all low / 2 or 3 all high Positives: L / J / L / K Non-detects: R / UJ / UL / NONE			
	Note: The B qualifier remains over surrogate flagging.			

Notes:

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
7.1	Is the matrix spike/matrix spike duplicate recovery form present?	X		
7.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 10-150%?	X		
7.4	Are there any RPDs outside the QC limits not to exceed 60%?	X		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

8.0 Laboratory Control Sample/Laboratory Control Sample Duplicate (LCS/LCSD)		Yes	No	NA
8.1	Is the LCS/LCSD recovery form present?	X		
8.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
8.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 10-150%?	X		
	If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
8.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 50%?			X
	If Yes, J(+) only.			

Notes:

9.0 Internal Standard		Yes	No	NA
9.1	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration? If not, J(+)/UJ(-).		X	
	If extremely low area counts are reported, or performance exhibits a major abrupt drop-off, then a severe loss of sensitivity is indicated. Non-detect target compounds should then be qualified as unusable (R).			
9.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?	X		
	The chromatographic profile for that sample must be examined to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Positive results should not needed to be qualified as "R", if the mass spectral criteria are met.			

Notes:

10.0 Field Duplicate		Yes	No	NA
10.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
10.2	Are all analyte duplicate results within control limits? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.		X	

Notes:

11.0 Tentatively Identified Compounds (TICs) and Detection Limit Verification		Yes	No	NA
11.1	Are any TICs detected in the field samples? If Yes, all TIC results should be flagged "NJ" (tentatively idenified, and approximate concentration).			X
11.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture?	X		
11.3	Were sample concentrations above the highest standard run at a dilution? If not, for ion saturation flag "L", unsaturated results "J".			X

Notes:

12.0 Data Completeness		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit 90%)	X		
	Number of samples: 22			
	Number of target compounds in each analysis: 67			
	Number of results rejected and not reported: 109			
	% Completeness = (12.1.1 x 12.1.2 - 12.1.3) x 100/(12.1.1 x 12.1.2)			
	% Completeness = 92.6%			

Notes:

SURROGATE STANDARD RECOVERY AND RT SUMMARY

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120947
Matrix: Soil

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 308
Calibration: 8L08004

Lab Sample Id Surrogate Compound Name	RT	Calibration Mean RT	RT Diff	RT Diff Limit	% Recovery	Recovery Limits	Q
Calibration Check (8120947-CCV1)		**Lab File ID: 10c1208.D**		**Analyzed: 12/08/08 08:29**			
2-Fluorophenol	5.18	5.30	-0.12	+/-1.0	89	75 - 105	
Phenol-d6	6.87	6.97	-0.10	+/-1.0	95	75 - 100	
Nitrobenzene-d5	8.70	8.82	-0.12	+/-1.0	98	75 - 100	
2-Fluorobiphenyl	12.83	12.97	-0.14	+/-1.0	100	75 - 105	
2,4,6-Tribromophenol	16.25	16.38	-0.13	+/-1.0	92	75 - 125	
o-Terphenyl	18.58	18.68	-0.10	+/-1.0	103	75 - 125	
13SB20A (0811328-06RE1)		**Lab File ID: 0811328-06re1**		**Analyzed: 12/08/08 11:55**			
2-Fluorophenol	5.26	5.30	-0.05	+/-1.0	96	35 - 105	
Phenol-d6	6.89	6.97	-0.08	+/-1.0	93	40 - 100	
Nitrobenzene-d5	8.70	8.82	-0.13	+/-1.0	99	35 - 100	
2-Fluorobiphenyl	12.83	12.97	-0.14	+/-1.0	106	45 - 105	*
2,4,6-Tribromophenol	16.24	16.38	-0.14	+/-1.0	102	35 - 125	
o-Terphenyl	18.58	18.68	-0.11	+/-1.0	111	30 - 125	
13SB17A (0811331-02RE1)		**Lab File ID: 0811331-02re1**		**Analyzed: 12/08/08 12:30**			
2-Fluorophenol	5.26	5.30	-0.04	+/-1.0	89	35 - 105	
Phenol-d6	6.90	6.97	-0.07	+/-1.0	89	40 - 100	
Nitrobenzene-d5	8.70	8.82	-0.12	+/-1.0	93	35 - 100	
2-Fluorobiphenyl	12.83	12.97	-0.14	+/-1.0	98	45 - 105	
2,4,6-Tribromophenol	16.26	16.38	-0.12	+/-1.0	98	35 - 125	
o-Terphenyl	18.58	18.68	-0.10	+/-1.0	88	30 - 125	

QC BATCH SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61

Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008

QC Batch: 0813364
QC Batch Matrix: Water
Preparation: 3510C Liquid-Liquid Extraction

Sample Name	Lab Sample ID	Date Prepared	Observations
EQBK-1	0811328-05	11/18/08 08:38	
EQBK-5	0811328-13	11/18/08 08:38	
EQBK-6	0811331-01	11/18/08 08:38	
Blank	0813364-BLK2	11/18/08 08:38	8270DoD only
LCS	0813364-BS2	11/18/08 08:38	8270DoD only

001555

METHOD BLANK DATA SHEET
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Water
Laboratory ID: 0813364-BLK2
File ID: 813364B2.D
Prepared: 11/18/08 08:38
Preparation: 3510C Liquid-Liquid Ext
Initial/Final: 1000 mL / 1 mL
Analyzed: 11/26/08 08:44
Instrument: 195
QC Batch: 0813364
Sequence: 8120138
Calibration: 8L01007

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
83-32-9	Acenaphthene	0.013	0.50	0.50	ug/L	U
208-96-8	Acenaphthylene	0.012	0.50	0.50	ug/L	U
98-86-2	Acetophenone	0.043	5.0	0.080	ug/L	J
120-12-7	Anthracene	0.014	0.50	0.50	ug/L	U
1912-24-9	Atrazine	0.026	5.0	5.0	ug/L	U
100-52-7	Benzaldehyde	0.051	5.0	5.0	ug/L	U
56-55-3	Benzo(a)anthracene	0.037	0.50	0.040	ug/L	J
50-32-8	Benzo(a)pyrene	0.023	0.50	0.50	ug/L	U
205-99-2	Benzo(b)fluoranthene	0.040	0.50	0.50	ug/L	U
207-08-9	Benzo(k)fluoranthene	0.036	0.50	0.040	ug/L	J
191-24-2	Benzo(g,h,i)perylene	0.022	0.50	0.50	ug/L	U
92-52-4	1,1'-Biphenyl	0.015	5.0	0.020	ug/L	J
101-55-3	4-Bromophenyl Phenyl Ether	0.026	5.0	5.0	ug/L	U
85-68-7	Butyl Benzyl Phthalate	0.029	5.0	5.0	ug/L	U
105-60-2	Caprolactam	0.14	5.0	5.0	ug/L	U
86-74-8	Carbazole	0.018	5.0	5.0	ug/L	U
59-50-7	4-Chloro-3-methylphenol	0.021	5.0	5.0	ug/L	U
106-47-8	4-Chloroaniline	0.021	5.0	5.0	ug/L	U
111-91-1	Bis(2-chloroethoxy)methane	0.016	5.0	5.0	ug/L	U
111-44-4	Bis(2-chloroethyl) Ether	0.016	5.0	5.0	ug/L	U
108-60-1	Bis(2-chloroisopropyl) Ether	0.047	5.0	5.0	ug/L	U
91-58-7	2-Chloronaphthalene	0.012	5.0	5.0	ug/L	U
95-57-8	2-Chlorophenol	0.016	5.0	5.0	ug/L	U
7005-72-3	4-Chlorophenyl Phenyl Ether	0.016	5.0	5.0	ug/L	U
218-01-9	Chrysene	0.020	0.50	0.030	ug/L	J
53-70-3	Dibenz(a,h)anthracene	0.026	0.50	0.50	ug/L	U
132-64-9	Dibenzofuran	0.016	5.0	5.0	ug/L	U
84-74-2	Di-n-butyl Phthalate	0.38	5.0	5.0	ug/L	U
91-94-1	3,3´-Dichlorobenzidine	0.21	5.0	5.0	ug/L	U
120-83-2	2,4-Dichlorophenol	0.015	5.0	5.0	ug/L	U
84-66-2	Diethyl Phthalate	0.034	5.0	0.040	ug/L	J

METHOD BLANK DATA SHEET
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Water
Laboratory ID: 0813364-BLK2
File ID: 813364B2.D
Prepared: 11/18/08 08:38
Preparation: 3510C Liquid-Liquid Ext
Initial/Final: 1000 mL / 1 mL
Analyzed: 11/26/08 08:44
Instrument: 195
QC Batch: 0813364
Sequence: 8120138
Calibration: 8L01007

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
105-67-9	2,4-Dimethylphenol	0.33	5.0	5.0	ug/L	U
131-11-3	Dimethyl Phthalate	0.016	5.0	5.0	ug/L	U
534-52-1	4,6-Dinitro-2-methylphenol	0.12	5.0	5.0	ug/L	U
51-28-5	2,4-Dinitrophenol	1.5	5.0	5.0	ug/L	U
121-14-2	2,4-Dinitrotoluene	0.21	5.0	5.0	ug/L	U
606-20-2	2,6-Dinitrotoluene	0.050	5.0	5.0	ug/L	U
117-84-0	Di-n-octyl Phthalate	0.34	5.0	5.0	ug/L	U
117-81-7	Bis(2-ethylhexyl) Phthalate	0.41	5.0	5.0	ug/L	U
206-44-0	Fluoranthene	0.016	0.50	0.50	ug/L	U
86-73-7	Fluorene	0.011	0.50	0.50	ug/L	U
118-74-1	Hexachlorobenzene	0.019	5.0	5.0	ug/L	U
87-68-3	Hexachlorobutadiene	0.018	5.0	5.0	ug/L	U
77-47-4	Hexachlorocyclopentadiene	0.13	5.0	5.0	ug/L	U
67-72-1	Hexachloroethane	0.038	5.0	5.0	ug/L	U
193-39-5	Indeno(1,2,3-cd)pyrene	0.014	0.50	0.50	ug/L	U
78-59-1	Isophorone	0.031	5.0	0.090	ug/L	J
91-57-6	2-Methylnaphthalene	0.015	5.0	5.0	ug/L	U
95-48-7	2-Methylphenol	0.14	5.0	5.0	ug/L	U
106-44-5	4-Methylphenol	0.16	5.0	5.0	ug/L	U
91-20-3	Naphthalene	0.023	0.50	0.50	ug/L	U
88-74-4	2-Nitroaniline	0.12	5.0	5.0	ug/L	U
99-09-2	3-Nitroaniline	0.13	5.0	5.0	ug/L	U
100-01-6	4-Nitroaniline	0.14	5.0	5.0	ug/L	U
98-95-3	Nitrobenzene	0.026	5.0	5.0	ug/L	U
100-02-7	4-Nitrophenol	1.3	5.0	5.0	ug/L	U
88-75-5	2-Nitrophenol	0.026	5.0	5.0	ug/L	U
86-30-6	N-Nitroso-diphenylamine	0.019	5.0	5.0	ug/L	U
621-64-7	N-Nitroso-di-n-propylamine	0.030	5.0	5.0	ug/L	U
87-86-5	Pentachlorophenol	0.19	5.0	5.0	ug/L	U
85-01-8	Phenanthrene	0.015	0.50	0.50	ug/L	U
108-95-2	Phenol	0.028	5.0	5.0	ug/L	U

METHOD BLANK DATA SHEET
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Water
Laboratory ID: 0813364-BLK2
File ID: 813364B2.D
Prepared: 11/18/08 08:38
Preparation: 3510C Liquid-Liquid Extr
Initial/Final: 1000 mL / 1 mL
Analyzed: 11/26/08 08:44
Instrument: 195
QC Batch: 0813364
Sequence: 8120138
Calibration: 8L01007

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
129-00-0	Pyrene	0.047	0.50	0.50	ug/L	U
95-94-3	1,2,4,5-Tetrachlorobenzene	0.024	5.0	5.0	ug/L	U
58-90-2	2,3,4,6-Tetrachlorophenol	0.16	5.0	5.0	ug/L	U
88-06-2	2,4,6-Trichlorophenol	0.027	5.0	5.0	ug/L	U
95-95-4	2,4,5-Trichlorophenol	0.11	5.0	5.0	ug/L	U

System Monitoring Compound	Added (ug/L)	Conc. (ug/L)	% REC	QC Limits	Q
2-Fluorophenol	20.2	11.9	59	20 - 110	
Phenol-d6	20.4	8.00	39	10 - 115	
Nitrobenzene-d5	10.2	8.02	79	40 - 110	
2-Fluorobiphenyl	10.1	7.97	79	50 - 110	
2,4,6-Tribromophenol	20.5	15.0	73	40 - 125	
o-Terphenyl	10.0	8.61	86	50 - 135	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	103773	4.99	93113	4.99	
Naphthalene-d8	427982	6.48	361517	6.48	
Acenaphthene-d10	253199	8.48	218183	8.49	
Phenanthrene-d10	346701	10.14	311094	10.14	
Chrysene-d12	282707	13.08	252432	13.08	
Perylene-d12	300441	14.55	257937	14.55	

LCS / LCS DUPLICATE RECOVERY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water

Laboratory ID: 0813364-BS2

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3510C Liquid-Liquid Extraction
Initial/Final: 1000 mL / 1 mL
QC Batch: 0813364
Sequence: 8120138

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
Acenaphthene	9.60	7.39	77	45 - 110	ug/L
Acenaphthylene	9.60	7.61	79	50 - 105	ug/L
Acetophenone	10.0	7.11	71	54 - 113	ug/L
Anthracene	9.60	8.17	85	55 - 110	ug/L
Atrazine	10.0	8.75	88	61 - 139	ug/L
Benzaldehyde	10.0	8.07	81	25 - 141	ug/L
Benzo(a)anthracene	9.60	7.71	80	55 - 110	ug/L
Benzo(a)pyrene	9.60	8.14	85	55 - 110	ug/L
Benzo(b)fluoranthene	9.60	7.73	81	45 - 120	ug/L
Benzo(k)fluoranthene	9.60	7.92	82	45 - 125	ug/L
Benzo(g,h,i)perylene	9.60	8.04	84	40 - 125	ug/L
1,1'-Biphenyl	10.0	7.35	74	59 - 114	ug/L
4-Bromophenyl Phenyl Ether	9.60	9.09	95	50 - 115	ug/L
Butyl Benzyl Phthalate	9.60	7.96	83	45 - 115	ug/L
Caprolactam	10.0	1.47	15 *	25 - 135	ug/L
Carbazole	9.60	9.60	100	50 - 115	ug/L
4-Chloro-3-methylphenol	9.60	7.80	81	45 - 110	ug/L
4-Chloroaniline	9.60	7.65	80	15 - 110	ug/L
Bis(2-chloroethoxy)methane	9.60	8.16	85	45 - 105	ug/L
Bis(2-chloroethyl) Ether	9.60	7.20	75	35 - 110	ug/L
Bis(2-chloroisopropyl) Ether	9.60	7.83	82	25 - 130	ug/L
2-Chloronaphthalene	9.60	8.03	84	50 - 105	ug/L
2-Chlorophenol	9.60	7.60	79	35 - 105	ug/L
4-Chlorophenyl Phenyl Ether	9.60	8.37	87	50 - 110	ug/L
Chrysene	9.60	7.74	81	55 - 110	ug/L
Dibenz(a,h)anthracene	9.60	7.85	82	40 - 125	ug/L
Dibenzofuran	9.60	8.23	86	55 - 105	ug/L
Di-n-butyl Phthalate	9.60	9.09	95	55 - 115	ug/L
3,3'-Dichlorobenzidine	20.0	18.5	93	20 - 110	ug/L

LCS / LCS DUPLICATE RECOVERY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water

Laboratory ID: 0813364-BS2

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3510C Liquid-Liquid Extraction
Initial/Final: 1000 mL / 1 mL
QC Batch: 0813364
Sequence: 8120138

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
2,4-Dichlorophenol	9.60	7.88	82	50 - 105	ug/L
Diethyl Phthalate	9.60	8.51	89	40 - 120	ug/L
2,4-Dimethylphenol	9.60	6.35	66	30 - 110	ug/L
Dimethyl Phthalate	9.60	8.41	88	25 - 125	ug/L
4,6-Dinitro-2-methylphenol	9.60	8.16	85	40 - 130	ug/L
2,4-Dinitrophenol	9.60	5.46	57	15 - 140	ug/L
2,4-Dinitrotoluene	9.60	8.06	84	50 - 120	ug/L
2,6-Dinitrotoluene	9.60	8.52	89	50 - 115	ug/L
Di-n-octyl Phthalate	9.60	8.19	85	35 - 135	ug/L
Bis(2-ethylhexyl) Phthalate	9.60	8.02	84	40 - 125	ug/L
Fluoranthene	9.60	8.34	87	55 - 115	ug/L
Fluorene	9.60	7.78	81	50 - 110	ug/L
Hexachlorobenzene	9.60	8.43	88	50 - 110	ug/L
Hexachlorobutadiene	9.60	7.47	78	25 - 105	ug/L
Hexachlorocyclopentadiene	9.60	5.58	58	30 - 141	ug/L
Hexachloroethane	9.60	7.14	74	30 - 95	ug/L
Indeno(1,2,3-cd)pyrene	9.60	8.10	84	45 - 125	ug/L
Isophorone	9.60	7.94	83	50 - 110	ug/L
2-Methylnaphthalene	9.60	7.77	81	45 - 105	ug/L
2-Methylphenol	9.80	6.32	64	40 - 110	ug/L
4-Methylphenol	9.80	7.06	72	30 - 110	ug/L
Naphthalene	9.60	7.28	76	40 - 100	ug/L
2-Nitroaniline	9.60	9.38	98	50 - 115	ug/L
3-Nitroaniline	9.60	9.02	94	20 - 125	ug/L
4-Nitroaniline	9.60	8.45	88	35 - 120	ug/L
Nitrobenzene	9.60	7.82	81	45 - 110	ug/L
4-Nitrophenol	9.60	3.79	39	0 - 125	ug/L
2-Nitrophenol	9.60	7.95	83	40 - 115	ug/L
N-Nitroso-diphenylamine	9.60	6.30	66	50 - 110	ug/L

LCS / LCS DUPLICATE RECOVERY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water

Laboratory ID: 0813364-BS2

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3510C Liquid-Liquid Extraction
Initial/Final: 1000 mL / 1 mL
QC Batch: 0813364
Sequence: 8120138

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
N-Nitroso-di-n-propylamine	9.60	7.92	82	35 - 130	ug/L
Pentachlorophenol	9.60	6.45	67	40 - 115	ug/L
Phenanthrene	9.60	8.00	83	50 - 115	ug/L
Phenol	9.60	4.05	42	0 - 115	ug/L
Pyrene	9.60	7.48	78	50 - 130	ug/L
1,2,4,5-Tetrachlorobenzene	5.00	4.10	82	40 - 140	ug/L
2,3,4,6-Tetrachlorophenol	9.60	10.4	109	40 - 115	ug/L
2,4,6-Trichlorophenol	9.60	7.82	81	50 - 115	ug/L
2,4,5-Trichlorophenol	9.80	7.96	81	50 - 110	ug/L

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

SURROGATE STANDARD RECOVERY AND RT SUMMARY

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120138
Matrix: Water

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 195
Calibration: 8L01007

Lab Sample Id Surrogate Compound Name	RT	Calibration Mean RT	RT Diff	RT Diff Limit	% Recovery	Recovery Limits	Q
Calibration Check (8120138-CCV1)		**Lab File ID: 10C1126A.D**		**Analyzed: 11/26/08 07:49**			
2-Fluorophenol	3.51	3.51	0.00	+/-1.0	92	75 - 110	
Phenol-d6	4.57	4.57	0.00	+/-1.0	89	75 - 115	
Nitrobenzene-d5	5.66	5.67	0.00	+/-1.0	92	75 - 110	
2-Fluorobiphenyl	7.74	7.74	0.00	+/-1.0	92	75 - 110	
2,4,6-Tribromophenol	9.37	9.38	-0.01	+/-1.0	89	75 - 125	
o-Terphenyl	10.58	10.58	0.00	+/-1.0	95	75 - 125	
Blank (0813364-BLK2)		**Lab File ID: 813364B2.D**		**Analyzed: 11/26/08 08:44**			
2-Fluorophenol	3.50	3.51	-0.01	+/-1.0	59	20 - 110	
Phenol-d6	4.56	4.57	-0.01	+/-1.0	39	10 - 115	
Nitrobenzene-d5	5.66	5.67	0.00	+/-1.0	79	40 - 110	
2-Fluorobiphenyl	7.73	7.74	-0.01	+/-1.0	79	50 - 110	
2,4,6-Tribromophenol	9.37	9.38	-0.01	+/-1.0	73	40 - 125	
o-Terphenyl	10.58	10.58	0.00	+/-1.0	86	50 - 135	
LCS (0813364-BS2)		**Lab File ID: 813364S2.D**		**Analyzed: 11/26/08 09:12**			
2-Fluorophenol	3.51	3.51	0.00	+/-1.0	51	20 - 110	
Phenol-d6	4.57	4.57	0.00	+/-1.0	38	10 - 115	
Nitrobenzene-d5	5.66	5.67	0.00	+/-1.0	78	40 - 110	
2-Fluorobiphenyl	7.73	7.74	-0.01	+/-1.0	83	50 - 110	
2,4,6-Tribromophenol	9.37	9.38	-0.01	+/-1.0	83	40 - 125	
o-Terphenyl	10.58	10.58	0.00	+/-1.0	86	50 - 135	
EQBK-1 (0811328-05)		**Lab File ID: 81132805.D**		**Analyzed: 11/26/08 09:39**			
2-Fluorophenol	3.50	3.51	-0.01	+/-1.0	62	20 - 110	
Phenol-d6	4.56	4.57	-0.01	+/-1.0	41	10 - 115	
Nitrobenzene-d5	5.66	5.67	0.00	+/-1.0	92	40 - 110	
2-Fluorobiphenyl	7.73	7.74	-0.01	+/-1.0	84	50 - 110	
2,4,6-Tribromophenol	9.37	9.38	-0.01	+/-1.0	93	40 - 125	
o-Terphenyl	10.58	10.58	0.00	+/-1.0	105	50 - 135	

SURROGATE STANDARD RECOVERY AND RT SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120138
Matrix: Water

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 195
Calibration: 8L01007

Lab Sample Id Surrogate Compound Name	RT	Calibration Mean RT	RT Diff	RT Diff Limit	% Recovery	Recovery Limits	Q
EQBK-5 (0811328-13)		**Lab File ID: 81132813.D**		**Analyzed: 11/26/08 10:07**			
2-Fluorophenol	3.49	3.51	-0.02	+/-1.0	65	20 - 110	
Phenol-d6	4.56	4.57	-0.01	+/-1.0	43	10 - 115	
Nitrobenzene-d5	5.66	5.67	0.00	+/-1.0	94	40 - 110	
2-Fluorobiphenyl	7.73	7.74	-0.01	+/-1.0	93	50 - 110	
2,4,6-Tribromophenol	9.37	9.38	-0.01	+/-1.0	96	40 - 125	
o-Terphenyl	10.58	10.58	0.00	+/-1.0	114	50 - 135	
EQBK-6 (0811331-01)		**Lab File ID: 81133101.D**		**Analyzed: 11/26/08 10:35**			
2-Fluorophenol	3.49	3.51	-0.02	+/-1.0	60	20 - 110	
Phenol-d6	4.56	4.57	-0.01	+/-1.0	41	10 - 115	
Nitrobenzene-d5	5.66	5.67	0.00	+/-1.0	88	40 - 110	
2-Fluorobiphenyl	7.73	7.74	-0.01	+/-1.0	84	50 - 110	
2,4,6-Tribromophenol	9.37	9.38	-0.01	+/-1.0	89	40 - 125	
o-Terphenyl	10.58	10.58	0.00	+/-1.0	105	50 - 135	

QC BATCH SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
QC Batch: 0813821
QC Batch Matrix: Soil
Preparation: 3550B Sonication Extraction

Sample Name	Lab Sample ID	Date Prepared	Observations
13SB13A	0811328-01	11/22/08 08:36	
13SB13A	0811328-01RE1	11/22/08 08:36	Added 12/1/2008 by ASC
13SB13A	0811328-01RE2	12/01/08 08:36	Added 12/9/2008 by JLB
13SB13C	0811328-02	11/22/08 08:36	
13SB13C	0811328-02RE1	12/01/08 08:36	Added 12/1/2008 by ASC
13SB21C	0811328-03	11/22/08 08:36	
13SB21C	0811328-03RE1	12/01/08 08:36	Added 12/1/2008 by ASC
13SB14A	0811328-04	11/22/08 08:36	
13SB14A	0811328-04RE1	12/01/08 08:36	Added 12/1/2008 by ASC
13SB20A	0811328-06	11/22/08 08:36	
13SB20A	0811328-06RE1	12/01/08 08:36	Added 12/1/2008 by ASC
13SB20A	0811328-06RE2	12/01/08 08:36	Added 12/9/2008 by JLB
13SB20C	0811328-07	11/22/08 08:36	
13SB20C	0811328-07RE1	12/01/08 08:36	Added 12/1/2008 by ASC
13SB22A	0811328-08	11/22/08 08:36	
13SB22A	0811328-08RE1	12/01/08 08:36	Added 12/1/2008 by ASC
13SB22C	0811328-09	11/22/08 08:36	
13SB22C	0811328-09RE1	12/01/08 08:36	Added 12/1/2008 by ASC
13SB21A	0811328-10	11/22/08 08:36	
13SB21A	0811328-10RE1	12/01/08 08:36	Added 12/1/2008 by ASC
13SB18A	0811328-11	11/22/08 08:36	
13SB18A	0811328-11RE1	12/01/08 08:36	Added 12/1/2008 by ASC
13SB18C	0811328-12	11/22/08 08:36	
13SB18C	0811328-12RE1	12/01/08 08:36	Added 12/1/2008 by ASC
13SB19A	0811328-14	11/22/08 08:36	
13SB19A	0811328-14RE1	12/01/08 08:36	Added 12/1/2008 by ASC
13SB19C	0811328-15	11/22/08 08:36	
13SB19C	0811328-15RE1	12/01/08 08:36	Added 12/1/2008 by ASC
13SB17A	0811331-02	11/22/08 08:36	
13SB17A	0811331-02RE1	12/01/08 08:36	Added 12/1/2008 by ASC
13SB17A	0811331-02RE2	12/01/08 08:36	Added 12/9/2008 by JLB
13SB17C	0811331-03	11/22/08 08:36	
13SB17C	0811331-03RE1	12/01/08 08:36	Added 12/1/2008 by ASC

002155

QC BATCH SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
QC Batch: 0813821
QC Batch Matrix: Soil
Preparation: 3550B Sonication Extraction

Sample Name	Lab Sample ID	Date Prepared	Observations
13SB16A	0811331-04	11/22/08 08:36	
13SB16A	0811331-04RE1	12/01/08 08:36	Added 12/1/2008 by ASC
13SB16C	0811331-05	11/22/08 08:36	
13SB16C	0811331-05RE1	12/01/08 08:36	Added 12/1/2008 by ASC
13SB15A	0811331-06	11/22/08 08:36	
13SB15A	0811331-06RE1	12/01/08 08:36	Added 12/1/2008 by ASC
DUP-13	0811331-07	11/22/08 08:36	
DUP-13	0811331-07RE1	11/22/08 08:36	Added 12/1/2008 by ASC
DUP-13	0811331-07RE2	12/01/08 08:36	Added 12/10/2008 by JLB
Blank	0813821-BLK1	11/22/08 08:36	
Blank	0813821-BLK2	12/01/08 08:36	
LCS	0813821-BS1	11/22/08 08:36	
LCS	0813821-BS2	12/01/08 08:36	
13SB19C	0813821-MS1	11/22/08 08:36	
13SB17C	0813821-MS2	11/22/08 08:36	
13SB19C	0813821-MS3	12/01/08 08:36	
13SB17C	0813821-MS4	12/01/08 08:36	
13SB19C	0813821-MSD1	11/22/08 08:36	
13SB17C	0813821-MSD2	11/22/08 08:36	
13SB19C	0813821-MSD3	12/01/08 08:36	
13SB17C	0813821-MSD4	12/01/08 08:36	

METHOD BLANK DATA SHEET
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0813821-BLK1
File ID: 813821B1.D
Prepared: 11/22/08 08:36
Preparation: 3550B Sonication Extract
Initial/Final: 30 g / 1 mL
Analyzed: 11/26/08 11:04
Instrument: 195
QC Batch: 0813821
Sequence: 8120153
Calibration: 8L01007

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
83-32-9	Acenaphthene	1.6	17	17	ug/kg wet	U
208-96-8	Acenaphthylene	1.0	17	17	ug/kg wet	U
98-86-2	Acetophenone	2.8	170	170	ug/kg wet	U
120-12-7	Anthracene	2.5	17	17	ug/kg wet	U
1912-24-9	Atrazine	1.5	170	170	ug/kg wet	U
100-52-7	Benzaldehyde	26	170	170	ug/kg wet	U
56-55-3	Benzo(a)anthracene	0.94	17	1.7	ug/kg wet	J
50-32-8	Benzo(a)pyrene	1.2	17	2.0	ug/kg wet	J
205-99-2	Benzo(b)fluoranthene	0.98	17	1.7	ug/kg wet	J
207-08-9	Benzo(k)fluoranthene	1.3	17	2.0	ug/kg wet	J
191-24-2	Benzo(g,h,i)perylene	0.90	67	1.0	ug/kg wet	J
92-52-4	1,1'-Biphenyl	0.90	170	170	ug/kg wet	U
101-55-3	4-Bromophenyl Phenyl Ether	1.3	170	170	ug/kg wet	U
85-68-7	Butyl Benzyl Phthalate	1.0	170	14	ug/kg wet	J
105-60-2	Caprolactam	23	330	330	ug/kg wet	U
86-74-8	Carbazole	0.50	170	3.7	ug/kg wet	J
59-50-7	4-Chloro-3-methylphenol	2.1	170	170	ug/kg wet	U
106-47-8	4-Chloroaniline	20	170	170	ug/kg wet	U
111-91-1	Bis(2-chloroethoxy)methane	0.84	170	170	ug/kg wet	U
111-44-4	Bis(2-chloroethyl) Ether	1.1	170	170	ug/kg wet	U
108-60-1	Bis(2-chloroisopropyl) Ether	1.1	170	170	ug/kg wet	U
91-58-7	2-Chloronaphthalene	1.2	170	170	ug/kg wet	U
95-57-8	2-Chlorophenol	0.60	170	170	ug/kg wet	U
7005-72-3	4-Chlorophenyl Phenyl Ether	0.45	170	170	ug/kg wet	U
218-01-9	Chrysene	0.72	17	1.7	ug/kg wet	J
53-70-3	Dibenz(a,h)anthracene	3.6	67	67	ug/kg wet	U
132-64-9	Dibenzofuran	1.5	170	170	ug/kg wet	U
84-74-2	Di-n-butyl Phthalate	2.4	170	110	ug/kg wet	J
91-94-1	3,3'-Dichlorobenzidine	78	330	330	ug/kg wet	U
120-83-2	2,4-Dichlorophenol	2.2	170	170	ug/kg wet	U
84-66-2	Diethyl Phthalate	0.37	170	1.3	ug/kg wet	J

METHOD BLANK DATA SHEET
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0813821-BLK1
File ID: 813821B1.D
Prepared: 11/22/08 08:36
Preparation: 3550B Sonication Extract
Initial/Final: 30 g / 1 mL
Analyzed: 11/26/08 11:04
Instrument: 195
QC Batch: 0813821
Sequence: 8120153
Calibration: 8L01007

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
105-67-9	2,4-Dimethylphenol	5.7	170	170	ug/kg wet	U
131-11-3	Dimethyl Phthalate	0.77	170	170	ug/kg wet	U
534-52-1	4,6-Dinitro-2-methylphenol	3.6	170	170	ug/kg wet	U
51-28-5	2,4-Dinitrophenol	33	330	330	ug/kg wet	U
121-14-2	2,4-Dinitrotoluene	4.1	170	170	ug/kg wet	U
606-20-2	2,6-Dinitrotoluene	2.3	170	170	ug/kg wet	U
117-84-0	Di-n-octyl Phthalate	9.8	170	170	ug/kg wet	U
117-81-7	Bis(2-ethylhexyl) Phthalate	2.0	170	340	ug/kg wet	
206-44-0	Fluoranthene	1.5	17	3.3	ug/kg wet	J
86-73-7	Fluorene	1.6	17	17	ug/kg wet	U
118-74-1	Hexachlorobenzene	3.4	170	170	ug/kg wet	U
87-68-3	Hexachlorobutadiene	1.1	170	170	ug/kg wet	U
77-47-4	Hexachlorocyclopentadiene	2.5	170	170	ug/kg wet	U
67-72-1	Hexachloroethane	0.78	170	170	ug/kg wet	U
193-39-5	Indeno(1,2,3-cd)pyrene	2.2	67	67	ug/kg wet	U
78-59-1	Isophorone	0.84	170	1.7	ug/kg wet	J
91-57-6	2-Methylnaphthalene	0.74	170	170	ug/kg wet	U
95-48-7	2-Methylphenol	2.2	170	170	ug/kg wet	U
106-44-5	4-Methylphenol	1.3	170	170	ug/kg wet	U
91-20-3	Naphthalene	1.9	17	17	ug/kg wet	U
88-74-4	2-Nitroaniline	2.3	170	170	ug/kg wet	U
99-09-2	3-Nitroaniline	11	170	170	ug/kg wet	U
100-01-6	4-Nitroaniline	23	170	170	ug/kg wet	U
98-95-3	Nitrobenzene	2.0	170	170	ug/kg wet	U
100-02-7	4-Nitrophenol	11	330	330	ug/kg wet	U
88-75-5	2-Nitrophenol	7.1	170	170	ug/kg wet	U
86-30-6	N-Nitroso-diphenylamine	0.74	170	170	ug/kg wet	U
621-64-7	N-Nitroso-di-n-propylamine	1.2	170	170	ug/kg wet	U
87-86-5	Pentachlorophenol	3.7	330	330	ug/kg wet	U
85-01-8	Phenanthrene	2.2	17	17	ug/kg wet	U
108-95-2	Phenol	5.0	170	170	ug/kg wet	U

METHOD BLANK DATA SHEET
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0813821-BLK1
File ID: 813821B1.D
Prepared: 11/22/08 08:36
Preparation: 3550B Sonication Extract
Initial/Final: 30 g / 1 mL
Analyzed: 11/26/08 11:04
Instrument: 195
QC Batch: 0813821
Sequence: 8120153
Calibration: 8L01007

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
129-00-0	Pyrene	0.56	17	3.0	ug/kg wet	J
95-94-3	1,2,4,5-Tetrachlorobenzene	1.0	170	170	ug/kg wet	U
58-90-2	2,3,4,6-Tetrachlorophenol	3.8	170	170	ug/kg wet	U
88-06-2	2,4,6-Trichlorophenol	1.3	170	170	ug/kg wet	U
95-95-4	2,4,5-Trichlorophenol	3.3	170	170	ug/kg wet	U

System Monitoring Compound	Added (ug/kg wet)	Conc. (ug/kg wet)	% REC	QC Limits	Q
2-Fluorophenol	673	634	94	35 - 105	
Phenol-d6	680	623	92	40 - 100	
Nitrobenzene-d5	340	307	90	35 - 100	
2-Fluorobiphenyl	337	332	99	45 - 105	
2,4,6-Tribromophenol	683	502	73	35 - 125	
o-Terphenyl	333	365	109	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	99403	5	93113	4.99	
Naphthalene-d8	399904	6.48	361517	6.48	
Acenaphthene-d10	235730	8.48	218183	8.49	
Phenanthrene-d10	314315	10.14	311094	10.14	
Chrysene-d12	240203	13.08	252432	13.08	
Perylene-d12	262491	14.55	257937	14.55	

LCS / LCS DUPLICATE RECOVERY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil

Laboratory ID: 0813821-BS1

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3550B Sonication Extraction
Initial/Final: 30 g / 1 mL
QC Batch: 0813821
Sequence: 8120153

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
Acenaphthene	320	305	95	45 - 110	ug/kg wet
Acenaphthylene	320	311	97	45 - 105	ug/kg wet
Acetophenone	333	282	85	50 - 150	ug/kg wet
Anthracene	320	317	99	55 - 105	ug/kg wet
Atrazine	333	378	113	61 - 146	ug/kg wet
Benzaldehyde	333	309	93	50 - 150	ug/kg wet
Benzo(a)anthracene	320	344	108	50 - 110	ug/kg wet
Benzo(a)pyrene	320	336	105	50 - 110	ug/kg wet
Benzo(b)fluoranthene	320	321	100	45 - 115	ug/kg wet
Benzo(k)fluoranthene	320	344	108	45 - 125	ug/kg wet
Benzo(g,h,i)perylene	320	352	110	40 - 125	ug/kg wet
1,1'-Biphenyl	333	297	89	60 - 131	ug/kg wet
4-Bromophenyl Phenyl Ether	320	366	114	45 - 115	ug/kg wet
Butyl Benzyl Phthalate	320	386	121	50 - 125	ug/kg wet
Caprolactam	333	282	85	62 - 112	ug/kg wet
Carbazole	320	354	111	45 - 115	ug/kg wet
4-Chloro-3-methylphenol	320	315	98	45 - 115	ug/kg wet
4-Chloroaniline	320	120	38	10 - 95	ug/kg wet
Bis(2-chloroethoxy)methane	320	321	100	45 - 110	ug/kg wet
Bis(2-chloroethyl) Ether	320	296	93	40 - 105	ug/kg wet
Bis(2-chloroisopropyl) Ether	320	310	97	20 - 115	ug/kg wet
2-Chloronaphthalene	320	331	104	45 - 105	ug/kg wet
2-Chlorophenol	320	329	103	45 - 105	ug/kg wet
4-Chlorophenyl Phenyl Ether	320	351	110	45 - 110	ug/kg wet
Chrysene	320	345	108	55 - 110	ug/kg wet
Dibenz(a,h)anthracene	320	346	108	40 - 125	ug/kg wet
Dibenzofuran	320	331	104	50 - 105	ug/kg wet
Di-n-butyl Phthalate	320	521	163 *	55 - 110	ug/kg wet
3,3'-Dichlorobenzidine	667	240	36	10 - 130	ug/kg wet

LCS / LCS DUPLICATE RECOVERY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil

Laboratory ID: 0813821-BS1

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3550B Sonication Extraction
Initial/Final: 30 g / 1 mL
QC Batch: 0813821
Sequence: 8120153

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
2,4-Dichlorophenol	320	314	98	45 - 110	ug/kg wet
Diethyl Phthalate	320	365	114	50 - 115	ug/kg wet
2,4-Dimethylphenol	320	181	56	30 - 105	ug/kg wet
Dimethyl Phthalate	320	352	110	50 - 110	ug/kg wet
4,6-Dinitro-2-methylphenol	320	312	97	30 - 135	ug/kg wet
2,4-Dinitrophenol	320	214	67	15 - 130	ug/kg wet
2,4-Dinitrotoluene	320	332	104	50 - 115	ug/kg wet
2,6-Dinitrotoluene	320	347	108	50 - 110	ug/kg wet
Di-n-octyl Phthalate	320	414	129	40 - 130	ug/kg wet
Bis(2-ethylhexyl) Phthalate	320	434	136 *	45 - 125	ug/kg wet
Fluoranthene	320	364	114	55 - 115	ug/kg wet
Fluorene	320	326	102	50 - 110	ug/kg wet
Hexachlorobenzene	320	347	108	45 - 120	ug/kg wet
Hexachlorobutadiene	320	302	94	40 - 115	ug/kg wet
Hexachlorocyclopentadiene	320	236	74	10 - 113	ug/kg wet
Hexachloroethane	320	290	91	35 - 110	ug/kg wet
Indeno(1,2,3-cd)pyrene	320	376	117	40 - 120	ug/kg wet
Isophorone	320	322	101	45 - 110	ug/kg wet
2-Methylnaphthalene	320	305	95	45 - 105	ug/kg wet
2-Methylphenol	327	278	85	40 - 105	ug/kg wet
4-Methylphenol	327	335	102	40 - 105	ug/kg wet
Naphthalene	320	291	91	40 - 105	ug/kg wet
2-Nitroaniline	320	350	109	45 - 120	ug/kg wet
3-Nitroaniline	320	143	45	25 - 110	ug/kg wet
4-Nitroaniline	320	227	71	35 - 115	ug/kg wet
Nitrobenzene	320	307	96	40 - 115	ug/kg wet
4-Nitrophenol	320	376	117	15 - 140	ug/kg wet
2-Nitrophenol	320	314	98	40 - 110	ug/kg wet
N-Nitroso-diphenylamine	320	251	78	50 - 115	ug/kg wet

LCS / LCS DUPLICATE RECOVERY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil

Laboratory ID: 0813821-BS1

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3550B Sonication Extraction
Initial/Final: 30 g / 1 mL
QC Batch: 0813821
Sequence: 8120153

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
N-Nitroso-di-n-propylamine	320	318	99	40 - 115	ug/kg wet
Pentachlorophenol	320	254	79	25 - 120	ug/kg wet
Phenanthrene	320	334	104	50 - 110	ug/kg wet
Phenol	320	288	90	40 - 100	ug/kg wet
Pyrene	320	362	113	45 - 125	ug/kg wet
1,2,4,5-Tetrachlorobenzene	167	172	103	30 - 150	ug/kg wet
2,3,4,6-Tetrachlorophenol	320	427	134	30 - 150	ug/kg wet
2,4,6-Trichlorophenol	320	329	103	45 - 110	ug/kg wet
2,4,5-Trichlorophenol	327	333	102	50 - 110	ug/kg wet

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

METHOD BLANK DATA SHEET
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0813821-BLK2
File ID: 0813821-blk2.D
Prepared: 12/01/08 08:36
Preparation: 3550B Sonication Extract
Initial/Final: 30 g / 1 mL
Analyzed: 12/06/08 15:35
Instrument: 308
QC Batch: 0813821
Sequence: 8120828
Calibration: 8L08004

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
84-74-2	Di-n-butyl Phthalate	2.4	170	9.0	ug/kg wet	J
117-81-7	Bis(2-ethylhexyl) Phthalate	2.0	170	6.3	ug/kg wet	J

System Monitoring Compound	Added (ug/kg wet)	Conc. (ug/kg wet)	% REC	QC Limits	Q
2-Fluorophenol	673	479	71	35 - 105	
Phenol-d6	680	482	71	40 - 100	
Nitrobenzene-d5	340	245	72	35 - 100	
2-Fluorobiphenyl	337	234	70	45 - 105	
2,4,6-Tribromophenol	683	470	69	35 - 125	
o-Terphenyl	333	256	77	30 - 125	

Internal Standard	Area	RT	Ref. Area	Ref. RT	Q
1,4-Dichlorobenzene-d4	136810	7.681	89832	7.675	
Naphthalene-d8	542476	10.385	358337	10.397	
Acenaphthene-d10	308215	14.489	202249	14.5	
Phenanthrene-d10	372327	17.91	271682	17.916	
Chrysene-d12	224891	21.53	164712	21.535	
Perylene-d12	185310	23.202	125756	23.202	

LCS / LCS DUPLICATE RECOVERY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil

Laboratory ID: 0813821-BS2

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3550B Sonication Extraction
Initial/Final: 30 g / 1 mL
QC Batch: 0813821
Sequence: 8120828

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
Di-n-butyl Phthalate	333	288	86	55 - 110	ug/kg wet
Bis(2-ethylhexyl) Phthalate	333	239	72	45 - 125	ug/kg wet

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-8270C

13SB19C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Preparation: 3550B Sonication Extraction
Initial/Final: 30 g / 1 mL
Laboratory ID: 0813821-MS1
QC Batch: 0813821

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Acenaphthene	420	ND	364	87	45 - 110	ug/kg dry
Acenaphthylene	420	ND	372	89	45 - 105	ug/kg dry
Acetophenone	438	ND	367	84	50 - 150	ug/kg dry
Anthracene	420	ND	359	85	55 - 105	ug/kg dry
Atrazine	438	ND	373	85	61 - 146	ug/kg dry
Benzaldehyde	438	ND	391	89	50 - 150	ug/kg dry
Benzo(a)anthracene	420	1.75	428	101	50 - 110	ug/kg dry
Benzo(a)pyrene	420	ND	418	99	50 - 110	ug/kg dry
Benzo(b)fluoranthene	420	ND	539	128 *	45 - 115	ug/kg dry
Benzo(k)fluoranthene	420	ND	362	86	45 - 125	ug/kg dry
Benzo(g,h,i)perylene	420	ND	211	50	40 - 125	ug/kg dry
1,1'-Biphenyl	438	ND	359	82	60 - 131	ug/kg dry
4-Bromophenyl Phenyl Ether	420	ND	444	106	45 - 115	ug/kg dry
Butyl Benzyl Phthalate	420	3.94	539	127 *	50 - 125	ug/kg dry
Caprolactam	438	ND	472	108	62 - 112	ug/kg dry
Carbazole	420	ND	369	88	45 - 115	ug/kg dry
4-Chloro-3-methylphenol	420	ND	384	91	45 - 115	ug/kg dry
4-Chloroaniline	420	ND	57.8	14	10 - 95	ug/kg dry
Bis(2-chloroethoxy)methane	420	ND	412	98	45 - 110	ug/kg dry
Bis(2-chloroethyl) Ether	420	ND	390	93	40 - 105	ug/kg dry
Bis(2-chloroisopropyl) Ether	420	ND	416	99	20 - 115	ug/kg dry
2-Chloronaphthalene	420	ND	380	90	45 - 105	ug/kg dry
2-Chlorophenol	420	ND	422	100	45 - 105	ug/kg dry
4-Chlorophenyl Phenyl Ether	420	ND	422	100	45 - 110	ug/kg dry
Chrysene	420	1.31	356	84	55 - 110	ug/kg dry
Dibenz(a,h)anthracene	420	ND	267	63	40 - 125	ug/kg dry
Dibenzofuran	420	ND	387	92	50 - 105	ug/kg dry
Di-n-butyl Phthalate	420	110	528	99	55 - 110	ug/kg dry
3,3´-Dichlorobenzidine	876	ND	389	44	10 - 130	ug/kg dry
2,4-Dichlorophenol	420	ND	359	86	45 - 110	ug/kg dry
Diethyl Phthalate	420	1.31	450	107	50 - 115	ug/kg dry
2,4-Dimethylphenol	420	ND	401	95	30 - 105	ug/kg dry
Dimethyl Phthalate	420	ND	423	101	50 - 110	ug/kg dry

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-8270C

13SB19C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3550B Sonication Extraction

Initial/Final: 30 g / 1 mL

Laboratory ID: 0813821-MS1

QC Batch: 0813821

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
4,6-Dinitro-2-methylphenol	420	ND	ND	*	30 - 135	ug/kg dry
2,4-Dinitrophenol	420	ND	ND	*	15 - 130	ug/kg dry
2,4-Dinitrotoluene	420	ND	359	86	50 - 115	ug/kg dry
2,6-Dinitrotoluene	420	ND	396	94	50 - 110	ug/kg dry
Di-n-octyl Phthalate	420	ND	560	133 *	40 - 130	ug/kg dry
Bis(2-ethylhexyl) Phthalate	420	15.3	583	135 *	45 - 125	ug/kg dry
Fluoranthene	420	ND	355	84	55 - 115	ug/kg dry
Fluorene	420	ND	384	91	50 - 110	ug/kg dry
Hexachlorobenzene	420	ND	438	104	45 - 120	ug/kg dry
Hexachlorobutadiene	420	ND	378	90	40 - 115	ug/kg dry
Hexachlorocyclopentadiene	420	ND	ND	*	10 - 113	ug/kg dry
Hexachloroethane	420	ND	22.8	5 *	35 - 110	ug/kg dry
Indeno(1,2,3-cd)pyrene	420	ND	176	42	40 - 120	ug/kg dry
Isophorone	420	3.50	388	92	45 - 110	ug/kg dry
2-Methylnaphthalene	420	ND	342	81	45 - 105	ug/kg dry
2-Methylphenol	429	ND	385	90	40 - 105	ug/kg dry
4-Methylphenol	429	ND	421	98	40 - 105	ug/kg dry
Naphthalene	420	ND	363	86	40 - 105	ug/kg dry
2-Nitroaniline	420	ND	412	98	45 - 120	ug/kg dry
3-Nitroaniline	420	ND	148	35	25 - 110	ug/kg dry
4-Nitroaniline	420	ND	253	60	35 - 115	ug/kg dry
Nitrobenzene	420	ND	349	83	40 - 115	ug/kg dry
4-Nitrophenol	420	ND	23.2	6 *	15 - 140	ug/kg dry
2-Nitrophenol	420	ND	353	84	40 - 110	ug/kg dry
N-Nitroso-diphenylamine	420	ND	310	74	50 - 115	ug/kg dry
N-Nitroso-di-n-propylamine	420	ND	413	98	40 - 115	ug/kg dry
Pentachlorophenol	420	ND	180	43	25 - 120	ug/kg dry
Phenanthrene	420	ND	410	98	50 - 110	ug/kg dry
Phenol	420	ND	388	92	40 - 100	ug/kg dry
Pyrene	420	1.31	441	105	45 - 125	ug/kg dry
1,2,4,5-Tetrachlorobenzene	219	ND	201	92	30 - 150	ug/kg dry
2,3,4,6-Tetrachlorophenol	420	ND	510	121	30 - 150	ug/kg dry
2,4,6-Trichlorophenol	420	ND	404	96	45 - 110	ug/kg dry

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-8270C

13SB19C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3550B Sonication Extraction
Initial/Final: 30 g / 1 mL

Laboratory ID: 0813821-MS1
QC Batch: 0813821

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
2,4,5-Trichlorophenol	429	ND	373	87	50 - 110	ug/kg dry

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-8270C

13SB19C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Preparation: 3550B Sonication Extraction
Initial/Final: 30 g / 1 mL
Laboratory ID: 0813821-MSD1
QC Batch: 0813821

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Acenaphthene	420	393	93	8	30	45 - 110	ug/kg dry
Acenaphthylene	420	398	95	7	30	45 - 105	ug/kg dry
Acetophenone	438	372	85	1	30	50 - 150	ug/kg dry
Anthracene	420	372	89	4	30	55 - 105	ug/kg dry
Atrazine	438	411	94	10	30	61 - 146	ug/kg dry
Benzaldehyde	438	402	92	3	30	50 - 150	ug/kg dry
Benzo(a)anthracene	420	456	108	6	30	50 - 110	ug/kg dry
Benzo(a)pyrene	420	445	106	6	30	50 - 110	ug/kg dry
Benzo(b)fluoranthene	420	550	131 *	2	30	45 - 115	ug/kg dry
Benzo(k)fluoranthene	420	417	99	14	30	45 - 125	ug/kg dry
Benzo(g,h,i)perylene	420	211	50	0.4	30	40 - 125	ug/kg dry
1,1'-Biphenyl	438	381	87	6	30	60 - 131	ug/kg dry
4-Bromophenyl Phenyl Ether	420	477	113	7	30	45 - 115	ug/kg dry
Butyl Benzyl Phthalate	420	566	134 *	5	30	50 - 125	ug/kg dry
Caprolactam	438	278	63	52 *	30	62 - 112	ug/kg dry
Carbazole	420	387	92	5	30	45 - 115	ug/kg dry
4-Chloro-3-methylphenol	420	417	99	8	30	45 - 115	ug/kg dry
4-Chloroaniline	420	46.0	11	23	30	10 - 95	ug/kg dry
Bis(2-chloroethoxy)methane	420	418	99	1	30	45 - 110	ug/kg dry
Bis(2-chloroethyl) Ether	420	422	100	8	30	40 - 105	ug/kg dry
Bis(2-chloroisopropyl) Ether	420	427	102	2	30	20 - 115	ug/kg dry
2-Chloronaphthalene	420	410	98	8	30	45 - 105	ug/kg dry
2-Chlorophenol	420	429	102	2	30	45 - 105	ug/kg dry
4-Chlorophenyl Phenyl Ether	420	440	105	4	30	45 - 110	ug/kg dry
Chrysene	420	396	94	11	30	55 - 110	ug/kg dry
Dibenz(a,h)anthracene	420	269	64	1	30	40 - 125	ug/kg dry
Dibenzofuran	420	407	97	5	30	50 - 105	ug/kg dry
Di-n-butyl Phthalate	420	481	88	9	30	55 - 110	ug/kg dry
3,3'-Dichlorobenzidine	876	338	39	14	30	10 - 130	ug/kg dry
2,4-Dichlorophenol	420	384	91	6	30	45 - 110	ug/kg dry
Diethyl Phthalate	420	460	109	2	30	50 - 115	ug/kg dry
2,4-Dimethylphenol	420	412	98	3	30	30 - 105	ug/kg dry
Dimethyl Phthalate	420	451	107	6	30	50 - 110	ug/kg dry
4,6-Dinitro-2-methylphenol	420	ND	*		30	30 - 135	ug/kg dry

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-8270C

13SB19C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3550B Sonication Extraction

Initial/Final: 30 g / 1 mL

Laboratory ID: 0813821-MSD1

QC Batch: 0813821

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
2,4-Dinitrophenol	420	ND	*		30	15 - 130	ug/kg dry
2,4-Dinitrotoluene	420	345	82	4	30	50 - 115	ug/kg dry
2,6-Dinitrotoluene	420	413	98	4	30	50 - 110	ug/kg dry
Di-n-octyl Phthalate	420	612	146 *	9	30	40 - 130	ug/kg dry
Bis(2-ethylhexyl) Phthalate	420	616	143 *	6	30	45 - 125	ug/kg dry
Fluoranthene	420	372	89	5	30	55 - 115	ug/kg dry
Fluorene	420	412	98	7	30	50 - 110	ug/kg dry
Hexachlorobenzene	420	473	113	8	30	45 - 120	ug/kg dry
Hexachlorobutadiene	420	382	91	1	30	40 - 115	ug/kg dry
Hexachlorocyclopentadiene	420	ND	*		30	10 - 113	ug/kg dry
Hexachloroethane	420	9.19	2 *	85 *	30	35 - 110	ug/kg dry
Indeno(1,2,3-cd)pyrene	420	174	41	1	30	40 - 120	ug/kg dry
Isophorone	420	405	96	4	30	45 - 110	ug/kg dry
2-Methylnaphthalene	420	346	82	1	30	45 - 105	ug/kg dry
2-Methylphenol	429	406	95	5	30	40 - 105	ug/kg dry
4-Methylphenol	429	430	100	2	30	40 - 105	ug/kg dry
Naphthalene	420	373	89	3	30	40 - 105	ug/kg dry
2-Nitroaniline	420	416	99	1	30	45 - 120	ug/kg dry
3-Nitroaniline	420	125	30	17	30	25 - 110	ug/kg dry
4-Nitroaniline	420	242	58	4	30	35 - 115	ug/kg dry
Nitrobenzene	420	359	85	3	30	40 - 115	ug/kg dry
4-Nitrophenol	420	45.5	11 *	65 *	30	15 - 140	ug/kg dry
2-Nitrophenol	420	349	83	1	30	40 - 110	ug/kg dry
N-Nitroso-diphenylamine	420	340	81	9	30	50 - 115	ug/kg dry
N-Nitroso-di-n-propylamine	420	432	103	4	30	40 - 115	ug/kg dry
Pentachlorophenol	420	216	51	18	30	25 - 120	ug/kg dry
Phenanthrene	420	433	103	5	30	50 - 110	ug/kg dry
Phenol	420	405	96	4	30	40 - 100	ug/kg dry
Pyrene	420	474	112	7	30	45 - 125	ug/kg dry
1,2,4,5-Tetrachlorobenzene	219	216	99	7	30	30 - 150	ug/kg dry
2,3,4,6-Tetrachlorophenol	420	560	133	9	30	30 - 150	ug/kg dry
2,4,6-Trichlorophenol	420	439	104	8	30	45 - 110	ug/kg dry
2,4,5-Trichlorophenol	429	395	92	6	30	50 - 110	ug/kg dry

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-8270C

13SB17C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3550B Sonication Extraction

Initial/Final: 30 g / 1 mL

Laboratory ID: 0813821-MS2

QC Batch: 0813821

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Acenaphthene	380	ND	320	84	45 - 110	ug/kg dry
Acenaphthylene	380	ND	322	85	45 - 105	ug/kg dry
Acetophenone	396	3.56	292	73	50 - 150	ug/kg dry
Anthracene	380	ND	305	80	55 - 105	ug/kg dry
Atrazine	396	ND	349	88	61 - 146	ug/kg dry
Benzaldehyde	396	ND	326	82	50 - 150	ug/kg dry
Benzo(a)anthracene	380	17.4	385	97	50 - 110	ug/kg dry
Benzo(a)pyrene	380	22.9	433	108	50 - 110	ug/kg dry
Benzo(b)fluoranthene	380	37.6	519	127 *	45 - 115	ug/kg dry
Benzo(k)fluoranthene	380	12.7	375	95	45 - 125	ug/kg dry
Benzo(g,h,i)perylene	380	26.9	194	44	40 - 125	ug/kg dry
1,1'-Biphenyl	396	ND	305	77	60 - 131	ug/kg dry
4-Bromophenyl Phenyl Ether	380	ND	394	104	45 - 115	ug/kg dry
Butyl Benzyl Phthalate	380	4.35	449	117	50 - 125	ug/kg dry
Caprolactam	396	ND	367	93	62 - 112	ug/kg dry
Carbazole	380	ND	336	89	45 - 115	ug/kg dry
4-Chloro-3-methylphenol	380	ND	307	81	45 - 115	ug/kg dry
4-Chloroaniline	380	ND	34.0	9 *	10 - 95	ug/kg dry
Bis(2-chloroethoxy)methane	380	ND	343	90	45 - 110	ug/kg dry
Bis(2-chloroethyl) Ether	380	ND	316	83	40 - 105	ug/kg dry
Bis(2-chloroisopropyl) Ether	380	ND	339	89	20 - 115	ug/kg dry
2-Chloronaphthalene	380	ND	341	90	45 - 105	ug/kg dry
2-Chlorophenol	380	ND	332	87	45 - 105	ug/kg dry
4-Chlorophenyl Phenyl Ether	380	ND	368	97	45 - 110	ug/kg dry
Chrysene	380	18.2	397	100	55 - 110	ug/kg dry
Dibenz(a,h)anthracene	380	7.12	237	60	40 - 125	ug/kg dry
Dibenzofuran	380	ND	335	88	50 - 105	ug/kg dry
Di-n-butyl Phthalate	380	434	526	24 *	55 - 110	ug/kg dry
3,3'-Dichlorobenzidine	791	ND	198	25	10 - 130	ug/kg dry
2,4-Dichlorophenol	380	ND	297	78	45 - 110	ug/kg dry
Diethyl Phthalate	380	17.4	520	132 *	50 - 115	ug/kg dry
2,4-Dimethylphenol	380	ND	327	86	30 - 105	ug/kg dry
Dimethyl Phthalate	380	1.19	366	96	50 - 110	ug/kg dry

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-8270C

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Preparation: 3550B Sonication Extraction
Initial/Final: 30 g / 1 mL
Laboratory ID: 0813821-MS2
QC Batch: 0813821

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
4,6-Dinitro-2-methylphenol	380	ND	5.54	1 *	30 - 135	ug/kg dry
2,4-Dinitrophenol	380	ND	ND	*	15 - 130	ug/kg dry
2,4-Dinitrotoluene	380	38.0	315	73	50 - 115	ug/kg dry
2,6-Dinitrotoluene	380	ND	352	93	50 - 110	ug/kg dry
Di-n-octyl Phthalate	380	ND	474	125	40 - 130	ug/kg dry
Bis(2-ethylhexyl) Phthalate	380	38.0	532	130 *	45 - 125	ug/kg dry
Fluoranthene	380	20.6	349	86	55 - 115	ug/kg dry
Fluorene	380	ND	336	89	50 - 110	ug/kg dry
Hexachlorobenzene	380	ND	380	100	45 - 120	ug/kg dry
Hexachlorobutadiene	380	ND	329	87	40 - 115	ug/kg dry
Hexachlorocyclopentadiene	380	ND	ND	*	10 - 113	ug/kg dry
Hexachloroethane	380	ND	30.9	8 *	35 - 110	ug/kg dry
Indeno(1,2,3-cd)pyrene	380	21.0	155	35 *	40 - 120	ug/kg dry
Isophorone	380	5.14	344	89	45 - 110	ug/kg dry
2-Methylnaphthalene	380	1.58	284	74	45 - 105	ug/kg dry
2-Methylphenol	388	ND	319	82	40 - 105	ug/kg dry
4-Methylphenol	388	ND	322	83	40 - 105	ug/kg dry
Naphthalene	380	2.37	313	82	40 - 105	ug/kg dry
2-Nitroaniline	380	ND	343	90	45 - 120	ug/kg dry
3-Nitroaniline	380	ND	87.0	23 *	25 - 110	ug/kg dry
4-Nitroaniline	380	ND	189	50	35 - 115	ug/kg dry
Nitrobenzene	380	ND	288	76	40 - 115	ug/kg dry
4-Nitrophenol	380	ND	38.8	10 *	15 - 140	ug/kg dry
2-Nitrophenol	380	ND	296	78	40 - 110	ug/kg dry
N-Nitroso-diphenylamine	380	36.8	320	74	50 - 115	ug/kg dry
N-Nitroso-di-n-propylamine	380	ND	349	92	40 - 115	ug/kg dry
Pentachlorophenol	380	ND	197	52	25 - 120	ug/kg dry
Phenanthrene	380	11.1	375	96	50 - 110	ug/kg dry
Phenol	380	ND	324	85	40 - 100	ug/kg dry
Pyrene	380	22.5	397	99	45 - 125	ug/kg dry
1,2,4,5-Tetrachlorobenzene	198	ND	172	87	30 - 150	ug/kg dry
2,3,4,6-Tetrachlorophenol	380	ND	427	112	30 - 150	ug/kg dry
2,4,6-Trichlorophenol	380	ND	348	92	45 - 110	ug/kg dry

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-8270C

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Preparation: 3550B Sonication Extraction
Initial/Final: 30 g / 1 mL
Laboratory ID: 0813821-MS2
QC Batch: 0813821

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
2,4,5-Trichlorophenol	388	ND	319	82	50 - 110	ug/kg dry

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-8270C

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3550B Sonication Extraction
Initial/Final: 30 g / 1 mL

Laboratory ID: 0813821-MSD2
QC Batch: 0813821

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Acenaphthene	380	311	82	3	30	45 - 110	ug/kg dry
Acenaphthylene	380	312	82	3	30	45 - 105	ug/kg dry
Acetophenone	396	316	79	8	30	50 - 150	ug/kg dry
Anthracene	380	297	78	3	30	55 - 105	ug/kg dry
Atrazine	396	328	83	6	30	61 - 146	ug/kg dry
Benzaldehyde	396	357	90	9	30	50 - 150	ug/kg dry
Benzo(a)anthracene	380	400	101	4	30	50 - 110	ug/kg dry
Benzo(a)pyrene	380	450	112 *	4	30	50 - 110	ug/kg dry
Benzo(b)fluoranthene	380	516	126 *	0.6	30	45 - 115	ug/kg dry
Benzo(k)fluoranthene	380	417	106	11	30	45 - 125	ug/kg dry
Benzo(g,h,i)perylene	380	184	41	5	30	40 - 125	ug/kg dry
1,1'-Biphenyl	396	307	78	0.9	30	60 - 131	ug/kg dry
4-Bromophenyl Phenyl Ether	380	397	104	0.8	30	45 - 115	ug/kg dry
Butyl Benzyl Phthalate	380	456	119	2	30	50 - 125	ug/kg dry
Caprolactam	396	369	93	0.6	30	62 - 112	ug/kg dry
Carbazole	380	291	77	15	30	45 - 115	ug/kg dry
4-Chloro-3-methylphenol	380	327	86	6	30	45 - 115	ug/kg dry
4-Chloroaniline	380	68.8	18	68 *	30	10 - 95	ug/kg dry
Bis(2-chloroethoxy)methane	380	345	91	0.6	30	45 - 110	ug/kg dry
Bis(2-chloroethyl) Ether	380	335	88	6	30	40 - 105	ug/kg dry
Bis(2-chloroisopropyl) Ether	380	347	91	2	30	20 - 115	ug/kg dry
2-Chloronaphthalene	380	332	87	3	30	45 - 105	ug/kg dry
2-Chlorophenol	380	341	90	3	30	45 - 105	ug/kg dry
4-Chlorophenyl Phenyl Ether	380	353	93	4	30	45 - 110	ug/kg dry
Chrysene	380	368	92	7	30	55 - 110	ug/kg dry
Dibenz(a,h)anthracene	380	197	50	18	30	40 - 125	ug/kg dry
Dibenzofuran	380	324	85	3	30	50 - 105	ug/kg dry
Di-n-butyl Phthalate	380	775	90	38 *	30	55 - 110	ug/kg dry
3,3'-Dichlorobenzidine	791	273	34	32 *	30	10 - 130	ug/kg dry
2,4-Dichlorophenol	380	281	74	5	30	45 - 110	ug/kg dry
Diethyl Phthalate	380	378	95	32 *	30	50 - 115	ug/kg dry
2,4-Dimethylphenol	380	312	82	5	30	30 - 105	ug/kg dry
Dimethyl Phthalate	380	362	95	1	30	50 - 110	ug/kg dry
4,6-Dinitro-2-methylphenol	380	ND	*		30	30 - 135	ug/kg dry

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-8270C

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3550B Sonication Extraction
Initial/Final: 30 g / 1 mL

Laboratory ID: 0813821-MSD2
QC Batch: 0813821

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
2,4-Dinitrophenol	380	ND	*		30	15 - 130	ug/kg dry
2,4-Dinitrotoluene	380	276	63	13	30	50 - 115	ug/kg dry
2,6-Dinitrotoluene	380	331	87	6	30	50 - 110	ug/kg dry
Di-n-octyl Phthalate	380	480	126	1	30	40 - 130	ug/kg dry
Bis(2-ethylhexyl) Phthalate	380	526	128 *	1	30	45 - 125	ug/kg dry
Fluoranthene	380	355	88	2	30	55 - 115	ug/kg dry
Fluorene	380	326	86	3	30	50 - 110	ug/kg dry
Hexachlorobenzene	380	375	99	1	30	45 - 120	ug/kg dry
Hexachlorobutadiene	380	321	85	2	30	40 - 115	ug/kg dry
Hexachlorocyclopentadiene	380	ND	*		30	10 - 113	ug/kg dry
Hexachloroethane	380	24.5	6 *	23	30	35 - 110	ug/kg dry
Indeno(1,2,3-cd)pyrene	380	142	32 *	9	30	40 - 120	ug/kg dry
Isophorone	380	331	86	4	30	45 - 110	ug/kg dry
2-Methylnaphthalene	380	254	67	11	30	45 - 105	ug/kg dry
2-Methylphenol	388	324	84	2	30	40 - 105	ug/kg dry
4-Methylphenol	388	303	78	6	30	40 - 105	ug/kg dry
Naphthalene	380	320	84	2	30	40 - 105	ug/kg dry
2-Nitroaniline	380	359	94	5	30	45 - 120	ug/kg dry
3-Nitroaniline	380	127	34	38 *	30	25 - 110	ug/kg dry
4-Nitroaniline	380	180	47	5	30	35 - 115	ug/kg dry
Nitrobenzene	380	276	73	4	30	40 - 115	ug/kg dry
4-Nitrophenol	380	11.5	3 *	109 *	30	15 - 140	ug/kg dry
2-Nitrophenol	380	280	74	6	30	40 - 110	ug/kg dry
N-Nitroso-diphenylamine	380	283	65	12	30	50 - 115	ug/kg dry
N-Nitroso-di-n-propylamine	380	352	93	0.9	30	40 - 115	ug/kg dry
Pentachlorophenol	380	122	32	47 *	30	25 - 120	ug/kg dry
Phenanthrene	380	388	99	3	30	50 - 110	ug/kg dry
Phenol	380	325	86	0.2	30	40 - 100	ug/kg dry
Pyrene	380	454	114	13	30	45 - 125	ug/kg dry
1,2,4,5-Tetrachlorobenzene	198	172	87	0.5	30	30 - 150	ug/kg dry
2,3,4,6-Tetrachlorophenol	380	430	113	0.6	30	30 - 150	ug/kg dry
2,4,6-Trichlorophenol	380	323	85	7	30	45 - 110	ug/kg dry
2,4,5-Trichlorophenol	388	329	85	3	30	50 - 110	ug/kg dry

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-8270C

13SB19C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3550B Sonication Extraction

Initial/Final: 30 g / 1 mL

Laboratory ID: 0813821-MS3

QC Batch: 0813821

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Di-n-butyl Phthalate	438	161	706	125 *	55 - 110	ug/kg dry
Bis(2-ethylhexyl) Phthalate	438	986	574	-94 *	45 - 125	ug/kg dry

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-8270C

13SB19C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3550B Sonication Extraction

Initial/Final: 30 g / 1 mL

Laboratory ID: 0813821-MSD3

QC Batch: 0813821

Analyte	Spike Added	MSD Conc.	MSD % Rec. #		% RPD #	QC Limits RPD	QC Limits Rec.	Units
Di-n-butyl Phthalate	438	772	140	*	9	30	55 - 110	ug/kg dry
Bis(2-ethylhexyl) Phthalate	438	584	-92	*	2	30	45 - 125	ug/kg dry

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-8270C

13SB17C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3550B Sonication Extraction

Initial/Final: 30 g / 1 mL

Laboratory ID: 0813821-MS4

QC Batch: 0813821

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Di-n-butyl Phthalate	396	400	892	124 *	55 - 110	ug/kg dry
Bis(2-ethylhexyl) Phthalate	396	35.6	564	134 *	45 - 125	ug/kg dry

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-8270C

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Preparation: 3550B Sonication Extraction
Initial/Final: 30 g / 1 mL
Laboratory ID: 0813821-MSD4
QC Batch: 0813821

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Di-n-butyl Phthalate	396	817	106	9	30	55 - 110	ug/kg dry
Bis(2-ethylhexyl) Phthalate	396	542	128 *	4	30	45 - 125	ug/kg dry

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

HOLDING TIME SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Method: Semivolatile Organic Compounds by EPA Method 8270C

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB13A	11/12/08	11/14/08		11/22/08	10	14	11/26/08	4	40	
13SB13A	11/12/08	11/14/08		11/22/08	10	14	12/01/08	9	40	
13SB13A	11/12/08	11/14/08		12/01/08	19	14	12/06/08	5	40	*
13SB13C	11/12/08	11/14/08		11/22/08	10	14	11/26/08	4	40	
13SB13C	11/12/08	11/14/08		12/01/08	19	14	12/06/08	5	40	*
13SB21C	11/12/08	11/14/08		11/22/08	10	14	11/26/08	4	40	
13SB21C	11/12/08	11/14/08		12/01/08	19	14	12/06/08	5	40	*
13SB14A	11/12/08	11/14/08		11/22/08	10	14	11/26/08	4	40	
13SB14A	11/12/08	11/14/08		12/01/08	19	14	12/06/08	5	40	*
EQBK-1	11/12/08	11/14/08		11/18/08	6	7	11/26/08	8	40	
13SB20A	11/12/08	11/14/08		11/22/08	10	14	11/26/08	4	40	
13SB20A	11/12/08	11/14/08		12/01/08	19	14	12/08/08	7	40	*
13SB20A	11/12/08	11/14/08		12/01/08	19	14	12/09/08	8	40	*
13SB20C	11/12/08	11/14/08		11/22/08	10	14	11/26/08	4	40	
13SB20C	11/12/08	11/14/08		12/01/08	19	14	12/06/08	5	40	*
13SB22A	11/12/08	11/14/08		11/22/08	10	14	11/26/08	4	40	
13SB22A	11/12/08	11/14/08		12/01/08	19	14	12/07/08	6	40	*
13SB22C	11/12/08	11/14/08		11/22/08	10	14	11/26/08	4	40	
13SB22C	11/12/08	11/14/08		12/01/08	19	14	12/06/08	6	40	*
13SB21A	11/12/08	11/14/08		11/22/08	10	14	11/26/08	4	40	
13SB21A	11/12/08	11/14/08		12/01/08	19	14	12/06/08	6	40	*

HOLDING TIME SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Method: Semivolatile Organic Compounds by EPA Method 8270C

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB18A	11/13/08	11/14/08		11/22/08	9	14	11/26/08	4	40	
13SB18A	11/13/08	11/14/08		12/01/08	18	14	12/06/08	6	40	*
13SB18C	11/13/08	11/14/08		11/22/08	9	14	11/26/08	4	40	
13SB18C	11/13/08	11/14/08		12/01/08	18	14	12/06/08	6	40	*
EQBK-5	11/13/08	11/14/08		11/18/08	5	7	11/26/08	8	40	
13SB19A	11/13/08	11/14/08		11/22/08	9	14	11/26/08	4	40	
13SB19A	11/13/08	11/14/08		12/01/08	18	14	12/06/08	6	40	*
13SB19C	11/13/08	11/14/08		11/22/08	9	14	11/26/08	4	40	
13SB19C	11/13/08	11/14/08		12/01/08	18	14	12/07/08	6	40	*
EQBK-6	11/14/08	11/15/08		11/18/08	4	7	11/26/08	8	40	
13SB17A	11/14/08	11/15/08		11/22/08	8	14	11/26/08	4	40	
13SB17A	11/14/08	11/15/08		12/01/08	17	14	12/08/08	7	40	*
13SB17A	11/14/08	11/15/08		12/01/08	17	14	12/09/08	8	40	*
13SB17C	11/14/08	11/15/08		11/22/08	8	14	12/01/08	9	40	
13SB17C	11/14/08	11/15/08		12/01/08	17	14	12/07/08	6	40	*
13SB16A	11/14/08	11/15/08		11/22/08	8	14	12/01/08	9	40	
13SB16A	11/14/08	11/15/08		12/01/08	17	14	12/07/08	6	40	*
13SB16C	11/14/08	11/15/08		11/22/08	8	14	12/01/08	9	40	
13SB16C	11/14/08	11/15/08		12/01/08	17	14	12/06/08	6	40	*
13SB15A	11/14/08	11/15/08		11/22/08	8	14	12/01/08	9	40	
13SB15A	11/14/08	11/15/08		12/01/08	17	14	12/06/08	6	40	*

HOLDING TIME SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Method: Semivolatile Organic Compounds by EPA Method 8270C

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
DUP-13	11/14/08	11/15/08		11/22/08	8	14	12/01/08	9	40	
DUP-13	11/14/08	11/15/08		11/22/08	8	14	12/09/08	17	40	
DUP-13	11/14/08	11/15/08		12/01/08	17	14	12/06/08	6	40	*

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Lab File ID: DFT1125H.D
Instrument ID: 195
Sequence: 8120134
Calibration: 8L01007

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Injection Date: 11/25/08
Injection Time: 20:20
Lab Sample ID: 8120134-TUN1

m/z	Ion Abundance Criteria	% Relative Abundance	
51	30 - 60% of 198	37.4	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	42	PASS
70	Less than 2% of 69	0	PASS
127	40 - 60% of 198	46.4	PASS
197	Less than 1% of 198	0.811	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.84	PASS
275	10 - 30% of 198	27.8	PASS
365	1.0001 - 200% of 198	1.88	PASS
441	0.0001 - 99.9999% of 443	62.4	PASS
442	40.0001 - 200% of 198	74.6	PASS
443	17 - 23% of 442	20.6	PASS

INITIAL CALIBRATION STANDARDS
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120134

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 195
Calibration: 8L01007

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
8110077	0.5ppm BNA	8120134-CAL1		
8110076	1ppm BNA	8120134-CAL2		
8110075	2ppm BNA	8120134-CAL3		
8110074	5ppm BNA	8120134-CAL4		
8110073	10ppm BNA	8120134-CAL5		
8110072	15ppm BNA	8120134-CAL6		
8110071	20ppm BNA	8120134-CAL7		
8110070	25ppm BNA	8120134-CAL8		
8080800	DFTPP tune std	8120134-TUN1	DFT1125H.D	11/25/08 20:20
8110073	10ppm BNA	8120134-CAL5	10IC1125.D	11/25/08 20:42
8110077	0.5ppm BNA	8120134-CAL1	05IC1125.D	11/25/08 21:10
8110076	1ppm BNA	8120134-CAL2	1IC1125.D	11/25/08 21:38
8110075	2ppm BNA	8120134-CAL3	2IC1125.D	11/25/08 22:06
8110074	5ppm BNA	8120134-CAL4	5IC1125.D	11/25/08 22:34
8110072	15ppm BNA	8120134-CAL6	15IC1125.D	11/25/08 23:01
8110071	20ppm BNA	8120134-CAL7	20IC1125.D	11/25/08 23:28
8110070	25ppm BNA	8120134-CAL8	25IC1125.D	11/25/08 23:56
8110079	10ppm BNA SCV	8120134-SCV1	BNALCS.D	11/26/08 00:23
8110089	0.5ppm a.b.e.	8120134-CAL9	05AB1125.D	11/26/08 00:51
8110088	1ppm a.b.e.	8120134-CALA	1AB1125.D	11/26/08 01:18
8110087	2ppm a.b.e.	8120134-CALB	2AB1125.D	11/26/08 01:46
8110086	5ppm a.b.e.	8120134-CALC	5AB1125.D	11/26/08 02:13
8110085	10ppm a.b.e.	8120134-CALD	10AB1125.D	11/26/08 02:41
8110084	15ppm a.b.e.	8120134-CALE	15AB1125.D	11/26/08 03:08
8110083	20ppm a.b.e.	8120134-CALF	20AB1125.D	11/26/08 03:35
8110082	25ppm a.b.e.	8120134-CALG	25AB1125.D	11/26/08 04:03
8110090	10ppm scv a.b.e.	8120134-SCV2	ABLCS.D	11/26/08 04:30

088172

INITIAL CALIBRATION DATA (Continued)

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Calibration: 8L01007

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Instrument: 195

Calibration Date: 11/25/08 10:59

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	Limit	Q
Acenaphthene	1.008913	5.811608	8.52125	7.551532E-02			CCC (30)	
Acenaphthylene	1.623395	5.438425	8.3225	5.844847E-02			15	
Acetophenone	1.66795	8.227728	5.4825	0.1039108			15	
Aniline	1.577874	4.513204	4.62	1.541915E-02			15	
Anthracene	1.055542	4.567034	10.22375	4.953097E-02			15	
Atrazine	0.209507	4.672113	9.85875	8.587671E-02		0.9996424	0.99	
Benzaldehyde	0.5750236	33.01537	4.4975	0.1023626		0.9951387	0.99	
Benzidine	0.4936048	15.86436	11.66625	4.571402E-02		0.998006	0.99	
Benzo(a)anthracene	1.160562	5.810192	13.06625	5.718411E-02			15	
Benzo(a)pyrene	0.9380577	4.580858	14.4975	6.150408E-02			CCC (30)	
Benzo(b)fluoranthene	1.035655	6.859998	14.185	6.521166E-02			15	
Benzo(k)fluoranthene	1.037239	8.669396	14.2125	8.237219E-02			15	
Benzo(g,h,i)perylene	0.9423672	6.4107	15.855	9.670529E-02			15	
Benzoic Acid	0.2313229	6.05692	6.28625	1.095298		0.9979403	0.99	
Benzyl Alcohol	0.7417471	9.622412	5.17875	0.1910803			15	
1,1'-Biphenyl	1.279267	6.540137	7.844375	6.512389E-02			15	
4-Bromophenyl Phenyl Ether	0.2152051	3.022963	9.65	5.272028E-02			15	
Butyl Benzyl Phthalate	0.5777452	5.557964	12.4775	2.945763E-02			15	
Caprolactam	7.876329E-02	7.294017	6.995	0.2535176		0.9995225	0.99	
Carbazole	0.7736528	19.24247	10.41429	5.008447E-02		0.9995828	0.99	
4-Chloro-3-methylphenol	0.2669963	8.589686	7.17375	0.1820576			CCC (30)	
4-Chloroaniline	0.2970579	6.88777	6.5975	6.779666E-02			15	
Bis(2-chloroethoxy)methane	0.3175214	9.745095	6.2325	7.384493E-02			15	
Bis(2-chloroethyl) Ether	1.199716	10.73524	4.7025	9.900405E-02			15	
Bis(2-chloroisopropyl) Ether	1.117249	9.565209	5.3275	8.748401E-02			15	
2-Chloronaphthalene	0.9758827	6.076325	7.85875	0.1056643			15	
2-Chlorophenol	1.211292	6.808421	4.745	0.159471			15	
4-Chlorophenyl Phenyl Ether	0.5539858	4.270482	9.105	5.896457E-02			15	
Chrysene	1.127141	5.669407	13.10875	7.697855E-02			15	
Dibenz(a,h)anthracene	0.8500052	8.603248	15.57875	7.415774E-02			15	
Dibenzofuran	1.384376	5.255625	8.715	6.049875E-02			15	
Di-n-butyl Phthalate	1.17235	6.106678	10.81375	4.893236E-02			15	

INITIAL CALIBRATION DATA (Continued)
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L01007
Instrument: 195
Calibration Date: 11/25/08 10:59

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	Limit	Q
1,2-Dichlorobenzene	1.406824	9.772542	5.1875	8.772325E-02			15	
1,3-Dichlorobenzene	1.47089	8.661412	4.92	1.983295E-02			15	
1,4-Dichlorobenzene	1.30249	9.015303	5.00875	6.822714E-02			CCC (30)	
3,3´-Dichlorobenzidine	0.3815981	14.26721	13.0625	3.703165E-02		0.9995621	0.99	
2,4-Dichlorophenol	0.265446	8.095098	6.32875	0.1311502			CCC (30)	
2,6-Dichlorophenol	0.2604263	9.775253	6.59375	7.622207E-02			15	
Diethyl Phthalate	1.083282	5.453265	9.00125	0.1259155			15	
2,4-Dimethylphenol	0.3052895	7.891655	6.11875	0.135621			15	
Dimethyl Phthalate	1.120345	4.783893	8.21625	0.1291762			15	
4,6-Dinitro-2-methylphenol	0.1372777	13.7428	9.17875	0.1070839		0.9993784	0.99	
1,3-Dinitrobenzene	8.529668E-02	7.948387	8.16625	0.0898045		0.9974994	0.99	
2,4-Dinitrophenol	0.1571229	16.91011	8.58625	0.1238864		0.9983516	SPCC (0.05)	
2,4-Dinitrotoluene	0.3345132	6.320271	8.73	0.1373008		0.9985778	0.99	
2,6-Dinitrotoluene	0.2388826	7.057608	8.28375	0.1098137		0.997495	0.99	
Di-n-octyl Phthalate	1.26003	6.680203	13.7875	3.047435E-02		0.9981609	CCC (30)	
1,2-Diphenylhydrazine	0.6763913	5.628204	9.28375	5.450711E-02			15	
Bis(2-ethylhexyl) Phthalate	0.8204803	8.880826	13.1025	3.809218E-02			15	
Fluoranthene	1.093336	4.297048	11.485	4.728525E-02			CCC (30)	
Fluorene	1.124704	5.303945	9.09625	8.247647E-02			15	
Hexachlorobenzene	0.2480578	5.072336	9.70625	7.780769E-02			15	
Hexachlorobutadiene	0.1852784	6.32804	6.65125	5.019741E-02			CCC (30)	
Hexachlorocyclopentadiene	0.263193	6.336058	7.48375	7.067941E-02			SPCC (0.05)	
Hexachloroethane	0.5126655	8.615834	5.575	9.549018E-02			15	
Indeno(1,2,3-cd)pyrene	1.046409	6.253	15.56625	9.146109E-02			15	
Isophorone	0.5615907	9.655356	5.965	8.660902E-02			15	
2-Methylnaphthalene	0.6782939	9.209454	7.30375	6.955868E-02			15	
1-Methylnaphthalene	0.6157178	8.021343	7.41375	6.799558E-02			15	
2-Methylphenol	1.139984	6.468085	5.3075	0.1674912			15	
4-Methylphenol	1.213125	8.997731	5.49875	0.1794764			15	
Naphthalene	0.9626745	9.456294	6.50625	8.069072E-02			15	
2-Nitroaniline	0.2542636	9.452365	8.0025	5.752897E-02		0.9985727	0.99	
3-Nitroaniline	0.1914718	14.64044	8.4675	0.1054789		0.9986056	0.99	

INITIAL CALIBRATION DATA (Continued)
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Calibration: 8L01007

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 195
Calibration Date: 11/25/08 10:59

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	Limit	Q
4-Nitroaniline	0.179396	16.85931	9.155	8.305654E-02		0.9978909	0.99	
Nitrobenzene	0.3146841	6.954296	5.685	9.543696E-02			15	
4-Nitrophenol	0.1647913	13.21282	8.6775	0.1710848			SPCC (0.05)	
2-Nitrophenol	0.174875	8.388109	6.0525	7.388534E-02		0.9992327	CCC (30)	
N-Nitroso-diphenylamine	0.5894312	12.73713	9.248125	8.968449E-02			CCC (30)	
N-Nitroso-di-n-propylamine	0.8111997	8.056749	5.493125	0.1085256			SPCC (0.05)	
Pentachlorophenol	0.1911827	12.08706	9.935	5.121988E-02			CCC (30)	
Phenanthrene	1.076793	4.985649	10.16625	7.213732E-02			15	
Phenol	1.475351	9.392665	4.59125	0.2453285			CCC (30)	
Pyrene	1.359312	5.28112	11.73625	0.0645268			15	
Pyridine	1.220128	10.43905	2.47	0.6609913			15	
1,2,4,5-Tetrachlorobenzene	0.5042534	5.839727	7.4975	6.218828E-02			15	
2,3,4,6-Tetrachlorophenol	0.2177717	3.299426	8.86	8.608946E-02			15	
1,2,4-Trichlorobenzene	0.3073559	9.264746	6.42	8.200206E-02			15	
2,4,6-Trichlorophenol	0.3322468	5.344562	7.6425	6.166295E-02			CCC (30)	
2,4,5-Trichlorophenol	0.3188605	3.600662	7.68	0.1391486			15	
2-Fluorophenol	1.06739	6.977181	3.51	0.2637654			15	
Phenol-d6	1.32742	6.260629	4.57375	0.2848427			15	
Nitrobenzene-d5	0.1401819	6.46469	5.665	0.1331976			15	
2-Fluorobiphenyl	1.146703	7.89569	7.7375	0.1141171			15	
2,4,6-Tribromophenol	0.1541098	7.865478	9.375	5.892557E-02			15	
o-Terphenyl	0.649415	10.60211	10.58125	6.163001E-02			15	

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Calibration: 8L01007
Sequence: 8120134

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Laboratory ID: 8120134-SCV1
Standard ID: 8110079

Analyte	Expected (ug/mL)	Found (ug/mL)	% Rec.	QC Limit
Acenaphthene	10.0	9.43	94	75-125
Acenaphthylene	10.0	9.57	96	75-125
Acetophenone	10.0	9.33	93	75-125
Anthracene	10.0	9.66	97	75-125
Atrazine	10.0	8.87	89	75-125
Benzaldehyde	10.0	11.4	114	75-125
Benzo(a)anthracene	10.0	9.46	95	75-125
Benzo(a)pyrene	10.0	9.80	98	75-125
Benzo(b)fluoranthene	10.0	9.54	95	75-125
Benzo(k)fluoranthene	10.0	10.1	101	75-125
Benzo(g,h,i)perylene	10.0	9.70	97	75-125
Benzoic Acid	20.0	18.3	92	75-125
Benzyl Alcohol	10.0	9.45	95	75-125
1,1'-Biphenyl	10.0	9.50	95	75-125
4-Bromophenyl Phenyl Ether	10.0	9.87	99	75-125
Butyl Benzyl Phthalate	10.0	10.0	100	75-125
Caprolactam	10.0	8.65	87	75-125
Carbazole	10.0	9.39	94	75-125
4-Chloro-3-methylphenol	10.0	9.53	95	75-125
Bis(2-chloroethoxy)methane	10.0	9.18	92	75-125
Bis(2-chloroethyl) Ether	10.0	9.40	94	75-125
Bis(2-chloroisopropyl) Ether	10.0	9.56	96	75-125
2-Chloronaphthalene	10.0	9.59	96	75-125
2-Chlorophenol	10.0	9.41	94	75-125
4-Chlorophenyl Phenyl Ether	10.0	9.65	97	75-125
Chrysene	10.0	9.52	95	75-125
Dibenz(a,h)anthracene	10.0	9.86	99	75-125

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc. **SDG:** 36440-61

Client: URS Corporation **Project:** RFAAP SWMU 13 RFI/CMS, WO 008

Calibration: 8L01007 **Laboratory ID:** 8120134-SCV1

Sequence: 8120134 **Standard ID:** 8110079

Dibenzofuran	10.0	9.43	94	75-125
Di-n-butyl Phthalate	10.0	10.4	104	75-125
1,2-Dichlorobenzene	10.0	9.55	96	75-125
1,3-Dichlorobenzene	10.0	9.61	96	75-125
1,4-Dichlorobenzene	10.0	9.68	97	75-125
2,4-Dichlorophenol	10.0	9.43	94	75-125
2,6-Dichlorophenol	10.0	9.57	96	75-125
Diethyl Phthalate	10.0	9.89	99	75-125
2,4-Dimethylphenol	10.0	9.40	94	75-125
Dimethyl Phthalate	10.0	9.57	96	75-125
4,6-Dinitro-2-methylphenol	10.0	10.3	103	75-125
1,3-Dinitrobenzene	10.0	9.64	96	75-125
2,4-Dinitrophenol	20.0	16.3	82	75-125
2,4-Dinitrotoluene	10.0	9.78	98	75-125
2,6-Dinitrotoluene	10.0	9.94	99	75-125
Di-n-octyl Phthalate	10.0	9.93	99	75-125
1,2-Diphenylhydrazine	10.0	9.57	96	75-125
Bis(2-ethylhexyl) Phthalate	10.0	9.77	98	75-125
Fluoranthene	10.0	9.92	99	75-125
Fluorene	10.0	9.61	96	75-125
Hexachlorobenzene	10.0	9.99	100	75-125
Hexachlorobutadiene	10.0	9.72	97	75-125
Hexachlorocyclopentadiene	10.0	8.67	87	75-125
Hexachloroethane	10.0	9.67	97	75-125
Indeno(1,2,3-cd)pyrene	10.0	9.54	95	75-125
Isophorone	10.0	9.53	95	75-125
2-Methylnaphthalene	10.0	9.45	95	75-125
1-Methylnaphthalene	10.0	9.40	94	75-125
2-Methylphenol	10.0	9.07	91	75-125

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc. **SDG:** 36440-61

Client: URS Corporation **Project:** RFAAP SWMU 13 RFI/CMS, WO 008

Calibration: 8L01007 **Laboratory ID:** 8120134-SCV1

Sequence: 8120134 **Standard ID:** 8110079

4-Methylphenol	10.0	9.30	93	75-125
Naphthalene	10.0	9.46	95	75-125
Nitrobenzene	10.0	9.04	90	75-125
4-Nitrophenol	20.0	18.2	91	75-125
2-Nitrophenol	10.0	9.14	91	75-125
N-Nitroso-diphenylamine	10.0	8.34	83	75-125
N-Nitroso-di-n-propylamine	10.0	9.56	96	75-125
Pentachlorophenol	10.0	9.15	92	75-125
Phenanthrene	10.0	9.90	99	75-125
Phenol	10.0	8.96	90	75-125
Pyrene	10.0	9.57	96	75-125
Pyridine	10.0	8.62	86	75-125
1,2,4,5-Tetrachlorobenzene	10.0	9.50	95	75-125
2,3,4,6-Tetrachlorophenol	10.0	9.42	94	75-125
1,2,4-Trichlorobenzene	10.0	9.16	92	75-125
2,4,6-Trichlorophenol	10.0	9.51	95	75-125
2,4,5-Trichlorophenol	10.0	9.45	95	75-125
2-Fluorophenol	20.2	19.0	94	75-125
Phenol-d6	20.4	18.1	89	75-125
Nitrobenzene-d5	20.4	17.9	88	75-125
2-Fluorobiphenyl	20.2	18.6	92	75-125
2,4,6-Tribromophenol	20.4	18.6	91	75-125
o-Terphenyl	20.0	19.3	97	75-125

* Values outside of QC limits

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L01007
Laboratory ID: 8120134-SCV2
Sequence: 8120134
Standard ID: 8110090

Analyte	Expected (ug/mL)	Found (ug/mL)	% Rec.	QC Limit
Acetophenone	10.0	9.06	91	75-125
Aniline	10.0	9.49	95	75-125
Atrazine	10.0	9.47	95	75-125
Benzaldehyde	10.0	9.31	93	75-125
Benzidine	10.0	9.58	96	75-125
1,1'-Biphenyl	10.0	9.24	92	75-125
Caprolactam	10.0	9.51	95	75-125
4-Chloroaniline	10.0	9.68	97	75-125
3,3´-Dichlorobenzidine	10.0	9.07	91	75-125
2-Nitroaniline	10.0	9.67	97	75-125
3-Nitroaniline	10.0	9.81	98	75-125
4-Nitroaniline	10.0	9.34	93	75-125
N-Nitroso-diphenylamine	10.0	9.07	91	75-125
N-Nitroso-di-n-propylamine	10.0	8.89	89	75-125
Pyridine	10.0	8.85	89	75-125

* Values outside of QC limits

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Lab File ID: DFT1126A.D
Instrument ID: 195
Sequence: 8120138

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Injection Date: 11/26/08
Injection Time: 07:28
Lab Sample ID: 8120138-TUN1

m/z	Ion Abundance Criteria	% Relative Abundance	
51	30 - 60% of 198	32.6	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	41.2	PASS
70	Less than 2% of 69	0	PASS
127	40 - 60% of 198	44.2	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.02	PASS
275	10 - 30% of 198	27.1	PASS
365	1.0001 - 200% of 198	3.01	PASS
441	0.0001 - 99.9999% of 443	72.8	PASS
442	40.0001 - 200% of 198	70.6	PASS
443	17 - 23% of 442	18.9	PASS

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 195
Calibration: 8L01007
Lab File ID: 10C1126A.D
Calibration Date: 11/25/08 10:59
Sequence: 8120138
Injection Date: 11/26/08
Lab Sample ID: 8120138-CCV1
Injection Time: 07:49

			CONC. (ug/mL)		Response Factor			% Diff. / Drift	
Analyte	Type	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	10.0	9.44	1.008913	0.9521619		-5.6	20
Acenaphthylene	A	10.0	9.52	1.623395	1.54473		-4.8	25
Acetophenone	A	10.0	9.10	1.66795	1.583758		-5.0	25
Anthracene	A	10.0	9.59	1.055542	1.012364		-4.1	25
Atrazine	Q	10.0	8.27	0.209507	0.1796507		-17.3	25
Benzaldehyde	Q	10.0	7.99	0.5750236	0.6219759		-20.1	25
Benzo(a)anthracene	A	10.0	9.41	1.160562	1.092611		-5.9	25
Benzo(a)pyrene	A	10.0	9.57	0.9380577	0.8972523		-4.3	20
Benzo(b)fluoranthene	A	10.0	9.13	1.035655	0.9457934		-8.7	25
Benzo(k)fluoranthene	A	10.0	10.4	1.037239	1.075723		3.7	25
Benzo(g,h,i)perylene	A	10.0	9.58	0.9423672	0.9024894		-4.2	25
X Benzoic Acid	Q	20.0	17.6	0.2313229	0.203714		-12.0	40
X Benzyl Alcohol	A	10.0	9.17	0.7417471	0.6801061		-8.3	25
1,1'-Biphenyl	A	10.0	9.59	1.279267	1.269019		-0.8	25
4-Bromophenyl Phenyl Ether	A	10.0	9.85	0.2152051	0.2120026		-1.5	25
Butyl Benzyl Phthalate	A	10.0	9.17	0.5777452	0.5300655		-8.3	25
Caprolactam	Q	10.0	7.77	7.876329E-02	7.740232E-02		-22.3	25
Carbazole	Q	10.0	10.5	0.7736528	0.7537513		5.3	25
4-Chloro-3-methylphenol	A	10.0	9.02	0.2669963	0.2407834		-9.8	20
Bis(2-chloroethoxy)methane	A	10.0	9.26	0.3175214	0.2941466		-7.4	25
Bis(2-chloroethyl) Ether	A	10.0	8.48	1.199716	1.017955		-15.2	25
Bis(2-chloroisopropyl) Ether	A	10.0	8.79	1.117249	0.9823459		-12.1	25
2-Chloronaphthalene	A	10.0	9.62	0.9758827	0.9388062		-3.8	25
2-Chlorophenol	A	10.0	9.21	1.211292	1.11558		-7.9	25
4-Chlorophenyl Phenyl Ether	A	10.0	9.39	0.5539858	0.5202905		-6.1	25
Chrysene	A	10.0	9.27	1.127141	1.044523		-7.3	25
Dibenz(a,h)anthracene	A	10.0	9.65	0.8500052	0.8201437		-3.5	25
Dibenzofuran	A	10.0	9.55	1.384376	1.322057		-4.5	25
Di-n-butyl Phthalate	A	10.0	9.81	1.17235	1.150176		-1.9	25

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 195
Calibration: 8L01007
Lab File ID: 10C1126A.D
Calibration Date: 11/25/08 10:59
Sequence: 8120138
Injection Date: 11/26/08
Lab Sample ID: 8120138-CCV1
Injection Time: 07:49

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
1,2-Dichlorobenzene	A	10.0	9.31	1.406824	1.309454		-6.9	25
1,3-Dichlorobenzene	A	10.0	9.26	1.47089	1.362022		-7.4	25
1,4-Dichlorobenzene	A	10.0	9.41	1.30249	1.2261		-5.9	20
2,4-Dichlorophenol	A	10.0	9.49	0.265446	0.2519712		-5.1	20
2,6-Dichlorophenol	A	10.0	9.48	0.2604263	0.246769		-5.2	25
Diethyl Phthalate	A	10.0	9.45	1.083282	1.02333		-5.5	25
2,4-Dimethylphenol	A	10.0	9.06	0.3052895	0.2765351		-9.4	25
Dimethyl Phthalate	A	10.0	9.38	1.120345	1.051009		-6.2	25
4,6-Dinitro-2-methylphenol	Q	10.0	9.89	0.1372777	0.1357194		-1.1	25
2,4-Dinitrophenol	Q	20.0	15.1	0.1571229	0.1395859	0.05	-24.4	40
2,4-Dinitrotoluene	Q	10.0	9.55	0.3345132	0.3194603		-4.5	25
2,6-Dinitrotoluene	Q	10.0	9.60	0.2388826	0.2294462		-4.0	25
Di-n-octyl Phthalate	Q	10.0	8.88	1.26003	1.118952		-11.2	20
1,2-Diphenylhydrazine	A	10.0	9.60	0.6763913	0.6494552		-4.0	25
Bis(2-ethylhexyl) Phthalate	A	10.0	9.51	0.8204803	0.7801344		-4.9	25
Fluoranthene	A	10.0	9.68	1.093336	1.057809		-3.2	20
Fluorene	A	10.0	9.57	1.124704	1.07665		-4.3	25
Hexachlorobenzene	A	10.0	10.0	0.2480578	0.2479393		-0.05	25
Hexachlorobutadiene	A	10.0	9.68	0.1852784	0.1792807		-3.2	20
Hexachlorocyclopentadiene	A	10.0	9.55	0.263193	0.2512328	0.05	-4.5	40
Hexachloroethane	A	10.0	9.39	0.5126655	0.4813942		-6.1	25
Indeno(1,2,3-cd)pyrene	A	10.0	9.18	1.046409	1.004584		-4.0	25
Isophorone	A	10.0	9.21	0.5615907	0.5169963		-7.9	25
2-Methylnaphthalene	A	10.0	9.21	0.6782939	0.6250245		-7.9	25
2-Methylphenol	A	10.0	9.07	1.139984	1.03372		-9.3	25
4-Methylphenol	A	10.0	9.15	1.213125	1.109865		-8.5	25
Naphthalene	A	10.0	9.47	0.9626745	0.9114927		-5.3	25
Nitrobenzene	A	10.0	9.45	0.3146841	0.2973592		-5.5	25
4-Nitrophenol	A	20.0	18.8	0.1647913	0.1549343	0.05	-6.0	40

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 195
Calibration: 8L01007
Lab File ID: 10C1126A.D
Calibration Date: 11/25/08 10:59
Sequence: 8120138
Injection Date: 11/26/08
Lab Sample ID: 8120138-CCV1
Injection Time: 07:49

		Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
	Analyte		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
✓	2-Nitrophenol	Q	10.0	9.20	0.174875	0.1609214		-8.0	20
✓	N-Nitroso-diphenylamine	A	10.0	7.99	0.5894312	0.5336214		-9.5	20
✓	N-Nitroso-di-n-propylamine	A	10.0	9.06	0.8111997	0.762242	0.05	-6.0	25
✓	Pentachlorophenol	A	10.0	9.59	0.1911827	0.1832925		-4.1	20
✓	Phenanthrene	A	10.0	9.86	1.076793	1.061798		-1.4	25
✓	Phenol	A	10.0	8.88	1.475351	1.309553		-11.2	20
✓	Pyrene	A	10.0	9.35	1.359312	1.270627		-6.5	25
✓	1,2,4,5-Tetrachlorobenzene	A	10.0	9.47	0.5042534	0.4777405		-5.3	25
✓	2,3,4,6-Tetrachlorophenol	A	10.0	9.32	0.2177717	0.2030508		-6.8	25
X	1,2,4-Trichlorobenzene	A	10.0	9.19	0.3073559	0.2825678		-8.1	25
✓	2,4,6-Trichlorophenol	A	10.0	9.39	0.3322468	0.312102		-6.1	20
✓	2,4,5-Trichlorophenol	A	10.0	9.41	0.3188605	0.3000125		-5.9	25

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

3,3'-dichlorobenzidene see 2nd standard
2-nitroaniline
3-nitroaniline
4-nitroaniline

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Instrument ID: 195
Lab File ID: 10AB1126.D
Sequence: 8120138
Lab Sample ID: 8120138-CCV2

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L01007
Calibration Date: 11/25/08 10:59
Injection Date: 11/26/08
Injection Time: 08:17

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acetophenone	A	10.0	9.58	1.66795	1.528707		-8.3	25
Aniline	A	10.0	9.80	1.577874	1.54627		-2.0	25
Atrazine	Q	10.0	10.2	0.209507	0.2134278		2.2	25
Benzaldehyde	Q	10.0	9.56	0.5750236	0.8230755		-4.4	25
Benzidine	Q	10.0	8.24	0.4936048	0.3806837		-17.6	40
1,1'-Biphenyl	A	10.0	9.85	1.279267	1.216498		-4.9	25
Caprolactam	Q	10.0	10.3	7.876329E-02	7.845421E-02		2.6	25
4-Chloroaniline	A	10.0	9.85	0.2970579	0.292581		-1.5	40
3,3´-Dichlorobenzidine	Q	10.0	9.31	0.3815981	0.355088		-6.9	25
2-Nitroaniline	Q	10.0	10.0	0.2542636	0.2549605		0.3	40
3-Nitroaniline	Q	10.0	9.99	0.1914718	0.1913397		-0.1	40
4-Nitroaniline	Q	10.0	8.29	0.179396	0.1590769		-17.1	40
N-Nitroso-diphenylamine	A	10.0	9.65	0.5894312	0.5900616		0.1	20
N-Nitroso-di-n-propylamine	A	10.0	9.70	0.8111997	0.7574871	0.05	-6.6	25

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120138

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 195
Calibration: 8L01007

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	8120138-TUN1	DFT1126A.D	11/26/08 07:28
Calibration Check	8120138-CCV1	10C1126A.D	11/26/08 07:49
Calibration Check	8120138-CCV2	10AB1126.D	11/26/08 08:17
Blank	0813364-BLK2	813364B2.D	11/26/08 08:44
LCS	0813364-BS2	813364S2.D	11/26/08 09:12
EQBK-1	0811328-05	81132805.D	11/26/08 09:39
EQBK-5	0811328-13	81132813.D	11/26/08 10:07
EQBK-6	0811331-01	81133101.D	11/26/08 10:35

INTERNAL STANDARD AREA AND RT SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8120138
Instrument: 195
Matrix: Water
Calibration: 8L01007

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (8120138-CCV1)			**Lab File ID: 10C1126A.D**			**Analyzed: 11/26/08 07:49**			
1,4-Dichlorobenzene-d4	101393	4.99	93113	4.99	109	50 - 200	0.0000	+/-0.50	
Naphthalene-d8	392527	6.48	361517	6.48	109	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	232597	8.49	218183	8.49	107	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	324154	10.14	311094	10.14	104	50 - 200	0.0000	+/-0.50	
Chrysene-d12	279091	13.08	252432	13.08	111	50 - 200	0.0000	+/-0.50	
Perylene-d12	282595	14.55	257937	14.55	110	50 - 200	0.0000	+/-0.50	
Calibration Check (8120138-CCV2)			**Lab File ID: 10AB1126.D**			**Analyzed: 11/26/08 08:17**			
1,4-Dichlorobenzene-d4	118771	4.99	93113	4.99	128	50 - 200	0.0000	+/-0.50	
Naphthalene-d8	471020	6.48	361517	6.48	130	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	272450	8.48	218183	8.49	125	50 - 200	-0.0100	+/-0.50	
Phenanthrene-d10	385758	10.13	311094	10.14	124	50 - 200	-0.0100	+/-0.50	
Chrysene-d12	314760	13.07	252432	13.08	125	50 - 200	-0.0100	+/-0.50	
Perylene-d12	315952	14.55	257937	14.55	122	50 - 200	0.0000	+/-0.50	
Blank (0813364-BLK2)			**Lab File ID: 813364B2.D**			**Analyzed: 11/26/08 08:44**			
1,4-Dichlorobenzene-d4	103773	4.99	93113	4.99	111	50 - 200	0.0000	+/-0.50	
Naphthalene-d8	427982	6.48	361517	6.48	118	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	253199	8.48	218183	8.49	116	50 - 200	-0.0100	+/-0.50	
Phenanthrene-d10	346701	10.14	311094	10.14	111	50 - 200	0.0000	+/-0.50	
Chrysene-d12	282707	13.08	252432	13.08	112	50 - 200	0.0000	+/-0.50	
Perylene-d12	300441	14.55	257937	14.55	116	50 - 200	0.0000	+/-0.50	
LCS (0813364-BS2)			**Lab File ID: 813364S2.D**			**Analyzed: 11/26/08 09:12**			
1,4-Dichlorobenzene-d4	105464	4.99	93113	4.99	113	50 - 200	0.0000	+/-0.50	
Naphthalene-d8	411098	6.48	361517	6.48	114	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	247051	8.48	218183	8.49	113	50 - 200	-0.0100	+/-0.50	
Phenanthrene-d10	340387	10.14	311094	10.14	109	50 - 200	0.0000	+/-0.50	
Chrysene-d12	318875	13.08	252432	13.08	126	50 - 200	0.0000	+/-0.50	
Perylene-d12	343921	14.55	257937	14.55	133	50 - 200	0.0000	+/-0.50	
EQBK-1 (0811328-05)			**Lab File ID: 81132805.D**			**Analyzed: 11/26/08 09:39**			
1,4-Dichlorobenzene-d4	96160	4.99	93113	4.99	103	50 - 200	0.0000	+/-0.50	
Naphthalene-d8	371859	6.48	361517	6.48	103	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	213733	8.48	218183	8.49	98	50 - 200	-0.0100	+/-0.50	
Phenanthrene-d10	291764	10.14	311094	10.14	94	50 - 200	0.0000	+/-0.50	
Chrysene-d12	253369	13.08	252432	13.08	100	50 - 200	0.0000	+/-0.50	
Perylene-d12	277563	14.55	257937	14.55	108	50 - 200	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120138
Matrix: Water

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 195
Calibration: 8L01007

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
EQBK-5 (0811328-13)			**Lab File ID: 81132813.D**			**Analyzed: 11/26/08 10:07**			
1,4-Dichlorobenzene-d4	89784	4.99	93113	4.99	96	50 - 200	0.0000	+/-0.50	
Naphthalene-d8	361610	6.48	361517	6.48	100	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	212950	8.48	218183	8.49	98	50 - 200	-0.0100	+/-0.50	
Phenanthrene-d10	294230	10.13	311094	10.14	95	50 - 200	-0.0100	+/-0.50	
Chrysene-d12	252445	13.08	252432	13.08	100	50 - 200	0.0000	+/-0.50	
Perylene-d12	274729	14.55	257937	14.55	107	50 - 200	0.0000	+/-0.50	
EQBK-6 (0811331-01)			**Lab File ID: 81133101.D**			**Analyzed: 11/26/08 10:35**			
1,4-Dichlorobenzene-d4	107170	4.99	93113	4.99	115	50 - 200	0.0000	+/-0.50	
Naphthalene-d8	413313	6.48	361517	6.48	114	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	241064	8.48	218183	8.49	110	50 - 200	-0.0100	+/-0.50	
Phenanthrene-d10	321426	10.14	311094	10.14	103	50 - 200	0.0000	+/-0.50	
Chrysene-d12	261896	13.08	252432	13.08	104	50 - 200	0.0000	+/-0.50	
Perylene-d12	285676	14.55	257937	14.55	111	50 - 200	0.0000	+/-0.50	

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Lab File ID: DFT1126A.D
Instrument ID: 195
Sequence: 8120153

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Injection Date: 11/26/08
Injection Time: 07:28
Lab Sample ID: 8120153-TUN1

m/z	Ion Abundance Criteria	% Relative Abundance	
51	30 - 60% of 198	32.6	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	41.2	PASS
70	Less than 2% of 69	0	PASS
127	40 - 60% of 198	44.2	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.02	PASS
275	10 - 30% of 198	27.1	PASS
365	1.0001 - 200% of 198	3.01	PASS
441	0.0001 - 99.9999% of 443	72.8	PASS
442	40.0001 - 200% of 198	70.6	PASS
443	17 - 23% of 442	18.9	PASS

001744

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 195
Calibration: 8L01007
Lab File ID: 10C1126A.D
Calibration Date: 11/25/08 10:59
Sequence: 8120153
Injection Date: 11/26/08
Lab Sample ID: 8120153-CCV1
Injection Time: 07:49

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	10.0	9.44	1.008913	0.9521619		-5.6	20
Acenaphthylene	A	10.0	9.52	1.623395	1.54473		-4.8	25
Anthracene	A	10.0	9.59	1.055542	1.012364		-4.1	25
Benzo(a)anthracene	A	10.0	9.41	1.160562	1.092611		-5.9	25
Benzo(a)pyrene	A	10.0	9.57	0.9380577	0.8972523		-4.3	20
Benzo(b)fluoranthene	A	10.0	9.13	1.035655	0.9457934		-8.7	25
Benzo(k)fluoranthene	A	10.0	10.4	1.037239	1.075723		3.7	25
Benzo(g,h,i)perylene	A	10.0	9.58	0.9423672	0.9024894		-4.2	25
Benzoic Acid	Q	20.0	17.6	0.2313229	0.203714		-12.0	40
Benzyl Alcohol	A	10.0	9.17	0.7417471	0.6801061		-8.3	25
4-Bromophenyl Phenyl Ether	A	10.0	9.85	0.2152051	0.2120026		-1.5	25
Butyl Benzyl Phthalate	A	10.0	9.17	0.5777452	0.5300655		-8.3	25
Carbazole	Q	10.0	10.5	0.7736528	0.7537513		5.3	25
4-Chloro-3-methylphenol	A	10.0	9.02	0.2669963	0.2407834		-9.8	20
Bis(2-chloroethoxy)methane	A	10.0	9.26	0.3175214	0.2941466		-7.4	25
Bis(2-chloroethyl) Ether	A	10.0	8.48	1.199716	1.017955		-15.2	25
Bis(2-chloroisopropyl) Ether	A	10.0	8.79	1.117249	0.9823459		-12.1	25
2-Chloronaphthalene	A	10.0	9.62	0.9758827	0.9388062		-3.8	25
2-Chlorophenol	A	10.0	9.21	1.211292	1.11558		-7.9	25
4-Chlorophenyl Phenyl Ether	A	10.0	9.39	0.5539858	0.5202905		-6.1	25
Chrysene	A	10.0	9.27	1.127141	1.044523		-7.3	25
Dibenz(a,h)anthracene	A	10.0	9.65	0.8500052	0.8201437		-3.5	25
Dibenzofuran	A	10.0	9.55	1.384376	1.322057		-4.5	25
Di-n-butyl Phthalate	A	10.0	9.81	1.17235	1.150176		-1.9	25
1,2-Dichlorobenzene	A	10.0	9.31	1.406824	1.309454		-6.9	25
1,3-Dichlorobenzene	A	10.0	9.26	1.47089	1.362022		-7.4	25
1,4-Dichlorobenzene	A	10.0	9.41	1.30249	1.2261		-5.9	20
2,4-Dichlorophenol	A	10.0	9.49	0.265446	0.2519712		-5.1	20
Diethyl Phthalate	A	10.0	9.45	1.083282	1.02333		-5.5	25

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 195
Calibration: 8L01007
Lab File ID: 10C1126A.D
Calibration Date: 11/25/08 10:59
Sequence: 8120153
Injection Date: 11/26/08
Lab Sample ID: 8120153-CCV1
Injection Time: 07:49

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
2,4-Dimethylphenol	A	10.0	9.06	0.3052895	0.2765351		-9.4	25
Dimethyl Phthalate	A	10.0	9.38	1.120345	1.051009		-6.2	25
4,6-Dinitro-2-methylphenol	Q	10.0	9.89	0.1372777	0.1357194		-1.1	25
2,4-Dinitrophenol	Q	20.0	15.1	0.1571229	0.1395859	0.05	-24.4	40
2,4-Dinitrotoluene	Q	10.0	9.55	0.3345132	0.3194603		-4.5	25
2,6-Dinitrotoluene	Q	10.0	9.60	0.2388826	0.2294462		-4.0	25
Di-n-octyl Phthalate	Q	10.0	8.88	1.26003	1.118952		-11.2	20
1,2-Diphenylhydrazine	A	10.0	9.60	0.6763913	0.6494552		-4.0	25
Bis(2-ethylhexyl) Phthalate	A	10.0	9.51	0.8204803	0.7801344		-4.9	25
Fluoranthene	A	10.0	9.68	1.093336	1.057809		-3.2	20
Fluorene	A	10.0	9.57	1.124704	1.07665		-4.3	25
Hexachlorobenzene	A	10.0	10.0	0.2480578	0.2479393		-0.05	25
Hexachlorobutadiene	A	10.0	9.68	0.1852784	0.1792807		-3.2	20
Hexachlorocyclopentadiene	A	10.0	9.55	0.263193	0.2512328	0.05	-4.5	40
Hexachloroethane	A	10.0	9.39	0.5126655	0.4813942		-6.1	25
Indeno(1,2,3-cd)pyrene	A	10.0	9.18	1.046409	1.004584		-4.0	25
Isophorone	A	10.0	9.21	0.5615907	0.5169963		-7.9	25
2-Methylnaphthalene	A	10.0	9.21	0.6782939	0.6250245		-7.9	25
2-Methylphenol	A	10.0	9.07	1.139984	1.03372		-9.3	25
4-Methylphenol	A	10.0	9.15	1.213125	1.109865		-8.5	25
Naphthalene	A	10.0	9.47	0.9626745	0.9114927		-5.3	25
Nitrobenzene	A	10.0	9.45	0.3146841	0.2973592		-5.5	25
4-Nitrophenol	A	20.0	18.8	0.1647913	0.1549343	0.05	-6.0	40
2-Nitrophenol	Q	10.0	9.20	0.174875	0.1609214		-8.0	20
N-Nitroso-diphenylamine	A	10.0	7.99	0.5894312	0.5336214		-9.5	20
N-Nitroso-di-n-propylamine	A	10.0	9.06	0.8111997	0.762242	0.05	-6.0	25
Pentachlorophenol	A	10.0	9.59	0.1911827	0.1832925		-4.1	20
Phenanthrene	A	10.0	9.86	1.076793	1.061798		-1.4	25
Phenol	A	10.0	8.88	1.475351	1.309553		-11.2	20

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 195
Calibration: 8L01007
Lab File ID: 10C1126A.D
Calibration Date: 11/25/08 10:59
Sequence: 8120153
Injection Date: 11/26/08
Lab Sample ID: 8120153-CCV1
Injection Time: 07:49

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Pyrene	A	10.0	9.35	1.359312	1.270627		-6.5	25
1,2,4-Trichlorobenzene	A	10.0	9.19	0.3073559	0.2825678		-8.1	25
2,4,6-Trichlorophenol	A	10.0	9.39	0.3322468	0.312102		-6.1	20
2,4,5-Trichlorophenol	A	10.0	9.41	0.3188605	0.3000125		-5.9	25

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

acetophenone
atrazine
benzaldehyde
1,1'-Biphenyl
caprolactam
1,2,4,5-TCB
2,3,4,6-TCP

} see same std summary for the EQB sequence that is the same.

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Instrument ID: 195
Lab File ID: 10AB1126.D
Sequence: 8120153
Lab Sample ID: 8120153-CCV2

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L01007
Calibration Date: 11/25/08 10:59
Injection Date: 11/26/08
Injection Time: 08:17

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Aniline	A	10.0	9.80	1.577874	1.54627		-2.0	25
Benzidine	Q	10.0	8.24	0.4936048	0.3806837		-17.6	40
4-Chloroaniline	A	10.0	9.85	0.2970579	0.292581		-1.5	40
3,3´-Dichlorobenzidine	Q	10.0	9.31	0.3815981	0.355088		-6.9	25
2-Nitroaniline	Q	10.0	10.0	0.2542636	0.2549605		0.3	40
3-Nitroaniline	Q	10.0	9.99	0.1914718	0.1913397		-0.1	40
4-Nitroaniline	Q	10.0	8.29	0.179396	0.1590769		-17.1	40
N-Nitroso-diphenylamine	A	10.0	9.65	0.5894312	0.5900616		0.1	20
N-Nitroso-di-n-propylamine	A	10.0	9.70	0.8111997	0.7574871	0.05	-6.6	25

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120153

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 195
Calibration: 8L01007

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	8120153-TUN1	DFT1126A.D	11/26/08 07:28
Calibration Check	8120153-CCV1	10C1126A.D	11/26/08 07:49
Calibration Check	8120153-CCV2	10AB1126.D	11/26/08 08:17
Blank	0813821-BLK1	813821B1.D	11/26/08 11:04
LCS	0813821-BS1	813821S1.D	11/26/08 11:32
13SB13A	0811328-01	81132801.D	11/26/08 12:00
13SB13C	0811328-02	81132802.D	11/26/08 12:29
13SB21C	0811328-03	81132803.D	11/26/08 12:58
13SB14A	0811328-04	81132804.D	11/26/08 13:27
13SB20A	0811328-06	81132806.D	11/26/08 13:55
13SB20C	0811328-07	81132807.D	11/26/08 14:25
13SB22A	0811328-08	81132808.D	11/26/08 14:54
13SB22C	0811328-09	81132809.D	11/26/08 15:24
13SB21A	0811328-10	81132810.D	11/26/08 15:53
13SB18A	0811328-11	81132811.D	11/26/08 16:22
13SB18C	0811328-12	81132812.D	11/26/08 16:51
13SB19A	0811328-14	81132814.D	11/26/08 17:20
13SB19C	0811328-15	81132815.D	11/26/08 17:48
13SB17A	0811331-02	81133102.D	11/26/08 19:13

00179

INTERNAL STANDARD AREA AND RT SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8120153
Instrument: 195
Matrix: Soil
Calibration: 8L01007

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (8120153-CCV1)			**Lab File ID: 10C1126A.D**			**Analyzed: 11/26/08 07:49**			
1,4-Dichlorobenzene-d4	101393	4.99	93113	4.99	109	50 - 200	0.0000	+/-0.50	
Naphthalene-d8	392527	6.48	361517	6.48	109	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	232597	8.49	218183	8.49	107	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	324154	10.14	311094	10.14	104	50 - 200	0.0000	+/-0.50	
Chrysene-d12	279091	13.08	252432	13.08	111	50 - 200	0.0000	+/-0.50	
Perylene-d12	282595	14.55	257937	14.55	110	50 - 200	0.0000	+/-0.50	
Calibration Check (8120153-CCV2)			**Lab File ID: 10AB1126.D**			**Analyzed: 11/26/08 08:17**			
1,4-Dichlorobenzene-d4	118771	4.99	93113	4.99	128	50 - 200	0.0000	+/-0.50	
Naphthalene-d8	471020	6.48	361517	6.48	130	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	272450	8.48	218183	8.49	125	50 - 200	-0.0100	+/-0.50	
Phenanthrene-d10	385758	10.13	311094	10.14	124	50 - 200	-0.0100	+/-0.50	
Chrysene-d12	314760	13.07	252432	13.08	125	50 - 200	-0.0100	+/-0.50	
Perylene-d12	315952	14.55	257937	14.55	122	50 - 200	0.0000	+/-0.50	
Blank (0813821-BLK1)			**Lab File ID: 813821B1.D**			**Analyzed: 11/26/08 11:04**			
1,4-Dichlorobenzene-d4	99403	5	93113	4.99	107	50 - 200	0.0100	+/-0.50	
Naphthalene-d8	399904	6.48	361517	6.48	111	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	235730	8.48	218183	8.49	108	50 - 200	-0.0100	+/-0.50	
Phenanthrene-d10	314315	10.14	311094	10.14	101	50 - 200	0.0000	+/-0.50	
Chrysene-d12	240203	13.08	252432	13.08	95	50 - 200	0.0000	+/-0.50	
Perylene-d12	262491	14.55	257937	14.55	102	50 - 200	0.0000	+/-0.50	
LCS (0813821-BS1)			**Lab File ID: 813821S1.D**			**Analyzed: 11/26/08 11:32**			
1,4-Dichlorobenzene-d4	99017	5	93113	4.99	106	50 - 200	0.0100	+/-0.50	
Naphthalene-d8	384271	6.48	361517	6.48	106	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	226048	8.48	218183	8.49	104	50 - 200	-0.0100	+/-0.50	
Phenanthrene-d10	316788	10.14	311094	10.14	102	50 - 200	0.0000	+/-0.50	
Chrysene-d12	254572	13.08	252432	13.08	101	50 - 200	0.0000	+/-0.50	
Perylene-d12	285868	14.55	257937	14.55	111	50 - 200	0.0000	+/-0.50	
13SB13A (0811328-01)			**Lab File ID: 81132801.D**			**Analyzed: 11/26/08 12:00**			
1,4-Dichlorobenzene-d4	110048	5.01	93113	4.99	118	50 - 200	0.0200	+/-0.50	
Naphthalene-d8	441552	6.48	361517	6.48	122	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	265694	8.48	218183	8.49	122	50 - 200	-0.0100	+/-0.50	
Phenanthrene-d10	350309	10.14	311094	10.14	113	50 - 200	0.0000	+/-0.50	
Chrysene-d12	255985	13.08	252432	13.08	101	50 - 200	0.0000	+/-0.50	
Perylene-d12	297808	14.56	257937	14.55	115	50 - 200	0.0100	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8120153
Instrument: 195
Matrix: Soil
Calibration: 8L01007

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
13SB13C (0811328-02)			**Lab File ID: 81132802.D**			**Analyzed: 11/26/08 12:29**			
1,4-Dichlorobenzene-d4	119617	5.01	93113	4.99	128	50 - 200	0.0200	+/-0.50	
Naphthalene-d8	463916	6.48	361517	6.48	128	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	284032	8.48	218183	8.49	130	50 - 200	-0.0100	+/-0.50	
Phenanthrene-d10	386890	10.14	311094	10.14	124	50 - 200	0.0000	+/-0.50	
Chrysene-d12	284261	13.08	252432	13.08	113	50 - 200	0.0000	+/-0.50	
Perylene-d12	329707	14.56	257937	14.55	128	50 - 200	0.0100	+/-0.50	
13SB21C (0811328-03)			**Lab File ID: 81132803.D**			**Analyzed: 11/26/08 12:58**			
1,4-Dichlorobenzene-d4	107655	5.01	93113	4.99	116	50 - 200	0.0200	+/-0.50	
Naphthalene-d8	429329	6.48	361517	6.48	119	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	253867	8.48	218183	8.49	116	50 - 200	-0.0100	+/-0.50	
Phenanthrene-d10	343780	10.14	311094	10.14	111	50 - 200	0.0000	+/-0.50	
Chrysene-d12	251883	13.08	252432	13.08	100	50 - 200	0.0000	+/-0.50	
Perylene-d12	276325	14.56	257937	14.55	107	50 - 200	0.0100	+/-0.50	
13SB14A (0811328-04)			**Lab File ID: 81132804.D**			**Analyzed: 11/26/08 13:27**			
1,4-Dichlorobenzene-d4	106029	5	93113	4.99	114	50 - 200	0.0100	+/-0.50	
Naphthalene-d8	421913	6.48	361517	6.48	117	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	243403	8.49	218183	8.49	112	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	319488	10.14	311094	10.14	103	50 - 200	0.0000	+/-0.50	
Chrysene-d12	227245	13.09	252432	13.08	90	50 - 200	0.0100	+/-0.50	
Perylene-d12	252784	14.56	257937	14.55	98	50 - 200	0.0100	+/-0.50	
13SB20A (0811328-06)			**Lab File ID: 81132806.D**			**Analyzed: 11/26/08 13:55**			
1,4-Dichlorobenzene-d4	107769	5.01	93113	4.99	116	50 - 200	0.0200	+/-0.50	
Naphthalene-d8	420223	6.48	361517	6.48	116	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	248080	8.49	218183	8.49	114	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	329855	10.15	311094	10.14	106	50 - 200	0.0100	+/-0.50	
Chrysene-d12	244824	13.09	252432	13.08	97	50 - 200	0.0100	+/-0.50	
Perylene-d12	272748	14.57	257937	14.55	106	50 - 200	0.0200	+/-0.50	
13SB20C (0811328-07)			**Lab File ID: 81132807.D**			**Analyzed: 11/26/08 14:25**			
1,4-Dichlorobenzene-d4	99221	5.01	93113	4.99	107	50 - 200	0.0200	+/-0.50	
Naphthalene-d8	401532	6.49	361517	6.48	111	50 - 200	0.0100	+/-0.50	
Acenaphthene-d10	235979	8.49	218183	8.49	108	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	317082	10.15	311094	10.14	102	50 - 200	0.0100	+/-0.50	
Chrysene-d12	224985	13.09	252432	13.08	89	50 - 200	0.0100	+/-0.50	
Perylene-d12	237742	14.57	257937	14.55	92	50 - 200	0.0200	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8120153
Instrument: 195
Matrix: Soil
Calibration: 8L01007

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
13SB22A (0811328-08)			**Lab File ID: 81132808.D**			**Analyzed: 11/26/08 14:54**			
1,4-Dichlorobenzene-d4	106474	5	93113	4.99	114	50 - 200	0.0100	+/-0.50	
Naphthalene-d8	417277	6.49	361517	6.48	115	50 - 200	0.0100	+/-0.50	
Acenaphthene-d10	251693	8.49	218183	8.49	115	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	342232	10.15	311094	10.14	110	50 - 200	0.0100	+/-0.50	
Chrysene-d12	247758	13.1	252432	13.08	98	50 - 200	0.0200	+/-0.50	
Perylene-d12	259796	14.58	257937	14.55	101	50 - 200	0.0300	+/-0.50	
13SB22C (0811328-09)			**Lab File ID: 81132809.D**			**Analyzed: 11/26/08 15:24**			
1,4-Dichlorobenzene-d4	105615	5	93113	4.99	113	50 - 200	0.0100	+/-0.50	
Naphthalene-d8	428779	6.48	361517	6.48	119	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	258502	8.49	218183	8.49	118	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	357465	10.15	311094	10.14	115	50 - 200	0.0100	+/-0.50	
Chrysene-d12	291425	13.1	252432	13.08	115	50 - 200	0.0200	+/-0.50	
Perylene-d12	283891	14.59	257937	14.55	110	50 - 200	0.0400	+/-0.50	
13SB21A (0811328-10)			**Lab File ID: 81132810.D**			**Analyzed: 11/26/08 15:53**			
1,4-Dichlorobenzene-d4	111360	5.01	93113	4.99	120	50 - 200	0.0200	+/-0.50	
Naphthalene-d8	444846	6.49	361517	6.48	123	50 - 200	0.0100	+/-0.50	
Acenaphthene-d10	262989	8.49	218183	8.49	121	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	330147	10.16	311094	10.14	106	50 - 200	0.0200	+/-0.50	
Chrysene-d12	264043	13.1	252432	13.08	105	50 - 200	0.0200	+/-0.50	
Perylene-d12	260920	14.58	257937	14.55	101	50 - 200	0.0300	+/-0.50	
13SB18A (0811328-11)			**Lab File ID: 81132811.D**			**Analyzed: 11/26/08 16:22**			
1,4-Dichlorobenzene-d4	107288	5.01	93113	4.99	115	50 - 200	0.0200	+/-0.50	
Naphthalene-d8	422818	6.49	361517	6.48	117	50 - 200	0.0100	+/-0.50	
Acenaphthene-d10	250659	8.49	218183	8.49	115	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	332496	10.16	311094	10.14	107	50 - 200	0.0200	+/-0.50	
Chrysene-d12	244447	13.1	252432	13.08	97	50 - 200	0.0200	+/-0.50	
Perylene-d12	253014	14.58	257937	14.55	98	50 - 200	0.0300	+/-0.50	
13SB18C (0811328-12)			**Lab File ID: 81132812.D**			**Analyzed: 11/26/08 16:51**			
1,4-Dichlorobenzene-d4	104477	5.01	93113	4.99	112	50 - 200	0.0200	+/-0.50	
Naphthalene-d8	413203	6.49	361517	6.48	114	50 - 200	0.0100	+/-0.50	
Acenaphthene-d10	250028	8.49	218183	8.49	115	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	333824	10.16	311094	10.14	107	50 - 200	0.0200	+/-0.50	
Chrysene-d12	251250	13.1	252432	13.08	100	50 - 200	0.0200	+/-0.50	
Perylene-d12	261113	14.58	257937	14.55	101	50 - 200	0.0300	+/-0.50	

001584

INTERNAL STANDARD AREA AND RT SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120153
Matrix: Soil

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 195
Calibration: 8L01007

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
13SB19A (0811328-14)			**Lab File ID: 81132814.D**			**Analyzed: 11/26/08 17:20**			
1,4-Dichlorobenzene-d4	105885	5.01	93113	4.99	114	50 - 200	0.0200	+/-0.50	
Naphthalene-d8	418418	6.49	361517	6.48	116	50 - 200	0.0100	+/-0.50	
Acenaphthene-d10	252939	8.49	218183	8.49	116	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	334774	10.16	311094	10.14	108	50 - 200	0.0200	+/-0.50	
Chrysene-d12	262334	13.1	252432	13.08	104	50 - 200	0.0200	+/-0.50	
Perylene-d12	235616	14.58	257937	14.55	91	50 - 200	0.0300	+/-0.50	
13SB19C (0811328-15)			**Lab File ID: 81132815.D**			**Analyzed: 11/26/08 17:48**			
1,4-Dichlorobenzene-d4	123144	5.01	93113	4.99	132	50 - 200	0.0200	+/-0.50	
Naphthalene-d8	508577	6.49	361517	6.48	141	50 - 200	0.0100	+/-0.50	
Acenaphthene-d10	317693	8.49	218183	8.49	146	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	448493	10.16	311094	10.14	144	50 - 200	0.0200	+/-0.50	
Chrysene-d12	335893	13.1	252432	13.08	133	50 - 200	0.0200	+/-0.50	
Perylene-d12	344863	14.59	257937	14.55	134	50 - 200	0.0400	+/-0.50	
13SB17A (0811331-02)			**Lab File ID: 81133102.D**			**Analyzed: 11/26/08 19:13**			
1,4-Dichlorobenzene-d4	107927	4.99	93113	4.99	116	50 - 200	0.0000	+/-0.50	
Naphthalene-d8	438940	6.49	361517	6.48	121	50 - 200	0.0100	+/-0.50	
Acenaphthene-d10	267563	8.5	218183	8.49	123	50 - 200	0.0100	+/-0.50	
Phenanthrene-d10	348335	10.16	311094	10.14	112	50 - 200	0.0200	+/-0.50	
Chrysene-d12	225142	13.12	252432	13.08	89	50 - 200	0.0400	+/-0.50	
Perylene-d12	208161	14.6	257937	14.55	81	50 - 200	0.0500	+/-0.50	

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Lab File ID: DFT1201E.D
Injection Date: 12/01/08
Instrument ID: 195
Injection Time: 11:17
Sequence: 8120219
Lab Sample ID: 8120219-TUN1

m/z	Ion Abundance Criteria	% Relative Abundance	
51	30 - 60% of 198	36.2	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	40.3	PASS
70	Less than 2% of 69	0	PASS
127	40 - 60% of 198	46.3	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.44	PASS
275	10 - 30% of 198	26.1	PASS
365	1.0001 - 200% of 198	1.53	PASS
441	0.0001 - 99.9999% of 443	55.2	PASS
442	40.0001 - 200% of 198	67.3	PASS
443	17 - 23% of 442	19.7	PASS

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120219

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 195
Calibration: 8L01007

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	8120219-TUN1	DFT1201E.D	12/01/08 11:17
Calibration Check	8120219-CCV1	10C1201.D	12/01/08 11:39
Calibration Check	8120219-CCV2	10AB1201.D	12/01/08 12:08
13SB13A	0811328-01RE1	81132801.D	12/01/08 15:26
13SB17C	0811331-03	81133103.D	12/01/08 15:55
13SB16A	0811331-04	81133104.D	12/01/08 16:23
13SB16C	0811331-05	81133105.D	12/01/08 16:51
13SB15A	0811331-06	81133106.D	12/01/08 17:19
DUP-13	0811331-07	81133107.D	12/01/08 17:48
13SB19C	0813821-MS1	813821M1.D	12/01/08 18:16
13SB19C	0813821-MSD1	813821MD.D	12/01/08 18:44
13SB17C	0813821-MS2	813821M2.D	12/01/08 19:12
13SB17C	0813821-MSD2	813821D2.D	12/01/08 19:39

00177

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Instrument ID: 195
Lab File ID: 10C1201.D
Sequence: 8120219
Lab Sample ID: 8120219-CCV1

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L01007
Calibration Date: 11/25/08 10:59
Injection Date: 12/01/08
Injection Time: 11:39

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	10.0	9.78	1.008913	0.9870283		-2.2	20
Acenaphthylene	A	10.0	9.86	1.623395	1.600937		-1.4	25
Acetophenone	A	10.0	9.54	1.66795	1.66083		-0.4	25
Anthracene	A	10.0	10.4	1.055542	1.095762		3.8	25
Atrazine	Q	10.0	7.90	0.209507	0.1733632		-21.0	25
Benzo(a)anthracene	A	10.0	10.2	1.160562	1.181282		1.8	25
Benzo(a)pyrene	A	10.0	10.5	0.9380577	0.9850129		5.0	20
Benzo(b)fluoranthene	A	10.0	10.3	1.035655	1.069932		3.3	25
Benzo(k)fluoranthene	A	10.0	11.0	1.037239	1.146625		10.5	25
Benzo(g,h,i)perylene	A	10.0	10.4	0.9423672	0.9823784		4.2	25
Benzoic Acid	Q	20.0	15.6	0.2313229	0.1800904		-22.2 N/A	40
Benzyl Alcohol	A	10.0	8.50	0.7417471	0.6303702		-15.0	25
1,1'-Biphenyl	A	10.0	10.2	1.279267	1.344182		5.1	25
4-Bromophenyl Phenyl Ether	A	10.0	10.6	0.2152051	0.2288646		6.3	25
Butyl Benzyl Phthalate	A	10.0	11.0	0.5777452	0.6352042		9.9	25
Caprolactam	Q	10.0	7.55	7.876329E-02	0.0752424		-24.5	25
Carbazole	Q	10.0	8.26	0.7736528	0.6246176		-17.4	25
4-Chloro-3-methylphenol	A	10.0	9.41	0.2669963	0.2512656		-5.9	20
Bis(2-chloroethoxy)methane	A	10.0	9.62	0.3175214	0.3055618		-3.8	25
Bis(2-chloroethyl) Ether	A	10.0	10.5	1.199716	1.258646		4.9	25
Bis(2-chloroisopropyl) Ether	A	10.0	9.68	1.117249	1.081448		-3.2	25
2-Chloronaphthalene	A	10.0	10.2	0.9758827	1.000077		2.5	25
2-Chlorophenol	A	10.0	9.71	1.211292	1.176073		-2.9	25
4-Chlorophenyl Phenyl Ether	A	10.0	10.2	0.5539858	0.5634648		1.7	25
Chrysene	A	10.0	10.3	1.127141	1.156947		2.6	25
Dibenz(a,h)anthracene	A	10.0	10.7	0.8500052	0.905856		6.6	25
Dibenzofuran	A	10.0	9.90	1.384376	1.370167		-1.0	25
Di-n-butyl Phthalate	A	10.0	10.7	1.17235	1.258783		7.4	25
1,2-Dichlorobenzene	A	10.0	9.81	1.406824	1.379975		-1.9	25

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 195
Calibration: 8L01007
Lab File ID: 10C1201.D
Calibration Date: 11/25/08 10:59
Sequence: 8120219
Injection Date: 12/01/08
Lab Sample ID: 8120219-CCV1
Injection Time: 11:39

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
1,3-Dichlorobenzene	A	10.0	9.75	1.47089	1.434733		-2.5	25
1,4-Dichlorobenzene	A	10.0	10.2	1.30249	1.327718		1.9	20
2,4-Dichlorophenol	A	10.0	9.56	0.265446	0.2537359		-4.4	20
Diethyl Phthalate	A	10.0	10.3	1.083282	1.11401		2.8	25
2,4-Dimethylphenol	A	10.0	9.37	0.3052895	0.2859737		-6.3	25
Dimethyl Phthalate	A	10.0	10.0	1.120345	1.120592		0.02	25
4,6-Dinitro-2-methylphenol	Q	10.0	9.05	0.1372777	0.1242935		-9.5	25
2,4-Dinitrophenol	Q	20.0	13.6	0.1571229	0.1253049	0.05	-32.1	40
2,4-Dinitrotoluene	Q	10.0	9.73	0.3345132	0.3253353		-2.7	25
2,6-Dinitrotoluene	Q	10.0	9.73	0.2388826	0.2323933		-2.7	25
Di-n-octyl Phthalate	Q	10.0	10.8	1.26003	1.360134		7.9	20
1,2-Diphenylhydrazine	A	10.0	10.6	0.6763913	0.7203656		6.5	25
Bis(2-ethylhexyl) Phthalate	A	10.0	11.4	0.8204803	0.9396403		14.5	25
Fluoranthene	A	10.0	10.1	1.093336	1.101894		0.8	20
Fluorene	A	10.0	10.0	1.124704	1.125951		0.1	25
Hexachlorobenzene	A	10.0	10.7	0.2480578	0.2656818		7.1	25
Hexachlorobutadiene	A	10.0	10.2	0.1852784	0.1896974		2.4	20
Hexachlorocyclopentadiene	A	10.0	7.11	0.263193	0.1871241	0.05	-28.9	40
Hexachloroethane	A	10.0	9.50	0.5126655	0.486986		-5.0	25
Indeno(1,2,3-cd)pyrene	A	10.0	10.3	1.046409	1.110789		6.2	25
Isophorone	A	10.0	9.66	0.5615907	0.5425563		-3.4	25
2-Methylnaphthalene	A	10.0	9.62	0.6782939	0.6523948		-3.8	25
2-Methylphenol	A	10.0	9.50	1.139984	1.082454		-5.0	25
4-Methylphenol	A	10.0	9.28	1.213125	1.125492		-7.2	25
Naphthalene	A	10.0	9.64	0.9626745	0.9283997		-3.6	25
Nitrobenzene	A	10.0	9.58	0.3146841	0.301346		-4.2	25
4-Nitrophenol	A	20.0	15.9	0.1647913	0.1311893	0.05	-20.4	40
2-Nitrophenol	Q	10.0	8.98	0.174875	0.1571063		-10.2	20
N-Nitroso-diphenylamine	A	10.0	7.99	0.5894312	0.533417		-9.5	20

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 195
Calibration: 8L01007
Lab File ID: 10C1201.D
Calibration Date: 11/25/08 10:59
Sequence: 8120219
Injection Date: 12/01/08
Lab Sample ID: 8120219-CCV1
Injection Time: 11:39

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
N-Nitroso-di-n-propylamine	A	10.0	9.48	0.8111997	0.7981054	0.05	-1.6	25
Pentachlorophenol	A	10.0	8.52	0.1911827	0.1629368		-14.8	20
Phenanthrene	A	10.0	10.3	1.076793	1.108771		3.0	25
Phenol	A	10.0	8.85	1.475351	1.306208		-11.5	20
Pyrene	A	10.0	10.6	1.359312	1.443761		6.2	25
1,2,4,5-Tetrachlorobenzene	A	10.0	9.87	0.5042534	0.4976338		-1.3	25
2,3,4,6-Tetrachlorophenol	A	10.0	9.36	0.2177717	0.2038805		-6.4	25
1,2,4-Trichlorobenzene	A	10.0	9.62	0.3073559	0.2956709		-3.8	25
2,4,6-Trichlorophenol	A	10.0	9.28	0.3322468	0.3083985		-7.2	20
2,4,5-Trichlorophenol	A	10.0	9.82	0.3188605	0.3131849		-1.8	25

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 195
Calibration: 8L01007
Lab File ID: 10AB1201.D
Calibration Date: 11/25/08 10:59
Sequence: 8120219
Injection Date: 12/01/08
Lab Sample ID: 8120219-CCV2
Injection Time: 12:08

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acetophenone	A	10.0	9.60	1.66795	1.532123		-8.1	25
Aniline	A	10.0	9.64	1.577874	1.521784		-3.6	25
Atrazine	Q	10.0	10.0	0.209507	0.2226548		0.2	25
Benzaldehyde	Q	10.0	9.50	0.5750236	0.8176161		-5.0	25
Benzidine	Q	10.0	6.61	0.4936048	0.3042055		-33.9	40
1,1'-Biphenyl	A	10.0	9.89	1.279267	1.220918		-4.6	25
Caprolactam	Q	10.0	9.09	7.876329E-02	7.038941E-02		-9.1	25
4-Chloroaniline	A	10.0	9.32	0.2970579	0.2769264		-6.8	40
3,3'-Dichlorobenzidine	Q	10.0	9.61	0.3815981	0.3667815		-3.9	25
2-Nitroaniline	Q	10.0	9.62	0.2542636	0.244624		-3.8	40
3-Nitroaniline	Q	10.0	9.41	0.1914718	0.1802455		-5.9	40
4-Nitroaniline	Q	10.0	6.95	0.179396	0.1316216		-30.5	40
N-Nitroso-diphenylamine	A	10.0	10.2	0.5894312	0.6207622		5.3	20
N-Nitroso-di-n-propylamine	A	10.0	9.71	0.8111997	0.758526	0.05	-6.5	25

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INTERNAL STANDARD AREA AND RT SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8120219
Instrument: 195
Matrix: Soil
Calibration: 8L01007

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (8120219-CCV1)			**Lab File ID: 10C1201.D**			**Analyzed: 12/01/08 11:39**			
1,4-Dichlorobenzene-d4	104349	4.92	93113	4.99	112	50 - 200	-0.0700	+/-0.50	
Naphthalene-d8	410480	6.41	361517	6.48	114	50 - 200	-0.0700	+/-0.50	
Acenaphthene-d10	241102	8.41	218183	8.49	111	50 - 200	-0.0800	+/-0.50	
Phenanthrene-d10	325568	10.07	311094	10.14	105	50 - 200	-0.0700	+/-0.50	
Chrysene-d12	253853	13.01	252432	13.08	101	50 - 200	-0.0700	+/-0.50	
Perylene-d12	261525	14.48	257937	14.55	101	50 - 200	-0.0700	+/-0.50	
Calibration Check (8120219-CCV2)			**Lab File ID: 10AB1201.D**			**Analyzed: 12/01/08 12:08**			
1,4-Dichlorobenzene-d4	115383	4.92	93113	4.99	124	50 - 200	-0.0700	+/-0.50	
Naphthalene-d8	465212	6.41	361517	6.48	129	50 - 200	-0.0700	+/-0.50	
Acenaphthene-d10	272459	8.41	218183	8.49	125	50 - 200	-0.0800	+/-0.50	
Phenanthrene-d10	362303	10.06	311094	10.14	116	50 - 200	-0.0800	+/-0.50	
Chrysene-d12	298277	13	252432	13.08	118	50 - 200	-0.0800	+/-0.50	
Perylene-d12	307373	14.48	257937	14.55	119	50 - 200	-0.0700	+/-0.50	
13SB13A (0811328-01RE1)			**Lab File ID: 81132801.D**			**Analyzed: 12/01/08 15:26**			
1,4-Dichlorobenzene-d4	108852	4.93	93113	4.99	117	50 - 200	-0.0600	+/-0.50	
Naphthalene-d8	423599	6.41	361517	6.48	117	50 - 200	-0.0700	+/-0.50	
Acenaphthene-d10	253156	8.41	218183	8.49	116	50 - 200	-0.0800	+/-0.50	
Phenanthrene-d10	322798	10.07	311094	10.14	104	50 - 200	-0.0700	+/-0.50	
Chrysene-d12	214511	13	252432	13.08	85	50 - 200	-0.0800	+/-0.50	
Perylene-d12	235510	14.47	257937	14.55	91	50 - 200	-0.0800	+/-0.50	
13SB17C (0811331-03)			**Lab File ID: 81133103.D**			**Analyzed: 12/01/08 15:55**			
1,4-Dichlorobenzene-d4	123595	4.92	93113	4.99	133	50 - 200	-0.0700	+/-0.50	
Naphthalene-d8	477951	6.41	361517	6.48	132	50 - 200	-0.0700	+/-0.50	
Acenaphthene-d10	294638	8.41	218183	8.49	135	50 - 200	-0.0800	+/-0.50	
Phenanthrene-d10	366295	10.07	311094	10.14	118	50 - 200	-0.0700	+/-0.50	
Chrysene-d12	241912	13.01	252432	13.08	96	50 - 200	-0.0700	+/-0.50	
Perylene-d12	289384	14.48	257937	14.55	112	50 - 200	-0.0700	+/-0.50	
13SB16A (0811331-04)			**Lab File ID: 81133104.D**			**Analyzed: 12/01/08 16:23**			
1,4-Dichlorobenzene-d4	123942	4.92	93113	4.99	133	50 - 200	-0.0700	+/-0.50	
Naphthalene-d8	497208	6.41	361517	6.48	138	50 - 200	-0.0700	+/-0.50	
Acenaphthene-d10	320538	8.41	218183	8.49	147	50 - 200	-0.0800	+/-0.50	
Phenanthrene-d10	416837	10.07	311094	10.14	134	50 - 200	-0.0700	+/-0.50	
Chrysene-d12	307115	13.02	252432	13.08	122	50 - 200	-0.0600	+/-0.50	
Perylene-d12	323702	14.5	257937	14.55	125	50 - 200	-0.0500	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8120219
Instrument: 195
Matrix: Soil
Calibration: 8L01007

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
13SB16C (0811331-05)			**Lab File ID: 81133105.D**			**Analyzed: 12/01/08 16:51**			
1,4-Dichlorobenzene-d4	116795	4.93	93113	4.99	125	50 - 200	-0.0600	+/-0.50	
Naphthalene-d8	476181	6.42	361517	6.48	132	50 - 200	-0.0600	+/-0.50	
Acenaphthene-d10	289232	8.42	218183	8.49	133	50 - 200	-0.0700	+/-0.50	
Phenanthrene-d10	387386	10.08	311094	10.14	125	50 - 200	-0.0600	+/-0.50	
Chrysene-d12	265071	13.02	252432	13.08	105	50 - 200	-0.0600	+/-0.50	
Perylene-d12	245896	14.51	257937	14.55	95	50 - 200	-0.0400	+/-0.50	
13SB15A (0811331-06)			**Lab File ID: 81133106.D**			**Analyzed: 12/01/08 17:19**			
1,4-Dichlorobenzene-d4	117996	4.93	93113	4.99	127	50 - 200	-0.0600	+/-0.50	
Naphthalene-d8	481736	6.42	361517	6.48	133	50 - 200	-0.0600	+/-0.50	
Acenaphthene-d10	294093	8.42	218183	8.49	135	50 - 200	-0.0700	+/-0.50	
Phenanthrene-d10	395724	10.08	311094	10.14	127	50 - 200	-0.0600	+/-0.50	
Chrysene-d12	276600	13.02	252432	13.08	110	50 - 200	-0.0600	+/-0.50	
Perylene-d12	222318	14.51	257937	14.55	86	50 - 200	-0.0400	+/-0.50	
DUP-13 (0811331-07)			**Lab File ID: 81133107.D**			**Analyzed: 12/01/08 17:48**			
1,4-Dichlorobenzene-d4	126077	4.93	93113	4.99	135	50 - 200	-0.0600	+/-0.50	
Naphthalene-d8	502936	6.42	361517	6.48	139	50 - 200	-0.0600	+/-0.50	
Acenaphthene-d10	322134	8.42	218183	8.49	148	50 - 200	-0.0700	+/-0.50	
Phenanthrene-d10	427574	10.08	311094	10.14	137	50 - 200	-0.0600	+/-0.50	
Chrysene-d12	298503	13.03	252432	13.08	118	50 - 200	-0.0500	+/-0.50	
Perylene-d12	233129	14.51	257937	14.55	90	50 - 200	-0.0400	+/-0.50	
Matrix Spike (0813821-MS1)			**Lab File ID: 813821M1.D**			**Analyzed: 12/01/08 18:16**			
1,4-Dichlorobenzene-d4	113833	4.93	93113	4.99	122	50 - 200	-0.0600	+/-0.50	
Naphthalene-d8	475284	6.42	361517	6.48	131	50 - 200	-0.0600	+/-0.50	
Acenaphthene-d10	297587	8.42	218183	8.49	136	50 - 200	-0.0700	+/-0.50	
Phenanthrene-d10	402395	10.08	311094	10.14	129	50 - 200	-0.0600	+/-0.50	
Chrysene-d12	269169	13.03	252432	13.08	107	50 - 200	-0.0500	+/-0.50	
Perylene-d12	198080	14.51	257937	14.55	77	50 - 200	-0.0400	+/-0.50	
Matrix Spike Dup (0813821-MSD1)			**Lab File ID: 813821MD.D**			**Analyzed: 12/01/08 18:44**			
1,4-Dichlorobenzene-d4	117240	4.93	93113	4.99	126	50 - 200	-0.0600	+/-0.50	
Naphthalene-d8	485842	6.42	361517	6.48	134	50 - 200	-0.0600	+/-0.50	
Acenaphthene-d10	297678	8.42	218183	8.49	136	50 - 200	-0.0700	+/-0.50	
Phenanthrene-d10	405163	10.08	311094	10.14	130	50 - 200	-0.0600	+/-0.50	
Chrysene-d12	262748	13.03	252432	13.08	104	50 - 200	-0.0500	+/-0.50	
Perylene-d12	192230	14.51	257937	14.55	75	50 - 200	-0.0400	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8120219
Instrument: 195
Matrix: Soil
Calibration: 8L01007

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike (0813821-MS2)			**Lab File ID: 813821M2.D**			**Analyzed: 12/01/08 19:12**			
1,4-Dichlorobenzene-d4	121884	4.93	93113	4.99	131	50 - 200	-0.0600	+/-0.50	
Naphthalene-d8	490407	6.42	361517	6.48	136	50 - 200	-0.0600	+/-0.50	
Acenaphthene-d10	313216	8.42	218183	8.49	144	50 - 200	-0.0700	+/-0.50	
Phenanthrene-d10	425699	10.08	311094	10.14	137	50 - 200	-0.0600	+/-0.50	
Chrysene-d12	299774	13.04	252432	13.08	119	50 - 200	-0.0400	+/-0.50	
Perylene-d12	216642	14.52	257937	14.55	84	50 - 200	-0.0300	+/-0.50	
Matrix Spike Dup (0813821-MSD2)			**Lab File ID: 813821D2.D**			**Analyzed: 12/01/08 19:39**			
1,4-Dichlorobenzene-d4	105628	4.93	93113	4.99	113	50 - 200	-0.0600	+/-0.50	
Naphthalene-d8	437187	6.42	361517	6.48	121	50 - 200	-0.0600	+/-0.50	
Acenaphthene-d10	275231	8.42	218183	8.49	126	50 - 200	-0.0700	+/-0.50	
Phenanthrene-d10	367911	10.09	311094	10.14	118	50 - 200	-0.0500	+/-0.50	
Chrysene-d12	230514	13.03	252432	13.08	91	50 - 200	-0.0500	+/-0.50	
Perylene-d12	164078	14.52	257937	14.55	64	50 - 200	-0.0300	+/-0.50	

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Lab File ID: DFT1114A.D

Instrument ID: 195

Sequence: 8120813

Calibration: 8L08002

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Injection Date: 11/14/08

Injection Time: 06:09

Lab Sample ID: 8120813-TUN1

m/z	Ion Abundance Criteria	% Relative Abundance	
51	30 - 60% of 198	32.6	PASS
68	Less than 2% of 69	1.06	PASS
69	Less than 200% of 198	40.4	PASS
70	Less than 2% of 69	0	PASS
127	40 - 60% of 198	47.9	PASS
197	Less than 1% of 198	0.242	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.92	PASS
275	10 - 30% of 198	27.9	PASS
365	1.0001 - 200% of 198	2.36	PASS
441	0.0001 - 99.9999% of 443	61.3	PASS
442	40.0001 - 200% of 198	71.8	PASS
443	17 - 23% of 442	20.6	PASS

00158

INITIAL CALIBRATION STANDARDS
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120813

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 195
Calibration: 8L08002

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
8110077	0.5ppm BNA	8120813-CAL1		
8110076	1ppm BNA	8120813-CAL2		
8110075	2ppm BNA	8120813-CAL3		
8110074	5ppm BNA	8120813-CAL4		
8110073	10ppm BNA	8120813-CAL5		
8110072	15ppm BNA	8120813-CAL6		
8110071	20ppm BNA	8120813-CAL7		
8110070	25ppm BNA	8120813-CAL8		
8110774	DFTPP tune std	8120813-TUN1	DFT1114A.D	11/14/08 06:09
8110073	10ppm BNA	8120813-CAL5	10IC1114.D	11/14/08 06:37
8110077	0.5ppm BNA	8120813-CAL1	05IC1114.D	11/14/08 07:16
8110076	1ppm BNA	8120813-CAL2	1IC1114.D	11/14/08 07:50
8110075	2ppm BNA	8120813-CAL3	2IC1114.D	11/14/08 08:25
8110074	5ppm BNA	8120813-CAL4	5IC1114.D	11/14/08 09:00
8110072	15ppm BNA	8120813-CAL6	15IC1114.D	11/14/08 09:35
8110071	20ppm BNA	8120813-CAL7	20IC1114.D	11/14/08 10:10
8110070	25ppm BNA	8120813-CAL8	25IC1114.D	11/14/08 10:45
8110079	10ppm BNA SCV	8120813-SCV1	BNASCV.D	11/14/08 11:20
8110089	0.5ppm a.b.e.	8120813-CAL9	05AB1114.D	11/14/08 11:54
8110088	1ppm a.b.e.	8120813-CALA	1AB1114.D	11/14/08 12:29
8110087	2ppm a.b.e.	8120813-CALB	2AB1114.D	11/14/08 13:04
8110086	5ppm a.b.e.	8120813-CALC	5AB1114.D	11/14/08 13:39
8110085	10ppm a.b.e.	8120813-CALD	10AB1114.D	11/14/08 14:14
8110084	15ppm a.b.e.	8120813-CALE	15AB1114.D	11/14/08 14:49
8110083	20ppm a.b.e.	8120813-CALF	20AB1114.D	11/14/08 15:23
8110082	25ppm a.b.e.	8120813-CALG	25AB1114.D	11/14/08 15:58
8110090	10ppm scv a.b.e.	8120813-SCV2	ABSCV5.D	11/14/08 16:33

INITIAL CALIBRATION DATA (Continued)

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Calibration: 8L08002

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Instrument: 195

Calibration Date: 11/14/08 08:34

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	Limit	Q
Acenaphthene	0.955042	5.660896	14.76625	8.817738E-02			CCC (30)	
Acenaphthylene	1.516303	7.883895	14.345	8.368459E-02			15	
Acetophenone	1.512776	8.71969	8.703125	0.1427654			15	
Aniline	1.532134	5.162444	7.21375	0.1026339			15	
Anthracene	0.9730686	10.5626	18.22375	5.934353E-02			15	
Atrazine	0.2086567	10.48582	17.67625	7.368251E-02		0.9992878	0.99	
Benzaldehyde	0.8251861	6.565281	7.02	7.538162E-02		0.9994283	0.99	
Benzo(a)anthracene	1.068962	11.02124	21.645	2.403907E-02			15	
Benzo(a)pyrene	0.8862261	6.008329	23.3425	5.026937E-02			CCC (30)	
Benzo(b)fluoranthene	0.9548366	5.854197	22.89875	5.094648E-02			15	
Benzo(k)fluoranthene	1.000904	13.8322	22.935	6.171602E-02			15	
Benzo(g,h,i)perylene	0.8623656	7.882045	25.7175	0.1124406			15	
Benzoic Acid	0.1503301	42.40206	10.15625	1.399362		0.9972362	0.99	
Benzyl Alcohol	0.6827651	9.67676	8.15875	0.1374041			15	
1,1'-Biphenyl	1.241927	8.247177	13.36562	5.496504E-02			15	
4-Bromophenyl Phenyl Ether	0.2099946	6.13868	17.2375	5.311192E-02			15	
Butyl Benzyl Phthalate	0.4748978	10.96853	21.0625	2.672099E-02			15	
Caprolactam	4.728507E-02	30.25949	11.53875	0.2717294		0.9986509	0.99	
Carbazole	0.6347879	38.63448	18.535	2.895996E-02		0.9904533	0.99	
4-Chloro-3-methylphenol	0.230058	10.51214	11.9575	0.145044			CCC (30)	
4-Chloroaniline	0.2987972	5.961132	10.78125	3.673387E-02			15	
Bis(2-chloroethoxy)methane	0.2928887	7.476686	10.11875	0.1108701			15	
Bis(2-chloroethyl) Ether	1.145993	9.321389	7.3675	0.1199925			15	
Bis(2-chloroisopropyl) Ether	0.9783765	8.304003	8.4575	0.1225151			15	
2-Chloronaphthalene	1.025451	6.971278	13.37375	9.778845E-02			15	
2-Chlorophenol	1.171321	8.387519	7.42625	0.1894742			15	
4-Chlorophenyl Phenyl Ether	0.5716563	6.029221	16.07875	5.401582E-02			15	
Chrysene	1.046247	14.38008	21.68625	3.136778E-02			15	
Dibenz(a,h)anthracene	0.8281729	8.915225	25.21875	0.0776683			15	
Dibenzofuran	1.364136	7.820417	15.19125	7.303997E-02			15	
Di-n-butyl Phthalate	0.9662018	15.19154	19.18625	3.039685E-02		0.9992816	0.99	
1,2-Dichlorobenzene	1.324483	9.054846	8.18	9.388389E-02			15	

012285

INITIAL CALIBRATION DATA (Continued)
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Calibration: 8L08002

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Instrument: 195

Calibration Date: 11/14/08 08:34

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	Limit	Q
1,3-Dichlorobenzene	1.444865	9.946227	7.72875	8.199071E-02			15	
1,4-Dichlorobenzene	1.290404	10.59397	7.88125	4.581215E-02			CCC (30)	
3,3'-Dichlorobenzidine	0.3393142	6.957453	21.6225	2.350452E-02		0.9994559	0.99	
2,4-Dichlorophenol	0.263707	8.99809	10.27125	0.1093816			CCC (30)	
2,6-Dichlorophenol	0.2574058	8.638574	10.78625	7.111845E-02			15	
Diethyl Phthalate	1.000016	9.406083	15.895	0.1066058			15	
2,4-Dimethylphenol	0.2799157	7.298311	9.8825	0.1302767			15	
Dimethyl Phthalate	0.9983324	8.106617	14.1775	0.1498009			15	
4,6-Dinitro-2-methylphenol	0.1251602	36.6161	16.1875	0.1139012		0.999072	0.99	
1,3-Dinitrobenzene	8.213434E-02	28.25125	14.0275	0.10604		0.9976266	0.99	
2,4-Dinitrophenol	0.1375726	51.12995	14.9075	0.1175815		0.9986433	SPCC (0.05)	
2,4-Dinitrotoluene	0.3429575	16.92928	15.22875	0.1284588		0.9990558	0.99	
2,6-Dinitrotoluene	0.2273105	15.78836	14.28375	0.1351086		0.9985873	0.99	
Di-n-octyl Phthalate	0.9036524	13.6979	22.395	2.299899E-02		0.9990993	CCC (30)	
1,2-Diphenylhydrazine	0.558329	6.075862	16.45375	0.0796973			15	
Bis(2-ethylhexyl) Phthalate	0.6139937	10.44797	21.685	1.884591E-02			15	
Fluoranthene	1.061135	14.93882	19.9625	1.601064E-02			CCC (30)	
Fluorene	1.105152	5.26738	16.00875	7.763294E-02			15	
Hexachlorobenzene	0.2350543	4.265158	17.29	0.0526863			15	
Hexachlorobutadiene	0.1906268	10.44645	10.93625	4.844308E-02			CCC (30)	
Hexachlorocyclopentadiene	0.3399274	8.050715	12.615	4.271263E-02			SPCC (0.05)	
Hexachloroethane	0.4832824	9.335538	8.88	5.823321E-02			15	
Indeno(1,2,3-cd)pyrene	1.009933	8.794136	25.17875	0.0776085			15	
Isophorone	0.4594838	8.103509	9.5975	0.182216			15	
2-Methylnaphthalene	0.6248063	8.72332	12.23625	6.203694E-02			15	
1-Methylnaphthalene	0.5571218	8.211215	12.46	7.460435E-02			15	
2-Methylphenol	1.023935	8.90344	8.38625	0.1904347			15	
4-Methylphenol	1.088765	8.871811	8.72625	0.2866715			15	
Naphthalene	0.9171311	11.67783	10.62125	7.898108E-02			15	
2-Nitroaniline	0.2196019	27.6095	13.65375	6.777903E-02		0.9991595	0.99	
3-Nitroaniline	0.1687641	36.2388	14.64	7.934088E-02		0.9998031	0.99	
4-Nitroaniline	0.2063866	10.93002	16.095	5.675095E-02		0.9996528	0.99	

081285

INITIAL CALIBRATION DATA (Continued)
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L08002
Instrument: 195
Calibration Date: 11/14/08 08:34

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	Limit	Q
Nitrobenzene	0.311404	8.481507	9.05625	0.1757731			15	
4-Nitrophenol	0.1446464	13.78674	15.1125	0.1959633			SPCC (0.05)	
2-Nitrophenol	0.1769972	14.41499	9.7425	0.1054107		0.9986428	CCC (30)	
N-Nitroso-diphenylamine	0.5299023	4.599863	16.36625	4.799169E-02			CCC (30)	
N-Nitroso-di-n-propylamine	0.7046143	7.30464	8.73375	0.1956661			SPCC (0.05)	
Pentachlorophenol	0.1499269	13.41534	17.72625	4.138843E-02			CCC (30)	
Phenanthrene	1.008518	10.10325	18.13	5.153626E-02			15	
Phenol	1.40364	11.71802	7.16625	0.3943478			CCC (30)	
Pyrene	1.147758	10.04703	20.25	4.725096E-02			15	
Pyridine	0.9243737	8.180751	3.476875	0.5530377			15	
1,2,4,5-Tetrachlorobenzene	0.5395512	8.162691	12.6275	7.234543E-02			15	
2,3,4,6-Tetrachlorophenol	0.2099537	10.48377	15.4975	0.0571397			15	
1,2,4-Trichlorobenzene	0.3164405	9.659714	10.46	7.147351E-02			15	
2,4,6-Trichlorophenol	0.337585	7.304185	12.92	0.0709635			CCC (30)	
2,4,5-Trichlorophenol	0.3202682	8.744676	12.99	9.273362E-02			15	
2-Fluorophenol	1.007062	13.17643	5.45125	0.432094			15	
Phenol-d6	1.26645	6.961811	7.14375	0.3954656			15	
Nitrobenzene-d5	0.1416853	7.40179	9.015	0.167245			15	
2-Fluorobiphenyl	1.080279	13.84977	13.15	6.889069E-02			15	
2,4,6-Tribromophenol	0.1548129	6.589972	16.585	9.057303E-02			15	
o-Terphenyl	0.5914282	22.76178	18.81875	4.333281E-02		0.9999179	0.99	

: 01287

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L08002
Laboratory ID: 8120813-SCV1
Sequence: 8120813
Standard ID: 8110079

Analyte	Expected (ug/mL)	Found (ug/mL)	% Rec.	QC Limit
Acenaphthene	10.0	9.59	96	75-125
Acenaphthylene	10.0	9.88	99	75-125
Acetophenone	10.0	9.65	97	75-125
Anthracene	10.0	9.91	99	75-125
Atrazine	10.0	7.91	79	75-125
Benzaldehyde	10.0	10.0	100	75-125
Benzo(a)anthracene	10.0	9.81	98	75-125
Benzo(a)pyrene	10.0	10.2	102	75-125
Benzo(b)fluoranthene	10.0	9.66	97	75-125
Benzo(k)fluoranthene	10.0	10.1	101	75-125
Benzo(g,h,i)perylene	10.0	10.2	102	75-125
Benzoic Acid	20.0	20.6	103	75-125
Benzyl Alcohol	10.0	9.85	99	75-125
1,1'-Biphenyl	10.0	9.58	96	75-125
4-Bromophenyl Phenyl Ether	10.0	9.55	96	75-125
Butyl Benzyl Phthalate	10.0	10.6	106	75-125
Caprolactam	10.0	9.97	100	75-125
Carbazole	10.0	10.4	104	75-125
4-Chloro-3-methylphenol	10.0	10.0	100	75-125
Bis(2-chloroethoxy)methane	10.0	9.58	96	75-125
Bis(2-chloroethyl) Ether	10.0	9.98	100	75-125
Bis(2-chloroisopropyl) Ether	10.0	9.55	96	75-125
2-Chloronaphthalene	10.0	9.46	95	75-125
2-Chlorophenol	10.0	9.69	97	75-125
4-Chlorophenyl Phenyl Ether	10.0	9.54	95	75-125
Chrysene	10.0	9.60	96	75-125
Dibenz(a,h)anthracene	10.0	10.5	105	75-125

01575

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc. **SDG:** 36440-61

Client: URS Corporation **Project:** RFAAP SWMU 13 RFI/CMS, WO 008

Calibration: 8L08002 **Laboratory ID:** 8120813-SCV1

Sequence: 8120813 **Standard ID:** 8110079

Dibenzofuran	10.0	9.48	95	75-125
Di-n-butyl Phthalate	10.0	9.76	98	75-125
1,2-Dichlorobenzene	10.0	9.43	94	75-125
1,3-Dichlorobenzene	10.0	9.33	93	75-125
1,4-Dichlorobenzene	10.0	9.41	94	75-125
2,4-Dichlorophenol	10.0	9.60	96	75-125
2,6-Dichlorophenol	10.0	9.59	96	75-125
Diethyl Phthalate	10.0	10.7	107	75-125
2,4-Dimethylphenol	10.0	9.71	97	75-125
Dimethyl Phthalate	10.0	10.4	104	75-125
4,6-Dinitro-2-methylphenol	10.0	9.72	97	75-125
1,3-Dinitrobenzene	10.0	9.44	94	75-125
2,4-Dinitrophenol	20.0	19.6	98	75-125
2,4-Dinitrotoluene	10.0	10.1	101	75-125
2,6-Dinitrotoluene	10.0	9.54	95	75-125
Di-n-octyl Phthalate	10.0	11.3	113	75-125
1,2-Diphenylhydrazine	10.0	9.84	98	75-125
Bis(2-ethylhexyl) Phthalate	10.0	10.9	109	75-125
Fluoranthene	10.0	9.42	94	75-125
Fluorene	10.0	9.74	97	75-125
Hexachlorobenzene	10.0	9.55	96	75-125
Hexachlorobutadiene	10.0	9.49	95	75-125
Hexachlorocyclopentadiene	10.0	10.0	100	75-125
Hexachloroethane	10.0	9.65	97	75-125
Indeno(1,2,3-cd)pyrene	10.0	10.2	102	75-125
Isophorone	10.0	9.68	97	75-125
2-Methylnaphthalene	10.0	9.69	97	75-125
1-Methylnaphthalene	10.0	9.59	96	75-125
2-Methylphenol	10.0	9.52	95	75-125

015558

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc. **SDG:** 36440-61

Client: URS Corporation **Project:** RFAAP SWMU 13 RFI/CMS, WO 008

Calibration: 8L08002 **Laboratory ID:** 8120813-SCV1

Sequence: 8120813 **Standard ID:** 8110079

4-Methylphenol	10.0	9.62	96	75-125
Naphthalene	10.0	9.45	95	75-125
Nitrobenzene	10.0	9.60	96	75-125
4-Nitrophenol	20.0	18.8	94	75-125
2-Nitrophenol	10.0	10.2	102	75-125
N-Nitroso-di-n-propylamine	10.0	9.85	99	75-125
Pentachlorophenol	10.0	10.5	105	75-125
Phenanthrene	10.0	9.67	97	75-125
Phenol	10.0	9.65	97	75-125
Pyrene	10.0	9.95	100	75-125
Pyridine	10.0	9.80	98	75-125
1,2,4,5-Tetrachlorobenzene	10.0	9.46	95	75-125
2,3,4,6-Tetrachlorophenol	10.0	10.6	106	75-125
1,2,4-Trichlorobenzene	10.0	9.44	94	75-125
2,4,6-Trichlorophenol	10.0	9.90	99	75-125
2,4,5-Trichlorophenol	10.0	10.2	102	75-125
2-Fluorophenol	20.2	20.0	99	75-125
Phenol-d6	20.4	18.8	92	75-125
Nitrobenzene-d5	20.4	19.6	96	75-125
2-Fluorobiphenyl	20.2	18.3	91	75-125
2,4,6-Tribromophenol	20.4	20.0	98	75-125
o-Terphenyl	20.0	18.8	94	75-125

* Values outside of QC limits

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L08002
Laboratory ID: 8120813-SCV2
Sequence: 8120813
Standard ID: 8110090

Analyte	Expected (ug/mL)	Found (ug/mL)	% Rec.	QC Limit
Acetophenone	10.0	8.91	89	75-125
Aniline	10.0	9.21	92	75-125
Atrazine	10.0	9.98	100	75-125
Benzaldehyde	10.0	9.12	91	75-125
1,1'-Biphenyl	10.0	9.11	91	75-125
Caprolactam	10.0	9.68	97	75-125
4-Chloroaniline	10.0	9.53	95	75-125
3,3´-Dichlorobenzidine	10.0	9.36	94	75-125
2-Nitroaniline	10.0	9.59	96	75-125
3-Nitroaniline	10.0	10.3	103	75-125
4-Nitroaniline	10.0	9.88	99	75-125
N-Nitroso-diphenylamine	10.0	9.29	93	75-125
N-Nitroso-di-n-propylamine	10.0	8.87	89	75-125
Pyridine	10.0	8.79	88	75-125

* Values outside of QC limits

081554

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Lab File ID: DFT1206B.D
Injection Date: 12/06/08
Instrument ID: 195
Injection Time: 14:05
Sequence: 8120815
Lab Sample ID: 8120815-TUN1

m/z	Ion Abundance Criteria	% Relative Abundance	
51	30 - 60% of 198	33.2	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	40.9	PASS
70	Less than 2% of 69	0.856	PASS
127	40 - 60% of 198	47.6	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.77	PASS
275	10 - 30% of 198	26.9	PASS
365	1.0001 - 200% of 198	2.86	PASS
441	0.0001 - 99.9999% of 443	69.9	PASS
442	40.0001 - 200% of 198	80.4	PASS
443	17 - 23% of 442	19.7	PASS

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120815

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 195
Calibration: 8L08002

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	8120815-TUN1	DFT1206B.D	12/06/08 14:05
Calibration Check	8120815-CCV1	10C1206.D	12/06/08 14:26
Calibration Check	8120815-CCV2	10AB1206.D	12/06/08 15:00
13SB16C	0811331-05RE1	81133105.D	12/06/08 20:44
13SB15A	0811331-06RE1	81133106.D	12/06/08 21:18
DUP-13	0811331-07RE2	81133107.D	12/06/08 21:52
13SB19C	0813821-MS3	813821MS.D	12/06/08 22:27
13SB19C	0813821-MSD3	813821MD.D	12/06/08 23:01
13SB17C	0813821-MS4	813821S4.D	12/06/08 23:35
13SB17C	0813821-MSD4	813821D4.D	12/07/08 00:09

CONTINUING CALIBRATION CHECK
USEPA-8270C

only Bis(2-ethylhexyl)phth & Di-n-butyl phth were reported from the CCV

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 195
Calibration: 8L08002
Lab File ID: 10C1206.D
Calibration Date: 11/14/08 08:34
Sequence: 8120815
Injection Date: 12/06/08
Lab Sample ID: 8120815-CCV1
Injection Time: 14:26

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	10.0	10.1	0.955042	0.9686214		1.4	20
Acenaphthylene	A	10.0	10.5	1.516303	1.588338		4.8	25
Acetophenone	A	10.0	10.5	1.512776	1.650312		9.1	25
Anthracene	A	10.0	10.4	0.9730686	1.013974		4.2	25
Benzaldehyde	Q	10.0	10.7	0.8251861	0.7636924		7.3	25
Benzo(a)anthracene	A	10.0	10.3	1.068962	1.103025		3.2	25
Benzo(a)pyrene	A	10.0	10.6	0.8862261	0.9437924		6.5	20
Benzo(b)fluoranthene	A	10.0	10.5	0.9548366	0.9990895		4.6	25
Benzo(k)fluoranthene	A	10.0	9.85	1.000904	0.9859403		-1.5	25
Benzo(g,h,i)perylene	A	10.0	11.3	0.8623656	0.9769445		13.3	25
1,1'-Biphenyl	A	10.0	10.2	1.241927	1.291654		4.0	25
4-Bromophenyl Phenyl Ether	A	10.0	10.8	0.2099946	0.2259161		7.6	25
Butyl Benzyl Phthalate	A	10.0	11.8	0.4748978	0.5606132		18.0	25
Caprolactam	Q	10.0	10.2	4.728507E-02	7.496153E-02		2.4	25
Carbazole	Q	10.0	8.95	0.6347879	0.4231466		-10.5	25
4-Chloro-3-methylphenol	A	10.0	11.8	0.230058	0.2718527		18.2	20
Bis(2-chloroethoxy)methane	A	10.0	10.6	0.2928887	0.3110788		6.2	25
Bis(2-chloroethyl) Ether	A	10.0	11.5	1.145993	1.31543		14.8	25
Bis(2-chloroisopropyl) Ether	A	10.0	10.2	0.9783765	0.9982583		2.0	25
2-Chloronaphthalene	A	10.0	9.85	1.025451	1.010328		-1.5	25
2-Chlorophenol	A	10.0	10.1	1.171321	1.18035		0.8	25
4-Chlorophenyl Phenyl Ether	A	10.0	9.60	0.5716563	0.5486749		-4.0	25
Chrysene	A	10.0	9.23	1.046247	0.9783656		-6.5	25
Dibenz(a,h)anthracene	A	10.0	11.5	0.8281729	0.9528479		15.1	25
Dibenzofuran	A	10.0	9.94	1.364136	1.356452		-0.6	25
Di-n-butyl Phthalate	Q	10.0	10.2	0.9662018	0.9851385		1.7	25
2,4-Dichlorophenol	A	10.0	10.5	0.263707	0.2759093		4.6	20
Diethyl Phthalate	A	10.0	10.8	1.000016	1.077589		7.8	25
2,4-Dimethylphenol	A	10.0	10.9	0.2799157	0.304202		8.7	25

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 195
Calibration: 8L08002
Lab File ID: 10C1206.D
Calibration Date: 11/14/08 08:34
Sequence: 8120815
Injection Date: 12/06/08
Lab Sample ID: 8120815-CCV1
Injection Time: 14:26

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Dimethyl Phthalate	A	10.0	10.6	0.9983324	1.057686		5.9	25
4,6-Dinitro-2-methylphenol	Q	10.0	10.2	0.1251602	0.1602448		1.9	25
2,4-Dinitrophenol	Q	20.0	20.2	0.1375726	0.1868982	0.05	1.1	40
2,4-Dinitrotoluene	Q	10.0	10.0	0.3429575	0.3802261		0.5	25
2,6-Dinitrotoluene	Q	10.0	9.73	0.2273105	0.2430932		-2.7	25
Di-n-octyl Phthalate	Q	10.0	11.8	0.9036524	1.069298		18.3	20
Bis(2-ethylhexyl) Phthalate	A	10.0	10.4	0.6139937	0.6404288		4.3	25
Fluoranthene	A	10.0	9.59	1.061135	1.012141		-4.6	20
Fluorene	A	10.0	9.95	1.105152	1.099831		-0.5	25
Hexachlorobenzene	A	10.0	10.4	0.2350543	0.2449098		4.2	25
Hexachlorobutadiene	A	10.0	9.83	0.1906268	0.1873642		-1.7	20
Hexachlorocyclopentadiene	A	10.0	8.91	0.3399274	0.3029094	0.05	-10.9	40
Hexachloroethane	A	10.0	10.3	0.4832824	0.4989763		3.2	25
Indeno(1,2,3-cd)pyrene	A	10.0	11.2	1.009933	1.13187		12.1	25
Isophorone	A	10.0	11.5	0.4594838	0.5301498		15.4	25
2-Methylnaphthalene	A	10.0	10.5	0.6248063	0.6582141		5.3	25
2-Methylphenol	A	10.0	10.5	1.023935	1.077814		5.3	25
4-Methylphenol	A	10.0	10.8	1.088765	1.180962		8.5	25
Naphthalene	A	10.0	10.0	0.9171311	0.92045		0.4	25
Nitrobenzene	A	10.0	10.7	0.311404	0.3321315		6.7	25
4-Nitrophenol	A	20.0	23.0	0.1446464	0.1841369	0.05	27.3	40
2-Nitrophenol	Q	10.0	11.7	0.1769972	0.2075966		17.3	20
N-Nitroso-di-n-propylamine	A	10.0	11.1	0.7046143	0.7893399	0.05	12.0	25
Pentachlorophenol	A	10.0	11.0	0.1499269	0.1650379		10.1	20
Phenanthrene	A	10.0	10.2	1.008518	1.032529		2.4	25
Phenol	A	10.0	10.4	1.40364	1.45811		3.9	20
Pyrene	A	10.0	10.4	1.147758	1.197017		4.3	25
1,2,4,5-Tetrachlorobenzene	A	10.0	9.49	0.5395512	0.5120841		-5.1	25
2,3,4,6-Tetrachlorophenol	A	10.0	10.8	0.2099537	0.2265445		7.9	25

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Instrument ID: 195
Lab File ID: 10C1206.D
Sequence: 8120815
Lab Sample ID: 8120815-CCV1

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L08002
Calibration Date: 11/14/08 08:34
Injection Date: 12/06/08
Injection Time: 14:26

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
2,4,6-Trichlorophenol	A	10.0	10.3	0.337585	0.3481344		3.1	20
2,4,5-Trichlorophenol	A	10.0	10.9	0.3202682	0.3483175		8.8	25

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 195
Calibration: 8L08002
Lab File ID: 10AB1206.D
Calibration Date: 11/14/08 08:34
Sequence: 8120815
Injection Date: 12/06/08
Lab Sample ID: 8120815-CCV2
Injection Time: 15:00

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acetophenone	A	10.0	10.2	1.512776	1.493683		-1.3	25
Atrazine	Q	10.0	11.0	0.2086567	0.2301181		10.3	25
Benzaldehyde	Q	10.0	10.1	0.8251861	0.8346706		1.1	25
1,1'-Biphenyl	A	10.0	10.2	1.241927	1.236429		-0.4	25
Caprolactam	Q	10.0	12.2	4.728507E-02	0.0677287		22.1	25
4-Chloroaniline	A	10.0	10.4	0.2987972	0.3111814		4.1	40
3,3'-Dichlorobenzidine	Q	10.0	10.8	0.3393142	0.3661426		7.9	25
2-Nitroaniline	Q	10.0	11.0	0.2196019	0.2737668		9.6	40
3-Nitroaniline	Q	10.0	10.7	0.1687641	0.2060029		7.3	40
4-Nitroaniline	Q	10.0	10.5	0.2063866	0.216462		4.9	40
N-Nitroso-diphenylamine	A	10.0	10.5	0.5299023	0.5558506		4.9	20
N-Nitroso-di-n-propylamine	A	10.0	10.7	0.7046143	0.7454002	0.05	5.8	25

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INTERNAL STANDARD AREA AND RT SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8120815
Instrument: 195
Matrix: Soil
Calibration: 8L08002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (8120815-CCV1)			**Lab File ID: 10C1206.D**			**Analyzed: 12/06/08 14:26**			
1,4-Dichlorobenzene-d4	904590	7.51	576509	7.85	157	50 - 200	-0.3400	+/-0.50	
Naphthalene-d8	3322431	10.24	2103574	10.59	158	50 - 200	-0.3500	+/-0.50	
Acenaphthene-d10	1884166	14.34	1148967	14.7	164	50 - 200	-0.3600	+/-0.50	
Phenanthrene-d10	2816435	17.79	1863437	18.09	151	50 - 200	-0.3000	+/-0.50	
Chrysene-d12	2383888	21.45	1611285	21.66	148	50 - 200	-0.2100	+/-0.50	
Perylene-d12	2585867	23.11	1765509	23.42	146	50 - 200	-0.3100	+/-0.50	
Calibration Check (8120815-CCV2)			**Lab File ID: 10AB1206.D**			**Analyzed: 12/06/08 15:00**			
1,4-Dichlorobenzene-d4	971352	7.52	576509	7.85	168	50 - 200	-0.3300	+/-0.50	
Naphthalene-d8	3623176	10.23	2103574	10.59	172	50 - 200	-0.3600	+/-0.50	
Acenaphthene-d10	1889362	14.34	1148967	14.7	164	50 - 200	-0.3600	+/-0.50	
Phenanthrene-d10	2713026	17.78	1863437	18.09	146	50 - 200	-0.3100	+/-0.50	
Chrysene-d12	2700195	21.44	1611285	21.66	168	50 - 200	-0.2200	+/-0.50	
Perylene-d12	2930167	23.1	1765509	23.42	166	50 - 200	-0.3200	+/-0.50	
13SB16C (0811331-05RE1)			**Lab File ID: 81133105.D**			**Analyzed: 12/06/08 20:44**			
1,4-Dichlorobenzene-d4	798508	7.52	576509	7.85	139	50 - 200	-0.3300	+/-0.50	
Naphthalene-d8	2940505	10.23	2103574	10.59	140	50 - 200	-0.3600	+/-0.50	
Acenaphthene-d10	1634790	14.34	1148967	14.7	142	50 - 200	-0.3600	+/-0.50	
Phenanthrene-d10	2246165	17.79	1863437	18.09	121	50 - 200	-0.3000	+/-0.50	
Chrysene-d12	1878139	21.45	1611285	21.66	117	50 - 200	-0.2100	+/-0.50	
Perylene-d12	2078368	23.12	1765509	23.42	118	50 - 200	-0.3000	+/-0.50	
13SB15A (0811331-06RE1)			**Lab File ID: 81133106.D**			**Analyzed: 12/06/08 21:18**			
1,4-Dichlorobenzene-d4	834038	7.54	576509	7.85	145	50 - 200	-0.3100	+/-0.50	
Naphthalene-d8	3058245	10.24	2103574	10.59	145	50 - 200	-0.3500	+/-0.50	
Acenaphthene-d10	1654482	14.34	1148967	14.7	144	50 - 200	-0.3600	+/-0.50	
Phenanthrene-d10	2259525	17.8	1863437	18.09	121	50 - 200	-0.2900	+/-0.50	
Chrysene-d12	1869520	21.45	1611285	21.66	116	50 - 200	-0.2100	+/-0.50	
Perylene-d12	1922312	23.12	1765509	23.42	109	50 - 200	-0.3000	+/-0.50	
DUP-13 (0811331-07RE2)			**Lab File ID: 81133107.D**			**Analyzed: 12/06/08 21:52**			
1,4-Dichlorobenzene-d4	793539	7.53	576509	7.85	138	50 - 200	-0.3200	+/-0.50	
Naphthalene-d8	2897695	10.24	2103574	10.59	138	50 - 200	-0.3500	+/-0.50	
Acenaphthene-d10	1590558	14.34	1148967	14.7	138	50 - 200	-0.3600	+/-0.50	
Phenanthrene-d10	2183479	17.8	1863437	18.09	117	50 - 200	-0.2900	+/-0.50	
Chrysene-d12	1912315	21.45	1611285	21.66	119	50 - 200	-0.2100	+/-0.50	
Perylene-d12	1898912	23.12	1765509	23.42	108	50 - 200	-0.3000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8120815
Instrument: 195
Matrix: Soil
Calibration: 8L08002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike (0813821-MS3)			**Lab File ID: 813821MS.D**			**Analyzed: 12/06/08 22:27**			
1,4-Dichlorobenzene-d4	841599	7.54	576509	7.85	146	50 - 200	-0.3100	+/-0.50	
Naphthalene-d8	3110395	10.24	2103574	10.59	148	50 - 200	-0.3500	+/-0.50	
Acenaphthene-d10	1742776	14.35	1148967	14.7	152	50 - 200	-0.3500	+/-0.50	
Phenanthrene-d10	2494167	17.81	1863437	18.09	134	50 - 200	-0.2800	+/-0.50	
Chrysene-d12	1997192	21.46	1611285	21.66	124	50 - 200	-0.2000	+/-0.50	
Perylene-d12	2090783	23.13	1765509	23.42	118	50 - 200	-0.2900	+/-0.50	
Matrix Spike Dup (0813821-MSD3)			**Lab File ID: 813821MD.D**			**Analyzed: 12/06/08 23:01**			
1,4-Dichlorobenzene-d4	794990	7.54	576509	7.85	138	50 - 200	-0.3100	+/-0.50	
Naphthalene-d8	2978847	10.24	2103574	10.59	142	50 - 200	-0.3500	+/-0.50	
Acenaphthene-d10	1662695	14.35	1148967	14.7	145	50 - 200	-0.3500	+/-0.50	
Phenanthrene-d10	2338920	17.81	1863437	18.09	126	50 - 200	-0.2800	+/-0.50	
Chrysene-d12	1915240	21.46	1611285	21.66	119	50 - 200	-0.2000	+/-0.50	
Perylene-d12	1951209	23.13	1765509	23.42	111	50 - 200	-0.2900	+/-0.50	
Matrix Spike (0813821-MS4)			**Lab File ID: 813821S4.D**			**Analyzed: 12/06/08 23:35**			
1,4-Dichlorobenzene-d4	845606	7.54	576509	7.85	147	50 - 200	-0.3100	+/-0.50	
Naphthalene-d8	3143850	10.24	2103574	10.59	149	50 - 200	-0.3500	+/-0.50	
Acenaphthene-d10	1752089	14.35	1148967	14.7	152	50 - 200	-0.3500	+/-0.50	
Phenanthrene-d10	2544808	17.81	1863437	18.09	137	50 - 200	-0.2800	+/-0.50	
Chrysene-d12	2034800	21.46	1611285	21.66	126	50 - 200	-0.2000	+/-0.50	
Perylene-d12	2017929	23.13	1765509	23.42	114	50 - 200	-0.2900	+/-0.50	
Matrix Spike Dup (0813821-MSD4)			**Lab File ID: 813821D4.D**			**Analyzed: 12/07/08 00:09**			
1,4-Dichlorobenzene-d4	750275	7.54	576509	7.85	130	50 - 200	-0.3100	+/-0.50	
Naphthalene-d8	2816944	10.25	2103574	10.59	134	50 - 200	-0.3400	+/-0.50	
Acenaphthene-d10	1582102	14.35	1148967	14.7	138	50 - 200	-0.3500	+/-0.50	
Phenanthrene-d10	2293642	17.81	1863437	18.09	123	50 - 200	-0.2800	+/-0.50	
Chrysene-d12	1885448	21.47	1611285	21.66	117	50 - 200	-0.1900	+/-0.50	
Perylene-d12	1836780	23.13	1765509	23.42	104	50 - 200	-0.2900	+/-0.50	

002602

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Lab File ID: DFT1207C.D
Instrument ID: 195
Sequence: 8120820

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Injection Date: 12/07/08
Injection Time: 10:45
Lab Sample ID: 8120820-TUN1

m/z	Ion Abundance Criteria	% Relative Abundance	
51	30 - 60% of 198	31.1	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	39.2	PASS
70	Less than 2% of 69	1.04	PASS
127	40 - 60% of 198	47	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.73	PASS
275	10 - 30% of 198	27.6	PASS
365	1.0001 - 200% of 198	3.22	PASS
441	0.0001 - 99.9999% of 443	72.6	PASS
442	40.0001 - 200% of 198	83	PASS
443	17 - 23% of 442	19.6	PASS

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120820

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 195
Calibration: 8L08002

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	8120820-TUN1	DFT1207C.D	12/07/08 10:45
Calibration Check	8120820-CCV1	10C1207A.D	12/07/08 11:05
Calibration Check	8120820-CCV2	10AB1207.D	12/07/08 11:40
13SB22A	0811328-08RE1	81132808.D	12/07/08 13:58
13SB16A	0811331-04RE1	81133104.D	12/07/08 15:07

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Instrument ID: 195
Lab File ID: 10C1207A.D
Sequence: 8120820
Lab Sample ID: 8120820-CCV1

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L08002
Calibration Date: 11/14/08 08:34
Injection Date: 12/07/08
Injection Time: 11:05

Only Bis-2EHpth & Di-n-butyl pth were reported

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	10.0	10.4	0.955042	0.9972183		4.4	20
Acenaphthylene	A	10.0	10.5	1.516303	1.588002		4.7	25
Acetophenone	A	10.0	10.4	1.512776	1.623945		7.3	25
Anthracene	A	10.0	10.5	0.9730686	1.019287		4.7	25
Benzaldehyde	Q	10.0	11.4	0.8251861	0.8054755		13.5	25
Benzo(a)anthracene	A	10.0	10.2	1.068962	1.087706		1.8	25
Benzo(a)pyrene	A	10.0	10.9	0.8862261	0.9691262		9.4	20
Benzo(b)fluoranthene	A	10.0	10.8	0.9548366	1.028543		7.7	25
Benzo(k)fluoranthene	A	10.0	10.2	1.000904	1.020188		1.9	25
Benzo(g,h,i)perylene	A	10.0	11.6	0.8623656	0.9968814		15.6	25
Benzoic Acid	Q	20.0	20.7	0.1503301	0.2053383		3.6	40
Benzyl Alcohol	A	10.0	10.2	0.6827651	0.6933103		1.5	25
1,1'-Biphenyl	A	10.0	10.3	1.241927	1.310162		5.5	25
4-Bromophenyl Phenyl Ether	A	10.0	10.8	0.2099946	0.2256833		7.5	25
Butyl Benzyl Phthalate	A	10.0	11.7	0.4748978	0.5541957		16.7	25
Caprolactam	Q	10.0	8.43	4.728507E-02	4.309871E-02		-15.7	25
Carbazole	Q	10.0	10.3	0.6347879	0.4796091		2.6	25
4-Chloro-3-methylphenol	A	10.0	11.3	0.230058	0.2589521		12.6	20
Bis(2-chloroethoxy)methane	A	10.0	10.6	0.2928887	0.3107467		6.1	25
Bis(2-chloroethyl) Ether	A	10.0	11.4	1.145993	1.30832		14.2	25
Bis(2-chloroisopropyl) Ether	A	10.0	10.1	0.9783765	0.9857778		0.8	25
2-Chloronaphthalene	A	10.0	9.97	1.025451	1.022132		-0.3	25
2-Chlorophenol	A	10.0	9.92	1.171321	1.162077		-0.8	25
4-Chlorophenyl Phenyl Ether	A	10.0	9.70	0.5716563	0.5542841		-3.0	25
Chrysene	A	10.0	9.67	1.046247	1.017901		-2.7	25
Dibenz(a,h)anthracene	A	10.0	11.8	0.8281729	0.9728909		17.5	25
Dibenzofuran	A	10.0	9.96	1.364136	1.35908		-0.4	25
Di-n-butyl Phthalate	Q	10.0	10.4	0.9662018	1.000085		3.5	25
1,2-Dichlorobenzene	A	10.0	9.98	1.324483	1.321229		-0.2	25

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CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 195
Calibration: 8L08002
Lab File ID: 10C1207A.D
Calibration Date: 11/14/08 08:34
Sequence: 8120820
Injection Date: 12/07/08
Lab Sample ID: 8120820-CCV1
Injection Time: 11:05

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
1,3-Dichlorobenzene	A	10.0	9.82	1.444865	1.418987		-1.8	25
1,4-Dichlorobenzene	A	10.0	9.97	1.290404	1.286784		-0.3	20
2,4-Dichlorophenol	A	10.0	10.2	0.263707	0.2697478		2.3	20
2,6-Dichlorophenol	A	10.0	10.3	0.2574058	0.2644174		2.7	25
Diethyl Phthalate	A	10.0	10.5	1.000016	1.048735		4.9	25
2,4-Dimethylphenol	A	10.0	10.6	0.2799157	0.2963842		5.9	25
Dimethyl Phthalate	A	10.0	10.4	0.9983324	1.036536		3.8	25
4,6-Dinitro-2-methylphenol	Q	10.0	9.62	0.1251602	0.150722		-3.8	25
1,3-Dinitrobenzene	Q	10.0	9.23	3.213434E-02	3.910341E-02		-7.7	25
2,4-Dinitrophenol	Q	20.0	18.6	0.1375726	0.1709621	0.05	-6.8	40
2,4-Dinitrotoluene	Q	10.0	9.88	0.3429575	0.3737336		-1.2	25
2,6-Dinitrotoluene	Q	10.0	9.53	0.2273105	0.2379899		-4.7	25
Di-n-octyl Phthalate	Q	10.0	11.2	0.9036524	1.012487		12.0	20
1,2-Diphenylhydrazine	A	10.0	11.5	0.558329	0.6420452		15.0	25
Bis(2-ethylhexyl) Phthalate	A	10.0	11.9	0.6139937	0.7302629		18.9	25
Fluoranthene	A	10.0	9.48	1.061135	1.002346		-5.5	20
Fluorene	A	10.0	10.0	1.105152	1.109392		0.4	25
Hexachlorobenzene	A	10.0	10.6	0.2350543	0.2492125		6.0	25
Hexachlorobutadiene	A	10.0	9.82	0.1906268	0.1872628		-1.8	20
Hexachlorocyclopentadiene	A	10.0	8.51	0.3399274	0.2891853	0.05	-14.9	40
Hexachloroethane	A	10.0	10.0	0.4832824	0.4841685		0.2	25
Indeno(1,2,3-cd)pyrene	A	10.0	11.4	1.009933	1.156354		14.5	25
Isophorone	A	10.0	11.3	0.4594838	0.5186893		12.9	25
2-Methylnaphthalene	A	10.0	10.4	0.6248063	0.6520578		4.4	25
1-Methylnaphthalene	A	10.0	10.3	0.5571218	0.5733519		2.9	25
2-Methylphenol	A	10.0	10.3	1.023935	1.058965		3.4	25
4-Methylphenol	A	10.0	10.3	1.088765	1.125351		3.4	25
Naphthalene	A	10.0	9.98	0.9171311	0.9153928		-0.2	25
Nitrobenzene	A	10.0	10.6	0.311404	0.3296143		5.8	25

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Instrument ID: 195
Lab File ID: 10C1207A.D
Sequence: 8120820
Lab Sample ID: 8120820-CCV1

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L08002
Calibration Date: 11/14/08 08:34
Injection Date: 12/07/08
Injection Time: 11:05

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
4-Nitrophenol	A	20.0	19.8	0.1446464	0.1598932	0.05	10.5	40
2-Nitrophenol	Q	10.0	9.93	0.1769972	0.1756756		-0.7	20
N-Nitroso-di-n-propylamine	A	10.0	11.0	0.7046143	0.7840506	0.05	11.3	25
Pentachlorophenol	A	10.0	10.0	0.1499269	0.150492		0.4	20
Phenanthrene	A	10.0	10.6	1.008518	1.066457		5.7	25
Phenol	A	10.0	9.90	1.40364	1.389168		-1.0	20
Pyrene	A	10.0	10.6	1.147758	1.213434		5.7	25
1,2,4,5-Tetrachlorobenzene	A	10.0	9.85	0.5395512	0.5316649		-1.5	25
2,3,4,6-Tetrachlorophenol	A	10.0	10.0	0.2099537	0.210095		0.07	25
1,2,4-Trichlorobenzene	A	10.0	9.59	0.3164405	0.3033981		-4.1	25
2,4,6-Trichlorophenol	A	10.0	10.2	0.337585	0.3441297		1.9	20
2,4,5-Trichlorophenol	A	10.0	10.8	0.3202682	0.3469578		8.3	25

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 195
Calibration: 8L08002
Lab File ID: 10AB1207.D
Calibration Date: 11/14/08 08:34
Sequence: 8120820
Injection Date: 12/07/08
Lab Sample ID: 8120820-CCV2
Injection Time: 11:40

			CONC. (ug/mL)		Response Factor			% Diff. / Drift	
	Analyte	Type	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
✓	Acetophenone	A	10.0	10.1	1.512776	1.468493		-2.9	25
	Aniline	A	10.0	9.55	1.532134	1.463161		-4.5	25
✓	Atrazine	Q	10.0	11.0	0.2086567	0.2291174		9.8	25
✓	Benzaldehyde	Q	10.0	10.1	0.8251861	0.8336617		1.0	25
✓	1,1'-Biphenyl	A	10.0	10.2	1.241927	1.23675		-0.4	25
✓	Caprolactam	Q	10.0	11.3	4.728507E-02	5.202572E-02		13.3	25
✓	4-Chloroaniline	A	10.0	9.24	0.2987972	0.2759458		-7.6	40
✓	3,3'-Dichlorobenzidine	Q	10.0	9.61	0.3393142	0.3262502		-3.9	25
✓	2-Nitroaniline	Q	10.0	10.4	0.2196019	0.2585531		4.2	40
✓	3-Nitroaniline	Q	10.0	9.40	0.1687641	0.1755612		-6.0	40
✓	4-Nitroaniline	Q	10.0	8.20	0.2063866	0.1692076		-18.0	40
✓	N-Nitroso-diphenylamine	A	10.0	10.9	0.5299023	0.5786761		9.2	20
✓	N-Nitroso-di-n-propylamine	A	10.0	10.5	0.7046143	0.7282709	0.05	3.4	25

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INTERNAL STANDARD AREA AND RT SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8120820
Instrument: 195
Matrix: Soil
Calibration: 8L08002

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (8120820-CCV1)			**Lab File ID: 10C1207A.D**			**Analyzed: 12/07/08 11:05**			
1,4-Dichlorobenzene-d4	879609	7.55	576509	7.85	153	50 - 200	-0.3000	+/-0.50	
Naphthalene-d8	3266390	10.27	2103574	10.59	155	50 - 200	-0.3200	+/-0.50	
Acenaphthene-d10	1800150	14.38	1148967	14.7	157	50 - 200	-0.3200	+/-0.50	
Phenanthrene-d10	2630582	17.82	1863437	18.09	141	50 - 200	-0.2700	+/-0.50	
Chrysene-d12	2236800	21.47	1611285	21.66	139	50 - 200	-0.1900	+/-0.50	
Perylene-d12	2360208	23.14	1765509	23.42	134	50 - 200	-0.2800	+/-0.50	
Calibration Check (8120820-CCV2)			**Lab File ID: 10AB1207.D**			**Analyzed: 12/07/08 11:40**			
1,4-Dichlorobenzene-d4	949589	7.55	576509	7.85	165	50 - 200	-0.3000	+/-0.50	
Naphthalene-d8	3530463	10.27	2103574	10.59	168	50 - 200	-0.3200	+/-0.50	
Acenaphthene-d10	1869177	14.37	1148967	14.7	163	50 - 200	-0.3300	+/-0.50	
Phenanthrene-d10	2539685	17.81	1863437	18.09	136	50 - 200	-0.2800	+/-0.50	
Chrysene-d12	2380880	21.46	1611285	21.66	148	50 - 200	-0.2000	+/-0.50	
Perylene-d12	2514691	23.14	1765509	23.42	142	50 - 200	-0.2800	+/-0.50	
13SB22A (0811328-08RE1)			**Lab File ID: 81132808.D**			**Analyzed: 12/07/08 13:58**			
1,4-Dichlorobenzene-d4	786610	7.56	576509	7.85	136	50 - 200	-0.2900	+/-0.50	
Naphthalene-d8	2912332	10.27	2103574	10.59	138	50 - 200	-0.3200	+/-0.50	
Acenaphthene-d10	1657511	14.37	1148967	14.7	144	50 - 200	-0.3300	+/-0.50	
Phenanthrene-d10	2154275	17.83	1863437	18.09	116	50 - 200	-0.2600	+/-0.50	
Chrysene-d12	1748252	21.48	1611285	21.66	109	50 - 200	-0.1800	+/-0.50	
Perylene-d12	1891103	23.16	1765509	23.42	107	50 - 200	-0.2600	+/-0.50	
13SB16A (0811331-04RE1)			**Lab File ID: 81133104.D**			**Analyzed: 12/07/08 15:07**			
1,4-Dichlorobenzene-d4	774305	7.56	576509	7.85	134	50 - 200	-0.2900	+/-0.50	
Naphthalene-d8	2938070	10.27	2103574	10.59	140	50 - 200	-0.3200	+/-0.50	
Acenaphthene-d10	1700773	14.38	1148967	14.7	148	50 - 200	-0.3200	+/-0.50	
Phenanthrene-d10	2357493	17.84	1863437	18.09	127	50 - 200	-0.2500	+/-0.50	
Chrysene-d12	1998067	21.49	1611285	21.66	124	50 - 200	-0.1700	+/-0.50	
Perylene-d12	1937728	23.18	1765509	23.42	110	50 - 200	-0.2400	+/-0.50	

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Lab File ID: dft1203d.D
Injection Date: 12/03/08
Instrument ID: 308
Injection Time: 10:22
Sequence: 8120826
Lab Sample ID: 8120826-TUN1
Calibration: 8L08004

m/z	Ion Abundance Criteria	% Relative Abundance	
51	30 - 60% of 198	30.6	PASS
68	Less than 2% of 69	1.33	PASS
69	Less than 200% of 198	37.7	PASS
70	Less than 2% of 69	1.53	PASS
127	40 - 60% of 198	44.8	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	5.01	PASS
275	10 - 30% of 198	23.6	PASS
365	1.0001 - 200% of 198	3.54	PASS
441	0.0001 - 99.9999% of 443	73.3	PASS
442	40.0001 - 200% of 198	56.3	PASS
443	17 - 23% of 442	17.5	PASS

INITIAL CALIBRATION STANDARDS
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120826

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 308
Calibration: 8L08004

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
8110077	0.5ppm BNA	8120826-CAL1		
8110076	1ppm BNA	8120826-CAL2		
8110075	2ppm BNA	8120826-CAL3		
8110074	5ppm BNA	8120826-CAL4		
8110073	10ppm BNA	8120826-CAL5		
8110072	15ppm BNA	8120826-CAL6		
8110071	20ppm BNA	8120826-CAL7		
8110070	25ppm BNA	8120826-CAL8		
8110774	DFTPP tune std	8120826-TUN1	dft1203d.D	12/03/08 10:22
8110073	10ppm BNA	8120826-CAL5	10c1203.D	12/03/08 11:18
8110077	0.5ppm BNA	8120826-CAL1	05ic1203.D	12/03/08 13:39
8110076	1ppm BNA	8120826-CAL2	1ic1203.D	12/03/08 14:14
8110075	2ppm BNA	8120826-CAL3	2ic1203.D	12/03/08 14:49
8110074	5ppm BNA	8120826-CAL4	5ic1203.D	12/03/08 15:24
8110072	15ppm BNA	8120826-CAL6	15ic1203.D	12/03/08 15:59
8110071	20ppm BNA	8120826-CAL7	20ic1203.D	12/03/08 16:34
8110070	25ppm BNA	8120826-CAL8	25ic1203.D	12/03/08 17:10
8110079	10ppm BNA SCV	8120826-SCV1	scv1bna1203.D	12/03/08 17:45

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MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Lab File ID: dft1104g.D
Instrument ID: 308
Sequence: 8120823
Calibration: 8L08004

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Injection Date: 11/04/08
Injection Time: 10:44
Lab Sample ID: 8120823-TUN1

m/z	Ion Abundance Criteria	% Relative Abundance	
51	30 - 60% of 198	47	PASS
68	Less than 2% of 69	1.53	PASS
69	Less than 200% of 198	42.7	PASS
70	Less than 2% of 69	0	PASS
127	40 - 60% of 198	51.2	PASS
197	Less than 1% of 198	0.904	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.17	PASS
275	10 - 30% of 198	27.6	PASS
365	1.0001 - 200% of 198	3.13	PASS
441	0.0001 - 99.9999% of 443	55.7	PASS
442	40.0001 - 200% of 198	92.8	PASS
443	17 - 23% of 442	19.8	PASS

INITIAL CALIBRATION STANDARDS
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120823

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 308
Calibration: 8L08004

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
8110774	DFTPP tune std	8120823-TUN1	dft1104g.D	11/04/08 10:44
8110089	0.5ppm a.b.e.	8120823-CAL1	05ab1104.D	11/04/08 16:16
8110088	1ppm a.b.e.	8120823-CAL2	1ab1104.D	11/04/08 16:51
8110087	2ppm a.b.e.	8120823-CAL3	2ab1104.D	11/04/08 17:25
8110086	5ppm a.b.e.	8120823-CAL4	5ab1104.D	11/04/08 17:59
8110085	10ppm a.b.e.	8120823-CAL5	10ab1104.D	11/04/08 18:34
8110084	15ppm a.b.e.	8120823-CAL6	15ab1104.D	11/04/08 19:09
8110083	20ppm a.b.e.	8120823-CAL7	20ab1104.D	11/04/08 19:44
8110082	25ppm a.b.e.	8120823-CAL8	25ab1104.D	11/04/08 20:18
8110090	10ppm scv a.b.e.	8120823-SCV1	scvab1104.D	11/04/08 20:53

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INITIAL CALIBRATION DATA (Continued)

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Calibration: 8L08004

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Instrument: 308

Calibration Date: 11/04/08 10:13

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	Limit	Q
Acenaphthene	1.046999	5.092625	14.57375	4.408318E-02			CCC (30)	
Acenaphthylene	1.613635	6.91314	14.14975	3.729037E-02			15	
Acetophenone	1.7605	6.51068	8.581125	0.7291215			15	
Aniline	1.690862	10.32043	7.097625	0.8610926			15	
Anthracene	1.006741	6.205501	18.05875	1.260698E-02			15	
Atrazine	0.193477	7.085402	17.56369	0.3345807			15	
Benzaldehyde	0.5504761	28.81275	6.835125	3.147023E-02		0.9971699	0.99	
Benzidine	0.5296278	13.70881	20.13025	1.191846E-02		0.9996312	0.99	
Benzo(a)anthracene	1.117423	6.50736	21.521	2.253614E-02			15	
Benzo(a)pyrene	0.9220826	7.824243	23.12975	1.018219E-02			CCC (30)	
Benzo(b)fluoranthene	1.075784	8.952417	22.716	1.142704E-02			15	
Benzo(k)fluoranthene	1.118033	5.923719	22.751	2.382296E-02			15	
Benzo(g,h,i)perylene	0.7250428	6.608264	25.32475	3.574858E-02			15	
Benzoic Acid	0.130376	54.07418	9.967	0.9623466		0.9991652	0.99	
Benzyl Alcohol	0.7680736	9.328366	7.9735	8.797337E-02			15	
1,1'-Biphenyl	1.350251	4.977651	13.2515	0.5109558			15	
4-Bromophenyl Phenyl Ether	0.2041599	5.714478	17.047	2.459748E-02			15	
Butyl Benzyl Phthalate	0.7046557	8.658543	20.9555	9.353074E-03			15	
Caprolactam	0.1050481	9.730753	11.41831	0.5396519			15	
Carbazole	0.6789426	12.5151	18.37825	0.022221			15	
4-Chloro-3-methylphenol	0.2472207	9.430168	11.78188	8.088129E-02			CCC (30)	
4-Chloroaniline	0.3234085	6.485176	10.729	2.961708E-02			15	
Bis(2-chloroethoxy)methane	0.316216	8.551247	9.945	5.256934E-02			15	
Bis(2-chloroethyl) Ether	1.138829	9.768509	7.18875	6.284901E-02			15	
Bis(2-chloroisopropyl) Ether	1.55743	7.712308	8.28925	5.083139E-02			15	
2-Chloronaphthalene	1.030716	3.898745	13.1845	4.549759E-02			15	
2-Chlorophenol	1.206983	9.65305	7.252125	9.520009E-02			15	
4-Chlorophenyl Phenyl Ether	0.4925968	6.593953	15.88875	1.635513E-02			15	
Chrysene	1.081973	5.333178	21.56037	2.194852E-02			15	
Dibenz(a,h)anthracene	0.6633091	8.098322	24.87575	2.014256E-02			15	
Dibenzofuran	1.328576	6.435603	14.99588	3.368253E-02			15	
Di-n-butyl Phthalate	1.193273	6.380985	19.06475	1.210022E-02			15	

INITIAL CALIBRATION DATA (Continued)

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Calibration: 8L08004

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Instrument: 308

Calibration Date: 11/04/08 10:13

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	Limit	Q
1,2-Dichlorobenzene	1.383001	8.608454	8.00625	1.329592E-02			15	
1,3-Dichlorobenzene	1.454172	9.563584	7.556625	2.942143E-02			15	
1,4-Dichlorobenzene	1.354188	7.87743	7.70775	3.848221E-02			CCC (30)	
3,3'-Dichlorobenzidine	0.3764328	12.08678	21.58275	1.085579E-02		0.9994281	0.99	
2,4-Dichlorophenol	0.2492971	7.988958	10.0925	5.481542E-02			CCC (30)	
2,6-Dichlorophenol	0.2520665	7.857547	10.60838	0.035699			15	
Diethyl Phthalate	1.080852	9.865984	15.70975	5.510392E-02			15	
2,4-Dimethylphenol	0.2919875	8.578297	9.71275	6.332602E-02			15	
Dimethyl Phthalate	1.005512	6.224376	13.99388	0.0791858			15	
4,6-Dinitro-2-methylphenol	9.530968E-02	52.02888	15.98588	6.084301E-02		0.9991083	0.99	
2,4-Dinitrophenol	7.950802E-02	71.16727	14.7295	0.2975402		0.9987632	SPCC (0.05)	
2,4-Dinitrotoluene	0.2855729	18.50967	15.02625	6.725905E-02		0.9995518	0.99	
2,6-Dinitrotoluene	0.2078692	14.25338	14.08925	0.0608716			15	
Di-n-octyl Phthalate	1.345206	10.80559	22.27	1.441061E-02			CCC (30)	
1,2-Diphenylhydrazine	0.1995267	5.482804	16.25837	4.039694E-02			15	
Bis(2-ethylhexyl) Phthalate	1.202141	9.056263	21.5895	1.657071E-02			15	
Fluoranthene	1.012841	5.672996	19.82925	1.109337E-03			CCC (30)	
Fluorene	1.025039	6.564994	15.81113	0.0319141			15	
Hexachlorobenzene	0.238566	5.955709	17.1	3.122617E-02			15	
Hexachlorobutadiene	0.1766828	7.348283	10.77375	3.097178E-02			CCC (30)	
Hexachlorocyclopentadiene	0.2081824	25.94574	12.44588	2.821084E-02		0.9983861	SPCC (0.05)	
Hexachloroethane	0.5239268	6.56729	8.706875	1.268605E-02			15	
Indeno(1,2,3-cd)pyrene	0.6291569	4.518862	24.84	2.243931E-02		0.9997093	0.99	
Isophorone	0.5478329	8.473567	9.41175	0.1143336			15	
2-Methylnaphthalene	0.6610919	7.733052	12.05575	3.567614E-02			15	
1-Methylnaphthalene	0.5831235	7.365073	12.2775	3.409269E-02			15	
2-Methylphenol	1.143195	8.028062	8.21625	8.060726E-02			15	
4-Methylphenol	1.19092	7.64346	8.55275	0.1103721			15	
Naphthalene	0.9774698	7.84834	10.44075	2.478497E-02			15	
2-Nitroaniline	0.2882291	8.560294	13.52775	0.5192252		0.9991434	0.99	
3-Nitroaniline	0.2150404	9.697941	14.5805	2.872047E-02		0.9994523	0.99	
4-Nitroaniline	0.2150811	11.79087	16.02438	4.918211E-02		0.9992947	0.99	

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INITIAL CALIBRATION DATA (Continued)
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L08004
Instrument: 308
Calibration Date: 11/04/08 10:13

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	Limit	Q
Nitrobenzene	0.3223777	8.068888	8.86325	9.089116E-02			15	
4-Nitrophenol	0.1192421	22.59276	14.91325	7.768312E-02		0.9995861	SPCC (0.05)	
2-Nitrophenol	0.1779458	16.9547	9.557875	4.559897E-02			CCC (30)	
N-Nitroso-dimethylamine	0.5386687	10.06619	3.366875	0.3354042		0.9949467	0.99	
N-Nitroso-diphenylamine	0.6060112	5.74431	16.24262	0.424693			CCC (30)	
N-Nitroso-di-n-propylamine	0.8538626	6.619591	8.611563	0.6925217			SPCC (0.05)	
Pentachlorophenol	0.1356304	26.48369	17.56075	2.654976E-02		0.9990696	CCC (30)	
Phenanthrene	1.068943	5.784589	17.96163	2.837487E-02			15	
Phenol	1.576233	6.012	6.99575	0.1946806			CCC (30)	
Pyrene	1.642276	5.605846	20.116	1.667117E-02			15	
Pyridine	1.013205	9.458838	3.40925	0.4317659		0.9945616	0.99	
1,2,4,5-Tetrachlorobenzene	0.4887533	7.083008	12.44662	3.795023E-02			15	
2,3,4,6-Tetrachlorophenol	0.1738182	13.95349	15.30838	1.542075E-02			15	
1,2,4-Trichlorobenzene	0.292239	8.084785	10.2815	3.299605E-02			15	
2,4,6-Trichlorophenol	0.3077254	9.193281	12.74	3.040575E-02			CCC (30)	
2,4,5-Trichlorophenol	0.3041514	9.781787	12.80625	5.237561E-02			15	
2-Fluorophenol	1.115409	8.356237	5.3035	0.1884849			15	
Phenol-d6	1.352529	6.321862	6.96975	0.183905			15	
Nitrobenzene-d5	0.3039719	5.751761	8.8245	8.727552E-02			15	
2-Fluorobiphenyl	1.156748	4.809761	12.9715	3.713531E-02			15	
2,4,6-Tribromophenol	0.1218008	6.661232	16.37925	3.753796E-02			15	
o-Terphenyl	0.6082756	10.91279	18.682	1.358225E-02			15	

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L08004
Laboratory ID: 8120823-SCV1
Sequence: 8120823
Standard ID: 8110090

Analyte	Expected (ug/mL)	Found (ug/mL)	% Rec.	QC Limit
Acetophenone	10.0	9.21	92	75-125
Aniline	10.0	9.35	94	75-125
Atrazine	10.0	9.38	94	75-125
Benzaldehyde	10.0	9.15	92	75-125
Benzidine	10.0	8.87	89	75-125
1,1'-Biphenyl	10.0	9.10	91	75-125
Caprolactam	10.0	9.12	91	75-125
4-Chloroaniline	10.0	8.91	89	75-125
3,3´-Dichlorobenzidine	10.0	8.91	89	75-125
2-Nitroaniline	10.0	9.29	93	75-125
3-Nitroaniline	10.0	9.11	91	75-125
4-Nitroaniline	10.0	8.81	88	75-125
N-Nitroso-dimethylamine	10.0	10.0	100	75-125
N-Nitroso-diphenylamine	10.0	9.15	92	75-125
N-Nitroso-di-n-propylamine	10.0	9.20	92	75-125
Pyridine	10.0	9.27	93	75-125

* Values outside of QC limits

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L08004
Laboratory ID: 8120826-SCV1
Sequence: 8120826
Standard ID: 8110079

Analyte	Expected (ug/mL)	Found (ug/mL)	% Rec.	QC Limit
Acenaphthene	10.0	9.53	95	75-125
Acenaphthylene	10.0	9.76	98	75-125
Acetophenone	10.0	9.50	95	75-125
Aniline	10.0	10.4	104	75-125
Anthracene	10.0	10.1	101	75-125
Atrazine	10.0	10.2	102	75-125
Benzaldehyde	10.0	10.1	101	75-125
Benzidine	20.0	24.9	125	75-125
Benzo(a)anthracene	10.0	9.87	99	75-125
Benzo(a)pyrene	10.0	10.2	102	75-125
Benzo(b)fluoranthene	10.0	10.8	108	75-125
Benzo(k)fluoranthene	10.0	9.67	97	75-125
Benzo(g,h,i)perylene	10.0	10.2	102	75-125
Benzoic Acid	20.0	19.7	99	75-125
Benzyl Alcohol	10.0	9.89	99	75-125
1,1'-Biphenyl	10.0	9.60	96	75-125
4-Bromophenyl Phenyl Ether	10.0	9.55	96	75-125
Butyl Benzyl Phthalate	10.0	10.2	102	75-125
Caprolactam	10.0	9.61	96	75-125
Carbazole	10.0	8.38	84	75-125
4-Chloro-3-methylphenol	10.0	9.83	98	75-125
Bis(2-chloroethoxy)methane	10.0	9.63	96	75-125
Bis(2-chloroethyl) Ether	10.0	9.37	94	75-125
Bis(2-chloroisopropyl) Ether	10.0	9.30	93	75-125
2-Chloronaphthalene	10.0	9.54	95	75-125
2-Chlorophenol	10.0	9.58	96	75-125
4-Chlorophenyl Phenyl Ether	10.0	9.41	94	75-125

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L08004
Laboratory ID: 8120826-SCV1
Sequence: 8120826
Standard ID: 8110079

Chrysene	10.0	9.86	99	75-125
Dibenz(a,h)anthracene	10.0	10.4	104	75-125
Dibenzofuran	10.0	9.60	96	75-125
Di-n-butyl Phthalate	10.0	9.77	98	75-125
1,2-Dichlorobenzene	10.0	9.43	94	75-125
1,3-Dichlorobenzene	10.0	9.63	96	75-125
1,4-Dichlorobenzene	10.0	9.26	93	75-125
3,3´-Dichlorobenzidine	10.0	9.83	98	75-125
2,4-Dichlorophenol	10.0	9.65	97	75-125
2,6-Dichlorophenol	10.0	9.64	96	75-125
Diethyl Phthalate	10.0	8.87	89	75-125
2,4-Dimethylphenol	10.0	9.81	98	75-125
Dimethyl Phthalate	10.0	9.61	96	75-125
4,6-Dinitro-2-methylphenol	10.0	10.1	101	75-125
2,4-Dinitrophenol	20.0	19.0	95	75-125
2,4-Dinitrotoluene	10.0	9.37	94	75-125
2,6-Dinitrotoluene	10.0	10.4	104	75-125
Di-n-octyl Phthalate	10.0	10.2	102	75-125
1,2-Diphenylhydrazine	10.0	9.76	98	75-125
Bis(2-ethylhexyl) Phthalate	10.0	9.90	99	75-125
Fluoranthene	10.0	10.1	101	75-125
Fluorene	10.0	9.70	97	75-125
Hexachlorobenzene	10.0	9.60	96	75-125
Hexachlorobutadiene	10.0	9.37	94	75-125
Hexachlorocyclopentadiene	10.0	9.94	99	75-125
Hexachloroethane	10.0	9.56	96	75-125
Indeno(1,2,3-cd)pyrene	10.0	10.4	104	75-125
Isophorone	10.0	9.74	97	75-125
2-Methylnaphthalene	10.0	9.44	94	75-125

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L08004
Laboratory ID: 8120826-SCV1
Sequence: 8120826
Standard ID: 8110079

1-Methylnaphthalene	10.0	9.46	95	75-125
2-Methylphenol	10.0	9.62	96	75-125
4-Methylphenol	10.0	9.75	98	75-125
Naphthalene	10.0	9.48	95	75-125
2-Nitroaniline	10.0	10.2	102	75-125
Nitrobenzene	10.0	9.66	97	75-125
4-Nitrophenol	20.0	20.2	101	75-125
2-Nitrophenol	10.0	9.01	90	75-125
N-Nitroso-dimethylamine	10.0	9.52	95	75-125
N-Nitroso-diphenylamine	10.0	9.46	95	75-125
N-Nitroso-di-n-propylamine	10.0	9.61	96	75-125
Pentachlorophenol	10.0	9.83	98	75-125
Phenanthrene	10.0	9.88	99	75-125
Phenol	10.0	9.67	97	75-125
Pyrene	10.0	9.76	98	75-125
Pyridine	10.0	9.61	96	75-125
1,2,4,5-Tetrachlorobenzene	10.0	9.40	94	75-125
2,3,4,6-Tetrachlorophenol	10.0	10.0	100	75-125
1,2,4-Trichlorobenzene	10.0	9.57	96	75-125
2,4,6-Trichlorophenol	10.0	9.97	100	75-125
2,4,5-Trichlorophenol	10.0	10.1	101	75-125
2-Fluorophenol	20.2	19.5	97	75-125
Phenol-d6	20.4	19.5	96	75-125
Nitrobenzene-d5	20.4	19.3	95	75-125
2-Fluorobiphenyl	20.2	18.7	93	75-125
2,4,6-Tribromophenol	20.4	19.1	94	75-125
o-Terphenyl	20.0	18.1	91	75-125

* Values outside of QC limits

816802

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Lab File ID: dft1206b.D
Instrument ID: 308
Sequence: 8120828

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Injection Date: 12/06/08
Injection Time: 14:06
Lab Sample ID: 8120828-TUN1

m/z	Ion Abundance Criteria	% Relative Abundance	
51	30 - 60% of 198	31.9	PASS
68	Less than 2% of 69	1.79	PASS
69	Less than 200% of 198	36.8	PASS
70	Less than 2% of 69	0	PASS
127	40 - 60% of 198	45.7	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.79	PASS
275	10 - 30% of 198	25.6	PASS
365	1.0001 - 200% of 198	3.26	PASS
441	0.0001 - 99.9999% of 443	39.8	PASS
442	40.0001 - 200% of 198	62.4	PASS
443	17 - 23% of 442	20.3	PASS

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120828

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 308
Calibration: 8L08004

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	8120828-TUN1	dft1206b.D	12/06/08 14:06
Calibration Check	8120828-CCV1	10c1206.D	12/06/08 14:26
Calibration Check	8120828-CCV2	10ab1206.D	12/06/08 15:01
Blank	0813821-BLK2	0813821-blk2.D	12/06/08 15:35
LCS	0813821-BS2	0813821-bs2.D	12/06/08 16:10
13SB13A	0811328-01RE2	0811328-01re1.D	12/06/08 17:19
13SB13C	0811328-02RE1	0811328-02re1.D	12/06/08 17:53
13SB21C	0811328-03RE1	0811328-03re1.D	12/06/08 18:28
13SB14A	0811328-04RE1	0811328-04re1.D	12/06/08 19:02
13SB20C	0811328-07RE1	0811328-07re1.D	12/06/08 20:11
13SB22C	0811328-09RE1	0811328-09re1.D	12/06/08 21:20
13SB21A	0811328-10RE1	0811328-10re1.D	12/06/08 21:54
13SB18A	0811328-11RE1	0811328-11re1.D	12/06/08 22:28
13SB18C	0811328-12RE1	0811328-12re1.D	12/06/08 23:02
13SB19A	0811328-14RE1	0811328-14re1.D	12/06/08 23:36
13SB19C	0811328-15RE1	0811328-15re1.D	12/07/08 00:11
13SB17C	0811331-03RE1	0811331-03re1.D	12/07/08 01:19

001883

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Instrument ID: 308
Lab File ID: 10c1206.D
Sequence: 8120828
Lab Sample ID: 8120828-CCV1

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L08004
Calibration Date: 11/04/08 10:13
Injection Date: 12/06/08
Injection Time: 14:26

Only bis(2EH)phth & Di-n-butylphth were reported

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	10.0	10.1	1.046999	1.059938		1.2	20
Acenaphthylene	A	10.0	10.2	1.613635	1.649497		2.2	25
Acetophenone	A	10.0	9.99	1.7605	1.772204		0.7	25
Aniline	A	10.0	10.2	1.690862	1.613932		-4.5	25
Anthracene	A	10.0	10.5	1.006741	1.059164		5.2	25
Atrazine	A	10.0	10.6	0.193477	0.2005163		3.6	25
Benzaldehyde	Q	10.0	9.23	0.5504761	0.6348421		-7.7	25
Benzidine	Q	20.0	15.6	0.5296278	3.954963E-02		-22.0	40
Benzo(a)anthracene	A	10.0	10.3	1.117423	1.150539		3.0	25
Benzo(a)pyrene	A	10.0	11.0	0.9220826	1.015957		10.2	20
Benzo(b)fluoranthene	A	10.0	11.1	1.075784	1.195057		11.1	25
Benzo(k)fluoranthene	A	10.0	10.2	1.118033	1.143249		2.3	25
Benzo(g,h,i)perylene	A	10.0	10.3	0.7250428	0.7490949		3.3	25
Benzoic Acid	Q	20.0	19.8	0.130376	0.1746707		-0.9	40
Benzyl Alcohol	A	10.0	9.79	0.7680736	0.7516076		-2.1	25
1,1'-Biphenyl	A	10.0	9.99	1.350251	1.378433		2.1	25
4-Bromophenyl Phenyl Ether	A	10.0	10.2	0.2041599	0.2090862		2.4	25
Butyl Benzyl Phthalate	A	10.0	10.7	0.7046557	0.754356		7.1	25
Caprolactam	A	10.0	9.44	0.1050481	9.267067E-02		-11.8	25
Carbazole	A	10.0	10.4	0.6789426	0.7109314		4.7	25
4-Chloro-3-methylphenol	A	10.0	10.4	0.2472207	0.2579524		4.3	20
Bis(2-chloroethoxy)methane	A	10.0	9.62	0.316216	0.3040988		-3.8	25
Bis(2-chloroethyl) Ether	A	10.0	8.67	1.138829	0.9869588		-13.3	25
Bis(2-chloroisopropyl) Ether	A	10.0	9.05	1.55743	1.409652		-9.5	25
2-Chloronaphthalene	A	10.0	10.1	1.030716	1.041355		1.0	25
2-Chlorophenol	A	10.0	9.65	1.206983	1.164333		-3.5	25
4-Chlorophenyl Phenyl Ether	A	10.0	10.4	0.4925968	0.5102933		3.6	25
Chrysene	A	10.0	9.99	1.081973	1.081228		-0.07	25
Dibenz(a,h)anthracene	A	10.0	9.84	0.6633091	0.6530105		-1.6	25

001678

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Instrument ID: 308
Lab File ID: 10c1206.D
Sequence: 8120828
Lab Sample ID: 8120828-CCV1

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L08004
Calibration Date: 11/04/08 10:13
Injection Date: 12/06/08
Injection Time: 14:26

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Dibenzofuran	A	10.0	10.2	1.328576	1.34841		1.5	25
Di-n-butyl Phthalate	A	10.0	10.5	1.193273	1.249388		4.7	25
1,2-Dichlorobenzene	A	10.0	9.91	1.383001	1.370897		-0.9	25
1,3-Dichlorobenzene	A	10.0	10.1	1.454172	1.462263		0.6	25
1,4-Dichlorobenzene	A	10.0	9.81	1.354188	1.328537		-1.9	20
3,3´-Dichlorobenzidine	Q	10.0	10.1	0.3764328	0.2577858		0.6	25
2,4-Dichlorophenol	A	10.0	9.94	0.2492971	0.2477735		-0.6	20
2,6-Dichlorophenol	A	10.0	10.1	0.2520665	0.2534907		0.6	25
Diethyl Phthalate	A	10.0	9.75	1.080852	1.053601		-2.5	25
2,4-Dimethylphenol	A	10.0	10.5	0.2919875	0.3059405		4.8	25
Dimethyl Phthalate	A	10.0	10.3	1.005512	1.035586		3.0	25
4,6-Dinitro-2-methylphenol	Q	10.0	10.6	9.530968E-02	0.1332923		5.8	25
2,4-Dinitrophenol	Q	20.0	19.4	7.950802E-02	0.1076632	0.05	-3.0	40
2,4-Dinitrotoluene	Q	10.0	9.89	0.2855729	0.3134406		-1.1	25
2,6-Dinitrotoluene	A	10.0	11.1	0.2078692	0.2299548		10.6	25
Di-n-octyl Phthalate	A	10.0	10.8	1.345206	1.455944		8.2	20
1,2-Diphenylhydrazine	A	10.0	10.3	0.1995267	0.2054161		3.0	25
Bis(2-ethylhexyl) Phthalate	A	10.0	8.92	1.202141	1.071825		-10.8	25
Fluoranthene	A	10.0	10.4	1.012841	1.051009		3.8	20
Fluorene	A	10.0	10.5	1.025039	1.075635		4.9	25
Hexachlorobenzene	A	10.0	10.1	0.238566	0.2409604		1.0	25
Hexachlorobutadiene	A	10.0	10.3	0.1766828	0.1817923		2.9	20
Hexachlorocyclopentadiene	Q	10.0	10.3	0.2081824	0.2413601	0.05	3.0	40
Hexachloroethane	A	10.0	10.2	0.5239268	0.5335817		1.8	25
Indeno(1,2,3-cd)pyrene	Q	10.0	10.3	0.6291569	0.6207846		2.6	25
Isophorone	A	10.0	10.1	0.5478329	0.5553646		1.4	25
2-Methylnaphthalene	A	10.0	9.90	0.6610919	0.6542317		-1.0	25
2-Methylphenol	A	10.0	9.82	1.143195	1.122385		-1.8	25
4-Methylphenol	A	10.0	9.68	1.19092	1.153232		-3.2	25

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Instrument ID: 308
Lab File ID: 10c1206.D
Sequence: 8120828
Lab Sample ID: 8120828-CCV1

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L08004
Calibration Date: 11/04/08 10:13
Injection Date: 12/06/08
Injection Time: 14:26

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Naphthalene	A	10.0	9.80	0.9774698	0.9579845		-2.0	25
2-Nitroaniline	Q	10.0	10.3	0.2882291	0.2951483		2.9	40
Nitrobenzene	A	10.0	10.1	0.3223777	0.3269663		1.4	25
4-Nitrophenol	Q	20.0	19.0	0.1192421	0.1310895	0.05	-5.2	40
2-Nitrophenol	A	10.0	9.16	0.1779458	0.1792541		0.7	20
N-Nitroso-dimethylamine	Q	10.0	10.0	0.5386687	0.5391665		0.1	25
N-Nitroso-diphenylamine	A	10.0	10.0	0.6060112	0.5992506		-1.1	20
N-Nitroso-di-n-propylamine	A	10.0	9.98	0.8538626	0.8287216	0.05	-2.9	25
Pentachlorophenol	Q	10.0	11.3	0.1356304	0.1801229		12.9	20
Phenanthrene	A	10.0	10.5	1.068943	1.117767		4.6	25
Phenol	A	10.0	9.61	1.576233	1.514368		-3.9	20
Pyrene	A	10.0	10.1	1.642276	1.658525		1.0	25
Pyridine	Q	10.0	9.35	1.013205	0.94729		-6.5	25
1,2,4,5-Tetrachlorobenzene	A	10.0	9.81	0.4887533	0.4796377		-1.9	25
2,3,4,6-Tetrachlorophenol	A	10.0	10.3	0.1738182	0.1790169		3.0	25
1,2,4-Trichlorobenzene	A	10.0	9.98	0.292239	0.2915237		-0.2	25
2,4,6-Trichlorophenol	A	10.0	10.3	0.3077254	0.3170089		3.0	20
2,4,5-Trichlorophenol	A	10.0	10.2	0.3041514	0.3103054		2.0	25

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 308
Calibration: 8L08004
Lab File ID: 10ab1206.D
Calibration Date: 11/04/08 10:13
Sequence: 8120828
Injection Date: 12/06/08
Lab Sample ID: 8120828-CCV2
Injection Time: 15:01

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acetophenone	A	10.0	9.18	1.7605	1.603305		-8.9	25
Aniline	A	10.0	8.68	1.690862	1.568775		-7.2	25
Atrazine	A	10.0	10.9	0.193477	0.215081		11.2	25
Benzaldehyde	Q	10.0	8.46	0.5504761	0.8482472		-15.4	25
Benzidine	Q	10.0	7.48	0.5296278	0.3960783		-25.2	40
1,1'-Biphenyl	A	10.0	9.72	1.350251	1.284797		-4.8	25
4-Chloroaniline	A	10.0	9.11	0.3234085	0.2945697		-8.9	40
3,3´-Dichlorobenzidine	Q	10.0	8.47	0.3764328	0.3187089		-15.3	25
2-Nitroaniline	Q	10.0	8.55	0.2882291	0.2474156		-14.5	40
3-Nitroaniline	Q	10.0	7.47	0.2150404	0.1607377		-25.3	40
4-Nitroaniline	Q	10.0	7.06	0.2150811	0.151813		-29.4	40
N-Nitroso-diphenylamine	A	10.0	9.22	0.6060112	0.5677574		-6.3	20
N-Nitroso-di-n-propylamine	A	10.0	8.77	0.8538626	0.7692203	0.05	-9.9	25

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INTERNAL STANDARD AREA AND RT SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8120828
Instrument: 308
Matrix: Soil
Calibration: 8L08004

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (8120828-CCV1)			**Lab File ID: 10c1206.D**			**Analyzed: 12/06/08 14:26**			
1,4-Dichlorobenzene-d4	116477	7.675	89832	7.675	130	50 - 200	0.0000	+/-0.50	
Naphthalene-d8	458009	10.391	358337	10.397	128	50 - 200	-0.0060	+/-0.50	
Acenaphthene-d10	256283	14.494	202249	14.5	127	50 - 200	-0.0060	+/-0.50	
Phenanthrene-d10	344401	17.916	271682	17.916	127	50 - 200	0.0000	+/-0.50	
Chrysene-d12	217801	21.529	164712	21.535	132	50 - 200	-0.0060	+/-0.50	
Perylene-d12	166005	23.202	125756	23.202	132	50 - 200	0.0000	+/-0.50	
Calibration Check (8120828-CCV2)			**Lab File ID: 10ab1206.D**			**Analyzed: 12/06/08 15:01**			
1,4-Dichlorobenzene-d4	132360	7.669	89832	7.675	147	50 - 200	-0.0060	+/-0.50	
Naphthalene-d8	529749	10.385	358337	10.397	148	50 - 200	-0.0120	+/-0.50	
Acenaphthene-d10	272111	14.489	202249	14.5	135	50 - 200	-0.0110	+/-0.50	
Phenanthrene-d10	343173	17.91	271682	17.916	126	50 - 200	-0.0060	+/-0.50	
Chrysene-d12	219906	21.53	164712	21.535	134	50 - 200	-0.0050	+/-0.50	
Perylene-d12	181123	23.202	125756	23.202	144	50 - 200	0.0000	+/-0.50	
Blank (0813821-BLK2)			**Lab File ID: 0813821-blk2.D**			**Analyzed: 12/06/08 15:35**			
1,4-Dichlorobenzene-d4	136810	7.681	89832	7.675	152	50 - 200	0.0060	+/-0.50	
Naphthalene-d8	542476	10.385	358337	10.397	151	50 - 200	-0.0120	+/-0.50	
Acenaphthene-d10	308215	14.489	202249	14.5	152	50 - 200	-0.0110	+/-0.50	
Phenanthrene-d10	372327	17.91	271682	17.916	137	50 - 200	-0.0060	+/-0.50	
Chrysene-d12	224891	21.53	164712	21.535	137	50 - 200	-0.0050	+/-0.50	
Perylene-d12	185310	23.202	125756	23.202	147	50 - 200	0.0000	+/-0.50	
LCS (0813821-BS2)			**Lab File ID: 0813821-bs2.D**			**Analyzed: 12/06/08 16:10**			
1,4-Dichlorobenzene-d4	123906	7.681	89832	7.675	138	50 - 200	0.0060	+/-0.50	
Naphthalene-d8	511690	10.391	358337	10.397	143	50 - 200	-0.0060	+/-0.50	
Acenaphthene-d10	300772	14.494	202249	14.5	149	50 - 200	-0.0060	+/-0.50	
Phenanthrene-d10	384546	17.916	271682	17.916	142	50 - 200	0.0000	+/-0.50	
Chrysene-d12	242092	21.53	164712	21.535	147	50 - 200	-0.0050	+/-0.50	
Perylene-d12	203783	23.202	125756	23.202	162	50 - 200	0.0000	+/-0.50	
13SB13A (0811328-01RE2)			**Lab File ID: 0811328-01re1.D**			**Analyzed: 12/06/08 17:19**			
1,4-Dichlorobenzene-d4	98337	7.681	89832	7.675	109	50 - 200	0.0060	+/-0.50	
Naphthalene-d8	395029	10.385	358337	10.397	110	50 - 200	-0.0120	+/-0.50	
Acenaphthene-d10	212226	14.489	202249	14.5	105	50 - 200	-0.0110	+/-0.50	
Phenanthrene-d10	233868	17.916	271682	17.916	86	50 - 200	0.0000	+/-0.50	
Chrysene-d12	90846	21.53	164712	21.535	55	50 - 200	-0.0050	+/-0.50	
Perylene-d12	68756	23.202	125756	23.202	55	50 - 200	0.0000	+/-0.50	

000281

INTERNAL STANDARD AREA AND RT SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8120828
Instrument: 308
Matrix: Soil
Calibration: 8L08004

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
13SB13C (0811328-02RE1)			**Lab File ID: 0811328-02re1.D**			**Analyzed: 12/06/08 17:53**			
1,4-Dichlorobenzene-d4	103921	7.681	89832	7.675	116	50 - 200	0.0060	+/-0.50	
Naphthalene-d8	414718	10.385	358337	10.397	116	50 - 200	-0.0120	+/-0.50	
Acenaphthene-d10	225723	14.489	202249	14.5	112	50 - 200	-0.0110	+/-0.50	
Phenanthrene-d10	258633	17.916	271682	17.916	95	50 - 200	0.0000	+/-0.50	
Chrysene-d12	115332	21.53	164712	21.535	70	50 - 200	-0.0050	+/-0.50	
Perylene-d12	94455	23.202	125756	23.202	75	50 - 200	0.0000	+/-0.50	
13SB21C (0811328-03RE1)			**Lab File ID: 0811328-03re1.D**			**Analyzed: 12/06/08 18:28**			
1,4-Dichlorobenzene-d4	115346	7.681	89832	7.675	128	50 - 200	0.0060	+/-0.50	
Naphthalene-d8	468193	10.385	358337	10.397	131	50 - 200	-0.0120	+/-0.50	
Acenaphthene-d10	261828	14.489	202249	14.5	129	50 - 200	-0.0110	+/-0.50	
Phenanthrene-d10	326918	17.916	271682	17.916	120	50 - 200	0.0000	+/-0.50	
Chrysene-d12	187389	21.53	164712	21.535	114	50 - 200	-0.0050	+/-0.50	
Perylene-d12	150340	23.203	125756	23.202	120	50 - 200	0.0010	+/-0.50	
13SB14A (0811328-04RE1)			**Lab File ID: 0811328-04re1.D**			**Analyzed: 12/06/08 19:02**			
1,4-Dichlorobenzene-d4	96571	7.681	89832	7.675	108	50 - 200	0.0060	+/-0.50	
Naphthalene-d8	386689	10.385	358337	10.397	108	50 - 200	-0.0120	+/-0.50	
Acenaphthene-d10	213193	14.489	202249	14.5	105	50 - 200	-0.0110	+/-0.50	
Phenanthrene-d10	224569	17.916	271682	17.916	83	50 - 200	0.0000	+/-0.50	
Chrysene-d12	92193	21.53	164712	21.535	56	50 - 200	-0.0050	+/-0.50	
Perylene-d12	72972	23.202	125756	23.202	58	50 - 200	0.0000	+/-0.50	
13SB20C (0811328-07RE1)			**Lab File ID: 0811328-07re1.D**			**Analyzed: 12/06/08 20:11**			
1,4-Dichlorobenzene-d4	101279	7.681	89832	7.675	113	50 - 200	0.0060	+/-0.50	
Naphthalene-d8	415768	10.391	358337	10.397	116	50 - 200	-0.0060	+/-0.50	
Acenaphthene-d10	222079	14.494	202249	14.5	110	50 - 200	-0.0060	+/-0.50	
Phenanthrene-d10	255490	17.916	271682	17.916	94	50 - 200	0.0000	+/-0.50	
Chrysene-d12	118587	21.53	164712	21.535	72	50 - 200	-0.0050	+/-0.50	
Perylene-d12	93814	23.208	125756	23.202	75	50 - 200	0.0060	+/-0.50	
13SB22C (0811328-09RE1)			**Lab File ID: 0811328-09re1.D**			**Analyzed: 12/06/08 21:20**			
1,4-Dichlorobenzene-d4	97294	7.681	89832	7.675	108	50 - 200	0.0060	+/-0.50	
Naphthalene-d8	389942	10.391	358337	10.397	109	50 - 200	-0.0060	+/-0.50	
Acenaphthene-d10	210486	14.494	202249	14.5	104	50 - 200	-0.0060	+/-0.50	
Phenanthrene-d10	235492	17.916	271682	17.916	87	50 - 200	0.0000	+/-0.50	
Chrysene-d12	104094	21.535	164712	21.535	63	50 - 200	0.0000	+/-0.50	
Perylene-d12	73974	23.214	125756	23.202	59	50 - 200	0.0120	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8120828
Instrument: 308
Matrix: Soil
Calibration: 8L08004

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
13SB21A (0811328-10RE1)			**Lab File ID: 0811328-10re1.D**			**Analyzed: 12/06/08 21:54**			
1,4-Dichlorobenzene-d4	99729	7.686	89832	7.675	111	50 - 200	0.0110	+/-0.50	
Naphthalene-d8	402270	10.391	358337	10.397	112	50 - 200	-0.0060	+/-0.50	
Acenaphthene-d10	227669	14.494	202249	14.5	113	50 - 200	-0.0060	+/-0.50	
Phenanthrene-d10	270340	17.922	271682	17.916	100	50 - 200	0.0060	+/-0.50	
Chrysene-d12	130392	21.535	164712	21.535	79	50 - 200	0.0000	+/-0.50	
Perylene-d12	104596	23.208	125756	23.202	83	50 - 200	0.0060	+/-0.50	
13SB18A (0811328-11RE1)			**Lab File ID: 0811328-11re1.D**			**Analyzed: 12/06/08 22:28**			
1,4-Dichlorobenzene-d4	97310	7.687	89832	7.675	108	50 - 200	0.0120	+/-0.50	
Naphthalene-d8	401759	10.397	358337	10.397	112	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	221873	14.494	202249	14.5	110	50 - 200	-0.0060	+/-0.50	
Phenanthrene-d10	265648	17.922	271682	17.916	98	50 - 200	0.0060	+/-0.50	
Chrysene-d12	133265	21.535	164712	21.535	81	50 - 200	0.0000	+/-0.50	
Perylene-d12	106263	23.208	125756	23.202	84	50 - 200	0.0060	+/-0.50	
13SB18C (0811328-12RE1)			**Lab File ID: 0811328-12re1.D**			**Analyzed: 12/06/08 23:02**			
1,4-Dichlorobenzene-d4	96605	7.687	89832	7.675	108	50 - 200	0.0120	+/-0.50	
Naphthalene-d8	379928	10.397	358337	10.397	106	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	213042	14.495	202249	14.5	105	50 - 200	-0.0050	+/-0.50	
Phenanthrene-d10	244795	17.922	271682	17.916	90	50 - 200	0.0060	+/-0.50	
Chrysene-d12	115203	21.536	164712	21.535	70	50 - 200	0.0010	+/-0.50	
Perylene-d12	90507	23.214	125756	23.202	72	50 - 200	0.0120	+/-0.50	
13SB19A (0811328-14RE1)			**Lab File ID: 0811328-14re1.D**			**Analyzed: 12/06/08 23:36**			
1,4-Dichlorobenzene-d4	99140	7.686	89832	7.675	110	50 - 200	0.0110	+/-0.50	
Naphthalene-d8	389038	10.391	358337	10.397	109	50 - 200	-0.0060	+/-0.50	
Acenaphthene-d10	218093	14.494	202249	14.5	108	50 - 200	-0.0060	+/-0.50	
Phenanthrene-d10	257400	17.922	271682	17.916	95	50 - 200	0.0060	+/-0.50	
Chrysene-d12	103260	21.535	164712	21.535	63	50 - 200	0.0000	+/-0.50	
Perylene-d12	77091	23.214	125756	23.202	61	50 - 200	0.0120	+/-0.50	
13SB19C (0811328-15RE1)			**Lab File ID: 0811328-15re1.D**			**Analyzed: 12/07/08 00:11**			
1,4-Dichlorobenzene-d4	101402	7.687	89832	7.675	113	50 - 200	0.0120	+/-0.50	
Naphthalene-d8	402155	10.397	358337	10.397	112	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	220180	14.495	202249	14.5	109	50 - 200	-0.0050	+/-0.50	
Phenanthrene-d10	250769	17.922	271682	17.916	92	50 - 200	0.0060	+/-0.50	
Chrysene-d12	96499	21.535	164712	21.535	59	50 - 200	0.0000	+/-0.50	
Perylene-d12	72160	23.214	125756	23.202	57	50 - 200	0.0120	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8120828
Instrument: 308
Matrix: Soil
Calibration: 8L08004

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
13SB17C (0811331-03RE1)			**Lab File ID: 0811331-03re1.D**			**Analyzed: 12/07/08 01:19**			
1,4-Dichlorobenzene-d4	103858	7.687	89832	7.675	116	50 - 200	0.0120	+/-0.50	
Naphthalene-d8	411677	10.397	358337	10.397	115	50 - 200	0.0000	+/-0.50	
Acenaphthene-d10	228158	14.5	202249	14.5	113	50 - 200	0.0000	+/-0.50	
Phenanthrene-d10	245183	17.928	271682	17.916	90	50 - 200	0.0120	+/-0.50	
Chrysene-d12	93773	21.541	164712	21.535	57	50 - 200	0.0060	+/-0.50	
Perylene-d12	68581	23.22	125756	23.202	55	50 - 200	0.0180	+/-0.50	

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Lab File ID: dft1208f.D
Instrument ID: 308
Sequence: 8120947

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Injection Date: 12/08/08
Injection Time: 08:08
Lab Sample ID: 8120947-TUN1

m/z	Ion Abundance Criteria	% Relative Abundance	
51	30 - 60% of 198	30.2	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	36.2	PASS
70	Less than 2% of 69	0	PASS
127	40 - 60% of 198	49	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	7.67	PASS
275	10 - 30% of 198	25.6	PASS
365	1.0001 - 200% of 198	1.85	PASS
441	0.0001 - 99.9999% of 443	81.4	PASS
442	40.0001 - 200% of 198	60.3	PASS
443	17 - 23% of 442	20.3	PASS

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 308
Calibration: 8L08004
Lab File ID: 10c1208.D
Calibration Date: 11/04/08 10:13
Sequence: 8120947
Injection Date: 12/08/08
Lab Sample ID: 8120947-CCV1
Injection Time: 08:29

Only bis(2-ethylhexyl)phth & Di-n-butyl phth were reported

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	10.0	10.2	1.046999	1.065508		1.8	20
Acenaphthylene	A	10.0	10.1	1.613635	1.624371		0.7	25
Acetophenone	A	10.0	9.50	1.7605	1.684921		-4.3	25
Aniline	A	10.0	8.53	1.690862	1.342618		-20.6 N/A	25
Anthracene	A	10.0	10.6	1.006741	1.069651		6.2	25
Atrazine	A	10.0	9.84	0.193477	0.1863478		-3.7	25
Benzaldehyde	Q	10.0	8.46	0.5504761	0.5827072		-15.4	25
Benzidine	Q	20.0	18.2	0.5296278	0.1027616		-9.2	40
Benzo(a)anthracene	A	10.0	10.6	1.117423	1.18089		5.7	25
Benzo(a)pyrene	A	10.0	11.0	0.9220826	1.012304		9.8	20
Benzo(b)fluoranthene	A	10.0	10.6	1.075784	1.135176		5.5	25
Benzo(k)fluoranthene	A	10.0	9.63	1.118033	1.076182		-3.7	25
Benzo(g,h,i)perylene	A	10.0	12.0	0.7250428	0.8691173		19.9	25
Benzoic Acid	Q	20.0	13.6	0.130376	0.1148865		-31.8 N/A	40
Benzyl Alcohol	A	10.0	8.30	0.7680736	0.6374238		-17.0	25
1,1'-Biphenyl	A	10.0	10.1	1.350251	1.391531		3.1	25
4-Bromophenyl Phenyl Ether	A	10.0	10.3	0.2041599	0.2108099		3.3	25
Butyl Benzyl Phthalate	A	10.0	9.29	0.7046557	0.6545935		-7.1	25
Caprolactam	A	10.0	8.14	0.1050481	7.994142E-02		-23.9	25
Carbazole	A	10.0	9.81	0.6789426	0.6780171		-0.1	25
4-Chloro-3-methylphenol	A	10.0	9.98	0.2472207	0.2467901		-0.2	20
Bis(2-chloroethoxy)methane	A	10.0	9.27	0.316216	0.2930986		-7.3	25
Bis(2-chloroethyl) Ether	A	10.0	9.56	1.138829	1.08818		-4.4	25
Bis(2-chloroisopropyl) Ether	A	10.0	8.09	1.55743	1.259286		-19.1	25
2-Chloronaphthalene	A	10.0	9.99	1.030716	1.029864		-0.08	25
2-Chlorophenol	A	10.0	9.74	1.206983	1.175766		-2.6	25
4-Chlorophenyl Phenyl Ether	A	10.0	10.5	0.4925968	0.5166934		4.9	25
Chrysene	A	10.0	10.1	1.081973	1.096038		1.3	25
Dibenz(a,h)anthracene	A	10.0	11.9	0.6633091	0.7891703		19.0	25

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 308
Calibration: 8L08004
Lab File ID: 10c1208.D
Calibration Date: 11/04/08 10:13
Sequence: 8120947
Injection Date: 12/08/08
Lab Sample ID: 8120947-CCV1
Injection Time: 08:29

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Dibenzofuran	A	10.0	10.5	1.328576	1.395016		5.0	25
Di-n-butyl Phthalate	A	10.0	10.0	1.193273	1.199437		0.5	25
1,2-Dichlorobenzene	A	10.0	9.87	1.383001	1.365354		-1.3	25
1,3-Dichlorobenzene	A	10.0	9.90	1.454172	1.439968		-1.0	25
1,4-Dichlorobenzene	A	10.0	9.92	1.354188	1.342792		-0.8	20
2,4-Dichlorophenol	A	10.0	10.0	0.2492971	0.2495996		0.1	20
2,6-Dichlorophenol	A	10.0	10.1	0.2520665	0.2552726		1.3	25
Diethyl Phthalate	A	10.0	9.99	1.080852	1.079285		-0.1	25
2,4-Dimethylphenol	A	10.0	10.6	0.2919875	0.3088094		5.8	25
Dimethyl Phthalate	A	10.0	10.2	1.005512	1.020272		1.5	25
4,6-Dinitro-2-methylphenol	Q	10.0	9.11	9.530968E-02	0.112315		-8.9	25
2,4-Dinitrophenol	Q	20.0	18.1	7.950802E-02	9.923607E-02	0.05	-9.3	40
2,4-Dinitrotoluene	Q	10.0	10.9	0.2855729	0.3457649		8.7	25
2,6-Dinitrotoluene	A	10.0	11.0	0.2078692	0.2281727		9.8	25
Di-n-octyl Phthalate	A	10.0	10.2	1.345206	1.376727		2.3	20
1,2-Diphenylhydrazine	A	10.0	10.2	0.1995267	0.2039828		2.2	25
Bis(2-ethylhexyl) Phthalate	A	10.0	8.29	1.202141	0.9965973		-17.1	25
Fluoranthene	A	10.0	10.5	1.012841	1.067632		5.4	20
Fluorene	A	10.0	10.6	1.025039	1.083127		5.7	25
Hexachlorobenzene	A	10.0	10.1	0.238566	0.2399018		0.6	25
Hexachlorobutadiene	A	10.0	11.0	0.1766828	0.1950189		10.4	20
Hexachlorocyclopentadiene	Q	10.0	9.06	0.2081824	0.2091734	0.05	-9.4	40
Hexachloroethane	A	10.0	9.65	0.5239268	0.5053602		-3.5	25
Indeno(1,2,3-cd)pyrene	Q	10.0	10.5	0.6291569	0.8029033		5.1	25
Isophorone	A	10.0	9.34	0.5478329	0.5116548		-6.6	25
2-Methylnaphthalene	A	10.0	9.63	0.6610919	0.6368511		-3.7	25
1-Methylnaphthalene	A	10.0	9.94	0.5831235	0.5793664		-0.6	25
2-Methylphenol	A	10.0	9.34	1.143195	1.067869		-6.6	25
4-Methylphenol	A	10.0	7.78	1.19092	0.9271174		-22.2	25

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CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 308
Calibration: 8L08004
Lab File ID: 10c1208.D
Calibration Date: 11/04/08 10:13
Sequence: 8120947
Injection Date: 12/08/08
Lab Sample ID: 8120947-CCV1
Injection Time: 08:29

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Naphthalene	A	10.0	9.76	0.9774698	0.9536529		-2.4	25
2-Nitroaniline	Q	10.0	10.2	0.2882291	0.2937915		2.4	40
Nitrobenzene	A	10.0	9.48	0.3223777	0.3056719		-5.2	25
4-Nitrophenol	Q	20.0	16.8	0.1192421	0.1158601	0.05	-15.8	40
2-Nitrophenol	A	10.0	8.67	0.1779458	0.1690272		-5.0	20
N-Nitroso-dimethylamine	Q	10.0	9.38	0.5386687	0.5053828		-6.2	25
N-Nitroso-diphenylamine	A	10.0	9.71	0.6060112	0.5789673		-4.5	20
N-Nitroso-di-n-propylamine	A	10.0	8.81	0.8538626	0.7317925	0.05	-14.3	25
Pentachlorophenol	Q	10.0	9.82	0.1356304	0.155995		-1.8	20
Phenanthrene	A	10.0	10.5	1.068943	1.120259		4.8	25
Phenol	A	10.0	8.55	1.576233	1.346962		-14.5	20
Pyrene	A	10.0	8.79	1.642276	1.443413		-12.1	25
1,2,4,5-Tetrachlorobenzene	A	10.0	10.4	0.4887533	0.5074416		3.8	25
2,3,4,6-Tetrachlorophenol	A	10.0	8.28	0.1738182	0.1439985		-17.2	25
1,2,4-Trichlorobenzene	A	10.0	10.0	0.292239	0.2923653		0.04	25
2,4,6-Trichlorophenol	A	10.0	9.68	0.3077254	0.2979631		-3.2	20
2,4,5-Trichlorophenol	A	10.0	9.25	0.3041514	0.2814396		-7.5	25

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Instrument ID: 308
Lab File ID: 10ab1208.D
Sequence: 8120947
Lab Sample ID: 8120947-CCV2

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L08004
Calibration Date: 11/04/08 10:13
Injection Date: 12/08/08
Injection Time: 09:03

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acetophenone	A	10.0	8.53	1.7605	1.489885		-15.4	25
Aniline	A	10.0	7.82	1.690862	1.413088		-16.4	25
Atrazine	A	10.0	10.9	0.193477	0.2160781		11.7	25
Benzaldehyde	Q	10.0	7.58	0.5504761	0.7595158		-24.2	25
Benzidine	Q	10.0	7.91	0.5296278	0.4190142		-20.9	40
1,1'-Biphenyl	A	10.0	9.80	1.350251	1.295237		-4.1	25
4-Chloroaniline	A	10.0	9.33	0.3234085	0.3016066		-6.7	40
3,3'-Dichlorobenzidine	Q	10.0	9.82	0.3764328	0.3696231		-1.8	25
2-Nitroaniline	Q	10.0	10.1	0.2882291	0.2916797		0.7	40
3-Nitroaniline	Q	10.0	9.56	0.2150404	0.205658		-4.4	40
4-Nitroaniline	Q	10.0	8.20	0.2150811	0.1763852		-18.0	40
N-Nitroso-diphenylamine	A	10.0	9.46	0.6060112	0.5828498		-3.8	20
N-Nitroso-di-n-propylamine	A	10.0	7.71	0.8538626	0.6767575	0.05	-20.7	25

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk
* Values outside of QC limits

seek std passes

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120947

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 308
Calibration: 8L08004

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	8120947-TUN1	dft1208f.D	12/08/08 08:08
Calibration Check	8120947-CCV1	10c1208.D	12/08/08 08:29
Calibration Check	8120947-CCV2	10ab1208.D	12/08/08 09:03
13SB20A	0811328-06RE1	0811328-06re1.D	12/08/08 11:55
13SB17A	0811331-02RE1	0811331-02re1.D	12/08/08 12:30

INTERNAL STANDARD AREA AND RT SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120947
Matrix: Soil

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 308
Calibration: 8L08004

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (8120947-CCV1)			**Lab File ID: 10c1208.D**			**Analyzed: 12/08/08 08:29**			
1,4-Dichlorobenzene-d4	66415	7.542	89832	7.675	74	50 - 200	-0.1330	+/-0.50	
Naphthalene-d8	259121	10.258	358337	10.397	72	50 - 200	-0.1390	+/-0.50	
Acenaphthene-d10	144189	14.361	202249	14.5	71	50 - 200	-0.1390	+/-0.50	
Phenanthrene-d10	201843	17.8	271682	17.916	74	50 - 200	-0.1160	+/-0.50	
Chrysene-d12	152377	21.449	164712	21.535	93	50 - 200	-0.0860	+/-0.50	
Perylene-d12	146616	23.087	125756	23.202	117	50 - 200	-0.1150	+/-0.50	
Calibration Check (8120947-CCV2)			**Lab File ID: 10ab1208.D**			**Analyzed: 12/08/08 09:03**			
1,4-Dichlorobenzene-d4	74639	7.547	89832	7.675	83	50 - 200	-0.1280	+/-0.50	
Naphthalene-d8	286504	10.258	358337	10.397	80	50 - 200	-0.1390	+/-0.50	
Acenaphthene-d10	153624	14.355	202249	14.5	76	50 - 200	-0.1450	+/-0.50	
Phenanthrene-d10	202487	17.8	271682	17.916	75	50 - 200	-0.1160	+/-0.50	
Chrysene-d12	179587	21.449	164712	21.535	109	50 - 200	-0.0860	+/-0.50	
Perylene-d12	179414	23.087	125756	23.202	143	50 - 200	-0.1150	+/-0.50	
13SB20A (0811328-06RE1)			**Lab File ID: 0811328-06re1.D**			**Analyzed: 12/08/08 11:55**			
1,4-Dichlorobenzene-d4	61899	7.553	89832	7.675	69	50 - 200	-0.1220	+/-0.50	
Naphthalene-d8	235973	10.258	358337	10.397	66	50 - 200	-0.1390	+/-0.50	
Acenaphthene-d10	124473	14.355	202249	14.5	62	50 - 200	-0.1450	+/-0.50	
Phenanthrene-d10	134307	17.8	271682	17.916	49	50 - 200	-0.1160	+/-0.50	*
Chrysene-d12	52433	21.449	164712	21.535	32	50 - 200	-0.0860	+/-0.50	*
Perylene-d12	47384	23.092	125756	23.202	38	50 - 200	-0.1100	+/-0.50	*
13SB17A (0811331-02RE1)			**Lab File ID: 0811331-02re1.D**			**Analyzed: 12/08/08 12:30**			
1,4-Dichlorobenzene-d4	56603	7.553	89832	7.675	63	50 - 200	-0.1220	+/-0.50	
Naphthalene-d8	219870	10.258	358337	10.397	61	50 - 200	-0.1390	+/-0.50	
Acenaphthene-d10	120856	14.355	202249	14.5	60	50 - 200	-0.1450	+/-0.50	
Phenanthrene-d10	141456	17.806	271682	17.916	52	50 - 200	-0.1100	+/-0.50	
Chrysene-d12	53535	21.449	164712	21.535	33	50 - 200	-0.0860	+/-0.50	*
Perylene-d12	42780	23.092	125756	23.202	34	50 - 200	-0.1100	+/-0.50	*

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Lab File ID: dft1209h.D
Injection Date: 12/09/08
Instrument ID: 308
Injection Time: 08:27
Sequence: 8120925
Lab Sample ID: 8120925-TUN1

m/z	Ion Abundance Criteria	% Relative Abundance	
51	30 - 60% of 198	31.5	PASS
68	Less than 2% of 69	0	PASS
69	Less than 200% of 198	40.8	PASS
70	Less than 2% of 69	0	PASS
127	40 - 60% of 198	50.7	PASS
197	Less than 1% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.32	PASS
275	10 - 30% of 198	25.7	PASS
365	1.0001 - 200% of 198	3.15	PASS
441	0.0001 - 99.9999% of 443	86.3	PASS
442	40.0001 - 200% of 198	59.2	PASS
443	17 - 23% of 442	19.5	PASS

001558

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120925

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 308
Calibration: 8L08004

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	8120925-TUN1	dft1209h.D	12/09/08 08:27
Calibration Check	8120925-CCV1	10c1209.D	12/09/08 08:48
Calibration Check	8120925-CCV2	10ab1209.D	12/09/08 09:23
DUP-13	0811331-07RE1	0811331-07 20x.D	12/09/08 10:34
13SB20A	0811328-06RE2	0811328-06re1 2x.D	12/09/08 11:09
13SB17A	0811331-02RE2	0811331-02re1 4x.D	12/09/08 14:04

001689

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Instrument ID: 308
Lab File ID: 10c1209.D
Sequence: 8120925
Lab Sample ID: 8120925-CCV1

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L08004
Calibration Date: 11/04/08 10:13
Injection Date: 12/09/08
Injection Time: 08:48

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acenaphthene	A	10.0	10.3	1.046999	1.075751		2.7	20
Acenaphthylene	A	10.0	10.3	1.613635	1.665564		3.2	25
Acetophenone	A	10.0	9.69	1.7605	1.719304		-2.3	25
Aniline	A	10.0	8.70	1.690862	1.369364		-19.0	25
Anthracene	A	10.0	10.5	1.006741	1.060301		5.3	25
Atrazine	A	10.0	9.51	0.193477	0.1800928		-6.9	25
Benzaldehyde	Q	10.0	8.66	0.5504761	0.5962665		-13.4	25
Benzidine	Q	20.0	18.2	0.5296278	0.1027632		-9.2	40
Benzo(a)anthracene	A	10.0	10.6	1.117423	1.184794		6.0	25
Benzo(a)pyrene	A	10.0	11.0	0.9220826	1.009293		9.5	20
Benzo(b)fluoranthene	A	10.0	10.7	1.075784	1.149495		6.9	25
Benzo(k)fluoranthene	A	10.0	9.65	1.118033	1.07898		-3.5	25
Benzo(g,h,i)perylene	A	10.0	11.8	0.7250428	0.8576566		18.3	25
Benzoic Acid	Q	20.0	18.8	0.130376	0.164959		-5.9	40
Benzyl Alcohol	A	10.0	8.86	0.7680736	0.6801618		-11.4	25
1,1'-Biphenyl	A	10.0	10.3	1.350251	1.420229		5.2	25
4-Bromophenyl Phenyl Ether	A	10.0	10.5	0.2041599	0.2144178		5.0	25
Butyl Benzyl Phthalate	A	10.0	9.08	0.7046557	0.639942		-9.2	25
Caprolactam	A	10.0	8.27	0.1050481	8.122746E-02		-22.7	25
Carbazole	A	10.0	8.87	0.6789426	0.6210198		-8.5	25
4-Chloro-3-methylphenol	A	10.0	10.7	0.2472207	0.2644393		7.0	20
Bis(2-chloroethoxy)methane	A	10.0	9.31	0.316216	0.2943268		-6.9	25
Bis(2-chloroethyl) Ether	A	10.0	9.10	1.138829	1.036044		-9.0	25
Bis(2-chloroisopropyl) Ether	A	10.0	8.34	1.55743	1.298613		-16.6	25
2-Chloronaphthalene	A	10.0	10.3	1.030716	1.05941		2.8	25
2-Chlorophenol	A	10.0	9.73	1.206983	1.174749		-2.7	25
4-Chlorophenyl Phenyl Ether	A	10.0	10.9	0.4925968	0.5359571		8.8	25
Chrysene	A	10.0	9.63	1.081973	1.041756		-3.7	25
Dibenz(a,h)anthracene	A	10.0	12.4	0.6633091	0.824245		24.3	25

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Instrument ID: 308
Lab File ID: 10c1209.D
Sequence: 8120925
Lab Sample ID: 8120925-CCV1

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L08004
Calibration Date: 11/04/08 10:13
Injection Date: 12/09/08
Injection Time: 08:48

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Dibenzofuran	A	10.0	10.8	1.328576	1.433086		7.9	25
Di-n-butyl Phthalate	A	10.0	10.2	1.193273	1.214591		1.8	25
1,2-Dichlorobenzene	A	10.0	9.54	1.383001	1.319111		-4.6	25
1,3-Dichlorobenzene	A	10.0	9.86	1.454172	1.433731		-1.4	25
1,4-Dichlorobenzene	A	10.0	9.51	1.354188	1.288137		-4.9	20
3,3´-Dichlorobenzidine	Q	10.0	12.5	0.3764328	0.3091562		24.7	25
2,4-Dichlorophenol	A	10.0	10.2	0.2492971	0.254922		2.3	20
2,6-Dichlorophenol	A	10.0	10.3	0.2520665	0.2589889		2.7	25
Diethyl Phthalate	A	10.0	10.7	1.080852	1.157261		7.1	25
2,4-Dimethylphenol	A	10.0	10.6	0.2919875	0.3091836		5.9	25
Dimethyl Phthalate	A	10.0	10.7	1.005512	1.077803		7.2	25
4,6-Dinitro-2-methylphenol	Q	10.0	10.0	9.530968E-02	0.1250818		0.1	25
2,4-Dinitrophenol	Q	20.0	22.5	7.950802E-02	0.1291062	0.05	12.6	40
2,4-Dinitrotoluene	Q	10.0	11.3	0.2855729	0.3595143		12.9	25
2,6-Dinitrotoluene	A	10.0	11.3	0.2078692	0.235726		13.4	25
Di-n-octyl Phthalate	A	10.0	9.97	1.345206	1.341475		-0.3	20
1,2-Diphenylhydrazine	A	10.0	10.4	0.1995267	0.2069762		3.7	25
Bis(2-ethylhexyl) Phthalate	A	10.0	7.92	1.202141	0.9519857		-20.8	25
Fluoranthene	A	10.0	10.5	1.012841	1.061828		4.8	20
Fluorene	A	10.0	10.8	1.025039	1.111832		8.5	25
Hexachlorobenzene	A	10.0	10.6	0.238566	0.2518227		5.6	25
Hexachlorobutadiene	A	10.0	11.2	0.1766828	0.1975485		11.8	20
Hexachlorocyclopentadiene	Q	10.0	10.3	0.2081824	0.2408723	0.05	2.8	40
Hexachloroethane	A	10.0	9.77	0.5239268	0.511755		-2.3	25
Indeno(1,2,3-cd)pyrene	Q	10.0	10.2	0.6291569	0.745594		2.4	25
Isophorone	A	10.0	9.55	0.5478329	0.5233817		-4.5	25
2-Methylnaphthalene	A	10.0	9.76	0.6610919	0.6452566		-2.4	25
1-Methylnaphthalene	A	10.0	9.91	0.5831235	0.5778936		-0.9	25
2-Methylphenol	A	10.0	9.34	1.143195	1.067641		-6.6	25

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 308
Calibration: 8L08004
Lab File ID: 10c1209.D
Calibration Date: 11/04/08 10:13
Sequence: 8120925
Injection Date: 12/09/08
Lab Sample ID: 8120925-CCV1
Injection Time: 08:48

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
4-Methylphenol	A	10.0	8.46	1.19092	1.007302		-15.4	25
Naphthalene	A	10.0	9.87	0.9774698	0.9644357		-1.3	25
2-Nitroaniline	Q	10.0	10.4	0.2882291	0.2990863		4.2	40
Nitrobenzene	A	10.0	9.83	0.3223777	0.3170565		-1.7	25
4-Nitrophenol	Q	20.0	21.3	0.1192421	0.1481769	0.05	6.6	40
2-Nitrophenol	A	10.0	8.83	0.1779458	0.1724264		-3.1	20
N-Nitroso-dimethylamine	Q	10.0	8.54	0.5386687	0.4602528		-14.6	25
N-Nitroso-diphenylamine	A	10.0	9.87	0.6060112	0.5880544		-3.0	20
N-Nitroso-di-n-propylamine	A	10.0	9.26	0.8538626	0.7691905	0.05	-9.9	25
Pentachlorophenol	Q	10.0	10.7	0.1356304	0.1699525		6.7	20
Phenanthrene	A	10.0	10.3	1.068943	1.101507		3.0	25
Phenol	A	10.0	8.91	1.576233	1.404518		-10.9	20
Pyrene	A	10.0	8.60	1.642276	1.413036		-14.0	25
Pyridine	Q	10.0	7.72	1.013205	0.7822536		-22.8 NK	25
1,2,4,5-Tetrachlorobenzene	A	10.0	10.3	0.4887533	0.5019522		2.7	25
2,3,4,6-Tetrachlorophenol	A	10.0	10.4	0.1738182	0.1806306		3.9	25
1,2,4-Trichlorobenzene	A	10.0	10.3	0.292239	0.3002674		2.7	25
2,4,6-Trichlorophenol	A	10.0	10.4	0.3077254	0.3186727		3.6	20
2,4,5-Trichlorophenol	A	10.0	10.6	0.3041514	0.3209408		5.5	25

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Instrument ID: 308
Lab File ID: 10ab1209.D
Sequence: 8120925
Lab Sample ID: 8120925-CCV2

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L08004
Calibration Date: 11/04/08 10:13
Injection Date: 12/09/08
Injection Time: 09:23

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Acetophenone	A	10.0	8.32	1.7605	1.452797		-17.5	25
Aniline	A	10.0	7.80	1.690862	1.410573		-16.6	25
Atrazine	A	10.0	10.9	0.193477	0.2152774		11.3	25
Benzaldehyde	Q	10.0	8.00	0.5504761	0.8025066		-20.0	25
Benzidine	Q	10.0	7.34	0.5296278	0.3887114		-26.6	40
1,1'-Biphenyl	A	10.0	9.92	1.350251	1.31085		-2.9	25
4-Chloroaniline	A	10.0	9.07	0.3234085	0.293363		-9.3	40
3,3'-Dichlorobenzidine	Q	10.0	9.62	0.3764328	0.362185		-3.8	25
2-Nitroaniline	Q	10.0	9.13	0.2882291	0.2643809		-8.7	40
3-Nitroaniline	Q	10.0	9.22	0.2150404	0.1981899		-7.8	40
4-Nitroaniline	Q	10.0	8.27	0.2150811	0.1778029		-17.3	40
N-Nitroso-diphenylamine	A	10.0	9.23	0.6060112	0.5685647		-6.2	20
N-Nitroso-di-n-propylamine	A	10.0	7.93	0.8538626	0.696136	0.05	-18.5	25

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INTERNAL STANDARD AREA AND RT SUMMARY
USEPA-8270C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120925
Matrix: Soil

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 308
Calibration: 8L08004

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (8120925-CCV1)			**Lab File ID: 10c1209.D**			**Analyzed: 12/09/08 08:48**			
1,4-Dichlorobenzene-d4	86006	7.366	89832	7.675	96	50 - 200	-0.3090	+/-0.50	
Naphthalene-d8	333551	10.082	358337	10.397	93	50 - 200	-0.3150	+/-0.50	
Acenaphthene-d10	185179	14.174	202249	14.5	92	50 - 200	-0.3260	+/-0.50	
Phenanthrene-d10	268828	17.636	271682	17.916	99	50 - 200	-0.2800	+/-0.50	
Chrysene-d12	203981	21.331	164712	21.535	124	50 - 200	-0.2040	+/-0.50	
Perylene-d12	187016	22.922	125756	23.202	149	50 - 200	-0.2800	+/-0.50	
Calibration Check (8120925-CCV2)			**Lab File ID: 10ab1209.D**			**Analyzed: 12/09/08 09:23**			
1,4-Dichlorobenzene-d4	93193	7.377	89832	7.675	104	50 - 200	-0.2980	+/-0.50	
Naphthalene-d8	357453	10.082	358337	10.397	100	50 - 200	-0.3150	+/-0.50	
Acenaphthene-d10	193138	14.168	202249	14.5	95	50 - 200	-0.3320	+/-0.50	
Phenanthrene-d10	251011	17.636	271682	17.916	92	50 - 200	-0.2800	+/-0.50	
Chrysene-d12	211958	21.325	164712	21.535	129	50 - 200	-0.2100	+/-0.50	
Perylene-d12	209126	22.922	125756	23.202	166	50 - 200	-0.2800	+/-0.50	
DUP-13 (0811331-07RE1)			**Lab File ID: 0811331-07 20x.D**			**Analyzed: 12/09/08 10:34**			
1,4-Dichlorobenzene-d4	74928	7.372	89832	7.675	83	50 - 200	-0.3030	+/-0.50	
Naphthalene-d8	293368	10.082	358337	10.397	82	50 - 200	-0.3150	+/-0.50	
Acenaphthene-d10	166006	14.168	202249	14.5	82	50 - 200	-0.3320	+/-0.50	
Phenanthrene-d10	213471	17.636	271682	17.916	79	50 - 200	-0.2800	+/-0.50	
Chrysene-d12	169799	21.325	164712	21.535	103	50 - 200	-0.2100	+/-0.50	
Perylene-d12	166488	22.917	125756	23.202	132	50 - 200	-0.2850	+/-0.50	
13SB20A (0811328-06RE2)			**Lab File ID: 0811328-06re1 2x.D**			**Analyzed: 12/09/08 11:09**			
1,4-Dichlorobenzene-d4	75887	7.377	89832	7.675	84	50 - 200	-0.2980	+/-0.50	
Naphthalene-d8	318656	10.076	358337	10.397	89	50 - 200	-0.3210	+/-0.50	
Acenaphthene-d10	185395	14.168	202249	14.5	92	50 - 200	-0.3320	+/-0.50	
Phenanthrene-d10	206247	17.636	271682	17.916	76	50 - 200	-0.2800	+/-0.50	
Chrysene-d12	97768	21.325	164712	21.535	59	50 - 200	-0.2100	+/-0.50	
Perylene-d12	87201	22.922	125756	23.202	69	50 - 200	-0.2800	+/-0.50	
13SB17A (0811331-02RE2)			**Lab File ID: 0811331-02re1 4x.D**			**Analyzed: 12/09/08 14:04**			
1,4-Dichlorobenzene-d4	78730	7.377	89832	7.675	88	50 - 200	-0.2980	+/-0.50	
Naphthalene-d8	318303	10.082	358337	10.397	89	50 - 200	-0.3150	+/-0.50	
Acenaphthene-d10	185031	14.168	202249	14.5	91	50 - 200	-0.3320	+/-0.50	
Phenanthrene-d10	214825	17.636	271682	17.916	79	50 - 200	-0.2800	+/-0.50	
Chrysene-d12	104824	21.331	164712	21.535	64	50 - 200	-0.2040	+/-0.50	
Perylene-d12	87126	22.928	125756	23.202	69	50 - 200	-0.2740	+/-0.50	

Semivolatiles MS, Water, 3510C Liquid-Liquid Extraction

Surrogate #1 = 8110251 (Pre-Prep)

Batch Comments: (none)

Work Order	Analysis	Work Order	Analysis	Work Order	Analysis
0811186	8270C MDEQ PNA	0811201	8270C Standard SVOCs	0811212	8270C MDEQ BNA
0811231	8270C Standard SVOCs	0811231	8270C APP IX BNA	0811231	8270C APP IX PEST
0811231	8270C DoD Standard SVOCs plus custom	0811231	8270C MDEQ PNA	0811231	8270C MDEQ BNA
0811268	8270C APP IX BNA	0811268	8270C APP IX PEST	0811279	8270C Standard SVOCs
0811293	8270C APP IX BNA	0811293	8270C APP IX PEST	0811328	8270C DoD Standard SVOCs plus custom
0811331	8270C DoD Standard SVOCs plus custom				

Lab Number	*Contain*	*Prepared*	*By*	*Initial (mL)*	*Final (mL)*	*uL Surrogate*	*Source ID*	*Spike ID*	*uL Spike*	*Client / QC Type*	*Extraction Comments*
0813364-BLK1		Nov-13-08 08:38	ASC	1000	1	100				BLANK	
0813364-BS1		Nov-13-08 08:38	ASC	1000	1	100		8110097	100	LCS	
0813364-MS1		Nov-13-08 08:38	ASC	1000	1	100	0811231-07	8110206	100	MATRIX SPIKE	
0813364-MSD1		Nov-13-08 08:38	ASC	1000	1	100	0811231-07	8110206	100	MATRIX SPIKE DUP	
0811186-01	C	Nov-13-08 08:38	ASC	630	1	100				ARCADIS - Novi	low volume
0811201-08	A	Nov-13-08 08:38	ASC	980	2	100				Independent Environmental Consultant	stopped boiling at 2 mL
0811212-02	C	Nov-13-08 08:38	ASC	990	1	100				EARTH TECH/AECOM - Livonia	8270 Field Blank/Weekly Eff bis-2EHP
0811231-07	M	Nov-13-08 08:38	ASC	1000	1	100				Allied Waste Systems	
0811231-07	M	Nov-13-08 08:38	ASC	1000	1	100				Allied Waste Systems	Added for BatchQC in: 0813364
0811231-07	M	Nov-13-08 08:38	ASC	1000	1	100				Allied Waste Systems	Added for BatchQC in: 0813364
0811231-07	M	Nov-13-08 08:38	JLB	1000	1	100				Allied Waste Systems	Added for BatchQC in: 0813364
0811231-07	M	Nov-13-08 08:38	ASC	1000	1	100				Allied Waste Systems	
0811231-07	M	Nov-13-08 08:38	ASC	1000	1	100				Allied Waste Systems	Added for BatchQC in: 0813364
0813364-BLK2		Nov-18-08 08:38	ASC	1000	1	100				BLANK	8270DoD only
0813364-BLK3		Nov-18-08 08:38	JLB	1000	1	100				BLANK	not 8270DoD
0813364-BS2		Nov-18-08 08:38	ASC	1000	1	100		8110189	100	LCS	8270DoD only
0813364-BS3		Nov-18-08 08:38	JLB	1000	1	100		8110189	100	LCS	not 8270DoD
0811231-07RE1	M	Nov-18-08 08:38	ASC	1000	1	100				Allied Waste Systems	Added 11/20/2008 by JLB
0811268-01	A	Nov-18-08 08:38	ASC	1000	1	100				TriMatrix Laboratories	

Comments:

Analyst Initials:

Semivolatiles MS, Water, 3510C Liquid-Liquid Extraction

Surrogate #1 = 8110251 (Pre-Prep)

Batch Comments: (none)

Lab Number	*Contain*	*Prepared*	*By*	*Initial (mL)*	*Final (mL)*	*uL Surrogate*	*Source ID*	*Spike ID*	*uL Spike*	*Client / QC Type*	*Extraction Comments*
0811268-01	A	Nov-18-08 08:38	ASC	1000	1	100				TriMatrix Laboratories	
0811279-01	F	Nov-18-08 08:38	ASC	950	10	1000				EQ-Environmental Quality Company	
0811293-05	H	Nov-18-08 08:38	ASC	970	1	100				Allied Waste Systems	
0811293-05	H	Nov-18-08 08:38	ASC	970	1	100				Allied Waste Systems	
0811293-06	E	Nov-18-08 08:38	ASC	960	1	100				Allied Waste Systems	
0811293-06	E	Nov-18-08 08:38	ASC	960	1	100				Allied Waste Systems	
0811293-07	G	Nov-18-08 08:38	ASC	960	1	100				Allied Waste Systems	
0811293-07	G	Nov-18-08 08:38	ASC	960	1	100				Allied Waste Systems	
0811293-08	F	Nov-18-08 08:38	ASC	1000	1	100				Allied Waste Systems	
0811293-08	F	Nov-18-08 08:38	ASC	1000	1	100				Allied Waste Systems	
0811293-10	G	Nov-18-08 08:38	ASC	1000	1	100				Allied Waste Systems	
0811293-10	G	Nov-18-08 08:38	ASC	1000	1	100				Allied Waste Systems	
0811328-05	B	Nov-18-08 08:38	ASC	960	1	100				URS Corporation	
0811328-13	B	Nov-18-08 08:38	ASC	960	1	100				URS Corporation	
0811331-01	A	Nov-18-08 08:38	ASC	920	1	100				URS Corporation	

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Comments:	Analyst Initials:

Semivolatiles MS, Soil, 3550B Sonication Extraction

Surrogate #1 = 8110251 (Pre-Prep)

Batch Comments: (none)

Work Order	Analysis	Work Order	Analysis	Work Order	Analysis
0811328	8270C DoD Standard SVOCs plus custom	0811331	8270C DoD Standard SVOCs plus custom		

Lab Number	*Contain*	*Prepared*	*By*	*Initial (g)*	*Final (mL)*	*uL Surrogate*	*Source ID*	*Spike ID*	*uL Spike*	*Client / QC Type*	*Extraction Comments*
0813821-BLK2		Dec-01-08 08:36	BJH	30	1	100				BLANK	
0813821-BS2		Dec-01-08 08:36	BJH	30	1	100		8120037	100	LCS	
0813821-MS3		Dec-01-08 08:36	BJH	30	1	100	811328-15RE	8120037	100	MATRIX SPIKE	
0813821-MS4		Dec-01-08 08:36	BJH	30	1	100	811331-03RE	8120037	100	MATRIX SPIKE	
0813821-MSD3		Dec-01-08 08:36	BJH	30	1	100	811328-15RE	8120037	100	MATRIX SPIKE DUP	
0813821-MSD4		Dec-01-08 08:36	BJH	30	1	100	811331-03RE	8120037	100	MATRIX SPIKE DUP	
0811328-01RE2	A	Dec-01-08 08:36	BJH	30	1	100				URS Corporation	Added 12/9/2008 by JLB
0811328-02RE1	A	Dec-01-08 08:36	BJH	30	1	100				URS Corporation	Added 12/1/2008 by ASC
0811328-03RE1	A	Dec-01-08 08:36	BJH	30	1	100				URS Corporation	Added 12/1/2008 by ASC
0811328-04RE1	A	Dec-01-08 08:36	BJH	30	1	100				URS Corporation	Added 12/1/2008 by ASC
0811328-06RE1	A	Dec-01-08 08:36	BJH	30	1	100				URS Corporation	Added 12/1/2008 by ASC
0811328-06RE2	A	Dec-01-08 08:36	BJH	30	1	100				URS Corporation	Added 12/9/2008 by JLB
0811328-07RE1	A	Dec-01-08 08:36	BJH	30	1	100				URS Corporation	Added 12/1/2008 by ASC
0811328-08RE1	A	Dec-01-08 08:36	BJH	30	1	100				URS Corporation	Added 12/1/2008 by ASC
0811328-09RE1	A	Dec-01-08 08:36	BJH	30	1	100				URS Corporation	Added 12/1/2008 by ASC
0811328-10RE1	A	Dec-01-08 08:36	BJH	30	1	100				URS Corporation	Added 12/1/2008 by ASC
0811328-11RE1	A	Dec-01-08 08:36	BJH	30	1	100				URS Corporation	Added 12/1/2008 by ASC
0811328-12RE1	A	Dec-01-08 08:36	BJH	30	1	100				URS Corporation	Added 12/1/2008 by ASC
0811328-14RE1	A	Dec-01-08 08:36	BJH	30	1	100				URS Corporation	Added 12/1/2008 by ASC
0811328-15RE1	A	Dec-01-08 08:36	BJH	30	1	100				URS Corporation	Added 12/1/2008 by ASC
0811331-02RE1	A	Dec-01-08 08:36	BJH	30	1	100				URS Corporation	Added 12/1/2008 by ASC
0811331-02RE2	A	Dec-01-08 08:36	BJH	30	1	100				URS Corporation	Added 12/9/2008 by JLB
0811331-03RE1	A	Dec-01-08 08:36	BJH	30	1	100				URS Corporation	Added 12/1/2008 by ASC
0811331-04RE1	A	Dec-01-08 08:36	BJH	30	1	100				URS Corporation	Added 12/1/2008 by ASC

Comments:

Analyst Initials:

Semivolatiles MS, Soil, 3550B Sonication Extraction

Surrogate #1 = 8110251 (Pre-Prep)

Batch Comments: (none)

Lab Number	*Contain*	*Prepared*	*By*	*Initial (g)*	*Final (mL)*	*uL Surrogate*	*Source ID*	*Spike ID*	*uL Spike*	*Client / QC Type*	*Extraction Comments*
0811331-05RE1	A	Dec-01-08 08:36	BJH	30	1	100				URS Corporation	Added 12/1/2008 by ASC
0811331-06RE1	A	Dec-01-08 08:36	BJH	30	1	100				URS Corporation	Added 12/1/2008 by ASC
0811331-07RE2	A	Dec-01-08 08:36	BJH	30	1	100				URS Corporation	Added 12/10/2008 by JLB
0813821-BLK1		Nov-22-08 08:36	BJH	30	1	100				BLANK	
0813821-BS1		Nov-22-08 08:36	BJH	30	1	100		8110189	100	LCS	
0813821-MS1		Nov-22-08 08:36	BJH	30	1	100	0811328-15	8110189	100	MATRIX SPIKE	
0813821-MS2		Nov-22-08 08:36	BJH	30	1	100	0811331-03	8110189	100	MATRIX SPIKE	
0813821-MSD1		Nov-22-08 08:36	BJH	30	1	100	0811328-15	8110189	100	MATRIX SPIKE DUP	
0813821-MSD2		Nov-22-08 08:36	BJH	30	1	100	0811331-03	8110189	100	MATRIX SPIKE DUP	
0811328-01	A	Nov-22-08 08:36	BJH	30	1	100				URS Corporation	
0811328-01RE1	A	Nov-22-08 08:36	BJH	30	1	100				URS Corporation	Added 12/1/2008 by ASC
0811328-02	A	Nov-22-08 08:36	BJH	30	1	100				URS Corporation	
0811328-03	A	Nov-22-08 08:36	BJH	30	1	100				URS Corporation	
0811328-04	A	Nov-22-08 08:36	BJH	30	1	100				URS Corporation	
0811328-06	A	Nov-22-08 08:36	BJH	30	1	100				URS Corporation	
0811328-07	A	Nov-22-08 08:36	BJH	30	1	100				URS Corporation	
0811328-08	A	Nov-22-08 08:36	BJH	30	1	100				URS Corporation	
0811328-09	A	Nov-22-08 08:36	BJH	30	1	100				URS Corporation	
0811328-10	A	Nov-22-08 08:36	BJH	30	1	100				URS Corporation	
0811328-11	A	Nov-22-08 08:36	BJH	30	1	100				URS Corporation	
0811328-12	A	Nov-22-08 08:36	BJH	30	1	100				URS Corporation	
0811328-14	A	Nov-22-08 08:36	BJH	30	1	100				URS Corporation	
0811328-15	A	Nov-22-08 08:36	BJH	30	1	100				URS Corporation	
0811331-02	A	Nov-22-08 08:36	BJH	30	1	100				URS Corporation	
0811331-03	A	Nov-22-08 08:36	BJH	30	1	100				URS Corporation	
0811331-04	A	Nov-22-08 08:36	BJH	30	1	100				URS Corporation	

Comments:

Analyst Initials:

Semivolatiles MS, Soil, 3550B Sonication Extraction

Surrogate #1 = 8110251 (Pre-Prep)

Batch Comments: (none)

Lab Number	*Contain*	*Prepared*	*By*	*Initial (g)*	*Final (mL)*	*uL Surrogate*	*Source ID*	*Spike ID*	*uL Spike*	*Client / QC Type*	*Extraction Comments*
0811331-05	A	Nov-22-08 08:36	BJH	30	1	100				URS Corporation	
0811331-06	A	Nov-22-08 08:36	BJH	30	1	100				URS Corporation	
0811331-07	A	Nov-22-08 08:36	BJH	30	1	100				URS Corporation	
0811331-07RE1	A	Nov-22-08 08:36	BJH	30	1	100				URS Corporation	Added 12/1/2008 by ASC

Comments:	Analyst Initials:

DATA VALIDATION WORKSHEET

Reviewer: Andrea Sansom
Date: 1/29/2009
DV Level: II III IV
Review Document:
_X_ Region III Modified for National Functional Guidelines
___ NFG for organic Data review (February 1994)
_X_ Project QAPP/SAP

Explosives

Project Name: Radford SWMU41
Project Number: 11656367.30000
Laboratory: TriMatrix
SDG No.: 36440-61
Test Name: Explosives
Method No.: 8330-HPLC

1.0 Laboratory Deliverables

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. %		X	
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	X		

Notes:

2.0 Holding Times

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X		
	Action: If the temperature of the cooler was elevated (> 10 ^{o}C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		X	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		X	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	X		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	X		
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	X		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
5.2	Are surrogate recoveries within acceptance criteria not to exceed 30-150% for all samples and method blanks?	X		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			X
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			X
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	X		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
6.3	Are there any %R for matrix spike recoveries outside the QC limits not to exceed 40-150%?	X		
6.4	Are there any RPDs outside the QC limits not to exceed 60%?	X		
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits not to exceed 40-150%?		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits not to exceed 60%?		X	
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	X		

Notes:

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are all positive identifications confirmed on second column or detector? If not, reject or estimate this detection.	X		
9.2	For positive sample detections, is RPD <40% between first and second columns. If not, apply J.		X	
9.3	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes:

10.0 Data Completeness			Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)		X		
	Number of samples:	22			
	Number of target compounds in each analysis:	14			
	Number of results rejected and not reported:	0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)				
	% Completeness =	100%			

Notes:

INITIAL CALIBRATION STANDARDS
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112549

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 221
Calibration: 8K25017

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
8090470	50 8330 STD	8112549-CAL1	data005-0	11/18/08 11:12
8090469	100 8330 STD	8112549-CAL2	data006-0	11/18/08 11:52
8090468	200 8330 STD	8112549-CAL3	data007-0	11/18/08 12:30
8090467	400 8330 STD	8112549-CAL4	data008-0	11/18/08 13:08
8090466	800 8330 std	8112549-CAL5	data009-0	11/18/08 13:46
8090465	1600 8330 std	8112549-CAL6	data010-0	11/18/08 14:25
8090464	3200 8330 std	8112549-CAL7	data011-0	11/18/08 15:03
8090471	400 8330 SCV	8112549-SCV1	data012-0	11/18/08 15:41

INITIAL CALIBRATION DATA (Continued)
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Calibration: 8K25017

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 221
Calibration Date: 11/18/08 12:51

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	Limit	Q
1,3,5-Trinitrobenzene	15.94115	4.196716	10.72429	0.2398067			20	
1,3-Dinitrobenzene	16.99332	2.247461	13.64857	0.1714165			20	
2,4,6-Trinitrotoluene	9.812432	1.388673	18.29143	0.167997			20	
2,4-Dinitrotoluene	10.48867	3.41345	23.17429	0.1296448			20	
2,6-Dinitrotoluene	6.466166	4.152892	21.97286	0.1138352			20	
2-Amino-4,6-dinitrotoluene	7.861712	2.813446	21.21143	0.1815394			20	
2-Nitrotoluene	4.368606	5.226108	25.84714	0.1839249			20	
3-Nitrotoluene	4.153622	5.383263	30.16	0.1530128			20	
4-Amino-2,6-dinitrotoluene	5.963479	2.69055	19.90429	0.1894693			20	
4-Nitrotoluene	3.464716	10.40709	28.38857	0.1810627			20	
Hexahydro-1,3,5-trinitro-1,3,5-triazine (R	8.425885	2.397839	7.435714	0.3457393			20	
Methyl-2,4,6-trinitrophenylnitramine (Tet	8.724596	4.910481	15.47571	0.1532727			20	
Nitrobenzene	10.25623	2.851739	14.82429	0.2633837			20	
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetraz	11.10739	2.77857	4.598333	0.6213856			20	
4-Nitroaniline	2.744027	6.69327	6.618333	0.4419305			20	

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Calibration: 8K25017

Sequence: 8112549

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Laboratory ID: 8112549-SCV1

Standard ID: 8090471

Analyte	Expected (ug/L)	Found (ug/L)	% Rec.	QC Limit
1,3,5-Trinitrobenzene	400	387	97	80-120
1,3-Dinitrobenzene	400	391	98	80-120
2,4,6-Trinitrotoluene	400	403	101	80-120
2,4-Dinitrotoluene	400	405	101	80-120
2,6-Dinitrotoluene	400	471	118	80-120
2-Amino-4,6-dinitrotoluene	800	761	95	80-120
2-Nitrotoluene	400	429	107	80-120
3-Nitrotoluene	400	453	113	80-120
4-Amino-2,6-dinitrotoluene	400	421	105	80-120
4-Nitrotoluene	400	419	105	80-120
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	400	367	92	80-120
Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	400	427	107	80-120
Nitrobenzene	400	394	99	80-120
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	400	409	102	80-120

* Values outside of QC limits

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112552

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 221
Calibration: 8K25017

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Calibration Check	8112552-CCV1	data002-20081124-135523-(	11/24/08 13:55
Blank	0813556-BLK1	data003-0	11/24/08 14:35
EQBK-1	0811328-05	data007-0	11/24/08 17:11
EQBK-5	0811328-13	data008-0	11/24/08 17:49
EQBK-6	0811331-01	data009-0	11/24/08 18:29
LCS	0813556-BS1	data010-0	11/24/08 19:07
LCS Dup	0813556-BSD1	data011-0	11/24/08 19:45
Calibration Check	8112552-CCV2	data013-0	11/24/08 21:01

CONTINUING CALIBRATION CHECK

USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 221
Calibration: 8K25017
Lab File ID: data002-20081124-135523-0
Calibration Date: 11/18/08 12:51
Sequence: 8112552
Injection Date: 11/24/08
Lab Sample ID: 8112552-CCV1
Injection Time: 13:55

Analyte	Type	CONC. (ug/L)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
1,3,5-Trinitrobenzene	A	400	373	15.94115	14.85668		-6.8	20
1,3-Dinitrobenzene	A	400	382	16.99332	16.2282		-4.5	20
2,4,6-Trinitrotoluene	A	400	367	9.812432	9.01265		-8.2	20
2,4-Dinitrotoluene	A	400	367	10.48867	9.6205		-8.3	20
2,6-Dinitrotoluene	A	400	387	6.466166	6.253225		-3.3	20
2-Amino-4,6-dinitrotoluene	A	400	388	7.861712	7.633625		-2.9	20
2-Nitrotoluene	A	400	345	4.368606	3.75605		-14.0	20
3-Nitrotoluene	A	400	396	4.153622	3.72105		-10.4	20
4-Amino-2,6-dinitrotoluene	A	400	377	5.963479	5.620575		-5.8	20
4-Nitrotoluene	A	400	371	3.464716	2.99875		-13.4	20
Hexahydro-1,3,5-trinitro-1,3,5-tri	A	400	384	8.425885	8.096125		-3.9	20
Methyl-2,4,6-trinitrophenylnitram	A	400	363	8.724596	7.9212		-9.2	20
Nitrobenzene	A	400	384	10.25623	9.836575		-4.1	20
Octahydro-1,3,5,7-tetranitro-1,3,5	A	400	362	11.10739	9.976225		-10.2	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 221
Calibration: 8K25017
Lab File ID: data013-0
Calibration Date: 11/18/08 12:51
Sequence: 8112552
Injection Date: 11/24/08
Lab Sample ID: 8112552-CCV2
Injection Time: 21:01

Analyte	Type	CONC. (ug/L)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
1,3,5-Trinitrobenzene	A	400	377	15.94115	15.00695		-5.9	20
1,3-Dinitrobenzene	A	400	387	16.99332	16.44913		-3.2	20
2,4,6-Trinitrotoluene	A	400	386	9.812432	9.460225		-3.6	20
2,4-Dinitrotoluene	A	400	380	10.48867	9.97665		-4.9	20
2,6-Dinitrotoluene	A	400	395	6.466166	6.379875		-1.3	20
2-Amino-4,6-dinitrotoluene	A	400	406	7.861712	7.98925		1.6	20
2-Nitrotoluene	A	400	420	4.368606	4.081725		-6.6	20
3-Nitrotoluene	A	400	429	4.153622	3.8791		-6.6	20
4-Amino-2,6-dinitrotoluene	A	400	394	5.963479	5.866575		-1.6	20
4-Nitrotoluene	A	400	446	3.464716	3.3003		-4.7	20
Hexahydro-1,3,5-trinitro-1,3,5-tri	A	400	392	8.425885	8.2507		-2.1	20
Methyl-2,4,6-trinitrophenylnitram	A	400	370	8.724596	8.07715		-7.4	20
Nitrobenzene	A	400	391	10.25623	10.01575		-2.3	20
Octahydro-1,3,5,7-tetranitro-1,3,5	A	400	372	11.10739	10.26435		-7.6	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

SURROGATE STANDARD RECOVERY AND RT SUMMARY

USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112552
Matrix: Water

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 221
Calibration: 8K25017

Lab Sample Id Surrogate Compound Name	RT	Calibration Mean RT	RT Diff	RT Diff Limit	% Recovery	Recovery Limits	Q
Calibration Check (8112552-CCV1)		**Lab File ID: data002-20081**		**Analyzed: 11/24/08 13:55**			
4-Nitroaniline	6.61	6.62	-0.01	+/-1.0	92	85 - 115	
Blank (0813556-BLK1)		**Lab File ID: data003-0**		**Analyzed: 11/24/08 14:35**			
4-Nitroaniline	6.64	6.62	0.02	+/-1.0	89	29 - 138	
EQBK-1 (0811328-05)		**Lab File ID: data007-0**		**Analyzed: 11/24/08 17:11**			
4-Nitroaniline	6.65	6.62	0.03	+/-1.0	76	29 - 138	
EQBK-5 (0811328-13)		**Lab File ID: data008-0**		**Analyzed: 11/24/08 17:49**			
4-Nitroaniline	6.62	6.62	0.00	+/-1.0	76	29 - 138	
EQBK-6 (0811331-01)		**Lab File ID: data009-0**		**Analyzed: 11/24/08 18:29**			
4-Nitroaniline	6.59	6.62	-0.03	+/-1.0	65	29 - 138	
LCS (0813556-BS1)		**Lab File ID: data010-0**		**Analyzed: 11/24/08 19:07**			
4-Nitroaniline	6.64	6.62	0.02	+/-1.0	69	29 - 138	
LCS Dup (0813556-BSD1)		**Lab File ID: data011-0**		**Analyzed: 11/24/08 19:45**			
4-Nitroaniline	6.27	6.62	-0.35	+/-1.0	40	29 - 138	
Calibration Check (8112552-CCV2)		**Lab File ID: data013-0**		**Analyzed: 11/24/08 21:01**			
4-Nitroaniline	6.61	6.62	-0.01	+/-1.0	92	85 - 115	

LCS / LCS DUPLICATE RECOVERY

USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Water
Preparation: 8330 Extraction
Initial/Final: 770 mL / 10 mL
Laboratory ID: 0813556-BS1
QC Batch: 0813556
Sequence: 8112552

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.60	2.11	81	65 - 140	ug/L
1,3-Dinitrobenzene	2.60	2.16	83	45 - 160	ug/L
2,4,6-Trinitrotoluene	2.60	1.99	77	50 - 145	ug/L
2,4-Dinitrotoluene	2.60	2.13	82	60 - 135	ug/L
2,6-Dinitrotoluene	2.60	2.29	88	60 - 135	ug/L
2-Amino-4,6-dinitrotoluene	5.19	4.10	79	50 - 155	ug/L
2-Nitrotoluene	2.60	2.61	101	45 - 135	ug/L
3-Nitrotoluene	2.60	2.66	102	50 - 130	ug/L
4-Amino-2,6-dinitrotoluene	2.60	2.16	83	55 - 155	ug/L
4-Nitrotoluene	2.60	2.77	107	50 - 130	ug/L
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	2.60	2.05	79	50 - 160	ug/L
Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	2.60	2.14	82	20 - 175	ug/L
Nitrobenzene	2.60	2.18	84	50 - 140	ug/L
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	2.60	2.10	81	80 - 115	ug/L

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

LCS / LCS DUPLICATE RECOVERY
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water

Laboratory ID: 0813556-BSD1

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 8330 Extraction
Initial/Final: 770 mL / 10 mL
QC Batch: 0813556
Sequence: 8112552

Analyte	Spike Added ug/L	LCSD Conc.	LCSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.60	2.41	93	13	30	65 - 140	ug/L
1,3-Dinitrobenzene	2.60	2.42	93	11	30	45 - 160	ug/L
2,4,6-Trinitrotoluene	2.60	2.31	89	15	30	50 - 145	ug/L
2,4-Dinitrotoluene	2.60	2.41	93	12	30	60 - 135	ug/L
2,6-Dinitrotoluene	2.60	2.77	107	19	30	60 - 135	ug/L
2-Amino-4,6-dinitrotoluene	5.19	4.68	90	13	30	50 - 155	ug/L
2-Nitrotoluene	2.60	3.08	119	17	30	45 - 135	ug/L
3-Nitrotoluene	2.60	2.97	115	11	30	50 - 130	ug/L
4-Amino-2,6-dinitrotoluene	2.60	2.61	100	19	30	55 - 155	ug/L
4-Nitrotoluene	2.60	3.04	117	9	30	50 - 130	ug/L
Hexahydro-1,3,5-trinitro-1,3,5-tria	2.60	2.56	98	22	30	50 - 160	ug/L
Methyl-2,4,6-trinitrophenylnitram	2.60	2.49	96	15	30	20 - 175	ug/L
Nitrobenzene	2.60	2.45	94	12	30	50 - 140	ug/L
Octahydro-1,3,5,7-tetranitro-1,3,5	2.60	2.73	105	26	30	80 - 115	ug/L

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

METHOD BLANK DATA SHEET
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Water
Laboratory ID: 0813556-BLK1
File ID: data003-0
Prepared: 11/19/08 07:18
Preparation: 8330 Extraction
Initial/Final: 770 mL / 10 mL
Analyzed: 11/24/08 14:35
Instrument: 221
QC Batch: 0813556
Sequence: 8112552
Calibration: 8K25017

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
99-35-4	1,3,5-Trinitrobenzene	0.045	5.0	5.0	ug/L	U
99-65-0	1,3-Dinitrobenzene	0.071	5.0	5.0	ug/L	U
118-96-7	2,4,6-Trinitrotoluene	0.10	5.0	5.0	ug/L	U
121-14-2	2,4-Dinitrotoluene	0.092	5.0	5.0	ug/L	U
606-20-2	2,6-Dinitrotoluene	0.16	5.0	5.0	ug/L	U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.24	5.0	5.0	ug/L	U
88-72-2	2-Nitrotoluene	0.28	5.0	5.0	ug/L	U
99-08-1	3-Nitrotoluene	0.17	5.0	5.0	ug/L	U
1946-51-0	4-Amino-2,6-dinitrotoluene	0.22	5.0	5.0	ug/L	U
99-99-0	4-Nitrotoluene	0.49	5.0	5.0	ug/L	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RD)	0.092	5.0	5.0	ug/L	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl	0.15	5.0	5.0	ug/L	U
98-95-3	Nitrobenzene	0.15	5.0	5.0	ug/L	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazoc	0.20	5.0	5.0	ug/L	U

System Monitoring Compound	Added (ug/L)	Conc. (ug/L)	% REC	QC Limits	Q
4-Nitroaniline	3.25	2.90	89	29 - 138	

QC BATCH SUMMARY
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

QC Batch: 0813556 QC Batch Matrix: Water

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 8330 Extraction

Sample Name	Lab Sample ID	Date Prepared	Observations
EQBK-1	0811328-05	11/19/08 07:18	
EQBK-5	0811328-13	11/19/08 07:18	
EQBK-6	0811331-01	11/19/08 07:18	
Blank	0813556-BLK1	11/19/08 07:18	
LCS	0813556-BS1	11/19/08 07:18	
LCS Dup	0813556-BSD1	11/19/08 07:18	

INITIAL CALIBRATION STANDARDS
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8113001

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 221
Calibration: 8K30001

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
8090467	400 8330 STD	8113001-CAL4	data002-0	11/26/08 11:48
8090470	50 8330 STD	8113001-CAL1	data003-0	11/26/08 12:38
8090469	100 8330 STD	8113001-CAL2	data004-0	11/26/08 13:17
8090468	200 8330 STD	8113001-CAL3	data005-0	11/26/08 13:55
8090466	800 8330 std	8113001-CAL5	data006-0	11/26/08 14:33
8090465	1600 8330 std	8113001-CAL6	data007-0	11/26/08 15:13
8090464	3200 8330 std	8113001-CAL7	data008-0	11/26/08 15:51
8090471	400 8330 SCV	8113001-SCV1	data009-0	11/26/08 16:29

INITIAL CALIBRATION DATA (Continued)

USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Calibration: 8K30001

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Instrument: 221

Calibration Date: 11/26/08 15:21

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	Limit	Q
1,3,5-Trinitrobenzene	13.09866	1.493136	10.68571	0.2285376			20	
1,3-Dinitrobenzene	14.49259	1.577769	13.58429	0.1401567			20	
2,4,6-Trinitrotoluene	8.317277	1.300835	18.2	8.489841E-02			20	
2,4-Dinitrotoluene	8.947277	2.35704	23.02	0.1451466			20	
2,6-Dinitrotoluene	5.959375	6.734714	21.81714	0.1013661			20	
2-Amino-4,6-dinitrotoluene	7.19875	3.475208	21.10143	0.1999798			20	
2-Nitrotoluene	3.912679	11.45245	25.68	0.1168208	0.99997		0.99	
3-Nitrotoluene	3.774509	10.55907	29.96286	0.1598574			20	
4-Amino-2,6-dinitrotoluene	5.358438	3.230421	19.80429	5.631177E-02			20	
4-Nitrotoluene	3.040714	8.599092	28.19143	0.1396166			20	
Hexahydro-1,3,5-trinitro-1,3,5-triazine (R	7.186429	1.546074	7.437143	0.2977882			20	
Methyl-2,4,6-trinitrophenylnitramine (Tet	7.788482	2.92988	15.40429	0.2482739			20	
Nitrobenzene	8.927545	1.48465	14.75714	0.1335723			20	
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetraz	9.009062	2.763671	4.621667	0.2874146			20	
4-Nitroaniline	2.555365	12.29683	6.616667	0.2812255	0.99996		0.99	

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8K30001
Laboratory ID: 8113001-SCV1
Sequence: 8113001
Standard ID: 8090471

Analyte	Expected (ug/L)	Found (ug/L)	% Rec.	QC Limit
1,3,5-Trinitrobenzene	400	429	107	80-120
1,3-Dinitrobenzene	400	428	107	80-120
2,4,6-Trinitrotoluene	400	424	106	80-120
2,4-Dinitrotoluene	400	433	108	80-120
2,6-Dinitrotoluene	400	378	95	80-120
2-Amino-4,6-dinitrotoluene	800	781	98	80-120
2-Nitrotoluene	400	431	108	80-120
3-Nitrotoluene	400	432	108	80-120
4-Amino-2,6-dinitrotoluene	400	426	107	80-120
4-Nitrotoluene	400	433	108	80-120
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	400	399	100	80-120
Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	400	435	109	80-120
Nitrobenzene	400	440	110	80-120
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	400	449	112	80-120

* Values outside of QC limits

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8113001

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 221
Calibration: 8K30001

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Cal Standard	8113001-CAL4	data002-0	11/26/08 11:48
Cal Standard	8113001-CAL1	data003-0	11/26/08 12:38
Cal Standard	8113001-CAL2	data004-0	11/26/08 13:17
Cal Standard	8113001-CAL3	data005-0	11/26/08 13:55
Cal Standard	8113001-CAL5	data006-0	11/26/08 14:33
Cal Standard	8113001-CAL6	data007-0	11/26/08 15:13
Cal Standard	8113001-CAL7	data008-0	11/26/08 15:51
Secondary Cal Check	8113001-SCV1	data009-0	11/26/08 16:29
Blank	0813554-BLK1	data010-0	11/26/08 17:07
LCS	0813554-BS1	data011-0	11/26/08 17:45
13SB13A	0811328-01	data012-0	11/26/08 18:23
13SB13C	0811328-02	data013-0	11/26/08 19:01
13SB21C	0811328-03	data014-0	11/26/08 19:39
13SB14A	0811328-04	data015-0	11/26/08 20:17
13SB20A	0811328-06	data016-0	11/26/08 20:55
13SB20C	0811328-07	data017-0	11/26/08 21:33
13SB22A	0811328-08	data018-0	11/26/08 22:12
13SB22C	0811328-09	data019-0	11/26/08 22:50
Calibration Check	8113001-CCV1	data020-0	11/26/08 23:28
13SB21A	0811328-10	data021-0	11/27/08 00:06
13SB18A	0811328-11	data022-0	11/27/08 00:44
13SB18C	0811328-12	data023-0	11/27/08 01:22
13SB19A	0811328-14	data024-0	11/27/08 02:00
13SB19C	0811328-15	data025-0	11/27/08 02:38
13SB17A	0811331-02	data026-0	11/27/08 03:16
13SB17C	0811331-03	data027-0	11/27/08 03:54
13SB16A	0811331-04	data028-0	11/27/08 04:32
13SB16C	0811331-05	data029-0	11/27/08 05:11
13SB15A	0811331-06	data030-0	11/27/08 05:49
Calibration Check	8113001-CCV2	data031-0	11/27/08 06:27
DUP-13	0811331-07	data032-0	11/27/08 07:05
13SB19C	0813554-MS1	data033-0	11/27/08 07:43

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8113001

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 221
Calibration: 8K30001

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
13SB19C	0813554-MSD1	data034-0	11/27/08 08:21
13SB17C	0813554-MS2	data035-0	11/27/08 08:59
13SB17C	0813554-MSD2	data036-0	11/27/08 09:37
Calibration Check	8113001-CCV3	data037-0	11/27/08 10:15

02107

CONTINUING CALIBRATION CHECK
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Instrument ID: 221
Lab File ID: data020-0
Sequence: 8113001
Lab Sample ID: 8113001-CCV1

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8K30001
Calibration Date: 11/26/08 15:21
Injection Date: 11/26/08
Injection Time: 23:28

Analyte	Type	CONC. (ug/L)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
1,3,5-Trinitrobenzene	A	400	413	13.09866	13.5375		3.4	20
1,3-Dinitrobenzene	A	400	414	14.49259	14.9825		3.4	20
2,4,6-Trinitrotoluene	A	400	415	8.317277	8.6225		3.7	20
2,4-Dinitrotoluene	A	400	414	8.947277	9.2575		3.5	20
2,6-Dinitrotoluene	A	400	410	5.959375	6.105		2.4	20
2-Amino-4,6-dinitrotoluene	A	400	400	7.19875	7.2		0.02	20
2-Nitrotoluene	L	400	387	3.912679	3.7925		-3.1	20
3-Nitrotoluene	A	400	383	3.774509	3.62		-4.1	20
4-Amino-2,6-dinitrotoluene	A	400	388	5.358438	5.1975		-3.0	20
4-Nitrotoluene	A	400	399	3.040714	3.0375		-0.1	20
Hexahydro-1,3,5-trinitro-1,3,5-tri	A	400	441	7.186429	7.9225		10.2	20
Methyl-2,4,6-trinitrophenylnitram	A	400	366	7.788482	7.13		-8.5	20
Nitrobenzene	A	400	413	8.927545	9.21		3.2	20
Octahydro-1,3,5,7-tetranitro-1,3,5	A	400	415	9.009062	9.2375		2.5	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Instrument ID: 221
Lab File ID: data031-0
Sequence: 8113001
Lab Sample ID: 8113001-CCV2

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8K30001
Calibration Date: 11/26/08 15:21
Injection Date: 11/27/08
Injection Time: 06:27

Analyte	Type	CONC. (ug/L)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
1,3,5-Trinitrobenzene	A	400	415	13.09866	13.5775		3.7	20
1,3-Dinitrobenzene	A	400	418	14.49259	15.1575		4.6	20
2,4,6-Trinitrotoluene	A	400	422	8.317277	8.7725		5.5	20
2,4-Dinitrotoluene	A	400	419	8.947277	9.375		4.8	20
2,6-Dinitrotoluene	A	400	409	5.959375	6.09		2.2	20
2-Amino-4,6-dinitrotoluene	A	400	420	7.19875	7.5625		5.1	20
2-Nitrotoluene	L	400	412	3.912679	4.035		3.1	20
3-Nitrotoluene	A	400	415	3.774509	3.915		3.7	20
4-Amino-2,6-dinitrotoluene	A	400	411	5.358438	5.5075		2.8	20
4-Nitrotoluene	A	400	416	3.040714	3.165		4.1	20
Hexahydro-1,3,5-trinitro-1,3,5-tri	A	400	412	7.186429	7.3925		2.9	20
Methyl-2,4,6-trinitrophenylnitrami	A	400	370	7.788482	7.2025		-7.5	20
Nitrobenzene	A	400	412	8.927545	9.1875		2.9	20
Octahydro-1,3,5,7-tetranitro-1,3,5	A	400	412	9.009062	9.1525		1.6	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Instrument ID: 221
Lab File ID: data037-0
Sequence: 8113001
Lab Sample ID: 8113001-CCV3

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8K30001
Calibration Date: 11/26/08 15:21
Injection Date: 11/27/08
Injection Time: 10:15

Analyte	Type	CONC. (ug/L)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
1,3,5-Trinitrobenzene	A	400	416	13.09866	13.6275		4.0	20
1,3-Dinitrobenzene	A	400	424	14.49259	15.3625		6.0	20
2,4,6-Trinitrotoluene	A	400	423	8.317277	8.7975		5.8	20
2,4-Dinitrotoluene	A	400	426	8.947277	9.5325		6.5	20
2,6-Dinitrotoluene	A	400	407	5.959375	6.0575		1.6	20
2-Amino-4,6-dinitrotoluene	A	400	425	7.19875	7.6475		6.2	20
2-Nitrotoluene	L	400	410	3.912679	4.0075		2.4	20
3-Nitrotoluene	A	400	415	3.774509	3.9175		3.8	20
4-Amino-2,6-dinitrotoluene	A	400	417	5.358438	5.585		4.2	20
4-Nitrotoluene	A	400	430	3.040714	3.2675		7.5	20
Hexahydro-1,3,5-trinitro-1,3,5-tri	A	400	415	7.186429	7.455		3.7	20
Methyl-2,4,6-trinitrophenylnitram	A	400	358	7.788482	6.9625		-10.6	20
Nitrobenzene	A	400	416	8.927545	9.28		3.9	20
Octahydro-1,3,5,7-tetranitro-1,3,5	A	400	429	9.009062	9.545		5.9	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

SURROGATE STANDARD RECOVERY AND RT SUMMARY

USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8113001
Matrix: Soil

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 221
Calibration: 8K30001

Lab Sample Id Surrogate Compound Name	RT	Calibration Mean RT	RT Diff	RT Diff Limit	% Recovery	Recovery Limits	Q
Cal Standard (8113001-CAL4)		**Lab File ID: data002-0**		**Analyzed: 11/26/08 11:48**			
4-Nitroaniline	6.62	6.62	0.00	+/-1.0	NA	NA	
Cal Standard (8113001-CAL1)		**Lab File ID: data003-0**		**Analyzed: 11/26/08 12:38**			
4-Nitroaniline	6.53	6.62	-0.09	+/-1.0	NA	NA	
Cal Standard (8113001-CAL2)		**Lab File ID: data004-0**		**Analyzed: 11/26/08 13:17**			
4-Nitroaniline	6.59	6.62	-0.03	+/-1.0	NA	NA	
Cal Standard (8113001-CAL3)		**Lab File ID: data005-0**		**Analyzed: 11/26/08 13:55**			
4-Nitroaniline	6.63	6.62	0.01	+/-1.0	NA	NA	
Cal Standard (8113001-CAL5)		**Lab File ID: data006-0**		**Analyzed: 11/26/08 14:33**			
4-Nitroaniline	6.62	6.62	0.00	+/-1.0	NA	NA	
Cal Standard (8113001-CAL6)		**Lab File ID: data007-0**		**Analyzed: 11/26/08 15:13**			
4-Nitroaniline	6.60	6.62	-0.02	+/-1.0	NA	NA	
Cal Standard (8113001-CAL7)		**Lab File ID: data008-0**		**Analyzed: 11/26/08 15:51**			
4-Nitroaniline	6.64	6.62	0.02	+/-1.0	NA	NA	
Blank (0813554-BLK1)		**Lab File ID: data010-0**		**Analyzed: 11/26/08 17:07**			
4-Nitroaniline	6.59	6.62	-0.03	+/-1.0	105	57 - 139	
LCS (0813554-BS1)		**Lab File ID: data011-0**		**Analyzed: 11/26/08 17:45**			
4-Nitroaniline	6.61	6.62	-0.01	+/-1.0	92	57 - 139	
13SB13A (0811328-01)		**Lab File ID: data012-0**		**Analyzed: 11/26/08 18:23**			
4-Nitroaniline	6.60	6.62	-0.02	+/-1.0	82	57 - 139	
13SB13C (0811328-02)		**Lab File ID: data013-0**		**Analyzed: 11/26/08 19:01**			
4-Nitroaniline	6.65	6.62	0.03	+/-1.0	100	57 - 139	
13SB21C (0811328-03)		**Lab File ID: data014-0**		**Analyzed: 11/26/08 19:39**			
4-Nitroaniline	6.60	6.62	-0.02	+/-1.0	98	57 - 139	
13SB14A (0811328-04)		**Lab File ID: data015-0**		**Analyzed: 11/26/08 20:17**			
4-Nitroaniline	6.63	6.62	0.01	+/-1.0	98	57 - 139	
13SB20A (0811328-06)		**Lab File ID: data016-0**		**Analyzed: 11/26/08 20:55**			
4-Nitroaniline	6.63	6.62	0.01	+/-1.0	103	57 - 139	
13SB20C (0811328-07)		**Lab File ID: data017-0**		**Analyzed: 11/26/08 21:33**			
4-Nitroaniline	6.64	6.62	0.02	+/-1.0	106	57 - 139	
13SB22A (0811328-08)		**Lab File ID: data018-0**		**Analyzed: 11/26/08 22:12**			
4-Nitroaniline	6.64	6.62	0.02	+/-1.0	102	57 - 139	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8113001
Matrix: Soil

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 221
Calibration: 8K30001

Lab Sample Id Surrogate Compound Name	RT	Calibration Mean RT	RT Diff	RT Diff Limit	% Recovery	Recovery Limits	Q
13SB22C (0811328-09)		**Lab File ID: data019-0**		**Analyzed: 11/26/08 22:50**			
4-Nitroaniline	6.55	6.62	-0.07	+/-1.0	96	57 - 139	
Calibration Check (8113001-CCV1)		**Lab File ID: data020-0**		**Analyzed: 11/26/08 23:28**			
4-Nitroaniline	6.61	6.62	-0.01	+/-1.0	95	85 - 115	
13SB21A (0811328-10)		**Lab File ID: data021-0**		**Analyzed: 11/27/08 00:06**			
4-Nitroaniline	6.56	6.62	-0.06	+/-1.0	96	57 - 139	
13SB18A (0811328-11)		**Lab File ID: data022-0**		**Analyzed: 11/27/08 00:44**			
4-Nitroaniline	6.57	6.62	-0.05	+/-1.0	105	57 - 139	
13SB18C (0811328-12)		**Lab File ID: data023-0**		**Analyzed: 11/27/08 01:22**			
4-Nitroaniline	6.60	6.62	-0.02	+/-1.0	104	57 - 139	
13SB19A (0811328-14)		**Lab File ID: data024-0**		**Analyzed: 11/27/08 02:00**			
4-Nitroaniline	6.58	6.62	-0.04	+/-1.0	105	57 - 139	
13SB19C (0811328-15)		**Lab File ID: data025-0**		**Analyzed: 11/27/08 02:38**			
4-Nitroaniline	6.61	6.62	-0.01	+/-1.0	105	57 - 139	
13SB17A (0811331-02)		**Lab File ID: data026-0**		**Analyzed: 11/27/08 03:16**			
4-Nitroaniline	6.61	6.62	-0.01	+/-1.0	98	57 - 139	
13SB17C (0811331-03)		**Lab File ID: data027-0**		**Analyzed: 11/27/08 03:54**			
4-Nitroaniline	6.62	6.62	0.00	+/-1.0	112	57 - 139	
13SB16A (0811331-04)		**Lab File ID: data028-0**		**Analyzed: 11/27/08 04:32**			
4-Nitroaniline	6.59	6.62	-0.03	+/-1.0	100	57 - 139	
13SB16C (0811331-05)		**Lab File ID: data029-0**		**Analyzed: 11/27/08 05:11**			
4-Nitroaniline	6.58	6.62	-0.04	+/-1.0	99	57 - 139	
13SB15A (0811331-06)		**Lab File ID: data030-0**		**Analyzed: 11/27/08 05:49**			
4-Nitroaniline	6.56	6.62	-0.06	+/-1.0	99	57 - 139	
Calibration Check (8113001-CCV2)		**Lab File ID: data031-0**		**Analyzed: 11/27/08 06:27**			
4-Nitroaniline	6.59	6.62	-0.03	+/-1.0	95	85 - 115	
DUP-13 (0811331-07)		**Lab File ID: data032-0**		**Analyzed: 11/27/08 07:05**			
4-Nitroaniline	6.60	6.62	-0.02	+/-1.0	106	57 - 139	
Matrix Spike (0813554-MS1)		**Lab File ID: data033-0**		**Analyzed: 11/27/08 07:43**			
4-Nitroaniline	6.60	6.62	-0.02	+/-1.0	91	57 - 139	
Matrix Spike Dup (0813554-MSD1)		**Lab File ID: data034-0**		**Analyzed: 11/27/08 08:21**			
4-Nitroaniline	6.59	6.62	-0.03	+/-1.0	91	57 - 139	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8113001
Matrix: Soil

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 221
Calibration: 8K30001

Lab Sample Id Surrogate Compound Name	RT	Calibration Mean RT	RT Diff	RT Diff Limit	% Recovery	Recovery Limits	Q
Matrix Spike (0813554-MS2)		**Lab File ID: data035-0**		**Analyzed: 11/27/08 08:59**			
4-Nitroaniline	6.58	6.62	-0.04	+/-1.0	87	57 - 139	
Matrix Spike Dup (0813554-MSD2)		**Lab File ID: data036-0**		**Analyzed: 11/27/08 09:37**			
4-Nitroaniline	6.59	6.62	-0.03	+/-1.0	95	57 - 139	
Calibration Check (8113001-CCV3)		**Lab File ID: data037-0**		**Analyzed: 11/27/08 10:15**			
4-Nitroaniline	6.62	6.62	0.00	+/-1.0	94	85 - 115	

LCS / LCS DUPLICATE RECOVERY
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil

Laboratory ID: 0813554-BS1

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 8330 Extraction
Initial/Final: 2 g / 20 mL
QC Batch: 0813554
Sequence: 8113001

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.00	1.93	96	75 - 125	mg/kg dry wt.
1,3-Dinitrobenzene	2.00	2.02	101	80 - 125	mg/kg dry wt.
2,4,6-Trinitrotoluene	2.00	2.06	103	55 - 140	mg/kg dry wt.
2,4-Dinitrotoluene	2.00	2.02	101	80 - 125	mg/kg dry wt.
2,6-Dinitrotoluene	2.00	2.09	104	80 - 120	mg/kg dry wt.
2-Amino-4,6-dinitrotoluene	4.00	3.76	94	80 - 125	mg/kg dry wt.
2-Nitrotoluene	2.00	2.07	103	80 - 125	mg/kg dry wt.
3-Nitrotoluene	2.00	1.98	99	75 - 120	mg/kg dry wt.
4-Amino-2,6-dinitrotoluene	2.00	2.12	106	80 - 125	mg/kg dry wt.
4-Nitrotoluene	2.00	2.12	106	75 - 125	mg/kg dry wt.
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	2.00	1.98	99	70 - 135	mg/kg dry wt.
Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	2.00	1.44	72	10 - 150	mg/kg dry wt.
Nitrobenzene	2.00	1.96	98	75 - 125	mg/kg dry wt.
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	2.00	2.17	109	75 - 125	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

METHOD BLANK DATA SHEET
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0813554-BLK1
File ID: data010-0
Prepared: 11/24/08 07:16
Preparation: 8330 Extraction
Initial/Final: 2 g / 20 mL
Analyzed: 11/26/08 17:07
Instrument: 221
QC Batch: 0813554
Sequence: 8113001
Calibration: 8K30001

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
99-35-4	1,3,5-Trinitrobenzene	0.074	2.5	2.5	mg/kg dry wt.	U
99-65-0	1,3-Dinitrobenzene	0.076	2.5	2.5	mg/kg dry wt.	U
118-96-7	2,4,6-Trinitrotoluene	0.15	2.5	2.5	mg/kg dry wt.	U
121-14-2	2,4-Dinitrotoluene	0.10	2.5	2.5	mg/kg dry wt.	U
606-20-2	2,6-Dinitrotoluene	0.20	2.5	2.5	mg/kg dry wt.	U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.22	2.5	2.5	mg/kg dry wt.	U
88-72-2	2-Nitrotoluene	0.17	2.5	2.5	mg/kg dry wt.	U
99-08-1	3-Nitrotoluene	0.21	2.5	2.5	mg/kg dry wt.	U
1946-51-0	4-Amino-2,6-dinitrotoluene	0.30	2.5	2.5	mg/kg dry wt.	U
99-99-0	4-Nitrotoluene	0.20	2.5	2.5	mg/kg dry wt.	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RD)	0.048	2.5	2.5	mg/kg dry wt.	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl	0.065	2.5	2.5	mg/kg dry wt.	U
98-95-3	Nitrobenzene	0.030	2.5	2.5	mg/kg dry wt.	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazoc	0.066	2.5	2.5	mg/kg dry wt.	U

System Monitoring Compound	Added (mg/kg dry wt.)	Conc. (mg/kg dry wt.)	% REC	QC Limits	Q
4-Nitroaniline	2.50	2.63	105	57 - 139	

QC BATCH SUMMARY
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

QC Batch: 0813554 QC Batch Matrix: Soil Preparation: 8330 Extraction

Sample Name	Lab Sample ID	Date Prepared	Observations
13SB13A	0811328-01	11/24/08 07:16	
13SB13A	0811328-01RE1	11/24/08 07:16	Added 12/2/2008 by JMK
13SB13C	0811328-02	11/24/08 07:16	
13SB13C	0811328-02RE1	11/24/08 07:16	Added 12/2/2008 by JMK
13SB21C	0811328-03	11/24/08 07:16	
13SB14A	0811328-04	11/24/08 07:16	
13SB14A	0811328-04RE1	11/24/08 07:16	Added 12/2/2008 by JMK
13SB20A	0811328-06	11/24/08 07:16	
13SB20C	0811328-07	11/24/08 07:16	
13SB22A	0811328-08	11/24/08 07:16	
13SB22C	0811328-09	11/24/08 07:16	
13SB21A	0811328-10	11/24/08 07:16	
13SB18A	0811328-11	11/24/08 07:16	
13SB18C	0811328-12	11/24/08 07:16	
13SB19A	0811328-14	11/24/08 07:16	
13SB19C	0811328-15	11/24/08 07:16	
13SB17A	0811331-02	11/24/08 07:16	
13SB17C	0811331-03	11/24/08 07:16	
13SB16A	0811331-04	11/24/08 07:16	
13SB16C	0811331-05	11/24/08 07:16	
13SB15A	0811331-06	11/24/08 07:16	
13SB15A	0811331-06RE1	11/24/08 07:16	Added 12/2/2008 by JMK
DUP-13	0811331-07	11/24/08 07:16	
Blank	0813554-BLK1	11/24/08 07:16	
Blank	0813554-BLK2	11/24/08 07:16	
LCS	0813554-BS1	11/24/08 07:16	
LCS	0813554-BS2	11/24/08 07:16	
13SB19C	0813554-MS1	11/24/08 07:16	
13SB17C	0813554-MS2	11/24/08 07:16	
13SB19C	0813554-MSD1	11/24/08 07:16	
13SB17C	0813554-MSD2	11/24/08 07:16	

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-8330

13SB19C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 8330 Extraction
Initial/Final: 2 g / 20 mL

Laboratory ID: 0813554-MS1
QC Batch: 0813554

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.00	ND	2.12	106	75 - 125	mg/kg dry wt.
1,3-Dinitrobenzene	2.00	ND	2.15	108	80 - 125	mg/kg dry wt.
2,4,6-Trinitrotoluene	2.00	ND	2.12	106	55 - 140	mg/kg dry wt.
2,4-Dinitrotoluene	2.00	ND	2.21	110	80 - 125	mg/kg dry wt.
2,6-Dinitrotoluene	2.00	ND	2.50	125 *	80 - 120	mg/kg dry wt.
2-Amino-4,6-dinitrotoluene	4.00	ND	4.06	102	80 - 125	mg/kg dry wt.
2-Nitrotoluene	2.00	ND	2.26	113	80 - 125	mg/kg dry wt.
3-Nitrotoluene	2.00	ND	2.28	114	75 - 120	mg/kg dry wt.
4-Amino-2,6-dinitrotoluene	2.00	ND	2.24	112	80 - 125	mg/kg dry wt.
4-Nitrotoluene	2.00	ND	2.39	120	75 - 125	mg/kg dry wt.
Hexahydro-1,3,5-trinitro-1,3,5-tria	2.00	ND	2.18	109	70 - 135	mg/kg dry wt.
Methyl-2,4,6-trinitrophenylnitram	2.00	ND	1.89	94	10 - 150	mg/kg dry wt.
Nitrobenzene	2.00	ND	2.13	106	75 - 125	mg/kg dry wt.
Octahydro-1,3,5,7-tetranitro-1,3,5	2.00	ND	2.26	113	75 - 125	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-8330

13SB19C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 8330 Extraction
Initial/Final: 2 g / 20 mL

Laboratory ID: 0813554-MSD1
QC Batch: 0813554

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.00	2.11	106	0.2	30	75 - 125	mg/kg dry wt.
1,3-Dinitrobenzene	2.00	2.15	107	0.2	30	80 - 125	mg/kg dry wt.
2,4,6-Trinitrotoluene	2.00	2.09	105	1	30	55 - 140	mg/kg dry wt.
2,4-Dinitrotoluene	2.00	2.22	111	0.4	30	80 - 125	mg/kg dry wt.
2,6-Dinitrotoluene	2.00	2.07	103	19	30	80 - 120	mg/kg dry wt.
2-Amino-4,6-dinitrotoluene	4.00	3.95	99	3	30	80 - 125	mg/kg dry wt.
2-Nitrotoluene	2.00	2.25	112	0.6	30	80 - 125	mg/kg dry wt.
3-Nitrotoluene	2.00	2.14	107	6	30	75 - 120	mg/kg dry wt.
4-Amino-2,6-dinitrotoluene	2.00	2.12	106	6	30	80 - 125	mg/kg dry wt.
4-Nitrotoluene	2.00	2.19	109	9	30	75 - 125	mg/kg dry wt.
Hexahydro-1,3,5-trinitro-1,3,5-tria	2.00	2.10	105	4	30	70 - 135	mg/kg dry wt.
Methyl-2,4,6-trinitrophenylnitram	2.00	1.89	94	0.01	30	10 - 150	mg/kg dry wt.
Nitrobenzene	2.00	2.10	105	1	30	75 - 125	mg/kg dry wt.
Octahydro-1,3,5,7-tetranitro-1,3,5	2.00	2.27	113	0.5	30	75 - 125	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-8330

13SB17C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 8330 Extraction

Initial/Final: 2 g / 20 mL

Laboratory ID: 0813554-MS2

QC Batch: 0813554

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.00	ND	1.96	98	75 - 125	mg/kg dry wt.
1,3-Dinitrobenzene	2.00	ND	2.11	105	80 - 125	mg/kg dry wt.
2,4,6-Trinitrotoluene	2.00	ND	2.23	112	55 - 140	mg/kg dry wt.
2,4-Dinitrotoluene	2.00	ND	2.18	109	80 - 125	mg/kg dry wt.
2,6-Dinitrotoluene	2.00	ND	2.38	119	80 - 120	mg/kg dry wt.
2-Amino-4,6-dinitrotoluene	4.00	ND	3.95	99	80 - 125	mg/kg dry wt.
2-Nitrotoluene	2.00	ND	2.21	110	80 - 125	mg/kg dry wt.
3-Nitrotoluene	2.00	ND	2.11	106	75 - 120	mg/kg dry wt.
4-Amino-2,6-dinitrotoluene	2.00	ND	2.19	109	80 - 125	mg/kg dry wt.
4-Nitrotoluene	2.00	ND	2.24	112	75 - 125	mg/kg dry wt.
Hexahydro-1,3,5-trinitro-1,3,5-tria	2.00	ND	2.01	101	70 - 135	mg/kg dry wt.
Methyl-2,4,6-trinitrophenylnitram	2.00	ND	1.62	81	10 - 150	mg/kg dry wt.
Nitrobenzene	2.00	ND	2.10	105	75 - 125	mg/kg dry wt.
Octahydro-1,3,5,7-tetranitro-1,3,5	2.00	ND	2.11	106	75 - 125	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY
USEPA-8330

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 8330 Extraction
Initial/Final: 2 g / 20 mL

Laboratory ID: 0813554-MSD2
QC Batch: 0813554

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.00	1.99	99	1	30	75 - 125	mg/kg dry wt.
1,3-Dinitrobenzene	2.00	2.10	105	0.2	30	80 - 125	mg/kg dry wt.
2,4,6-Trinitrotoluene	2.00	2.13	106	5	30	55 - 140	mg/kg dry wt.
2,4-Dinitrotoluene	2.00	3.20	160 *	38 *	30	80 - 125	mg/kg dry wt.
2,6-Dinitrotoluene	2.00	2.38	119	0.1	30	80 - 120	mg/kg dry wt.
2-Amino-4,6-dinitrotoluene	4.00	4.03	101	2	30	80 - 125	mg/kg dry wt.
2-Nitrotoluene	2.00	2.18	109	1	30	80 - 125	mg/kg dry wt.
3-Nitrotoluene	2.00	2.13	107	0.8	30	75 - 120	mg/kg dry wt.
4-Amino-2,6-dinitrotoluene	2.00	2.21	111	1	30	80 - 125	mg/kg dry wt.
4-Nitrotoluene	2.00	2.30	115	3	30	75 - 125	mg/kg dry wt.
Hexahydro-1,3,5-trinitro-1,3,5-tria	2.00	2.00	100	0.4	30	70 - 135	mg/kg dry wt.
Methyl-2,4,6-trinitrophenylnitram	2.00	1.59	79	2	30	10 - 150	mg/kg dry wt.
Nitrobenzene	2.00	2.09	104	0.8	30	75 - 125	mg/kg dry wt.
Octahydro-1,3,5,7-tetranitro-1,3,5	2.00	2.11	106	0.01	30	75 - 125	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

HOLDING TIME SUMMARY
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Method: Nitroaromatics & Nitramines by EPA Method 8330

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB13A	11/12/08	11/14/08		11/24/08	12	14	11/26/08	2	40	
13SB13A	11/12/08	11/14/08		11/24/08	12	14	12/02/08	8	40	
13SB13C	11/12/08	11/14/08		11/24/08	12	14	11/26/08	2	40	
13SB13C	11/12/08	11/14/08		11/24/08	12	14	12/02/08	8	40	
13SB21C	11/12/08	11/14/08		11/24/08	12	14	11/26/08	3	40	
13SB14A	11/12/08	11/14/08		11/24/08	12	14	11/26/08	3	40	
13SB14A	11/12/08	11/14/08		11/24/08	12	14	12/02/08	9	40	
EQBK-1	11/12/08	11/14/08		11/19/08	7	7	11/24/08	5	40	
13SB20A	11/12/08	11/14/08		11/24/08	12	14	11/26/08	3	40	
13SB20C	11/12/08	11/14/08		11/24/08	12	14	11/26/08	3	40	
13SB22A	11/12/08	11/14/08		11/24/08	12	14	11/26/08	3	40	
13SB22C	11/12/08	11/14/08		11/24/08	12	14	11/26/08	3	40	
13SB21A	11/12/08	11/14/08		11/24/08	12	14	11/27/08	3	40	
13SB18A	11/13/08	11/14/08		11/24/08	11	14	11/27/08	3	40	
13SB18C	11/13/08	11/14/08		11/24/08	11	14	11/27/08	3	40	
EQBK-5	11/13/08	11/14/08		11/19/08	6	7	11/24/08	5	40	
13SB19A	11/13/08	11/14/08		11/24/08	11	14	11/27/08	3	40	
13SB19C	11/13/08	11/14/08		11/24/08	11	14	11/27/08	3	40	
EQBK-6	11/14/08	11/15/08		11/19/08	5	7	11/24/08	5	40	
13SB17A	11/14/08	11/15/08		11/24/08	10	14	11/27/08	3	40	
13SB17C	11/14/08	11/15/08		11/24/08	10	14	11/27/08	3	40	

HOLDING TIME SUMMARY
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Method: Nitroaromatics & Nitramines by EPA Method 8330

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB16A	11/14/08	11/15/08		11/24/08	10	14	11/27/08	3	40	
13SB16C	11/14/08	11/15/08		11/24/08	10	14	11/27/08	3	40	
13SB15A	11/14/08	11/15/08		11/24/08	10	14	11/27/08	3	40	
13SB15A	11/14/08	11/15/08		11/24/08	10	14	12/02/08	9	40	
DUP-13	11/14/08	11/15/08		11/24/08	10	14	11/27/08	3	40	

INITIAL CALIBRATION STANDARDS
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120212

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 221
Calibration: 8L02003

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
8090470	50 8330 STD	8120212-CAL1	data002-0	12/01/08 07:19
8090469	100 8330 STD	8120212-CAL2	data003-0	12/01/08 08:07
8090468	200 8330 STD	8120212-CAL3	data004-0	12/01/08 08:56
8090467	400 8330 STD	8120212-CAL4	data005-0	12/01/08 09:44
8090466	800 8330 std	8120212-CAL5	data006-0	12/01/08 10:32
8090465	1600 8330 std	8120212-CAL6	data007-0	12/01/08 11:20
8090464	3200 8330 std	8120212-CAL7	data008-0	12/01/08 12:08
8090471	400 8330 SCV	8120212-SCV1	data009-0	12/01/08 12:56

INITIAL CALIBRATION DATA (Continued)

USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Calibration: 8L02003

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Instrument: 221

Calibration Date: 12/01/08 10:10

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	Limit	Q
1,3,5-Trinitrobenzene	16.91411	4.460725	12.72857	0.1140811			20	
1,3-Dinitrobenzene	18.98366	5.125489	15.97571	3.223272E-02			20	
2,4,6-Trinitrotoluene	10.98911	4.221512	22.29714	8.170662E-02			20	
2,4-Dinitrotoluene	12.11188	4.919609	27.45857	6.338861E-02			20	
2,6-Dinitrotoluene	7.171429	4.912161	26.41143	4.715924E-02			20	
2-Amino-4,6-dinitrotoluene	6.177679	7.831488	40.4	7.360679E-02			20	
2-Nitrotoluene	5.431071	9.880739	30.43571	6.758533E-02			20	
3-Nitrotoluene	5.180446	12.32883	35.80857	0.0775306			20	
4-Amino-2,6-dinitrotoluene	4.700134	8.205706	38.43	0.1276219			20	
4-Nitrotoluene	4.342098	11.99315	33.26714	9.343702E-02			20	
Hexahydro-1,3,5-trinitro-1,3,5-triazine (R	6.424554	9.498272	12.23143	0.1284882			20	
Methyl-2,4,6-trinitrophenylnitramine (Tet	7.558571	5.990908	24.07714	0.104722			20	
Nitrobenzene	11.46813	6.971804	17.49286	5.410124E-02			20	
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetraz	6.156875	4.839783	7.623333	0.158598			20	
4-Nitroaniline	2.633177	13.33181	9.576667	0.1700268			20	

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L02003
Laboratory ID: 8120212-SCV1
Sequence: 8120212
Standard ID: 8090471

Analyte	Expected (ug/L)	Found (ug/L)	% Rec.	QC Limit
1,3,5-Trinitrobenzene	400	411	103	80-120
1,3-Dinitrobenzene	400	397	99	80-120
2,4,6-Trinitrotoluene	400	397	99	80-120
2,4-Dinitrotoluene	400	411	103	80-120
2,6-Dinitrotoluene	400	416	104	80-120
2-Amino-4,6-dinitrotoluene	800	757	95	80-120
2-Nitrotoluene	400	407	102	80-120
3-Nitrotoluene	400	402	101	80-120
4-Amino-2,6-dinitrotoluene	400	406	102	80-120
4-Nitrotoluene	400	399	100	80-120
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	400	373	93	80-120
Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	400	394	99	80-120
Nitrobenzene	400	397	99	80-120
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	400	411	103	80-120

* Values outside of QC limits

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120311

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 221
Calibration: 8L02003

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Calibration Check	8120311-CCV1	exa003-0	12/02/08 15:14
Blank	0813554-BLK2	EXa004-0	12/02/08 16:04
13SB13A	0811328-01RE1	EXa006-0	12/02/08 17:42
13SB13C	0811328-02RE1	EXa007-0	12/02/08 18:32
13SB14A	0811328-04RE1	EXa008-0	12/02/08 19:20
13SB15A	0811331-06RE1	EXa009-0	12/02/08 20:08
LCS	0813554-BS2	EXa011-0	12/02/08 21:44
Calibration Check	8120311-CCV2	NGa012-0	12/02/08 22:32

CONTINUING CALIBRATION CHECK

USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Instrument ID: 221
Lab File ID: exa003-0
Sequence: 8120311
Lab Sample ID: 8120311-CCV1

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L02003
Calibration Date: 12/01/08 10:10
Injection Date: 12/02/08
Injection Time: 15:14

Analyte	Type	CONC. (ug/L)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
1,3,5-Trinitrobenzene	A	400	377	16.91411	15.925		-5.8	20
1,3-Dinitrobenzene	A	400	371	18.98366	17.5875		-7.4	20
2,4,6-Trinitrotoluene	A	400	373	10.98911	10.255		-6.7	20
2,4-Dinitrotoluene	A	400	366	12.11188	11.0825		-8.5	20
2,6-Dinitrotoluene	A	400	372	7.171429	6.67		-7.0	20
2-Amino-4,6-dinitrotoluene	A	400	361	6.177679	5.5775		-9.7	20
2-Nitrotoluene	A	400	357	5.431071	4.85		-10.7	20
3-Nitrotoluene	A	400	358	5.180446	4.6325		-10.6	20
4-Amino-2,6-dinitrotoluene	A	400	359	4.700134	4.2175		-10.3	20
4-Nitrotoluene	A	400	346	4.342098	3.7525		-13.6	20
Hexahydro-1,3,5-trinitro-1,3,5-tri	A	400	368	6.424554	5.9125		-8.0	20
Methyl-2,4,6-trinitrophenylnitram	A	400	372	7.558571	7.025		-7.1	20
Nitrobenzene	A	400	368	11.46813	10.5425		-8.1	20
Octahydro-1,3,5,7-tetranitro-1,3,5	A	400	370	6.156875	5.7775		-6.2	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 221
Calibration: 8L02003
Lab File ID: NGa012-0
Calibration Date: 12/01/08 10:10
Sequence: 8120311
Injection Date: 12/02/08
Lab Sample ID: 8120311-CCV2
Injection Time: 22:32

Analyte	Type	CONC. (ug/L)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
1,3,5-Trinitrobenzene	A	400	375	16.91411	15.8625		-6.2	20
1,3-Dinitrobenzene	A	400	373	18.98366	17.7075		-6.7	20
2,4,6-Trinitrotoluene	A	400	379	10.98911	10.4125		-5.2	20
2,4-Dinitrotoluene	A	400	378	12.11188	11.46		-5.4	20
2,6-Dinitrotoluene	A	400	382	7.171429	6.8575		-4.4	20
2-Amino-4,6-dinitrotoluene	A	400	367	6.177679	5.665		-8.3	20
2-Nitrotoluene	A	400	371	5.431071	5.045		-7.1	20
3-Nitrotoluene	A	400	360	5.180446	4.655		-10.1	20
4-Amino-2,6-dinitrotoluene	A	400	362	4.700134	4.2575		-9.4	20
4-Nitrotoluene	A	400	360	4.342098	3.91		-10.0	20
Hexahydro-1,3,5-trinitro-1,3,5-tri	A	400	368	6.424554	5.9075		-8.0	20
Methyl-2,4,6-trinitrophenylnitram	A	400	365	7.558571	6.895		-8.8	20
Nitrobenzene	A	400	368	11.46813	10.5575		-7.9	20
Octahydro-1,3,5,7-tetranitro-1,3,5	A	400	372	6.156875	5.8075		-5.7	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

SURROGATE STANDARD RECOVERY AND RT SUMMARY

USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120311
Matrix: Soil

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 221
Calibration: 8L02003

Lab Sample Id Surrogate Compound Name	RT	Calibration Mean RT	RT Diff	RT Diff Limit	% Recovery	Recovery Limits	Q
Calibration Check (8120311-CCV1)		**Lab File ID: exa003-0**		**Analyzed: 12/02/08 15:14**			
4-Nitroaniline	9.50	9.58	-0.08	+/-1.0	89	80 - 120	
Blank (0813554-BLK2)		**Lab File ID: EXa004-0**		**Analyzed: 12/02/08 16:04**			
4-Nitroaniline	9.53	9.58	-0.05	+/-1.0	101	57 - 139	
13SB13A (0811328-01RE1)		**Lab File ID: EXa006-0**		**Analyzed: 12/02/08 17:42**			
4-Nitroaniline	9.52	9.58	-0.06	+/-1.0	80	57 - 139	
13SB13C (0811328-02RE1)		**Lab File ID: EXa007-0**		**Analyzed: 12/02/08 18:32**			
4-Nitroaniline	9.50	9.58	-0.08	+/-1.0	84	57 - 139	
13SB14A (0811328-04RE1)		**Lab File ID: EXa008-0**		**Analyzed: 12/02/08 19:20**			
4-Nitroaniline	9.55	9.58	-0.03	+/-1.0	92	57 - 139	
13SB15A (0811331-06RE1)		**Lab File ID: EXa009-0**		**Analyzed: 12/02/08 20:08**			
4-Nitroaniline	9.45	9.58	-0.13	+/-1.0	94	57 - 139	
LCS (0813554-BS2)		**Lab File ID: EXa011-0**		**Analyzed: 12/02/08 21:44**			
4-Nitroaniline	9.51	9.58	-0.07	+/-1.0	91	57 - 139	
Calibration Check (8120311-CCV2)		**Lab File ID: NGa012-0**		**Analyzed: 12/02/08 22:32**			
4-Nitroaniline	9.50	9.58	-0.08	+/-1.0	92	80 - 120	

LCS / LCS DUPLICATE RECOVERY
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil

Laboratory ID: 0813554-BS2

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 8330 Extraction
Initial/Final: 2 g / 20 mL
QC Batch: 0813554
Sequence: 8120311

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
1,3,5-Trinitrobenzene	2.00	1.81	91	75 - 125	mg/kg dry wt.
1,3-Dinitrobenzene	2.00	1.84	92	80 - 125	mg/kg dry wt.
2,4,6-Trinitrotoluene	2.00	1.83	92	55 - 140	mg/kg dry wt.
2,4-Dinitrotoluene	2.00	1.87	94	80 - 125	mg/kg dry wt.
2,6-Dinitrotoluene	2.00	1.92	96	80 - 120	mg/kg dry wt.
2-Amino-4,6-dinitrotoluene	2.00	1.85	93	80 - 125	mg/kg dry wt.
2-Nitrotoluene	2.00	1.80	90	80 - 125	mg/kg dry wt.
3-Nitrotoluene	2.00	1.72	86	75 - 120	mg/kg dry wt.
4-Amino-2,6-dinitrotoluene	2.00	1.83	91	80 - 125	mg/kg dry wt.
4-Nitrotoluene	2.00	1.71	85	75 - 125	mg/kg dry wt.
Hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX)	2.00	1.80	90	70 - 135	mg/kg dry wt.
Methyl-2,4,6-trinitrophenylnitramine (Tetryl)	2.00	1.75	88	10 - 150	mg/kg dry wt.
Nitrobenzene	2.00	1.84	92	75 - 125	mg/kg dry wt.
Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	2.00	1.88	94	75 - 125	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

METHOD BLANK DATA SHEET
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0813554-BLK2
File ID: EXa004-0
Prepared: 11/24/08 07:16
Preparation: 8330 Extraction
Initial/Final: 2 g / 20 mL
Analyzed: 12/02/08 16:04
Instrument: 221
QC Batch: 0813554
Sequence: 8120311
Calibration: 8L02003

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
99-35-4	1,3,5-Trinitrobenzene	0.074	2.5	2.5	mg/kg dry wt.	U
99-65-0	1,3-Dinitrobenzene	0.076	2.5	2.5	mg/kg dry wt.	U
118-96-7	2,4,6-Trinitrotoluene	0.15	2.5	2.5	mg/kg dry wt.	U
121-14-2	2,4-Dinitrotoluene	0.10	2.5	2.5	mg/kg dry wt.	U
606-20-2	2,6-Dinitrotoluene	0.20	2.5	2.5	mg/kg dry wt.	U
35572-78-2	2-Amino-4,6-dinitrotoluene	0.22	2.5	2.5	mg/kg dry wt.	U
88-72-2	2-Nitrotoluene	0.17	2.5	2.5	mg/kg dry wt.	U
99-08-1	3-Nitrotoluene	0.21	2.5	2.5	mg/kg dry wt.	U
1946-51-0	4-Amino-2,6-dinitrotoluene	0.30	2.5	2.5	mg/kg dry wt.	U
99-99-0	4-Nitrotoluene	0.20	2.5	2.5	mg/kg dry wt.	U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine (RD)	0.048	2.5	2.5	mg/kg dry wt.	U
479-45-8	Methyl-2,4,6-trinitrophenylnitramine (Tetryl	0.065	2.5	2.5	mg/kg dry wt.	U
98-95-3	Nitrobenzene	0.030	2.5	2.5	mg/kg dry wt.	U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazoc	0.066	2.5	2.5	mg/kg dry wt.	U

System Monitoring Compound	Added (mg/kg dry wt.)	Conc. (mg/kg dry wt.)	% REC	QC Limits	Q
4-Nitroaniline	2.50	2.52	101	57 - 139	

QC BATCH SUMMARY
USEPA-8330

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61

Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008

QC Batch: 0813554 QC Batch Matrix: Soil
Preparation: 8330 Extraction

Sample Name	Lab Sample ID	Date Prepared	Observations
13SB13A	0811328-01	11/24/08 07:16	
13SB13A	0811328-01RE1	11/24/08 07:16	Added 12/2/2008 by JMK
13SB13C	0811328-02	11/24/08 07:16	
13SB13C	0811328-02RE1	11/24/08 07:16	Added 12/2/2008 by JMK
13SB21C	0811328-03	11/24/08 07:16	
13SB14A	0811328-04	11/24/08 07:16	
13SB14A	0811328-04RE1	11/24/08 07:16	Added 12/2/2008 by JMK
13SB20A	0811328-06	11/24/08 07:16	
13SB20C	0811328-07	11/24/08 07:16	
13SB22A	0811328-08	11/24/08 07:16	
13SB22C	0811328-09	11/24/08 07:16	
13SB21A	0811328-10	11/24/08 07:16	
13SB18A	0811328-11	11/24/08 07:16	
13SB18C	0811328-12	11/24/08 07:16	
13SB19A	0811328-14	11/24/08 07:16	
13SB19C	0811328-15	11/24/08 07:16	
13SB17A	0811331-02	11/24/08 07:16	
13SB17C	0811331-03	11/24/08 07:16	
13SB16A	0811331-04	11/24/08 07:16	
13SB16C	0811331-05	11/24/08 07:16	
13SB15A	0811331-06	11/24/08 07:16	
13SB15A	0811331-06RE1	11/24/08 07:16	Added 12/2/2008 by JMK
DUP-13	0811331-07	11/24/08 07:16	
Blank	0813554-BLK1	11/24/08 07:16	
Blank	0813554-BLK2	11/24/08 07:16	
LCS	0813554-BS1	11/24/08 07:16	
LCS	0813554-BS2	11/24/08 07:16	
13SB19C	0813554-MS1	11/24/08 07:16	
13SB17C	0813554-MS2	11/24/08 07:16	
13SB19C	0813554-MSD1	11/24/08 07:16	
13SB17C	0813554-MSD2	11/24/08 07:16	

SINGLE-COMPONENT IDENTIFICATION SUMMARY

EPA SAMPLE #: 13SB13A LAB SAMPLE # 0811328-01

	COLUMN 1	COLUMN 2
Inst.ID:	221	221
Column:	Acclaim E1	Acclaim E2
ID(mm):		

Compound	Column	Retention Time	RT Window From	RT Window To	Concentration (mg/Kg)	RPD
2,4,6-Trinitrotoluene	1	18.20	17.82	18.40	3.00700	44.7%
	2	22.20	22.13	22.23	1.90800	
2,4-Dinitrotoluene	1	23.03	22.56	23.28	0.17300	18.6%
	2	27.38	27.12	27.49	0.14350	
HMX	1	4.60	4.47	4.65	0.72600	21.2%
	2	7.57	7.48	7.69	0.58700	

082316

SINGLE-COMPONENT IDENTIFICATION SUMMARY

EPA SAMPLE #: 13SB13C LAB SAMPLE # 0811328-02

	COLUMN 1	COLUMN 2
Inst.ID:	221	221
Column:	Acclaim E1	Acclaim E2
ID(mm):		

Compound	Column	Retention Time	RT Window From	RT Window To	Concentration mg/Kg)	RPD
2,4,6-Trinitrotoluene	1	18.20	17.82	18.40	1.27800	34.5%
	2	22.17	22.13	22.23	0.90170	
HMX	1	4.62	4.47	4.65	0.79180	20.5%
	2	7.58	7.48	7.69	0.64460	

: 02317

SINGLE-COMPONENT IDENTIFICATION SUMMARY

EPA SAMPLE #: 13SB14A LAB SAMPLE # 0811238-04

	COLUMN 1	COLUMN 2
Inst.ID:	221	221
Column:	Acclaim E1	Acclaim E2
ID(mm):		

Compound	Column	Retention Time	RT Window From	RT Window To	Concentration (mg/Kg)	RPD
2,4,6-Trinitrotoluene	1	18.28	17.82	18.40	0.22500	5.5%
	2	22.28	22.13	22.23	0.21300	

823128

SINGLE-COMPONENT IDENTIFICATION SUMMARY

EPA SAMPLE #: 13SB15A LAB SAMPLE # 0811331-06

	COLUMN 1	COLUMN 2
Inst.ID:	221	221
Column:	Acclaim E1	Acclaim E2
ID(mm):		

Compound	Column	Retention Time	RT Window From	RT Window To	Concentration (mg/Kg)	RPD
2,4,6-Trinitrotoluene	1	18.01	17.82	18.40	0.45370	28.4%
	2	22.10	22.13	22.23	0.34070	
2,6-Dinitrotoluene	1	21.76	21.43	22.41	0.67600	55.2%
	2	26.20	26.10	26.40	0.38370	
HMX	1	4.56	4.47	4.65	0.24530	6.4%
	2	7.47	7.48	7.69	0.23000	
1,3,5-Trinitrobenzene	1	10.59	10.41	10.81	0.36420	32.0%
	2	12.60	12.60	12.74	0.26370	

82319

Semivolatiles GC, Water, 8330 Extraction

Surrogate #1 = 8080092 (Pre-Prep)

Batch Comments: (none)

Work Order	Analysis	Work Order	Analysis	Work Order	Analysis
0811328	8330 Explosives DoD	0811331	8330 Explosives DoD		

Lab Number	*Contain*	*Prepared*	*By*	*Initial (mL)*	*Final (mL)*	*uL Surrogate*	*Source ID*	*Spike ID*	*uL Spike*	*Client / QC Type*	*Extraction Comments*
0813556-BLK1		Nov-19-08 07:18	ASC	770	10	250				BLANK	
0813556-BS1		Nov-19-08 07:18	ASC	770	10	250		8070375	500	LCS	
0813556-BSD1		Nov-19-08 07:18	ASC	770	10	250		8070375	500	LCS DUP	
0811328-05	A	Nov-19-08 16:48	ASC	770	10	250				URS Corporation	
0811328-13	C	Nov-19-08 16:48	ASC	770	10	250				URS Corporation	
0811331-01	B	Nov-19-08 16:48	ASC	770	10	250				URS Corporation	

Comments:

Analyst Initials:

Semivolatiles GC, Soil, 8330 Extraction

Surrogate #1 = 8080092 (Pre-Prep)

Batch Comments: (none)

Work Order	Analysis	Work Order	Analysis	Work Order	Analysis
0811328	8330 Explosives DoD	0811331	8330 Explosives DoD		

Lab Number	*Contain*	*Prepared*	*By*	*Initial (g)*	*Final (mL)*	*uL Surrogate*	*Source ID*	*Spike ID*	*uL Spike*	*Client / QC Type*	*Extraction Comments*
0813554-BLK1		Nov-24-08 07:16	ASC	2	20	500				BLANK	
0813554-BS1		Nov-24-08 07:16	ASC	2	20	500		8070375	1000	LCS	
0813554-MS1		Nov-24-08 07:16	ASC	2	20	500	0811328-15	8070375	1000	MATRIX SPIKE	
0813554-MS2		Nov-24-08 07:16	ASC	2	20	500	0811331-03	8070375	1000	MATRIX SPIKE	
0813554-MSD1		Nov-24-08 07:16	ASC	2	20	500	0811328-15	8070375	1000	MATRIX SPIKE DUP	
0813554-MSD2		Nov-24-08 07:16	ASC	2	20	500	0811331-03	8070375	1000	MATRIX SPIKE DUP	
0811328-01	A	Nov-24-08 07:16	ASC	2	20	500				URS Corporation	
0811328-02	A	Nov-24-08 07:16	ASC	2	20	500				URS Corporation	
0811328-03	A	Nov-24-08 07:16	ASC	2	20	500				URS Corporation	
0811328-04	A	Nov-24-08 07:16	ASC	2	20	500				URS Corporation	
0811328-06	A	Nov-24-08 07:16	ASC	2	20	500				URS Corporation	
0811328-07	A	Nov-24-08 07:16	ASC	2	20	500				URS Corporation	
0811328-08	A	Nov-24-08 07:16	ASC	2	20	500				URS Corporation	
0811328-09	A	Nov-24-08 07:16	ASC	2	20	500				URS Corporation	
0811328-10	A	Nov-24-08 07:16	ASC	2	20	500				URS Corporation	
0811328-11	A	Nov-24-08 07:16	ASC	2	20	500				URS Corporation	
0811328-12	A	Nov-24-08 07:16	ASC	2	20	500				URS Corporation	
0811328-14	A	Nov-24-08 07:16	ASC	2	20	500				URS Corporation	
0811328-15	A	Nov-24-08 07:16	ASC	2	20	500				URS Corporation	
0811331-02	A	Nov-24-08 07:16	ASC	2	20	500				URS Corporation	
0811331-03	A	Nov-24-08 07:16	ASC	2	20	500				URS Corporation	
0811331-04	A	Nov-24-08 07:16	ASC	2	20	500				URS Corporation	
0811331-05	A	Nov-24-08 07:16	ASC	2	20	500				URS Corporation	
0811331-06	A	Nov-24-08 07:16	ASC	2	20	500				URS Corporation	

Comments:

Analyst Initials:

Semivolatiles GC, Soil, 8330 Extraction

Surrogate #1 = 8080092 (Pre-Prep)

Batch Comments: (none)

Lab Number	*Contain*	*Prepared*	*By*	*Initial (g)*	*Final (mL)*	*uL Surrogate*	*Source ID*	*Spike ID*	*uL Spike*	*Client / QC Type*	*Extraction Comments*
0811331-07	A	Nov-24-08 07:16	ASC	2	20	500				URS Corporation	

Comments:

Analyst Initials:

DATA VALIDATION WORKSHEET

Reviewer: Andrea Sansom
Date: 1/29/2009
DV Level: II III IV
Review Document:
_X__ Region III Modified for National Functional Guidelines
____ NFG for organic Data review (February 1994)
____ Project QAPP/SAP

Nitroglycerin/PETN

Project Name: Radford SWMU41
Project Number: 11656367.30000
Laboratory: TriMatrix
SDG No.: 36440-61
Test Name: Nitroglycerin/PETN
Method No.: 8330-HPLC

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	
1.4	Are the sample preparation benchsheets present and complete with sample volume/weights, dilutions, final volumes. %		X	
1.5	Are the measurement read out records legible and complete (properly labeled, and include all samples and QC)?	X		

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X		
	Action: If the temperature of the cooler was elevated (> 10 ^{O}C), then flag all positive results with a "J" and all non-detects "UJ".	X		
2.2	Have any technical holding times, determined from date of sampling to date of analysis (including dilution and reanalyese, been exceeded? Action: If yes, apply J (+) and UJ (-) to all analytes in the sample. For aqueous matrix - 7 days (extraction) and 40 days (analysis) For soil matrix - 14 days (extraction) and 40 days (analysis).		X	
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, note in the DV report.		X	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.		X	
3.4	Are there field equipment blank/trip blanks associated with every sample? If No, note in the DV report.	X		

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are sufficient standards (5 for first order, 6 for second order, or 7 for third order) included in the calibration curve? If no, apply professional judgement towards usability.	X		
4.2	Was an initial calibration analyzed at the beginning of each analysis? If No, apply R to all results for specific analyte(s) for all samples associated with the calibration.	X		
4.3	Are all calibration standard (ICV and CCV) %RSD (or correlation coefficient) or % drift within the control limits? Control Limits: r≥0.99, %RSD < ± 20% and %D < ± 15%	X		
	For initial Calibration: for %RSD > ± 20%, but < ± 50%, J(+) only. for %RSD > ± 50%, but < ± 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).			
	For Continuing Calibration: displaying a negative bias: %D > + 15% and < + 50%, J(+)/UJ(-), >50%J(+)/R(-); displaying a positive bias >15%, J(+).			
4.4	Has a continuing calibration verification been analyzed prior to and after every 10 samples and at the end of the analysis sequence? If no, apply R to associated samples.	X		

Notes:

5.0 Surrogate Recovery		Yes	No	NA
5.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form ?	X		
5.2	Are surrogate recoveries within acceptance criteria for all samples and method blanks?	X		
5.3	If No in Section 5.2, are these sample(s) or method blank(s) reanalyzed?			X
5.4	If No in Section 5.3, is any sample DF greater than 10? No action is taken if surrogate is expected to be diluted out.			X
	Action: If No, for any %R > UCL, apply K to all positive results of analytes; for any %R < LCL, but > 10%, L(+)/UL (-); for any %R < 10%, apply L (+) and R (-) to all results of analytes asociated with the surrogate.			

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Is the matrix spike/matrix spike duplicate recovery form present?	X		
6.2	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
6.3	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?		X	
	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		X	
	No action is taken on MS/MSD data alone. However, using informed professional judgement, the data reviewer may use the MS and MSD results in conjunction with other QC criteria to determine the need for some qualification of the data. If determined to affect only the sample spiked, then qualify the parent sample alone. If determined that problem is systematic, flag all associated samples.			

Notes:

7.0 Laboratory Control Sample (LCS)		Yes	No	NA
7.1	Is the LCS/LCSD recovery form present?	X		
7.2	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
7.3	Are there any %R for LCS/LCSD recoveries outside the QC limits?		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
7.4	Are there any RPD for LCS/LCSD recoveries outside the QC limits?		X	
	Action: If Yes, J(+) only.			

Notes:

8.0 Field Duplicate		Yes	No	NA
8.1	Were field duplicate prepared and analyzed at the corrected frequency (one per 20 samples, per matrix and per level)?	X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.			
8.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report.	X		

Notes:

9.0 Compound Identification and Detection Limit Verification		Yes	No	NA
9.1	Are any target compounds detected in the field samples? If Yes, is all positive identifications were confirmed in second column? Apply J flag if RPD >40% between first and second columns.		X	
9.2	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes:

10.0 Data Completeness		Yes	No	NA
10.1	Is % completeness within the control limits? (Control limit 90%)	X		
10.1.1	Number of samples: 22			
10.1.3	Number of results rejected and not reported: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

INITIAL CALIBRATION STANDARDS

USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Sequence: 8112470

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Instrument: 221

Calibration: 8K24006

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
8110795	8332 L1	8112470-CAL1	NPa002-0	11/21/08 16:21
8110794	8332 L2	8112470-CAL2	NPa003-0	11/21/08 16:39
8110793	8332 L3	8112470-CAL3	NPa004-0	11/21/08 16:56
8110792	8332 l4	8112470-CAL4	NPa005-0	11/21/08 17:13
8110791	8332 L5	8112470-CAL5	NPa006-0	11/21/08 17:30
8110790	8332 L6	8112470-CAL6	NPa007-0	11/21/08 17:48
8110789	8332 cal 7	8112470-CAL7	NPa008-0	11/21/08 18:05
8110797	8332 scv	8112470-SCV1	NPa009-0	11/21/08 18:22

INITIAL CALIBRATION DATA (Continued)

USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Calibration: 8K24006

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Instrument: 221

Calibration Date: 11/21/08 14:16

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	Limit	Q
Nitroglycerin	9687.811	3.005077	3.631429	0.1896883			20	
Pentaerythritol Tetranitrate	10015.14	1.78502	5.721428	0.1872475			20	
1-Nitronaphthalene	111048.2	2.012729	5.37	0.1861791			20	

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8K24006
Laboratory ID: 8112470-SCV1
Sequence: 8112470
Standard ID: 8110797

Analyte	Expected (ug/mL)	Found (ug/mL)	% Rec.	QC Limit
Nitroglycerin	1.00	0.854	85	80-120
Pentaerythritol Tetranitrate	1.00	0.894	89	80-120
1-Nitronaphthalene	0.0992	0.0974	98	85-115

* Values outside of QC limits

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112470

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 221
Calibration: 8K24006

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Cal Standard	8112470-CAL1	NPa002-0	11/21/08 16:21
Cal Standard	8112470-CAL2	NPa003-0	11/21/08 16:39
Cal Standard	8112470-CAL3	NPa004-0	11/21/08 16:56
Cal Standard	8112470-CAL4	NPa005-0	11/21/08 17:13
Cal Standard	8112470-CAL5	NPa006-0	11/21/08 17:30
Cal Standard	8112470-CAL6	NPa007-0	11/21/08 17:48
Cal Standard	8112470-CAL7	NPa008-0	11/21/08 18:05
Secondary Cal Check	8112470-SCV1	NPa009-0	11/21/08 18:22
Blank	0813557-BLK1	NPa010-0	11/21/08 18:39
LCS	0813557-BS1	NPa011-0	11/21/08 18:57
LCS Dup	0813557-BSD1	NPa012-0	11/21/08 19:14
EQBK-1	0811328-05	NPa014-0	11/21/08 19:49
EQBK-5	0811328-13	NPa015-0	11/21/08 20:06
EQBK-6	0811331-01	NPa016-0	11/21/08 20:23
Calibration Check	8112470-CCV1	NPa017-0	11/21/08 20:40

CONTINUING CALIBRATION CHECK

USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Instrument ID: 221
Lab File ID: NPa017-0
Sequence: 8112470
Lab Sample ID: 8112470-CCV1

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8K24006
Calibration Date: 11/21/08 14:16
Injection Date: 11/21/08
Injection Time: 20:40

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Nitroglycerin	A	1.00	1.13	9687.811	10933.12		12.9	20
Pentaerythritol Tetranitrate	A	1.00	1.15	10015.14	11480.59		14.6	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

SURROGATE STANDARD RECOVERY AND RT SUMMARY

USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112470
Matrix: Water

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 221
Calibration: 8K24006

Lab Sample Id Surrogate Compound Name	RT	Calibration Mean RT	RT Diff	RT Diff Limit	% Recovery	Recovery Limits	Q
Cal Standard (8112470-CAL1)		**Lab File ID: NPa002-0**		**Analyzed: 11/21/08 16:21**			
1-Nitronaphthalene	5.35	5.37	-0.02	+/-1.0	NA	NA	
Cal Standard (8112470-CAL2)		**Lab File ID: NPa003-0**		**Analyzed: 11/21/08 16:39**			
1-Nitronaphthalene	5.37	5.37	0.00	+/-1.0	NA	NA	
Cal Standard (8112470-CAL3)		**Lab File ID: NPa004-0**		**Analyzed: 11/21/08 16:56**			
1-Nitronaphthalene	5.37	5.37	0.00	+/-1.0	NA	NA	
Cal Standard (8112470-CAL4)		**Lab File ID: NPa005-0**		**Analyzed: 11/21/08 17:13**			
1-Nitronaphthalene	5.37	5.37	0.00	+/-1.0	NA	NA	
Cal Standard (8112470-CAL5)		**Lab File ID: NPa006-0**		**Analyzed: 11/21/08 17:30**			
1-Nitronaphthalene	5.37	5.37	0.00	+/-1.0	NA	NA	
Cal Standard (8112470-CAL6)		**Lab File ID: NPa007-0**		**Analyzed: 11/21/08 17:48**			
1-Nitronaphthalene	5.38	5.37	0.01	+/-1.0	NA	NA	
Cal Standard (8112470-CAL7)		**Lab File ID: NPa008-0**		**Analyzed: 11/21/08 18:05**			
1-Nitronaphthalene	5.38	5.37	0.01	+/-1.0	NA	NA	
Secondary Cal Check (8112470-SCV1)		**Lab File ID: NPa009-0**		**Analyzed: 11/21/08 18:22**			
1-Nitronaphthalene	5.29	5.37	-0.08	+/-1.0	98	85 - 115	
Blank (0813557-BLK1)		**Lab File ID: NPa010-0**		**Analyzed: 11/21/08 18:39**			
1-Nitronaphthalene	5.32	5.37	-0.05	+/-1.0	102	50 - 150	
LCS (0813557-BS1)		**Lab File ID: NPa011-0**		**Analyzed: 11/21/08 18:57**			
1-Nitronaphthalene	5.37	5.37	0.00	+/-1.0	106	50 - 150	
LCS Dup (0813557-BSD1)		**Lab File ID: NPa012-0**		**Analyzed: 11/21/08 19:14**			
1-Nitronaphthalene	5.37	5.37	0.00	+/-1.0	98	50 - 150	
EQBK-1 (0811328-05)		**Lab File ID: NPa014-0**		**Analyzed: 11/21/08 19:49**			
1-Nitronaphthalene	5.36	5.37	-0.01	+/-1.0	102	50 - 150	
EQBK-5 (0811328-13)		**Lab File ID: NPa015-0**		**Analyzed: 11/21/08 20:06**			
1-Nitronaphthalene	5.37	5.37	0.00	+/-1.0	102	50 - 150	
EQBK-6 (0811331-01)		**Lab File ID: NPa016-0**		**Analyzed: 11/21/08 20:23**			
1-Nitronaphthalene	5.37	5.37	0.00	+/-1.0	100	50 - 150	
Calibration Check (8112470-CCV1)		**Lab File ID: NPa017-0**		**Analyzed: 11/21/08 20:40**			
1-Nitronaphthalene	5.36	5.37	-0.01	+/-1.0	115	85 - 115	

ANALYSIS BATCH (SEQUENCE) SUMMARY

USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112590

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 221
Calibration: 8K24006

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Calibration Check	8112590-CCV1	data002-0	11/25/08 07:39
Blank	0813555-BLK1	data003-0	11/25/08 08:01
LCS	0813555-BS1	data004-0	11/25/08 08:20
13SB13A	0811328-01	data005-0	11/25/08 08:38
13SB13C	0811328-02	data006-0	11/25/08 08:56
13SB21C	0811328-03	data007-0	11/25/08 09:13
13SB19C	0813555-MS1	data008-0	11/25/08 09:30
13SB19C	0813555-MSD1	data009-0	11/25/08 09:47
13SB14A	0811328-04	data010-0	11/25/08 10:05
13SB20A	0811328-06	data011-0	11/25/08 10:23
13SB20C	0811328-07	data012-0	11/25/08 10:40
Calibration Check	8112590-CCV2	data013-0	11/25/08 10:57
13SB22A	0811328-08	data014-0	11/25/08 11:15
13SB22C	0811328-09	data015-0	11/25/08 11:32
13SB21A	0811328-10	data016-0	11/25/08 11:49
13SB18A	0811328-11	data017-0	11/25/08 12:06
13SB18C	0811328-12	data018-0	11/25/08 12:24
13SB19A	0811328-14	data019-0	11/25/08 12:41
13SB19C	0811328-15	data020-0	11/25/08 12:58
13SB17A	0811331-02	data021-0	11/25/08 13:16
13SB17C	0811331-03	data022-0	11/25/08 13:33
13SB16A	0811331-04	data023-0	11/25/08 13:50
Calibration Check	8112590-CCV3	data024-0	11/25/08 14:07
13SB16C	0811331-05	data025-0	11/25/08 14:25
13SB15A	0811331-06	data026-0	11/25/08 14:42
DUP-13	0811331-07	data027-0	11/25/08 14:59
13SB17C	0813555-MS2	data028-0	11/25/08 15:16
13SB17C	0813555-MSD2	data032-0	11/25/08 16:27
Calibration Check	8112590-CCV4	data034-0	11/25/08 17:02

CONTINUING CALIBRATION CHECK

USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Instrument ID: 221

Lab File ID: data002-0

Sequence: 8112590

Lab Sample ID: 8112590-CCV1

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Calibration: 8K24006

Calibration Date: 11/21/08 14:16

Injection Date: 11/25/08

Injection Time: 07:39

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Nitroglycerin	A	1.00	1.04	9687.811	10104		4.3	20
Pentaerythritol Tetranitrate	A	1.00	1.01	10015.14	10131		1.2	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 221
Calibration: 8K24006
Lab File ID: data013-0
Calibration Date: 11/21/08 14:16
Sequence: 8112590
Injection Date: 11/25/08
Lab Sample ID: 8112590-CCV2
Injection Time: 10:57

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Nitroglycerin	A	1.00	1.06	9687.811	10225		5.5	20
Pentaerythritol Tetranitrate	A	1.00	1.02	10015.14	10257		2.4	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 221
Calibration: 8K24006
Lab File ID: data024-0
Calibration Date: 11/21/08 14:16
Sequence: 8112590
Injection Date: 11/25/08
Lab Sample ID: 8112590-CCV3
Injection Time: 14:07

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Nitroglycerin	A	1.00	1.06	9687.811	10313		6.5	20
Pentaerythritol Tetranitrate	A	1.00	1.04	10015.14	10452		4.4	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK
USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Instrument ID: 221
Lab File ID: data034-0
Sequence: 8112590
Lab Sample ID: 8112590-CCV4

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8K24006
Calibration Date: 11/21/08 14:16
Injection Date: 11/25/08
Injection Time: 17:02

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Nitroglycerin	A	1.00	0.866	9687.811	8395		-13.3	20
Pentaerythritol Tetranitrate	A	1.00	0.871	10015.14	8719		-12.9	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

SURROGATE STANDARD RECOVERY AND RT SUMMARY

USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112590
Matrix: Soil

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 221
Calibration: 8K24006

Lab Sample Id Surrogate Compound Name	RT	Calibration Mean RT	RT Diff	RT Diff Limit	% Recovery	Recovery Limits	Q
Calibration Check (8112590-CCV1)		**Lab File ID: data002-0**		**Analyzed: 11/25/08 07:39**			
1-Nitronaphthalene	5.40	5.37	0.03	+/-1.0	115	85 - 115	
Blank (0813555-BLK1)		**Lab File ID: data003-0**		**Analyzed: 11/25/08 08:01**			
1-Nitronaphthalene	5.33	5.37	-0.04	+/-1.0	115	50 - 150	
LCS (0813555-BS1)		**Lab File ID: data004-0**		**Analyzed: 11/25/08 08:20**			
1-Nitronaphthalene	5.38	5.37	0.01	+/-1.0	104	50 - 150	
13SB13A (0811328-01)		**Lab File ID: data005-0**		**Analyzed: 11/25/08 08:38**			
1-Nitronaphthalene	5.35	5.37	-0.02	+/-1.0	114	50 - 150	
13SB13C (0811328-02)		**Lab File ID: data006-0**		**Analyzed: 11/25/08 08:56**			
1-Nitronaphthalene	5.37	5.37	0.00	+/-1.0	114	50 - 150	
13SB21C (0811328-03)		**Lab File ID: data007-0**		**Analyzed: 11/25/08 09:13**			
1-Nitronaphthalene	5.38	5.37	0.01	+/-1.0	114	50 - 150	
Matrix Spike (0813555-MS1)		**Lab File ID: data008-0**		**Analyzed: 11/25/08 09:30**			
1-Nitronaphthalene	5.37	5.37	0.00	+/-1.0	103	50 - 150	
Matrix Spike Dup (0813555-MSD1)		**Lab File ID: data009-0**		**Analyzed: 11/25/08 09:47**			
1-Nitronaphthalene	5.32	5.37	-0.05	+/-1.0	103	50 - 150	
13SB14A (0811328-04)		**Lab File ID: data010-0**		**Analyzed: 11/25/08 10:05**			
1-Nitronaphthalene	5.32	5.37	-0.05	+/-1.0	114	50 - 150	
13SB20A (0811328-06)		**Lab File ID: data011-0**		**Analyzed: 11/25/08 10:23**			
1-Nitronaphthalene	5.37	5.37	0.00	+/-1.0	114	50 - 150	
13SB20C (0811328-07)		**Lab File ID: data012-0**		**Analyzed: 11/25/08 10:40**			
1-Nitronaphthalene	5.36	5.37	-0.01	+/-1.0	114	50 - 150	
Calibration Check (8112590-CCV2)		**Lab File ID: data013-0**		**Analyzed: 11/25/08 10:57**			
1-Nitronaphthalene	5.36	5.37	-0.01	+/-1.0	115	85 - 115	
13SB22A (0811328-08)		**Lab File ID: data014-0**		**Analyzed: 11/25/08 11:15**			
1-Nitronaphthalene	5.36	5.37	-0.01	+/-1.0	113	50 - 150	
13SB22C (0811328-09)		**Lab File ID: data015-0**		**Analyzed: 11/25/08 11:32**			
1-Nitronaphthalene	5.38	5.37	0.01	+/-1.0	114	50 - 150	
13SB21A (0811328-10)		**Lab File ID: data016-0**		**Analyzed: 11/25/08 11:49**			
1-Nitronaphthalene	5.37	5.37	0.00	+/-1.0	115	50 - 150	
13SB18A (0811328-11)		**Lab File ID: data017-0**		**Analyzed: 11/25/08 12:06**			
1-Nitronaphthalene	5.38	5.37	0.01	+/-1.0	114	50 - 150	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112590
Matrix: Soil

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 221
Calibration: 8K24006

Lab Sample Id Surrogate Compound Name	RT	Calibration Mean RT	RT Diff	RT Diff Limit	% Recovery	Recovery Limits	Q
13SB18C (0811328-12)		**Lab File ID: data018-0**		**Analyzed: 11/25/08 12:24**			
1-Nitronaphthalene	5.31	5.37	-0.06	+/-1.0	114	50 - 150	
13SB19A (0811328-14)		**Lab File ID: data019-0**		**Analyzed: 11/25/08 12:41**			
1-Nitronaphthalene	5.34	5.37	-0.03	+/-1.0	113	50 - 150	
13SB19C (0811328-15)		**Lab File ID: data020-0**		**Analyzed: 11/25/08 12:58**			
1-Nitronaphthalene	5.33	5.37	-0.04	+/-1.0	114	50 - 150	
13SB17A (0811331-02)		**Lab File ID: data021-0**		**Analyzed: 11/25/08 13:16**			
1-Nitronaphthalene	5.37	5.37	0.00	+/-1.0	113	50 - 150	
13SB17C (0811331-03)		**Lab File ID: data022-0**		**Analyzed: 11/25/08 13:33**			
1-Nitronaphthalene	5.36	5.37	-0.01	+/-1.0	114	50 - 150	
13SB16A (0811331-04)		**Lab File ID: data023-0**		**Analyzed: 11/25/08 13:50**			
1-Nitronaphthalene	5.36	5.37	-0.01	+/-1.0	114	50 - 150	
Calibration Check (8112590-CCV3)		**Lab File ID: data024-0**		**Analyzed: 11/25/08 14:07**			
1-Nitronaphthalene	5.36	5.37	-0.01	+/-1.0	115	85 - 115	
13SB16C (0811331-05)		**Lab File ID: data025-0**		**Analyzed: 11/25/08 14:25**			
1-Nitronaphthalene	5.37	5.37	0.00	+/-1.0	114	50 - 150	
13SB15A (0811331-06)		**Lab File ID: data026-0**		**Analyzed: 11/25/08 14:42**			
1-Nitronaphthalene	5.38	5.37	0.01	+/-1.0	114	50 - 150	
DUP-13 (0811331-07)		**Lab File ID: data027-0**		**Analyzed: 11/25/08 14:59**			
1-Nitronaphthalene	5.38	5.37	0.01	+/-1.0	114	50 - 150	
Matrix Spike (0813555-MS2)		**Lab File ID: data028-0**		**Analyzed: 11/25/08 15:16**			
1-Nitronaphthalene	5.38	5.37	0.01	+/-1.0	102	50 - 150	
Matrix Spike Dup (0813555-MSD2)		**Lab File ID: data032-0**		**Analyzed: 11/25/08 16:27**			
1-Nitronaphthalene	5.37	5.37	0.00	+/-1.0	103	50 - 150	
Calibration Check (8112590-CCV4)		**Lab File ID: data034-0**		**Analyzed: 11/25/08 17:02**			
1-Nitronaphthalene	5.35	5.37	-0.02	+/-1.0	95	85 - 115	

INITIAL CALIBRATION STANDARDS
USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120310

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 221
Calibration: 8L03001

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
8110795	8332 L1	8120310-CAL1	NGPT012-0	07/28/08 17:19
8110794	8332 L2	8120310-CAL2	NGPT013-0	07/28/08 17:34
8110793	8332 L3	8120310-CAL3	NGPT014-0	07/28/08 17:48
8110792	8332 l4	8120310-CAL4	NGPT015-0	07/28/08 18:02
8110791	8332 L5	8120310-CAL5	NGPT016-0	07/28/08 18:17
8110790	8332 L6	8120310-CAL6	NGPT017-0	07/28/08 18:31
8110789	8332 cal 7	8120310-CAL7	NGPT018-0	07/28/08 18:45
8110797	8332 scv	8120310-SCV1	NGPT019-0	07/28/08 18:59

INITIAL CALIBRATION DATA (Continued)

USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Calibration: 8L03001

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Instrument: 221

Calibration Date: 07/28/08 07:20

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	Limit	Q
Nitroglycerin	18475.85	29.89333	4.655714	0.8306475	0.99992		0.99	
Pentaerythritol Tetranitrate	16654.46	12.09535	5.674286	0.8195966	0.99993		0.99	
1-Nitronaphthalene	152301.3	2.999747	7.301429	0.4431362			20	

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Calibration: 8L03001
Laboratory ID: 8120310-SCV1
Sequence: 8120310
Standard ID: 8110797

Analyte	Expected (ug/mL)	Found (ug/mL)	% Rec.	QC Limit
Nitroglycerin	1.00	0.920	92	80-120
Pentaerythritol Tetranitrate	1.00	0.847	85	80-120
1-Nitronaphthalene	0.0992	0.0956	96	80-120

* Values outside of QC limits

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120233

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 221
Calibration: 8L03001

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Calibration Check	8120233-CCV1	NGa014-0	12/02/08 23:50
Blank	0813555-BLK2	NGa015-0	12/03/08 00:05
LCS	0813555-BS2	NGa016-0	12/03/08 00:19
13SB13C	0811328-02RE1	NGa018-0	12/03/08 00:47
Calibration Check	8120233-CCV2	NGa022-0	12/03/08 01:44

CONTINUING CALIBRATION CHECK

USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Instrument ID: 221

Lab File ID: NGa014-0

Sequence: 8120233

Lab Sample ID: 8120233-CCV1

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Calibration: 8L03001

Calibration Date: 07/28/08 07:20

Injection Date: 12/02/08

Injection Time: 23:50

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Nitroglycerin	L	1.00	0.959	18475.85	14438		-4.1	20
Pentaerythritol Tetranitrate	L	1.00	0.880	16654.46	13652		-12.0	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 221
Calibration: 8L03001
Lab File ID: NGa022-0
Calibration Date: 07/28/08 07:20
Sequence: 8120233
Injection Date: 12/03/08
Lab Sample ID: 8120233-CCV2
Injection Time: 01:44

Analyte	Type	CONC. (ug/mL)		Response Factor			% Diff. / Drift	
		STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Nitroglycerin	L	1.00	0.916	18475.85	13836		-8.4	20
Pentaerythritol Tetranitrate	L	1.00	0.852	16654.46	13229		-14.8	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

SURROGATE STANDARD RECOVERY AND RT SUMMARY
USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8120233
Instrument: 221
Matrix: Soil
Calibration: 8L03001

Lab Sample Id Surrogate Compound Name	RT	Calibration Mean RT	RT Diff	RT Diff Limit	% Recovery	Recovery Limits	Q
Calibration Check (8120233-CCV1)		**Lab File ID: NGa014-0**		**Analyzed: 12/02/08 23:50**			
1-Nitronaphthalene	7.94	7.30	0.64	+/-1.0	99	85 - 115	
Blank (0813555-BLK2)		**Lab File ID: NGa015-0**		**Analyzed: 12/03/08 00:05**			
1-Nitronaphthalene	7.95	7.30	0.65	+/-1.0	55	50 - 150	
LCS (0813555-BS2)		**Lab File ID: NGa016-0**		**Analyzed: 12/03/08 00:19**			
1-Nitronaphthalene	7.94	7.30	0.64	+/-1.0	91	50 - 150	
13SB13C (0811328-02RE1)		**Lab File ID: NGa018-0**		**Analyzed: 12/03/08 00:47**			
1-Nitronaphthalene	7.95	7.30	0.65	+/-1.0	62	50 - 150	
Calibration Check (8120233-CCV2)		**Lab File ID: NGa022-0**		**Analyzed: 12/03/08 01:44**			
1-Nitronaphthalene	7.91	7.30	0.61	+/-1.0	96	85 - 115	

LCS / LCS DUPLICATE RECOVERY

USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

Laboratory ID: 0813555-BS2

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 8332 Extraction

Initial/Final: 2 g / 20 mL

QC Batch: 0813555

Sequence: 8120233

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
Nitroglycerin	10.0	8.71	87	72 - 112	mg/kg dry wt.
Pentaerythritol Tetranitrate	10.0	8.25	82	30 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

METHOD BLANK DATA SHEET
USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0813555-BLK2
File ID: NGa015-0
Prepared: 11/24/08 07:17
Preparation: 8332 Extraction
Initial/Final: 2 g / 20 mL
Analyzed: 12/03/08 00:05
Instrument: 221
QC Batch: 0813555
Sequence: 8120233
Calibration: 8L03001

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
55-63-0	Nitroglycerin	0.39	5.0	5.0	mg/kg dry wt.	U
78-11-5	Pentaerythritol Tetranitrate	0.23	5.0	5.0	mg/kg dry wt.	U

System Monitoring Compound	Added (mg/kg dry wt.)	Conc. (mg/kg dry wt.)	% REC	QC Limits	Q
1-Nitronaphthalene	2.48	1.37	55	50 - 150	

QC BATCH SUMMARY

USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

QC Batch: 0813555 QC Batch Matrix: Soil

Preparation: 8332 Extraction

Sample Name	Lab Sample ID	Date Prepared	Observations
13SB13A	0811328-01	11/24/08 07:17	
13SB13C	0811328-02	11/24/08 07:17	
13SB13C	0811328-02RE1	11/24/08 07:17	Added 12/2/2008 by JMK
13SB21C	0811328-03	11/24/08 07:17	
13SB14A	0811328-04	11/24/08 07:17	
13SB20A	0811328-06	11/24/08 07:17	
13SB20C	0811328-07	11/24/08 07:17	
13SB22A	0811328-08	11/24/08 07:17	
13SB22C	0811328-09	11/24/08 07:17	
13SB21A	0811328-10	11/24/08 07:17	
13SB18A	0811328-11	11/24/08 07:17	
13SB18C	0811328-12	11/24/08 07:17	
13SB19A	0811328-14	11/24/08 07:17	
13SB19C	0811328-15	11/24/08 07:17	
13SB17A	0811331-02	11/24/08 07:17	
13SB17C	0811331-03	11/24/08 07:17	
13SB16A	0811331-04	11/24/08 07:17	
13SB16C	0811331-05	11/24/08 07:17	
13SB15A	0811331-06	11/24/08 07:17	
DUP-13	0811331-07	11/24/08 07:17	
Blank	0813555-BLK1	11/24/08 07:17	
Blank	0813555-BLK2	11/24/08 07:17	
LCS	0813555-BS1	11/24/08 07:17	
LCS	0813555-BS2	11/24/08 07:17	
13SB19C	0813555-MS1	11/24/08 07:17	
13SB17C	0813555-MS2	11/24/08 07:17	
13SB19C	0813555-MSD1	11/24/08 07:17	
13SB17C	0813555-MSD2	11/24/08 07:17	

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-8332

13SB19C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 8332 Extraction

Initial/Final: 2 g / 20 mL

Laboratory ID: 0813555-MS1

QC Batch: 0813555

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Nitroglycerin	10.0	ND	9.77	98	70 - 120	mg/kg dry wt.
Pentaerythritol Tetranitrate	10.0	ND	11.2	112	30 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-8332

13SB19C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 8332 Extraction

Initial/Final: 2 g / 20 mL

Laboratory ID: 0813555-MSD1

QC Batch: 0813555

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Nitroglycerin	10.0	9.86	99	1	20	70 - 120	mg/kg dry wt.
Pentaerythritol Tetranitrate	10.0	11.2	112	0.04	20	30 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-8332

13SB17C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 8332 Extraction

Initial/Final: 2 g / 20 mL

Laboratory ID: 0813555-MS2

QC Batch: 0813555

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Nitroglycerin	10.0	ND	9.72	97	70 - 120	mg/kg dry wt.
Pentaerythritol Tetranitrate	10.0	ND	11.0	110	30 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-8332

13SB17C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 8332 Extraction

Initial/Final: 2 g / 20 mL

Laboratory ID: 0813555-MSD2

QC Batch: 0813555

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Nitroglycerin	10.0	9.77	98	0.5	20	70 - 120	mg/kg dry wt.
Pentaerythritol Tetranitrate	10.0	11.2	112	2	20	30 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

LCS / LCS DUPLICATE RECOVERY
USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil

Laboratory ID: 0813555-BS1

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 8332 Extraction
Initial/Final: 2 g / 20 mL
QC Batch: 0813555
Sequence: 8112590

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
Nitroglycerin	10.0	9.17	92	72 - 112	mg/kg dry wt.
Pentaerythritol Tetranitrate	10.0	10.7	107	30 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

LCS / LCS DUPLICATE RECOVERY
USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water

Laboratory ID: 0813557-BS1

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 8332 Extraction
Initial/Final: 770 mL / 10 mL
QC Batch: 0813557
Sequence: 8112470

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
Nitroglycerin	13.0	12.5	97	30 - 120	ug/L
Pentaerythritol Tetranitrate	13.0	14.0	108	30 - 120	ug/L

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

LCS / LCS DUPLICATE RECOVERY

USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Water

Laboratory ID: 0813557-BSD1

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 8332 Extraction

Initial/Final: 770 mL / 10 mL

QC Batch: 0813557

Sequence: 8112470

Analyte	Spike Added ug/L	LCSD Conc.	LCSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Nitroglycerin	13.0	12.7	97	0.9	20	30 - 120	ug/L
Pentaerythritol Tetranitrate	13.0	13.4	103	5	20	30 - 120	ug/L

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

METHOD BLANK DATA SHEET
USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0813555-BLK1
File ID: data003-0
Prepared: 11/24/08 07:17
Preparation: 8332 Extraction
Initial/Final: 2 g / 20 mL
Analyzed: 11/25/08 08:01
Instrument: 221
QC Batch: 0813555
Sequence: 8112590
Calibration: 8K24006

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
55-63-0	Nitroglycerin	0.39	5.0	5.0	mg/kg dry wt.	U
78-11-5	Pentaerythritol Tetranitrate	0.23	5.0	5.0	mg/kg dry wt.	U

System Monitoring Compound	Added (mg/kg dry wt.)	Conc. (mg/kg dry wt.)	% REC	QC Limits	Q
1-Nitronaphthalene	2.48	2.85	115	50 - 150	

QC BATCH SUMMARY
USEPA-8332

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

QC Batch: 0813555 QC Batch Matrix: Soil Preparation: 8332 Extraction

Sample Name	Lab Sample ID	Date Prepared	Observations
13SB13A	0811328-01	11/24/08 07:17	
13SB13C	0811328-02	11/24/08 07:17	
13SB13C	0811328-02RE1	11/24/08 07:17	Added 12/2/2008 by JMK
13SB21C	0811328-03	11/24/08 07:17	
13SB14A	0811328-04	11/24/08 07:17	
13SB20A	0811328-06	11/24/08 07:17	
13SB20C	0811328-07	11/24/08 07:17	
13SB22A	0811328-08	11/24/08 07:17	
13SB22C	0811328-09	11/24/08 07:17	
13SB21A	0811328-10	11/24/08 07:17	
13SB18A	0811328-11	11/24/08 07:17	
13SB18C	0811328-12	11/24/08 07:17	
13SB19A	0811328-14	11/24/08 07:17	
13SB19C	0811328-15	11/24/08 07:17	
13SB17A	0811331-02	11/24/08 07:17	
13SB17C	0811331-03	11/24/08 07:17	
13SB16A	0811331-04	11/24/08 07:17	
13SB16C	0811331-05	11/24/08 07:17	
13SB15A	0811331-06	11/24/08 07:17	
DUP-13	0811331-07	11/24/08 07:17	
Blank	0813555-BLK1	11/24/08 07:17	
Blank	0813555-BLK2	11/24/08 07:17	
LCS	0813555-BS1	11/24/08 07:17	
LCS	0813555-BS2	11/24/08 07:17	
13SB19C	0813555-MS1	11/24/08 07:17	
13SB17C	0813555-MS2	11/24/08 07:17	
13SB19C	0813555-MSD1	11/24/08 07:17	
13SB17C	0813555-MSD2	11/24/08 07:17	

METHOD BLANK DATA SHEET
USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Water
Laboratory ID: 0813557-BLK1
File ID: NPa010-0
Prepared: 11/19/08 07:19
Preparation: 8332 Extraction
Initial/Final: 770 mL / 10 mL
Analyzed: 11/21/08 18:39
Instrument: 221
QC Batch: 0813557
Sequence: 8112470
Calibration: 8K24006

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
55-63-0	Nitroglycerin	1.2	10	10	ug/L	U
78-11-5	Pentaerythritol Tetranitrate	1.2	10	10	ug/L	U

System Monitoring Compound	Added (ug/L)	Conc. (ug/L)	% REC	QC Limits	Q
1-Nitronaphthalene	3.22	3.29	102	50 - 150	

QC BATCH SUMMARY
USEPA-8332

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

QC Batch: 0813557 QC Batch Matrix: Water Preparation: 8332 Extraction

Sample Name	Lab Sample ID	Date Prepared	Observations
EQBK-1	0811328-05	11/19/08 07:19	
EQBK-5	0811328-13	11/19/08 07:19	
EQBK-6	0811331-01	11/19/08 07:19	
Blank	0813557-BLK1	11/19/08 07:19	
LCS	0813557-BS1	11/19/08 07:19	
LCS Dup	0813557-BSD1	11/19/08 07:19	

HOLDING TIME SUMMARY
USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Method: Nitroglycerine by EPA Method 8332

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB13A	11/12/08	11/14/08		11/24/08	12	14	11/25/08	1	40	
13SB13C	11/12/08	11/14/08		11/24/08	12	14	11/25/08	1	40	
13SB13C	11/12/08	11/14/08		11/24/08	12	14	12/03/08	9	40	
13SB21C	11/12/08	11/14/08		11/24/08	12	14	11/25/08	1	40	
13SB14A	11/12/08	11/14/08		11/24/08	12	14	11/25/08	1	40	
EQBK-1	11/12/08	11/14/08		11/19/08	7	7	11/21/08	3	40	
13SB20A	11/12/08	11/14/08		11/24/08	12	14	11/25/08	1	40	
13SB20C	11/12/08	11/14/08		11/24/08	12	14	11/25/08	1	40	
13SB22A	11/12/08	11/14/08		11/24/08	12	14	11/25/08	1	40	
13SB22C	11/12/08	11/14/08		11/24/08	12	14	11/25/08	1	40	
13SB21A	11/12/08	11/14/08		11/24/08	12	14	11/25/08	1	40	
13SB18A	11/13/08	11/14/08		11/24/08	11	14	11/25/08	1	40	
13SB18C	11/13/08	11/14/08		11/24/08	11	14	11/25/08	1	40	
EQBK-5	11/13/08	11/14/08		11/19/08	6	7	11/21/08	3	40	
13SB19A	11/13/08	11/14/08		11/24/08	11	14	11/25/08	1	40	
13SB19C	11/13/08	11/14/08		11/24/08	11	14	11/25/08	1	40	
EQBK-6	11/14/08	11/15/08		11/19/08	5	7	11/21/08	3	40	
13SB17A	11/14/08	11/15/08		11/24/08	10	14	11/25/08	1	40	
13SB17C	11/14/08	11/15/08		11/24/08	10	14	11/25/08	1	40	
13SB16A	11/14/08	11/15/08		11/24/08	10	14	11/25/08	1	40	
13SB16C	11/14/08	11/15/08		11/24/08	10	14	11/25/08	1	40	

HOLDING TIME SUMMARY
USEPA-8332

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Method: Nitroglycerine by EPA Method 8332

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB15A	11/14/08	11/15/08		11/24/08	10	14	11/25/08	1	40	
DUP-13	11/14/08	11/15/08		11/24/08	10	14	11/25/08	1	40	

DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

Project Name: Radford SWMU13
Reviewer: Andrea Sansom
Date: 1/30/2009

SDG No.: 36440-61
Project No.: 11656367.30000

		6020			6010B			CVAA-Hg		
1.0 Chain of Custody/Sample Condition/Raw Data		Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?	X			X			X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X			X			X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X			X			X	
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 $^{O}C \pm 2\ ^{O}C$)		X			X			X	
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	X			X			X		

Note:

		6020			6010B			CVAA-Hg		
2.0 Holding Time		Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days; other metals: 6 months) Action:L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).		X			X			X	

Note:

3.0 Instrument Calibration		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? (ICP& ICPMS: blank + one standard & a RL standard OR 3 standards and a blank with one standard at the RL). If not, qualify with "R".	X			X			X		
3.2	Are the correlation coefficients > 0.99? Action: J(+)/UJ(-).	X			X			X		
3.3	Once per calibration, did a high and low distilled standard recovery within 85-115%? If no, follow 3.6.									
3.4	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".	X			X			X		
3.5	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.	X			X			X		
3.6	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? For ICP 90% 110%; For Hg 80-120%.	X			X			X		
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury < 65% 65% - 79% > 120% Other Metals < 75% 75% - 89% > 110%									
3.7	For ICP & ICPMS, did the CRDL standard recover between 80-120%?			X			X			
	<50% 50%-79% >120% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K									

Note: _____

4.0 Blanks		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	X			X			X		
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".	X			X			X		
4.3	Are there reported MB or ICB/CCBs values > MDL?	X			X				X	
	Sample Results > MDL									
	< 5X Blank Contamination B									
4.4	Are there negative blank results with the absolute value > MDL?	X			X				X	
	Sample Results Non-detects > MDL									
	< 5X absolute Blank Contamination UL L									
4.5	Are there reported field blank > ± MDL?	X			X				X	
	Sample Results > MDL									
	< 5X Blank Contamination B									

Note: _____

5.0 ICP Interference Check Sample (ICS)		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning of each ICP run?	X			X					
5.2	Are the ICS AB recoveries within 80% - 120%?	X			X					
5.3	Are the results for unspiked analytes (in ICS A) < ± 2*MDL?		X			X				
5.4	If not, are the associated sample Al, Ca, Fe, and Mg or Al & Mn concentrations less than the level in the ICS?	X			X					
	If not...									
	Action: Not Spiked Analytes Spiked analytes (ICS AB analytes)									
	< -IDL > IDL < 50% 50% - 79% >120%									
	Result<5X|ICSAB|: L(+)/UL(-) K(+) L(+)/R(-) L(+)/UL(-) K(+)									

Note: _____

6.0 Laboratory Control Sample (LCS)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.	X			X			X		
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)		X			X			X	
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)									

Note: _____

7.0 Laboratory Duplicates (MSD)

		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.	X			X			X		
	For aqueous 6010B and Hg - RPD< 25%, aqueous CN - RPD < 20%, aqueous 6020 - RPD < 20%, and for soil - use laboratory generated limits for MS/MSD.									
7.2	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ(-) for the analyte with results that fall outside criteria.	X			X			X		

Note: _____

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.	X			X			X		
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125%?		X			X		X		
	%R > 125% 30%< %R < 74% < 30%									
	Positive K L L									
	Non-detect None UL R									
8.3	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.	X			X			X		

Note: _____

9.0 Instrument Detection Limits (IDL)		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?		X			X		X		

Note: _____

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?	X			X					
10.2	Was a five-fold dilution performed?	X			X					
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 5 X the RL for 6010 or > 20 X the RL for 6020 in the original sample? If no, J(+).		X			X				

Note: _____

11.0 Field Duplicate Samples		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?	X			X			X		
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.									
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report	X			X			X		

Note: _____

12.0 Result Verification/ Internal Standards/ Tune		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?			X			X	X		
12.2	Were all dilutions reflected in the positive results and detection limits?	X			X			X		
12.3	Were the Internal Standard recoveries within 30-120%	X					X			
12.4	Were the tunes run at a minimum of four times with RSD < 5% for analytes in solution?	X								
12.5	Were the tune mass calibrations < 0.1 amu from the true value?	X								
12.6	Was the resolution check peak width < 0.9 amu at 10% peak height?	X								

Note: ALL SOILS WERE AIR DRIED AT 50C

13.0 Completeness Calculation		6020			6010B			CVAA-Hg		
		Yes	No	NA	Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)	X			X			X		
13.1.1	Number of samples: 22									
13.1.2	Number of target compounds in each analysis: 23									
13.1.3	Number of results rejected and not reported: 0									
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2) % Completeness = 100%									

Note: _____

QC BATCH SUMMARY

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

QC Batch: 0813642 QC Batch Matrix: Soil

Preparation: 3050B Digestion

Sample Name	Lab Sample ID	Date Prepared	Observations
13SB13A	0811328-01	11/19/08 07:30	
13SB13C	0811328-02	11/19/08 07:30	
13SB21C	0811328-03	11/19/08 07:30	
13SB14A	0811328-04	11/19/08 07:30	
13SB20A	0811328-06	11/19/08 07:30	
13SB20C	0811328-07	11/19/08 07:30	
13SB22A	0811328-08	11/19/08 07:30	
13SB22C	0811328-09	11/19/08 07:30	
13SB21A	0811328-10	11/19/08 07:30	
13SB18A	0811328-11	11/19/08 07:30	
13SB18C	0811328-12	11/19/08 07:30	
13SB19A	0811328-14	11/19/08 07:30	
13SB19C	0811328-15	11/19/08 07:30	
Blank	0813642-BLK1	11/19/08 07:30	
Blank	0813642-BLK2	11/19/08 07:30	
LCS	0813642-BS1	11/19/08 07:30	
LCS	0813642-BS2	11/19/08 07:30	
13SB19C	0813642-MS1	11/19/08 07:30	
13SB19C	0813642-MS2	11/19/08 07:30	
13SB19C	0813642-MSD1	11/19/08 07:30	
13SB19C	0813642-MSD2	11/19/08 07:30	
13SB19C	0813642-PS1	11/24/08 12:25	[Spk] 0.5g->250mL; 10mL->10mL; Spiked 10mL
13SB19C	0813642-PS2	11/24/08 12:25	[Spk] 0.5g->250mL; 10mL->10mL; Spiked 10mL
13SB19C	0813642-PS3	11/24/08 12:25	[Spk] 0.5g->250mL; 10mL->10mL; Spiked 10mL

METHOD BLANK DATA SHEET
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0813642-BLK1
File ID: 8112445-015
Prepared: 11/19/08 07:30
Preparation: 3050B Digestion
Initial/Final: 0.5 g / 250 mL
Analyzed: 11/24/08 12:38
Instrument: 114
QC Batch: 0813642
Sequence: 8112445
Calibration: 8K25005

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
7440-38-2	Arsenic, Total	0.026	0.20	0.20	mg/kg dry wt.	U
7440-50-8	Copper, Total	0.027	0.20	0.20	mg/kg dry wt.	U
7439-92-1	Lead, Total	0.024	0.20	0.20	mg/kg dry wt.	U
7440-02-0	Nickel, Total	0.035	0.10	0.10	mg/kg dry wt.	U
7782-49-2	Selenium, Total	0.028	0.30	0.30	mg/kg dry wt.	U
7440-22-4	Silver, Total	0.0093	0.10	0.10	mg/kg dry wt.	U
7440-28-0	Thallium, Total	0.0068	0.10	0.10	mg/kg dry wt.	U

METHOD BLANK DATA SHEET
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0813642-BLK2
File ID: 8112479-014
Prepared: 11/19/08 07:30
Preparation: 3050B Digestion
Initial/Final: 0.5 g / 250 mL
Analyzed: 11/24/08 16:34
Instrument: 114
QC Batch: 0813642
Sequence: 8112479
Calibration: 8K25015

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
7440-62-2	Vanadium, Total	0.032	0.10	0.10	mg/kg dry wt.	U

LCS / LCS DUPLICATE RECOVERY

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

Laboratory ID: 0813642-BS1

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.5 g / 250 mL

QC Batch: 0813642

Sequence: 8112445

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
Arsenic, Total	20.0	19.8	99	80 - 120	mg/kg dry wt.
Copper, Total	20.0	20.3	102	80 - 120	mg/kg dry wt.
Lead, Total	20.0	20.0	100	80 - 120	mg/kg dry wt.
Nickel, Total	20.0	20.2	101	80 - 120	mg/kg dry wt.
Selenium, Total	20.0	19.1	95	80 - 120	mg/kg dry wt.
Silver, Total	20.0	19.6	98	75 - 120	mg/kg dry wt.
Thallium, Total	20.0	20.0	100	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

LCS / LCS DUPLICATE RECOVERY

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

Laboratory ID: 0813642-BS2

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.5 g / 250 mL

QC Batch: 0813642

Sequence: 8112479

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
Vanadium, Total	20.0	20.4	102	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

QC BATCH SUMMARY

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

QC Batch: 0813766 QC Batch Matrix: Soil

Preparation: 3050B Digestion

Sample Name	Lab Sample ID	Date Prepared	Observations
13SB13A	0811328-01	11/21/08 09:00	
13SB13C	0811328-02	11/21/08 09:00	
13SB21C	0811328-03	11/21/08 09:00	
13SB14A	0811328-04	11/21/08 09:00	
13SB20A	0811328-06	11/21/08 09:00	
13SB20C	0811328-07	11/21/08 09:00	
13SB22A	0811328-08	11/21/08 09:00	
13SB22C	0811328-09	11/21/08 09:00	
13SB21A	0811328-10	11/21/08 09:00	
13SB18A	0811328-11	11/21/08 09:00	
13SB18C	0811328-12	11/21/08 09:00	
13SB19A	0811328-14	11/21/08 09:00	
13SB19C	0811328-15	11/21/08 09:00	
Blank	0813766-BLK1	11/21/08 09:00	
LCS	0813766-BS1	11/21/08 09:00	
13SB19C	0813766-MS1	11/21/08 09:00	
13SB19C	0813766-MSD1	11/21/08 09:00	
13SB19C	0813766-PS1	11/25/08 13:40	[Spk] 0.4999g->250mL; 5mL->5mL; Spiked 5mL

METHOD BLANK DATA SHEET
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0813766-BLK1
File ID: 8112556-015
Prepared: 11/21/08 09:00
Preparation: 3050B Digestion
Initial/Final: 0.5 g / 250 mL
Analyzed: 11/25/08 14:15
Instrument: 201
QC Batch: 0813766
Sequence: 8112556
Calibration: 8K25023

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
7440-36-0	Antimony, Total	0.026	0.20	0.20	mg/kg dry wt.	U

LCS / LCS DUPLICATE RECOVERY

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

Laboratory ID: 0813766-BS1

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.5 g / 250 mL

QC Batch: 0813766

Sequence: 8112556

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
Antimony, Total	20.0	18.4	92	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

QC BATCH SUMMARY

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

QC Batch: 0813780 QC Batch Matrix: Soil

Preparation: 3050B Digestion

Sample Name	Lab Sample ID	Date Prepared	Observations
13SB17A	0811331-02	11/21/08 07:30	
13SB17C	0811331-03	11/21/08 07:30	
13SB16A	0811331-04	11/21/08 07:30	
13SB16C	0811331-05	11/21/08 07:30	
13SB15A	0811331-06	11/21/08 07:30	
DUP-13	0811331-07	11/21/08 07:30	
Blank	0813780-BLK1	11/21/08 07:30	
Blank	0813780-BLK2	11/21/08 07:30	
LCS	0813780-BS1	11/21/08 07:30	
LCS	0813780-BS2	11/21/08 07:30	
13SB17C	0813780-MS1	11/21/08 07:30	
13SB17C	0813780-MS2	11/21/08 07:30	
13SB17C	0813780-MSD1	11/21/08 07:30	
13SB17C	0813780-MSD2	11/21/08 07:30	
13SB17C	0813780-PS1	11/24/08 12:40	[Spk] 0.5002g->250mL; 10mL->10mL; Spiked 10mL
13SB17C	0813780-PS2	11/24/08 12:40	[Spk] 0.5002g->250mL; 10mL->10mL; Spiked 10mL
13SB17C	0813780-PS3	11/24/08 12:40	[Spk] 0.5002g->250mL; 10mL->10mL; Spiked 10mL

METHOD BLANK DATA SHEET
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0813780-BLK1
File ID: 8112445-036
Prepared: 11/21/08 07:30
Preparation: 3050B Digestion
Initial/Final: 0.5 g / 250 mL
Analyzed: 11/24/08 13:39
Instrument: 114
QC Batch: 0813780
Sequence: 8112445
Calibration: 8K25005

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
7440-38-2	Arsenic, Total	0.026	0.20	0.20	mg/kg dry wt.	U
7440-50-8	Copper, Total	0.027	0.20	0.20	mg/kg dry wt.	U
7439-92-1	Lead, Total	0.024	0.20	0.20	mg/kg dry wt.	U
7440-02-0	Nickel, Total	0.035	0.10	0.10	mg/kg dry wt.	U
7782-49-2	Selenium, Total	0.028	0.30	0.30	mg/kg dry wt.	U
7440-22-4	Silver, Total	0.0093	0.10	0.10	mg/kg dry wt.	U
7440-28-0	Thallium, Total	0.0068	0.10	0.10	mg/kg dry wt.	U

METHOD BLANK DATA SHEET
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0813780-BLK2
File ID: 8112479-035
Prepared: 11/21/08 07:30
Preparation: 3050B Digestion
Initial/Final: 0.5 g / 250 mL
Analyzed: 11/24/08 17:17
Instrument: 114
QC Batch: 0813780
Sequence: 8112479
Calibration: 8K25015

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
7440-62-2	Vanadium, Total	0.032	0.10	0.10	mg/kg dry wt.	U

LCS / LCS DUPLICATE RECOVERY

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

Laboratory ID: 0813780-BS1

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.5 g / 250 mL

QC Batch: 0813780

Sequence: 8112445

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
Arsenic, Total	20.0	19.5	97	80 - 120	mg/kg dry wt.
Copper, Total	20.0	19.9	100	80 - 120	mg/kg dry wt.
Lead, Total	20.0	19.6	98	80 - 120	mg/kg dry wt.
Nickel, Total	20.0	20.1	101	80 - 120	mg/kg dry wt.
Selenium, Total	20.0	18.3	92	80 - 120	mg/kg dry wt.
Silver, Total	20.0	19.4	97	75 - 120	mg/kg dry wt.
Thallium, Total	20.0	19.5	97	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

LCS / LCS DUPLICATE RECOVERY

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

Laboratory ID: 0813780-BS2

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.5 g / 250 mL

QC Batch: 0813780

Sequence: 8112479

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
Vanadium, Total	20.0	19.8	99	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

QC BATCH SUMMARY

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

QC Batch: 0813767 QC Batch Matrix: Soil

Preparation: 3050B Digestion

Sample Name	Lab Sample ID	Date Prepared	Observations
13SB17A	0811331-02	11/21/08 10:30	
13SB17C	0811331-03	11/21/08 10:30	
13SB16A	0811331-04	11/21/08 10:30	
13SB16C	0811331-05	11/21/08 10:30	
13SB15A	0811331-06	11/21/08 10:30	
DUP-13	0811331-07	11/21/08 10:30	
Blank	0813767-BLK1	11/21/08 10:30	
LCS	0813767-BS1	11/21/08 10:30	
13SB17C	0813767-MS1	11/21/08 10:30	
13SB17C	0813767-MSD1	11/21/08 10:30	
13SB17C	0813767-PS1	11/25/08 13:40	[Spk] 0.5003g->250mL; 5mL->5mL; Spiked 5mL

METHOD BLANK DATA SHEET
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0813767-BLK1
File ID: 8112556-036
Prepared: 11/21/08 10:30
Preparation: 3050B Digestion
Initial/Final: 0.5 g / 250 mL
Analyzed: 11/25/08 15:09
Instrument: 201
QC Batch: 0813767
Sequence: 8112556
Calibration: 8K25023

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
7440-36-0	Antimony, Total	0.026	0.20	0.20	mg/kg dry wt.	U

LCS / LCS DUPLICATE RECOVERY

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

Laboratory ID: 0813767-BS1

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.5 g / 250 mL

QC Batch: 0813767

Sequence: 8112556

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
Antimony, Total	20.0	18.8	94	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

QC BATCH SUMMARY

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

QC Batch: 0813681 QC Batch Matrix: Water

Preparation: 3020A Digestion

Sample Name	Lab Sample ID	Date Prepared	Observations
EQBK-1	0811328-05	11/20/08 07:30	
EQBK-5	0811328-13	11/20/08 07:30	
EQBK-6	0811331-01	11/20/08 07:30	
Blank	0813681-BLK1	11/20/08 07:30	
Blank	0813681-BLK2	11/20/08 07:30	
LCS	0813681-BS1	11/20/08 07:30	
LCS	0813681-BS2	11/20/08 07:30	

METHOD BLANK DATA SHEET
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Water
Laboratory ID: 0813681-BLK1
File ID: 8120103-017
Prepared: 11/20/08 07:30
Preparation: 3020A Digestion
Initial/Final: 25 mL / 125 mL
Analyzed: 12/01/08 10:00
Instrument: 114
QC Batch: 0813681
Sequence: 8120103
Calibration: 8L01014

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
7440-39-3	Barium, Total	0.23	2.0	2.0	ug/L	U
7440-41-7	Beryllium, Total	0.23	2.0	2.0	ug/L	U
7440-43-9	Cadmium, Total	0.056	0.20	0.20	ug/L	U
7440-47-3	Chromium, Total	0.33	2.0	2.0	ug/L	U
7440-50-8	Copper, Total	0.29	1.0	1.0	ug/L	U
7439-92-1	Lead, Total	0.29	1.0	1.0	ug/L	U
7439-96-5	Manganese, Total	0.30	3.0	3.0	ug/L	U
7440-02-0	Nickel, Total	0.35	2.0	2.0	ug/L	U
7782-49-2	Selenium, Total	0.30	3.0	3.0	ug/L	U
7440-22-4	Silver, Total	0.061	0.50	0.50	ug/L	U
7440-28-0	Thallium, Total	0.050	0.20	0.20	ug/L	U
7440-66-6	Zinc, Total	1.8	10	10	ug/L	U

METHOD BLANK DATA SHEET
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Water
Laboratory ID: 0813681-BLK2
File ID: 8120139-016
Prepared: 11/20/08 07:30
Preparation: 3020A Digestion
Initial/Final: 25 mL / 125 mL
Analyzed: 12/01/08 12:16
Instrument: 114
QC Batch: 0813681
Sequence: 8120139
Calibration: 8L01017

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
7440-36-0	Antimony, Total	0.32	3.0	3.0	ug/L	U
7440-38-2	Arsenic, Total	0.24	3.0	3.0	ug/L	U
7440-48-4	Cobalt, Total	0.050	1.0	1.0	ug/L	U
7440-62-2	Vanadium, Total	0.27	5.0	5.0	ug/L	U

LCS / LCS DUPLICATE RECOVERY

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water

Laboratory ID: 0813681-BS1

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3020A Digestion
Initial/Final: 25 mL / 125 mL
QC Batch: 0813681
Sequence: 8120103

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
Barium, Total	50.0	41.4	83	80 - 120	ug/L
Beryllium, Total	50.0	40.7	81	80 - 120	ug/L
Cadmium, Total	50.0	41.8	84	80 - 120	ug/L
Chromium, Total	50.0	48.0	96	80 - 120	ug/L
Copper, Total	50.0	44.0	88	80 - 120	ug/L
Lead, Total	50.0	43.4	87	80 - 120	ug/L
Manganese, Total	50.0	48.1	96	80 - 120	ug/L
Nickel, Total	50.0	42.0	84	80 - 120	ug/L
Selenium, Total	50.0	40.1	80	80 - 120	ug/L
Silver, Total	50.0	43.4	87	80 - 120	ug/L
Thallium, Total	50.0	42.6	85	80 - 120	ug/L
Zinc, Total	50.0	48.8	98	80 - 120	ug/L

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

LCS / LCS DUPLICATE RECOVERY

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water

Laboratory ID: 0813681-BS2

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3020A Digestion
Initial/Final: 25 mL / 125 mL
QC Batch: 0813681
Sequence: 8120139

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
Antimony, Total	50.0	40.7	81	80 - 120	ug/L
Arsenic, Total	50.0	41.6	83	80 - 120	ug/L
Cobalt, Total	50.0	42.9	86	80 - 120	ug/L
Vanadium, Total	50.0	42.8	86	80 - 120	ug/L

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6020A

13SB17C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.4998 g / 250 mL

Laboratory ID: 0813767-MS1

QC Batch: 0813767

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Antimony, Total	20.0	0.178	18.8	93	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6020A

13SB17C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.4997 g / 250 mL

Laboratory ID: 0813767-MSD1

QC Batch: 0813767

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Antimony, Total	20.0	18.8	93	0.3	20	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6020A

13SB17C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.4995 g / 250 mL

Laboratory ID: 0813780-MS1

QC Batch: 0813780

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Arsenic, Total	20.0	1.48	17.6	81	80 - 120	mg/kg dry wt.
Copper, Total	20.0	16.2	34.0	89	80 - 120	mg/kg dry wt.
Lead, Total	20.0	125	149	121 *	80 - 120	mg/kg dry wt.
Nickel, Total	20.0	9.84	28.9	95	80 - 120	mg/kg dry wt.
Selenium, Total	20.0	0.142	14.8	73 *	80 - 120	mg/kg dry wt.
Silver, Total	20.0	0.0660	18.7	93	75 - 120	mg/kg dry wt.
Thallium, Total	20.0	0.294	19.0	94	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6020A

13SB17C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.4998 g / 250 mL

Laboratory ID: 0813780-MSD1

QC Batch: 0813780

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Arsenic, Total	20.0	17.3	79 *	2	20	80 - 120	mg/kg dry wt.
Copper, Total	20.0	33.6	87	1	20	80 - 120	mg/kg dry wt.
Lead, Total	20.0	143	91	4	20	80 - 120	mg/kg dry wt.
Nickel, Total	20.0	29.6	99	3	20	80 - 120	mg/kg dry wt.
Selenium, Total	20.0	14.2	70 *	4	20	80 - 120	mg/kg dry wt.
Silver, Total	20.0	18.8	94	0.3	20	75 - 120	mg/kg dry wt.
Thallium, Total	20.0	19.4	95	2	20	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6020A

13SB17C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.4995 g / 250 mL

Laboratory ID: 0813780-MS2

QC Batch: 0813780

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Vanadium, Total	20.0	21.1	41.0	99	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6020A

13SB17C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.4998 g / 250 mL

Laboratory ID: 0813780-MSD2

QC Batch: 0813780

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Vanadium, Total	20.0	42.9	109	4	20	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

POST DIGEST SPIKE SAMPLE RECOVERY

USEPA-6020A

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
% Solids: 84.26
Laboratory ID: 0813767-PS1
Lab Source ID: 0811331-03

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Initial/Final: 0.010006 g / 5 mL
QC Batch: 0813767
Sequence: 8112556

Analyte	Control Limit %R	Spike Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R	Units
Antimony, Total	75 - 125	0.0198	0.000356	0.0200	97	mg/L

* Values outside of QC limits

POST DIGEST SPIKE SAMPLE RECOVERY

USEPA-6020A

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
% Solids: 84.26
Laboratory ID: 0813780-PS1
Lab Source ID: 0811331-03

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Initial/Final: 0.020008 g / 10 mL
QC Batch: 0813780
Sequence: 8112445

Analyte	Control Limit %R	Spike Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R	Units
Arsenic, Total	75 - 125	0.0208	0.00297	0.0200	89	mg/L
Copper, Total	75 - 125	0.0495	0.0324	0.0200	85	mg/L
Nickel, Total	75 - 125	0.0371	0.0197	0.0200	87	mg/L
Selenium, Total	75 - 125	0.0172	0.000284	0.0200	85	mg/L
Silver, Total	75 - 125	0.0201	0.000132	0.0200	100	mg/L
Thallium, Total	75 - 125	0.0193	0.000589	0.0200	94	mg/L

* Values outside of QC limits

POST DIGEST SPIKE SAMPLE RECOVERY

USEPA-6020A

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
% Solids: 84.26
Laboratory ID: 0813780-PS2
Lab Source ID: 0811331-03

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Initial/Final: 0.020008 g / 10 mL
QC Batch: 0813780
Sequence: 8112445

Analyte	Control Limit %R	Spike Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R	Units
Lead, Total	75 - 125	0.343	0.250	0.100	93	mg/L

* Values outside of QC limits

POST DIGEST SPIKE SAMPLE RECOVERY

USEPA-6020A

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
% Solids: 84.26
Laboratory ID: 0813780-PS3
Lab Source ID: 0811331-03

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Initial/Final: 0.020008 g / 10 mL
QC Batch: 0813780
Sequence: 8112479

Analyte	Control Limit %R	Spike Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R	Units
Vanadium, Total	75 - 125	0.0635	0.0423	0.0200	106	mg/L

* Values outside of QC limits

SERIAL DILUTION
USEPA-6020A

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
% Solids: 84.26
Laboratory ID: 8112445-SRD2
Lab Source ID: 0811331-03

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
QC Batch: 8112445
Sequence: 8112445

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Units	QC Limits % Difference
Arsenic, Total	0.00297		0.00312		5.0 #		mg/L	10
Copper, Total	0.0324		0.0351		8.0		mg/L	10
Nickel, Total	0.0197		0.0218		11.0	*	mg/L	10
Selenium, Total	0.000284	J	0.000690	J	143.0 #		mg/L	10
Silver, Total	0.000132	J	0.000185	J	40.0 #		mg/L	10
Thallium, Total	0.000589		0.000655	J	11.0 #		mg/L	10

* Values outside of QC limits

Initial Sample Result (I) was less than 50xMDL (for 6010) or 100xMDL (for 6020), therefore serial dilution is not required.

SERIAL DILUTION

USEPA-6020A

13SB17C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

% Solids: 84.26

Laboratory ID: 8112445-SRD4

Lab Source ID: 0811331-03

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

QC Batch: 8112445

Sequence: 8112445

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Units	QC Limits % Difference
Lead, Total	0.0500		0.0545		9.0		mg/L	10

* Values outside of QC limits

Initial Sample Result (I) was less than 50xMDL (for 6010) or 100xMDL (for 6020), therefore serial dilution is not required.

SERIAL DILUTION

USEPA-6020A

13SB17C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

% Solids: 84.26

Laboratory ID: 8112479-SRD2

Lab Source ID: 0811331-03

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

QC Batch: 8112479

Sequence: 8112479

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Units	QC Limits % Difference
Vanadium, Total	0.0423		0.0451		7.0		mg/L	10

* Values outside of QC limits

Initial Sample Result (I) was less than 50xMDL (for 6010) or 100xMDL (for 6020), therefore serial dilution is not required.

SERIAL DILUTION

USEPA-6020A

13SB17C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

% Solids: 84.26

Laboratory ID: 8112556-SRD2

Lab Source ID: 0811331-03

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

QC Batch: 8112556

Sequence: 8112556

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Units	QC Limits % Difference
Antimony, Total	0.000356	J	0.000165	U	54.0 #		mg/L	10

* Values outside of QC limits

Initial Sample Result (I) was less than 50xMDL (for 6010) or 100xMDL (for 6020), therefore serial dilution is not required.

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6020A

13SB19C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.4999 g / 250 mL

Laboratory ID: 0813642-MS1

QC Batch: 0813642

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Arsenic, Total	20.0	0.707	17.3	83	80 - 120	mg/kg dry wt.
Copper, Total	20.0	4.40	24.1	99	80 - 120	mg/kg dry wt.
Lead, Total	20.0	44.2	66.9	114	80 - 120	mg/kg dry wt.
Nickel, Total	20.0	7.82	27.9	100	80 - 120	mg/kg dry wt.
Selenium, Total	20.0	0.156	17.2	85	80 - 120	mg/kg dry wt.
Silver, Total	20.0	0.0295	19.5	97	75 - 120	mg/kg dry wt.
Thallium, Total	20.0	0.297	20.4	101	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6020A

13SB19C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.5002 g / 250 mL

Laboratory ID: 0813642-MSD1

QC Batch: 0813642

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Arsenic, Total	20.0	17.0	81	2	20	80 - 120	mg/kg dry wt.
Copper, Total	20.0	22.8	92	5	20	80 - 120	mg/kg dry wt.
Lead, Total	20.0	57.5	67 *	15	20	80 - 120	mg/kg dry wt.
Nickel, Total	20.0	26.9	95	4	20	80 - 120	mg/kg dry wt.
Selenium, Total	20.0	17.1	85	0.8	20	80 - 120	mg/kg dry wt.
Silver, Total	20.0	19.6	98	0.7	20	75 - 120	mg/kg dry wt.
Thallium, Total	20.0	19.9	98	3	20	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6020A

13SB19C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.4999 g / 250 mL

Laboratory ID: 0813642-MS2

QC Batch: 0813642

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Vanadium, Total	20.0	13.0	32.9	99	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6020A

13SB19C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.5002 g / 250 mL

Laboratory ID: 0813642-MSD2

QC Batch: 0813642

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Vanadium, Total	20.0	32.2	96	2	20	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6020A

13SB19C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.5004 g / 250 mL

Laboratory ID: 0813766-MS1

QC Batch: 0813766

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Antimony, Total	20.0	ND	18.9	95	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6020A

13SB19C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.4999 g / 250 mL

Laboratory ID: 0813766-MSD1

QC Batch: 0813766

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Antimony, Total	20.0	18.7	93	2	20	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

POST DIGEST SPIKE SAMPLE RECOVERY

USEPA-6020A

13SB19C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
% Solids: 76.14
Laboratory ID: 0813642-PS1
Lab Source ID: 0811328-15

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Initial/Final: 0.02 g / 10 mL
QC Batch: 0813642
Sequence: 8112445

Analyte	Control Limit %R	Spike Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R	Units
Arsenic, Total	75 - 125	0.0206	0.00141	0.0200	96	mg/L
Copper, Total	75 - 125	0.0276	0.00880	0.0200	94	mg/L
Nickel, Total	75 - 125	0.0350	0.0156	0.0200	97	mg/L
Selenium, Total	75 - 125	0.0187	0.000312	0.0200	92	mg/L
Silver, Total	75 - 125	0.0204	0.0000590	0.0200	102	mg/L
Thallium, Total	75 - 125	0.0203	0.000594	0.0200	98	mg/L

* Values outside of QC limits

POST DIGEST SPIKE SAMPLE RECOVERY

USEPA-6020A

13SB19C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
% Solids: 76.14
Laboratory ID: 0813642-PS2
Lab Source ID: 0811328-15

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Initial/Final: 0.02 g / 10 mL
QC Batch: 0813642
Sequence: 8112445

Analyte	Control Limit %R	Spike Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R	Units
Lead, Total	75 - 125	0.125	0.0883	0.0400	92	mg/L

* Values outside of QC limits

POST DIGEST SPIKE SAMPLE RECOVERY

USEPA-6020A

13SB19C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
% Solids: 76.14
Laboratory ID: 0813642-PS3
Lab Source ID: 0811328-15

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Initial/Final: 0.02 g / 10 mL
QC Batch: 0813642
Sequence: 8112479

Analyte	Control Limit %R	Spike Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R	Units
Vanadium, Total	75 - 125	0.0449	0.0260	0.0200	94	mg/L

* Values outside of QC limits

POST DIGEST SPIKE SAMPLE RECOVERY

USEPA-6020A

13SB19C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
% Solids: 76.14
Laboratory ID: 0813766-PS1
Lab Source ID: 0811328-15

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Initial/Final: 0.009998 g / 5 mL
QC Batch: 0813766
Sequence: 8112556

Analyte	Control Limit %R	Spike Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R	Units
Antimony, Total	75 - 125	0.0195	0.0000390	0.0200	97	mg/L

* Values outside of QC limits

SERIAL DILUTION

USEPA-6020A

13SB19C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
% Solids: 76.14
Laboratory ID: 8112445-SRD1
QC Batch: 8112445
Lab Source ID: 0811328-15
Sequence: 8112445

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Units	QC Limits % Difference
Arsenic, Total	0.00141		0.00149	J	6.0 #		mg/L	10
Copper, Total	0.00880		0.00952		8.0		mg/L	10
Nickel, Total	0.0156		0.0169		8.0		mg/L	10
Selenium, Total	0.000312	J	-0.000175	U	156.0 #		mg/L	10
Silver, Total	0.0000590	J	0.0000950	J	61.0 #		mg/L	10
Thallium, Total	0.000594		0.000610	J	3.0 #		mg/L	10

* Values outside of QC limits

Initial Sample Result (I) was less than 50xMDL (for 6010) or 100xMDL (for 6020), therefore serial dilution is not required.

SERIAL DILUTION

USEPA-6020A

13SB19C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

% Solids: 76.14

Laboratory ID: 8112445-SRD3

Lab Source ID: 0811328-15

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

QC Batch: 8112445

Sequence: 8112445

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Units	QC Limits % Difference
Lead, Total	0.0442		0.0470		6.0		mg/L	10

* Values outside of QC limits

Initial Sample Result (I) was less than 50xMDL (for 6010) or 100xMDL (for 6020), therefore serial dilution is not required.

SERIAL DILUTION

USEPA-6020A

13SB19C

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil

% Solids: 76.14

Laboratory ID: 8112479-SRD1

QC Batch: 8112479

Lab Source ID: 0811328-15

Sequence: 8112479

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Units	QC Limits % Difference
Vanadium, Total	0.0260		0.0265		2.0		mg/L	10

* Values outside of QC limits

Initial Sample Result (I) was less than 50xMDL (for 6010) or 100xMDL (for 6020), therefore serial dilution is not required.

SERIAL DILUTION

USEPA-6020A

13SB19C

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil

% Solids: 76.14

Laboratory ID: 8112556-SRD1

QC Batch: 8112556

Lab Source ID: 0811328-15

Sequence: 8112556

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Units	QC Limits % Difference
Antimony, Total	0.0000390	U	-0.000145	U	472.0 #		mg/L	10

* Values outside of QC limits

Initial Sample Result (I) was less than 50xMDL (for 6010) or 100xMDL (for 6020), therefore serial dilution is not required.

HOLDING TIME SUMMARY
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB13A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13A	11/12/08	11/14/08		11/21/08	9	NA	11/25/08	13	180	
13SB13C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13C	11/12/08	11/14/08		11/21/08	9	NA	11/25/08	13	180	
13SB21C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	

HOLDING TIME SUMMARY
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB21C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21C	11/12/08	11/14/08		11/21/08	9	NA	11/25/08	13	180	
13SB14A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB14A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB14A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB14A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB14A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB14A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB14A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB14A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB14A	11/12/08	11/14/08		11/21/08	9	NA	11/25/08	13	180	
EQBK-1	11/12/08	11/14/08		11/20/08	8	NA	12/01/08	19	180	
EQBK-1	11/12/08	11/14/08		11/20/08	8	NA	12/01/08	19	180	
EQBK-1	11/12/08	11/14/08		11/20/08	8	NA	12/01/08	19	180	
EQBK-1	11/12/08	11/14/08		11/20/08	8	NA	12/01/08	19	180	
EQBK-1	11/12/08	11/14/08		11/20/08	8	NA	12/01/08	19	180	
EQBK-1	11/12/08	11/14/08		11/20/08	8	NA	12/01/08	19	180	

HOLDING TIME SUMMARY
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
EQBK-1	11/12/08	11/14/08		11/20/08	8	NA	12/01/08	19	180	
EQBK-1	11/12/08	11/14/08		11/20/08	8	NA	12/01/08	19	180	
EQBK-1	11/12/08	11/14/08		11/20/08	8	NA	12/01/08	19	180	
EQBK-1	11/12/08	11/14/08		11/20/08	8	NA	12/01/08	19	180	
EQBK-1	11/12/08	11/14/08		11/20/08	8	NA	12/01/08	19	180	
EQBK-1	11/12/08	11/14/08		11/20/08	8	NA	12/01/08	19	180	
EQBK-1	11/12/08	11/14/08		11/20/08	8	NA	12/01/08	19	180	
EQBK-1	11/12/08	11/14/08		11/20/08	8	NA	12/01/08	19	180	
EQBK-1	11/12/08	11/14/08		11/20/08	8	NA	12/01/08	19	180	
EQBK-1	11/12/08	11/14/08		11/20/08	8	NA	12/01/08	19	180	
13SB20A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20A	11/12/08	11/14/08		11/21/08	9	NA	11/25/08	13	180	
13SB20C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	

HOLDING TIME SUMMARY
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB20C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20C	11/12/08	11/14/08		11/21/08	9	NA	11/25/08	13	180	
13SB22A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22A	11/12/08	11/14/08		11/21/08	9	NA	11/25/08	13	180	
13SB22C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	

HOLDING TIME SUMMARY
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB22C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22C	11/12/08	11/14/08		11/21/08	9	NA	11/25/08	13	180	
13SB21A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21A	11/12/08	11/14/08		11/21/08	9	NA	11/25/08	13	180	
13SB18A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	

HOLDING TIME SUMMARY
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB18A	11/13/08	11/14/08		11/21/08	8	NA	11/25/08	12	180	
13SB18C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18C	11/13/08	11/14/08		11/21/08	8	NA	11/25/08	12	180	
EQBK-5	11/13/08	11/14/08		11/20/08	7	NA	12/01/08	18	180	
EQBK-5	11/13/08	11/14/08		11/20/08	7	NA	12/01/08	18	180	
EQBK-5	11/13/08	11/14/08		11/20/08	7	NA	12/01/08	18	180	
EQBK-5	11/13/08	11/14/08		11/20/08	7	NA	12/01/08	18	180	
EQBK-5	11/13/08	11/14/08		11/20/08	7	NA	12/01/08	18	180	
EQBK-5	11/13/08	11/14/08		11/20/08	7	NA	12/01/08	18	180	
EQBK-5	11/13/08	11/14/08		11/20/08	7	NA	12/01/08	18	180	
EQBK-5	11/13/08	11/14/08		11/20/08	7	NA	12/01/08	18	180	
EQBK-5	11/13/08	11/14/08		11/20/08	7	NA	12/01/08	18	180	
EQBK-5	11/13/08	11/14/08		11/20/08	7	NA	12/01/08	18	180	

HOLDING TIME SUMMARY
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
EQBK-5	11/13/08	11/14/08		11/20/08	7	NA	12/01/08	18	180	
EQBK-5	11/13/08	11/14/08		11/20/08	7	NA	12/01/08	18	180	
EQBK-5	11/13/08	11/14/08		11/20/08	7	NA	12/01/08	18	180	
EQBK-5	11/13/08	11/14/08		11/20/08	7	NA	12/01/08	18	180	
EQBK-5	11/13/08	11/14/08		11/20/08	7	NA	12/01/08	18	180	
13SB19A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19A	11/13/08	11/14/08		11/21/08	8	NA	11/25/08	12	180	
13SB19C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	

HOLDING TIME SUMMARY
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB19C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19C	11/13/08	11/14/08		11/21/08	8	NA	11/25/08	12	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	12/01/08	17	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	12/01/08	17	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	12/01/08	17	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	12/01/08	17	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	12/01/08	17	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	12/01/08	17	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	12/01/08	17	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	12/01/08	17	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	12/01/08	17	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	12/01/08	17	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	12/01/08	17	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	12/01/08	17	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	12/01/08	17	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	12/01/08	17	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	12/01/08	17	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	12/01/08	17	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	12/01/08	17	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	12/01/08	17	180	
13SB17A	11/14/08	11/15/08		11/21/08	7	NA	11/25/08	11	180	
13SB17A	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB17A	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	

HOLDING TIME SUMMARY
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB17A	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB17A	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB17A	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB17A	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB17A	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB17A	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB17C	11/14/08	11/15/08		11/21/08	7	NA	11/25/08	11	180	
13SB17C	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB17C	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB17C	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB17C	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB17C	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB17C	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB17C	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB16A	11/14/08	11/15/08		11/21/08	7	NA	11/25/08	11	180	
13SB16A	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB16A	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB16A	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB16A	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB16A	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	

HOLDING TIME SUMMARY
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB16A	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB16A	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB16A	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB16C	11/14/08	11/15/08		11/21/08	7	NA	11/25/08	11	180	
13SB16C	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB16C	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB16C	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB16C	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB16C	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB16C	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB16C	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB16C	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB15A	11/14/08	11/15/08		11/21/08	7	NA	11/25/08	11	180	
13SB15A	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB15A	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB15A	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB15A	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB15A	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB15A	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	
13SB15A	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	10	180	

HOLDING TIME SUMMARY
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
DUP-13	11/14/08	11/15/08		11/21/08	7	NA	11/25/08	12	180	
DUP-13	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	11	180	
DUP-13	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	11	180	
DUP-13	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	11	180	
DUP-13	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	11	180	
DUP-13	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	11	180	
DUP-13	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	11	180	
DUP-13	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	11	180	
DUP-13	11/14/08	11/15/08		11/21/08	7	NA	11/24/08	11	180	

INITIAL AND CONTINUING CALIBRATION CHECK

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112445
Instrument ID: 114
Control Limt: +/- 10.00%
Calibration: 8K25005

Lab Sample ID	Analyte	True	Found	%R	Units	Analyzed
8112445-CCV1	Arsenic	0.0400	0.0426	106	mg/L	11/24/08 12:20
	Copper	0.0400	0.0418	104	mg/L	11/24/08 12:20
	Lead	0.0400	0.0404	101	mg/L	11/24/08 12:20
	Nickel	0.0400	0.0415	104	mg/L	11/24/08 12:20
	Selenium	0.0400	0.0417	104	mg/L	11/24/08 12:20
	Silver	0.0400	0.0409	102	mg/L	11/24/08 12:20
	Thallium	0.0400	0.0412	103	mg/L	11/24/08 12:20
8112445-CCV2	Arsenic	0.0400	0.0417	104	mg/L	11/24/08 12:32
	Copper	0.0400	0.0404	101	mg/L	11/24/08 12:32
	Lead	0.0400	0.0392	98	mg/L	11/24/08 12:32
	Nickel	0.0400	0.0400	100	mg/L	11/24/08 12:32
	Selenium	0.0400	0.0399	100	mg/L	11/24/08 12:32
	Silver	0.0400	0.0401	100	mg/L	11/24/08 12:32
	Thallium	0.0400	0.0393	98	mg/L	11/24/08 12:32
8112445-CCV3	Arsenic	0.0400	0.0412	103	mg/L	11/24/08 13:07
	Copper	0.0400	0.0398	99	mg/L	11/24/08 13:07
	Lead	0.0400	0.0387	97	mg/L	11/24/08 13:07
	Nickel	0.0400	0.0396	99	mg/L	11/24/08 13:07
	Selenium	0.0400	0.0382	96	mg/L	11/24/08 13:07
	Silver	0.0400	0.0389	97	mg/L	11/24/08 13:07
	Thallium	0.0400	0.0388	97	mg/L	11/24/08 13:07
8112445-CCV4	Arsenic	0.0400	0.0421	105	mg/L	11/24/08 13:42
	Copper	0.0400	0.0403	101	mg/L	11/24/08 13:42
	Lead	0.0400	0.0400	100	mg/L	11/24/08 13:42
	Nickel	0.0400	0.0401	100	mg/L	11/24/08 13:42
	Selenium	0.0400	0.0395	99	mg/L	11/24/08 13:42
	Silver	0.0400	0.0399	100	mg/L	11/24/08 13:42
	Thallium	0.0400	0.0401	100	mg/L	11/24/08 13:42
8112445-CCV5	Arsenic	0.0400	0.0426	107	mg/L	11/24/08 14:21
	Copper	0.0400	0.0406	101	mg/L	11/24/08 14:21
	Lead	0.0400	0.0404	101	mg/L	11/24/08 14:21
	Nickel	0.0400	0.0408	102	mg/L	11/24/08 14:21
	Selenium	0.0400	0.0391	98	mg/L	11/24/08 14:21
	Silver	0.0400	0.0405	101	mg/L	11/24/08 14:21
	Thallium	0.0400	0.0402	101	mg/L	11/24/08 14:21
8112445-CCV6	Arsenic	0.0400	0.0421	105	mg/L	11/24/08 14:30
	Copper	0.0400	0.0402	101	mg/L	11/24/08 14:30
	Lead	0.0400	0.0398	100	mg/L	11/24/08 14:30

INITIAL AND CONTINUING CALIBRATION CHECK

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112445
Instrument ID: 114
Control Limt: +/- 10.00%
Calibration: 8K25005

Lab Sample ID	Analyte	True	Found	%R	Units	Analyzed
8112445-CCV6	Nickel	0.0400	0.0406	101	mg/L	11/24/08 14:30
	Selenium	0.0400	0.0399	100	mg/L	11/24/08 14:30
	Silver	0.0400	0.0401	100	mg/L	11/24/08 14:30
	Thallium	0.0400	0.0397	99	mg/L	11/24/08 14:30
8112445-CCV7	Copper	0.0400	0.0440	110	mg/L	11/24/08 15:01
	Lead	0.0400	0.0415	104	mg/L	11/24/08 15:01
8112445-CCV8	Copper	0.0400	0.0421	105	mg/L	11/24/08 15:26
	Lead	0.0400	0.0401	100	mg/L	11/24/08 15:26
8112445-CCV9	Copper	0.0400	0.0412	103	mg/L	11/24/08 15:57
	Lead	0.0400	0.0391	98	mg/L	11/24/08 15:57

* Values outside of QC limits

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112445
Instrument: 114
Laboratory ID: 8112445-SCV1
Calibration: 8K25005

Analyte	Expected	Found	% R	QC Limit	Units
Arsenic	0.0400	0.0426	107	90-110	mg/L
Copper	0.0400	0.0418	105	90-110	mg/L
Lead	0.0400	0.0404	101	90-110	mg/L
Nickel	0.0400	0.0415	104	90-110	mg/L
Selenium	0.0400	0.0417	104	90-110	mg/L
Silver	0.0400	0.0409	102	90-110	mg/L
Thallium	0.0400	0.0412	103	90-110	mg/L

* Values outside of QC limits

BLANKS
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112445
Instrument ID: 114
Calibration: 8K25005

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
8112445-CCB1	Arsenic	0.000056	0.00040	0.000053	mg/L	J	11/24/08 12:23
	Copper	0.0000060	0.00040	0.000053	mg/L	U	11/24/08 12:23
	Lead	0.0000040	0.00040	0.000047	mg/L	U	11/24/08 12:23
	Nickel	0.0	0.00020	0.000069	mg/L	U	11/24/08 12:23
	Selenium	0.00011	0.00060	0.000056	mg/L	J	11/24/08 12:23
	Silver	0.0000070	0.00020	0.000019	mg/L	U	11/24/08 12:23
	Thallium	0.0000030	0.00020	0.000014	mg/L	U	11/24/08 12:23
8112445-CCB2	Arsenic	-0.000023	0.00040	0.000053	mg/L	U	11/24/08 12:35
	Copper	0.0000010	0.00040	0.000053	mg/L	U	11/24/08 12:35
	Lead	0.0000030	0.00040	0.000047	mg/L	U	11/24/08 12:35
	Nickel	-0.0000020	0.00020	0.000069	mg/L	U	11/24/08 12:35
	Selenium	0.000036	0.00060	0.000056	mg/L	U	11/24/08 12:35
	Silver	0.0000050	0.00020	0.000019	mg/L	U	11/24/08 12:35
	Thallium	0.0000030	0.00020	0.000014	mg/L	U	11/24/08 12:35
0813642-BLK1	Arsenic, Total	0.20	0.20	0.026	mg/kg dry wt.	U	11/24/08 12:38
	Copper, Total	0.20	0.20	0.027	mg/kg dry wt.	U	11/24/08 12:38
	Lead, Total	0.20	0.20	0.024	mg/kg dry wt.	U	11/24/08 12:38
	Nickel, Total	0.10	0.10	0.035	mg/kg dry wt.	U	11/24/08 12:38
	Selenium, Total	0.30	0.30	0.028	mg/kg dry wt.	U	11/24/08 12:38
	Silver, Total	0.10	0.10	0.0093	mg/kg dry wt.	U	11/24/08 12:38
	Thallium, Total	0.10	0.10	0.0068	mg/kg dry wt.	U	11/24/08 12:38
8112445-CCB3	Arsenic	-0.000036	0.00040	0.000053	mg/L	U	11/24/08 13:10
	Copper	0.0000040	0.00040	0.000053	mg/L	U	11/24/08 13:10
	Lead	0.000014	0.00040	0.000047	mg/L	U	11/24/08 13:10
	Nickel	0.0000040	0.00020	0.000069	mg/L	U	11/24/08 13:10
	Selenium	0.0000080	0.00060	0.000056	mg/L	U	11/24/08 13:10
	Silver	0.0000040	0.00020	0.000019	mg/L	U	11/24/08 13:10
	Thallium	0.0000020	0.00020	0.000014	mg/L	U	11/24/08 13:10
0813780-BLK1	Arsenic, Total	0.20	0.20	0.026	mg/kg dry wt.	U	11/24/08 13:39
	Copper, Total	0.20	0.20	0.027	mg/kg dry wt.	U	11/24/08 13:39
	Lead, Total	0.20	0.20	0.024	mg/kg dry wt.	U	11/24/08 13:39
	Nickel, Total	0.10	0.10	0.035	mg/kg dry wt.	U	11/24/08 13:39
	Selenium, Total	0.30	0.30	0.028	mg/kg dry wt.	U	11/24/08 13:39

083138

BLANKS
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112445
Instrument ID: 114
Calibration: 8K25005

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
0813780-BLK1	Silver, Total	0.10	0.10	0.0093	mg/kg dry wt.	U	11/24/08 13:39
	Thallium, Total	0.10	0.10	0.0068	mg/kg dry wt.	U	11/24/08 13:39
8112445-CCB4	Arsenic	-0.000022	0.00040	0.000053	mg/L	U	11/24/08 13:48
	Copper	0.0000060	0.00040	0.000053	mg/L	U	11/24/08 13:48
	Lead	0.0000090	0.00040	0.000047	mg/L	U	11/24/08 13:48
	Nickel	-0.0000020	0.00020	0.000069	mg/L	U	11/24/08 13:48
	Selenium	0.000027	0.00060	0.000056	mg/L	U	11/24/08 13:48
	Silver	0.0000030	0.00020	0.000019	mg/L	U	11/24/08 13:48
	Thallium	0.0000030	0.00020	0.000014	mg/L	U	11/24/08 13:48
8112445-CCB5	Arsenic	-0.000022	0.00040	0.000053	mg/L	U	11/24/08 14:24
	Copper	0.0000040	0.00040	0.000053	mg/L	U	11/24/08 14:24
	Lead	0.000016	0.00040	0.000047	mg/L	U	11/24/08 14:24
	Nickel	-0.0000010	0.00020	0.000069	mg/L	U	11/24/08 14:24
	Selenium	0.000018	0.00060	0.000056	mg/L	U	11/24/08 14:24
	Silver	0.0000040	0.00020	0.000019	mg/L	U	11/24/08 14:24
	Thallium	0.0000030	0.00020	0.000014	mg/L	U	11/24/08 14:24
8112445-CCB6	Arsenic	-0.000031	0.00040	0.000053	mg/L	U	11/24/08 14:32
	Copper	0.0000030	0.00040	0.000053	mg/L	U	11/24/08 14:32
	Lead	0.000015	0.00040	0.000047	mg/L	U	11/24/08 14:32
	Nickel	0.0000020	0.00020	0.000069	mg/L	U	11/24/08 14:32
	Selenium	-0.000042	0.00060	0.000056	mg/L	U	11/24/08 14:32
	Silver	0.0000050	0.00020	0.000019	mg/L	U	11/24/08 14:32
	Thallium	0.0000050	0.00020	0.000014	mg/L	U	11/24/08 14:32
8112445-CCB7	Copper	0.0000030	0.00040	0.000053	mg/L	U	11/24/08 14:59
	Lead	0.000010	0.00040	0.000047	mg/L	U	11/24/08 14:59
8112445-CCB8	Copper	0.0000050	0.00040	0.000053	mg/L	U	11/24/08 15:28
	Lead	0.0000080	0.00040	0.000047	mg/L	U	11/24/08 15:28
8112445-CCB9	Copper	0.0000040	0.00040	0.000053	mg/L	U	11/24/08 16:00
	Lead	0.0000090	0.00040	0.000047	mg/L	U	11/24/08 16:00

* Values outside of QC limits

ICP INTERFERENCE CHECK SAMPLE

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Sequence: 8112445

Instrument ID: 114

2 x MDL

Calibration: 8K25005

Lab Sample ID	Analyte	True	Found	%R	Units
8112445-IFA1	Arsenic 0.000106	0.00	0.0000470		mg/L
	Copper 0.000166	0.00	0.000266		mg/L
	Lead 0.000074	0.00	0.0000140		mg/L
	Nickel 0.000138	0.00	0.000275		mg/L
	Selenium 0.000112	0.00	0.00000400		mg/L
	Silver 0.000038	0.00	0.00000900		mg/L
	Thallium 0.00007	0.00	0.00000200		mg/L
8112445-IFB1	Arsenic	0.0200	0.0207	104	mg/L
	Copper	0.0200	0.0194	97	mg/L
	Lead	0.0200	0.0195	97	mg/L
	Nickel	0.0200	0.0193	96	mg/L
	Selenium	0.0200	0.0194	97	mg/L
	Silver	0.0200	0.0195	97	mg/L
	Thallium	0.0200	0.0199	100	mg/L

* Values outside of QC limits

ANALYSIS BATCH (SEQUENCE) SUMMARY

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Sequence: 8112445

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Instrument: 114

Calibration: 8K25005

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Cal Standard	8112445-CAL1	8112445-001	11/24/08 11:57
Cal Standard	8112445-CAL2	8112445-002	11/24/08 12:00
Cal Standard	8112445-CAL3	8112445-003	11/24/08 12:03
Cal Standard	8112445-CAL4	8112445-004	11/24/08 12:05
Cal Standard	8112445-CAL5	8112445-005	11/24/08 12:08
Cal Standard	8112445-CAL6	8112445-006	11/24/08 12:11
Cal Standard	8112445-CAL7	8112445-007	11/24/08 12:14
Cal Standard	8112445-CAL8	8112445-008	11/24/08 12:17
Secondary Cal Check	8112445-SCV1	8112445-009	11/24/08 12:20
Calibration Check	8112445-CCV1	8112445-009	11/24/08 12:20
Calibration Blank	8112445-CCB1	8112445-010	11/24/08 12:23
Interference Check A	8112445-IFA1	8112445-011	11/24/08 12:26
Interference Check B	8112445-IFB1	8112445-012	11/24/08 12:29
Calibration Check	8112445-CCV2	8112445-013	11/24/08 12:32
Calibration Blank	8112445-CCB2	8112445-014	11/24/08 12:35
Blank	0813642-BLK1	8112445-015	11/24/08 12:38
LCS	0813642-BS1	8112445-016	11/24/08 12:40
13SB13A	0811328-01	8112445-017	11/24/08 12:43
13SB13A	0811328-01	8112445-017	11/24/08 12:43
13SB13A	0811328-01	8112445-017	11/24/08 12:43
13SB13A	0811328-01	8112445-017	11/24/08 12:43
13SB13A	0811328-01	8112445-017	11/24/08 12:43
13SB13A	0811328-01	8112445-017	11/24/08 12:43
13SB13C	0811328-02	8112445-018	11/24/08 12:46
13SB13C	0811328-02	8112445-018	11/24/08 12:46
13SB13C	0811328-02	8112445-018	11/24/08 12:46
13SB13C	0811328-02	8112445-018	11/24/08 12:46
13SB13C	0811328-02	8112445-018	11/24/08 12:46
13SB13C	0811328-02	8112445-018	11/24/08 12:46
13SB21C	0811328-03	8112445-019	11/24/08 12:49
13SB21C	0811328-03	8112445-019	11/24/08 12:49
13SB21C	0811328-03	8112445-019	11/24/08 12:49

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112445

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 114
Calibration: 8K25005

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
13SB21C	0811328-03	8112445-019	11/24/08 12:49
13SB21C	0811328-03	8112445-019	11/24/08 12:49
13SB21C	0811328-03	8112445-019	11/24/08 12:49
13SB14A	0811328-04	8112445-020	11/24/08 12:52
13SB14A	0811328-04	8112445-020	11/24/08 12:52
13SB14A	0811328-04	8112445-020	11/24/08 12:52
13SB14A	0811328-04	8112445-020	11/24/08 12:52
13SB14A	0811328-04	8112445-020	11/24/08 12:52
13SB14A	0811328-04	8112445-020	11/24/08 12:52
13SB20A	0811328-06	8112445-021	11/24/08 12:55
13SB20A	0811328-06	8112445-021	11/24/08 12:55
13SB20A	0811328-06	8112445-021	11/24/08 12:55
13SB20A	0811328-06	8112445-021	11/24/08 12:55
13SB20A	0811328-06	8112445-021	11/24/08 12:55
13SB20A	0811328-06	8112445-021	11/24/08 12:55
13SB20C	0811328-07	8112445-022	11/24/08 12:58
13SB20C	0811328-07	8112445-022	11/24/08 12:58
13SB20C	0811328-07	8112445-022	11/24/08 12:58
13SB20C	0811328-07	8112445-022	11/24/08 12:58
13SB20C	0811328-07	8112445-022	11/24/08 12:58
13SB20C	0811328-07	8112445-022	11/24/08 12:58
13SB22A	0811328-08	8112445-023	11/24/08 13:01
13SB22A	0811328-08	8112445-023	11/24/08 13:01
13SB22A	0811328-08	8112445-023	11/24/08 13:01
13SB22A	0811328-08	8112445-023	11/24/08 13:01
13SB22A	0811328-08	8112445-023	11/24/08 13:01
13SB22A	0811328-08	8112445-023	11/24/08 13:01
13SB22C	0811328-09	8112445-024	11/24/08 13:04
13SB22C	0811328-09	8112445-024	11/24/08 13:04
13SB22C	0811328-09	8112445-024	11/24/08 13:04
13SB22C	0811328-09	8112445-024	11/24/08 13:04
13SB22C	0811328-09	8112445-024	11/24/08 13:04

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112445

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 114
Calibration: 8K25005

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
13SB22C	0811328-09	8112445-024	11/24/08 13:04
Calibration Check	8112445-CCV3	8112445-025	11/24/08 13:07
Calibration Blank	8112445-CCB3	8112445-026	11/24/08 13:10
13SB21A	0811328-10	8112445-027	11/24/08 13:13
13SB21A	0811328-10	8112445-027	11/24/08 13:13
13SB21A	0811328-10	8112445-027	11/24/08 13:13
13SB21A	0811328-10	8112445-027	11/24/08 13:13
13SB21A	0811328-10	8112445-027	11/24/08 13:13
13SB21A	0811328-10	8112445-027	11/24/08 13:13
13SB18A	0811328-11	8112445-028	11/24/08 13:16
13SB18A	0811328-11	8112445-028	11/24/08 13:16
13SB18A	0811328-11	8112445-028	11/24/08 13:16
13SB18A	0811328-11	8112445-028	11/24/08 13:16
13SB18A	0811328-11	8112445-028	11/24/08 13:16
13SB18C	0811328-12	8112445-029	11/24/08 13:18
13SB18C	0811328-12	8112445-029	11/24/08 13:18
13SB18C	0811328-12	8112445-029	11/24/08 13:18
13SB18C	0811328-12	8112445-029	11/24/08 13:18
13SB18C	0811328-12	8112445-029	11/24/08 13:18
13SB19A	0811328-14	8112445-030	11/24/08 13:21
13SB19A	0811328-14	8112445-030	11/24/08 13:21
13SB19A	0811328-14	8112445-030	11/24/08 13:21
13SB19A	0811328-14	8112445-030	11/24/08 13:21
13SB19A	0811328-14	8112445-030	11/24/08 13:21
13SB19A	0811328-14	8112445-030	11/24/08 13:21
13SB19C	0811328-15	8112445-031	11/24/08 13:24
13SB19C	0811328-15	8112445-031	11/24/08 13:24
13SB19C	0811328-15	8112445-031	11/24/08 13:24
13SB19C	0811328-15	8112445-031	11/24/08 13:24
13SB19C	0811328-15	8112445-031	11/24/08 13:24
13SB19C	0811328-15	8112445-031	11/24/08 13:24
13SB19C	0813642-MS1	8112445-032	11/24/08 13:27

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112445

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 114
Calibration: 8K25005

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
13SB19C	0813642-MSD1	8112445-033	11/24/08 13:30
13SB19C	8112445-SRD1	8112445-034	11/24/08 13:33
13SB19C	0813642-PS1	8112445-035	11/24/08 13:36
Blank	0813780-BLK1	8112445-036	11/24/08 13:39
Calibration Check	8112445-CCV4	8112445-037	11/24/08 13:42
Calibration Blank	8112445-CCB4	8112445-039	11/24/08 13:48
LCS	0813780-BS1	8112445-040	11/24/08 13:52
13SB17A	0811331-02	8112445-041	11/24/08 13:54
13SB17A	0811331-02	8112445-041	11/24/08 13:54
13SB17A	0811331-02	8112445-041	11/24/08 13:54
13SB17A	0811331-02	8112445-041	11/24/08 13:54
13SB17A	0811331-02	8112445-041	11/24/08 13:54
13SB17A	0811331-02	8112445-041	11/24/08 13:54
13SB17C	0811331-03	8112445-042	11/24/08 13:57
13SB17C	0811331-03	8112445-042	11/24/08 13:57
13SB17C	0811331-03	8112445-042	11/24/08 13:57
13SB17C	0811331-03	8112445-042	11/24/08 13:57
13SB17C	0811331-03	8112445-042	11/24/08 13:57
13SB17C	0811331-03	8112445-042	11/24/08 13:57
13SB17C	0813780-MS1	8112445-043	11/24/08 14:00
13SB17C	0813780-MSD1	8112445-044	11/24/08 14:03
13SB17C	8112445-SRD2	8112445-045	11/24/08 14:06
13SB17C	0813780-PS1	8112445-046	11/24/08 14:09
13SB16A	0811331-04	8112445-047	11/24/08 14:12
13SB16A	0811331-04	8112445-047	11/24/08 14:12
13SB16A	0811331-04	8112445-047	11/24/08 14:12
13SB16A	0811331-04	8112445-047	11/24/08 14:12
13SB16A	0811331-04	8112445-047	11/24/08 14:12
13SB16A	0811331-04	8112445-047	11/24/08 14:12
13SB16C	0811331-05	8112445-048	11/24/08 14:15
13SB16C	0811331-05	8112445-048	11/24/08 14:15
13SB16C	0811331-05	8112445-048	11/24/08 14:15

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112445

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 114
Calibration: 8K25005

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
13SB16C	0811331-05	8112445-048	11/24/08 14:15
13SB16C	0811331-05	8112445-048	11/24/08 14:15
13SB16C	0811331-05	8112445-048	11/24/08 14:15
13SB15A	0811331-06	8112445-049	11/24/08 14:18
13SB15A	0811331-06	8112445-049	11/24/08 14:18
13SB15A	0811331-06	8112445-049	11/24/08 14:18
13SB15A	0811331-06	8112445-049	11/24/08 14:18
13SB15A	0811331-06	8112445-049	11/24/08 14:18
13SB15A	0811331-06	8112445-049	11/24/08 14:18
Calibration Check	8112445-CCV5	8112445-050	11/24/08 14:21
Calibration Blank	8112445-CCB5	8112445-051	11/24/08 14:24
DUP-13	0811331-07	8112445-052	11/24/08 14:27
DUP-13	0811331-07	8112445-052	11/24/08 14:27
DUP-13	0811331-07	8112445-052	11/24/08 14:27
DUP-13	0811331-07	8112445-052	11/24/08 14:27
DUP-13	0811331-07	8112445-052	11/24/08 14:27
DUP-13	0811331-07	8112445-052	11/24/08 14:27
Calibration Check	8112445-CCV6	8112445-053	11/24/08 14:30
Calibration Blank	8112445-CCB6	8112445-054	11/24/08 14:32
13SB13A	0811328-01	8112445-055	11/24/08 14:36
13SB13C	0811328-02	8112445-056	11/24/08 14:39
13SB21C	0811328-03	8112445-057	11/24/08 14:41
13SB14A	0811328-04	8112445-058	11/24/08 14:43
13SB20A	0811328-06	8112445-059	11/24/08 14:45
13SB20C	0811328-07	8112445-060	11/24/08 14:48
13SB22A	0811328-08	8112445-061	11/24/08 14:50
13SB22C	0811328-09	8112445-062	11/24/08 14:52
13SB21A	0811328-10	8112445-063	11/24/08 14:54
Calibration Blank	8112445-CCB7	8112445-065	11/24/08 14:59
Calibration Check	8112445-CCV7	8112445-066	11/24/08 15:01
13SB18A	0811328-11	8112445-067	11/24/08 15:03
13SB18C	0811328-12	8112445-068	11/24/08 15:06

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112445

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 114
Calibration: 8K25005

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
13SB18C	0811328-12	8112445-069	11/24/08 15:08
13SB19A	0811328-14	8112445-070	11/24/08 15:10
13SB19C	0811328-15	8112445-071	11/24/08 15:12
13SB19C	0813642-MS1	8112445-072	11/24/08 15:15
13SB19C	0813642-MSD1	8112445-073	11/24/08 15:17
13SB19C	8112445-SRD3	8112445-074	11/24/08 15:19
13SB19C	0813642-PS2	8112445-075	11/24/08 15:21
13SB17A	0811331-02	8112445-076	11/24/08 15:24
Calibration Check	8112445-CCV8	8112445-077	11/24/08 15:26
Calibration Blank	8112445-CCB8	8112445-078	11/24/08 15:28
13SB17C	0811331-03	8112445-079	11/24/08 15:35
13SB17C	0813780-MS1	8112445-080	11/24/08 15:37
13SB17C	0813780-MSD1	8112445-081	11/24/08 15:39
13SB17C	8112445-SRD4	8112445-082	11/24/08 15:42
13SB17C	0813780-PS2	8112445-083	11/24/08 15:44
13SB16A	0811331-04	8112445-084	11/24/08 15:46
13SB16C	0811331-05	8112445-085	11/24/08 15:48
13SB15A	0811331-06	8112445-086	11/24/08 15:51
DUP-13	0811331-07	8112445-087	11/24/08 15:53
13SB18A	0811328-11	8112445-088	11/24/08 15:55
Calibration Check	8112445-CCV9	8112445-089	11/24/08 15:57
Calibration Blank	8112445-CCB9	8112445-090	11/24/08 16:00

INITIAL AND CONTINUING CALIBRATION CHECK

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112479
Instrument ID: 114
Control Limt: +/- 10.00%
Calibration: 8K25015

Lab Sample ID	Analyte	True	Found	%R	Units	Analyzed
8112479-CCV1	Vanadium	0.0400	0.0404	101	mg/L	11/24/08 16:22
8112479-CCV2	Vanadium	0.0400	0.0404	101	mg/L	11/24/08 16:30
8112479-CCV3	Vanadium	0.0400	0.0384	96	mg/L	11/24/08 16:54
8112479-CCV4	Vanadium	0.0400	0.0392	98	mg/L	11/24/08 17:19
8112479-CCV5	Vanadium	0.0400	0.0383	96	mg/L	11/24/08 17:43
8112479-CCV6	Vanadium	0.0400	0.0383	96	mg/L	11/24/08 17:49

* Values outside of QC limits

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112479
Instrument: 114
Laboratory ID: 8112479-SCV1
Calibration: 8K25015

Analyte	Expected	Found	% R	QC Limit	Units
Vanadium	0.0400	0.0404	101	90-110	mg/L

* Values outside of QC limits

BLANKS
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112479
Instrument ID: 114
Calibration: 8K25015

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
8112479-CCB1	Vanadium	0.000015	0.00020	0.000063	mg/L	U	11/24/08 16:24
8112479-CCB2	Vanadium	0.0000060	0.00020	0.000063	mg/L	U	11/24/08 16:32
0813642-BLK2	Vanadium, Total	0.10	0.10	0.032	mg/kg dry wt.	U	11/24/08 16:34
8112479-CCB3	Vanadium	0.000011	0.00020	0.000063	mg/L	U	11/24/08 16:56
0813780-BLK2	Vanadium, Total	0.10	0.10	0.032	mg/kg dry wt.	U	11/24/08 17:17
8112479-CCB4	Vanadium	-0.000011	0.00020	0.000063	mg/L	U	11/24/08 17:21
8112479-CCB5	Vanadium	0.000014	0.00020	0.000063	mg/L	U	11/24/08 17:45
8112479-CCB6	Vanadium	-0.0000020	0.00020	0.000063	mg/L	U	11/24/08 17:51

* Values outside of QC limits

ICP INTERFERENCE CHECK SAMPLE

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Sequence: 8112479

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Instrument ID: 114

Calibration: 8K25015

Lab Sample ID	Analyte	True	Found	%R	Units
8112479-IFA1	Vanadium	0.00	-0.00000900		mg/L
8112479-IFB1	Vanadium	0.0200	0.0194	97	mg/L

* Values outside of QC limits

ANALYSIS BATCH (SEQUENCE) SUMMARY

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112479
Instrument: 114
Calibration: 8K25015

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Cal Standard	8112479-CAL1	8112479-001	11/24/08 16:07
Cal Standard	8112479-CAL2	8112479-002	11/24/08 16:09
Cal Standard	8112479-CAL3	8112479-003	11/24/08 16:11
Cal Standard	8112479-CAL4	8112479-004	11/24/08 16:14
Cal Standard	8112479-CAL5	8112479-005	11/24/08 16:16
Cal Standard	8112479-CAL6	8112479-006	11/24/08 16:18
Cal Standard	8112479-CAL7	8112479-007	11/24/08 16:20
Secondary Cal Check	8112479-SCV1	8112479-008	11/24/08 16:22
Calibration Check	8112479-CCV1	8112479-008	11/24/08 16:22
Calibration Blank	8112479-CCB1	8112479-009	11/24/08 16:24
Interference Check A	8112479-IFA1	8112479-010	11/24/08 16:26
Interference Check B	8112479-IFB1	8112479-011	11/24/08 16:28
Calibration Check	8112479-CCV2	8112479-012	11/24/08 16:30
Calibration Blank	8112479-CCB2	8112479-013	11/24/08 16:32
Blank	0813642-BLK2	8112479-014	11/24/08 16:34
LCS	0813642-BS2	8112479-015	11/24/08 16:36
13SB13A	0811328-01	8112479-016	11/24/08 16:38
13SB13C	0811328-02	8112479-017	11/24/08 16:40
13SB21C	0811328-03	8112479-018	11/24/08 16:42
13SB14A	0811328-04	8112479-019	11/24/08 16:44
13SB20A	0811328-06	8112479-020	11/24/08 16:46
13SB20C	0811328-07	8112479-021	11/24/08 16:48
13SB22A	0811328-08	8112479-022	11/24/08 16:50
13SB22C	0811328-09	8112479-023	11/24/08 16:52
Calibration Check	8112479-CCV3	8112479-024	11/24/08 16:54
Calibration Blank	8112479-CCB3	8112479-025	11/24/08 16:56
13SB21A	0811328-10	8112479-026	11/24/08 16:58
13SB18A	0811328-11	8112479-027	11/24/08 17:00
13SB18C	0811328-12	8112479-028	11/24/08 17:02
13SB19A	0811328-14	8112479-029	11/24/08 17:04
13SB19C	0811328-15	8112479-030	11/24/08 17:06
13SB19C	0813642-MS2	8112479-031	11/24/08 17:09

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112479

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 114
Calibration: 8K25015

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
13SB19C	0813642-MSD2	8112479-032	11/24/08 17:11
13SB19C	8112479-SRD1	8112479-033	11/24/08 17:13
13SB19C	0813642-PS3	8112479-034	11/24/08 17:15
Blank	0813780-BLK2	8112479-035	11/24/08 17:17
Calibration Check	8112479-CCV4	8112479-036	11/24/08 17:19
Calibration Blank	8112479-CCB4	8112479-037	11/24/08 17:21
LCS	0813780-BS2	8112479-038	11/24/08 17:23
13SB17A	0811331-02	8112479-039	11/24/08 17:25
13SB17C	0811331-03	8112479-040	11/24/08 17:27
13SB17C	0813780-MS2	8112479-041	11/24/08 17:29
13SB17C	0813780-MSD2	8112479-042	11/24/08 17:31
13SB17C	8112479-SRD2	8112479-043	11/24/08 17:33
13SB17C	0813780-PS3	8112479-044	11/24/08 17:35
13SB16A	0811331-04	8112479-045	11/24/08 17:37
13SB16C	0811331-05	8112479-046	11/24/08 17:39
13SB15A	0811331-06	8112479-047	11/24/08 17:41
Calibration Check	8112479-CCV5	8112479-048	11/24/08 17:43
Calibration Blank	8112479-CCB5	8112479-049	11/24/08 17:45
DUP-13	0811331-07	8112479-050	11/24/08 17:47
Calibration Check	8112479-CCV6	8112479-051	11/24/08 17:49
Calibration Blank	8112479-CCB6	8112479-052	11/24/08 17:51

INITIAL AND CONTINUING CALIBRATION CHECK

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112556
Instrument ID:201
Control Limt: +/- 10.00%
Calibration: 8K25023

Lab Sample ID	Analyte	True	Found	%R	Units	Analyzed
8112556-CCV1	Antimony	0.0400	0.0407	102	mg/L	11/25/08 13:58
8112556-CCV2	Antimony	0.0400	0.0395	99	mg/L	11/25/08 14:08
8112556-CCV3	Antimony	0.0400	0.0392	98	mg/L	11/25/08 14:39
8112556-CCV4	Antimony	0.0400	0.0409	102	mg/L	11/25/08 15:11
8112556-CCV5	Antimony	0.0400	0.0402	101	mg/L	11/25/08 15:45
8112556-CCV6	Antimony	0.0400	0.0399	100	mg/L	11/25/08 15:54

* Values outside of QC limits

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112556
Instrument: 201
Laboratory ID: 8112556-SCV1
Calibration: 8K25023

Analyte	Expected	Found	% R	QC Limit	Units
Antimony	0.0400	0.0407	102	90-110	mg/L

* Values outside of QC limits

BLANKS
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112556
Instrument ID: 201
Calibration: 8K25023

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
8112556-CCB1	Antimony	0.000041	0.00040	0.000053	mg/L	U	11/25/08 14:02
8112556-CCB2	Antimony	0.000013	0.00040	0.000053	mg/L	U	11/25/08 14:13
0813766-BLK1	Antimony, Total	0.20	0.20	0.026	mg/kg dry wt.	U	11/25/08 14:15
8112556-CCB3	Antimony	-0.000010	0.00040	0.000053	mg/L	U	11/25/08 14:43
0813767-BLK1	Antimony, Total	0.20	0.20	0.026	mg/kg dry wt.	U	11/25/08 15:09
8112556-CCB4	Antimony	-0.000016	0.00040	0.000053	mg/L	U	11/25/08 15:15
8112556-CCB5	Antimony	-0.000024	0.00040	0.000053	mg/L	U	11/25/08 15:50
8112556-CCB6	Antimony	-0.000022	0.00040	0.000053	mg/L	U	11/25/08 15:58

* Values outside of QC limits

ICP INTERFERENCE CHECK SAMPLE

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Sequence: 8112556

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Instrument ID: 201

Calibration: 8K25023

Lab Sample ID	Analyte	True	Found	%R	Units
8112556-IFA1	Antimony	0.00	0.0000390		mg/L
8112556-IFB1	Antimony	0.0200	0.0197	99	mg/L

* Values outside of QC limits

ANALYSIS BATCH (SEQUENCE) SUMMARY

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Sequence: 8112556

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Instrument: 201

Calibration: 8K25023

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Cal Standard	8112556-CAL1	8112556-001	11/25/08 13:41
Cal Standard	8112556-CAL2	8112556-003	11/25/08 13:45
Cal Standard	8112556-CAL3	8112556-004	11/25/08 13:47
Cal Standard	8112556-CAL4	8112556-005	11/25/08 13:49
Cal Standard	8112556-CAL5	8112556-006	11/25/08 13:51
Cal Standard	8112556-CAL6	8112556-007	11/25/08 13:54
Cal Standard	8112556-CAL7	8112556-008	11/25/08 13:56
Secondary Cal Check	8112556-SCV1	8112556-009	11/25/08 13:58
Calibration Check	8112556-CCV1	8112556-009	11/25/08 13:58
Calibration Blank	8112556-CCB1	8112556-010	11/25/08 14:02
Interference Check A	8112556-IFA1	8112556-011	11/25/08 14:04
Interference Check B	8112556-IFB1	8112556-012	11/25/08 14:06
Calibration Check	8112556-CCV2	8112556-013	11/25/08 14:08
Calibration Blank	8112556-CCB2	8112556-014	11/25/08 14:13
Blank	0813766-BLK1	8112556-015	11/25/08 14:15
LCS	0813766-BS1	8112556-016	11/25/08 14:17
13SB13A	0811328-01	8112556-017	11/25/08 14:22
13SB13C	0811328-02	8112556-018	11/25/08 14:24
13SB21C	0811328-03	8112556-019	11/25/08 14:26
13SB14A	0811328-04	8112556-020	11/25/08 14:28
13SB20A	0811328-06	8112556-021	11/25/08 14:30
13SB20C	0811328-07	8112556-022	11/25/08 14:32
13SB22A	0811328-08	8112556-023	11/25/08 14:34
13SB22C	0811328-09	8112556-024	11/25/08 14:36
Calibration Check	8112556-CCV3	8112556-025	11/25/08 14:39
Calibration Blank	8112556-CCB3	8112556-026	11/25/08 14:43
13SB21A	0811328-10	8112556-027	11/25/08 14:45
13SB18A	0811328-11	8112556-028	11/25/08 14:47
13SB18C	0811328-12	8112556-029	11/25/08 14:49
13SB19A	0811328-14	8112556-030	11/25/08 14:51
13SB19C	0811328-15	8112556-031	11/25/08 14:53
13SB19C	0813766-MS1	8112556-032	11/25/08 14:56

ANALYSIS BATCH (SEQUENCE) SUMMARY

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112556

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 201
Calibration: 8K25023

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
13SB19C	0813766-MSD1	8112556-033	11/25/08 14:58
13SB19C	8112556-SRD1	8112556-034	11/25/08 15:02
13SB19C	0813766-PS1	8112556-035	11/25/08 15:04
Blank	0813767-BLK1	8112556-036	11/25/08 15:09
Calibration Check	8112556-CCV4	8112556-037	11/25/08 15:11
Calibration Blank	8112556-CCB4	8112556-038	11/25/08 15:15
LCS	0813767-BS1	8112556-039	11/25/08 15:17
13SB17A	0811331-02	8112556-040	11/25/08 15:22
13SB17C	0811331-03	8112556-041	11/25/08 15:24
13SB17C	0813767-MS1	8112556-042	11/25/08 15:26
13SB17C	0813767-MSD1	8112556-043	11/25/08 15:28
13SB17C	8112556-SRD2	8112556-044	11/25/08 15:33
13SB17C	0813767-PS1	8112556-045	11/25/08 15:35
13SB16A	0811331-04	8112556-046	11/25/08 15:39
13SB16C	0811331-05	8112556-047	11/25/08 15:41
13SB15A	0811331-06	8112556-048	11/25/08 15:43
Calibration Check	8112556-CCV5	8112556-049	11/25/08 15:45
Calibration Blank	8112556-CCB5	8112556-050	11/25/08 15:50
DUP-13	0811331-07	8112556-051	11/25/08 15:52
Calibration Check	8112556-CCV6	8112556-052	11/25/08 15:54
Calibration Blank	8112556-CCB6	8112556-053	11/25/08 15:58

INITIAL AND CONTINUING CALIBRATION CHECK

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8120103
Instrument ID: 114
Control Limt: +/- 10.00%
Calibration: 8L01014

Lab Sample ID	Analyte	True	Found	%R	Units	Analyzed
8120103-CCV1	Barium	40.0	38.9	97	ug/L	12/01/08 08:57
	Beryllium	40.0	38.9	97	ug/L	12/01/08 08:57
	Cadmium	40.0	38.9	97	ug/L	12/01/08 08:57
	Chromium	40.0	43.0	108	ug/L	12/01/08 08:57
	Copper	40.0	38.8	97	ug/L	12/01/08 08:57
	Lead	40.0	38.4	96	ug/L	12/01/08 08:57
	Manganese	40.0	42.7	107	ug/L	12/01/08 08:57
	Nickel	40.0	38.6	96	ug/L	12/01/08 08:57
	Selenium	40.0	38.7	97	ug/L	12/01/08 08:57
	Silver	40.0	40.0	100	ug/L	12/01/08 08:57
	Thallium	40.0	38.5	96	ug/L	12/01/08 08:57
	Zinc	40.0	38.6	96	ug/L	12/01/08 08:57
8120103-CCV2	Barium	40.0	39.5	99	ug/L	12/01/08 09:35
	Beryllium	40.0	37.6	94	ug/L	12/01/08 09:35
	Cadmium	40.0	40.2	100	ug/L	12/01/08 09:35
	Chromium	40.0	43.8	109	ug/L	12/01/08 09:35
	Copper	40.0	40.4	101	ug/L	12/01/08 09:35
	Lead	40.0	40.5	101	ug/L	12/01/08 09:35
	Manganese	40.0	44.1	110	ug/L	12/01/08 09:35
	Nickel	40.0	39.9	100	ug/L	12/01/08 09:35
	Selenium	40.0	39.9	100	ug/L	12/01/08 09:35
	Silver	40.0	40.4	101	ug/L	12/01/08 09:35
	Thallium	40.0	39.8	100	ug/L	12/01/08 09:35
	Zinc	40.0	39.6	99	ug/L	12/01/08 09:35
8120103-CCV3	Barium	40.0	36.5	91	ug/L	12/01/08 10:54
	Beryllium	40.0	35.9	90	ug/L	12/01/08 10:54
	Cadmium	40.0	36.2	90	ug/L	12/01/08 10:54
	Chromium	40.0	40.1	100	ug/L	12/01/08 10:54
	Copper	40.0	37.6	94	ug/L	12/01/08 10:54
	Lead	40.0	36.2	91	ug/L	12/01/08 10:54
	Manganese	40.0	40.2	101	ug/L	12/01/08 10:54
	Nickel	40.0	36.8	92	ug/L	12/01/08 10:54
	Selenium	40.0	36.6	92	ug/L	12/01/08 10:54
	Silver	40.0	37.0	93	ug/L	12/01/08 10:54
	Thallium	40.0	36.7	92	ug/L	12/01/08 10:54
	Zinc	40.0	37.1	93	ug/L	12/01/08 10:54

* Values outside of QC limits

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8120103
Instrument: 114
Laboratory ID: 8120103-SCV1
Calibration: 8L01014

Analyte	Expected	Found	% R	QC Limit	Units
Barium	40.0	38.9	97	90-110	ug/L
Beryllium	40.0	38.9	97	90-110	ug/L
Cadmium	40.0	38.9	97	90-110	ug/L
Chromium	40.0	43.0	108	90-110	ug/L
Copper	40.0	38.8	97	90-110	ug/L
Lead	40.0	38.4	96	90-110	ug/L
Manganese	40.0	42.7	107	90-110	ug/L
Nickel	40.0	38.6	97	90-110	ug/L
Selenium	40.0	38.7	97	90-110	ug/L
Silver	40.0	40.0	100	90-110	ug/L
Thallium	40.0	38.5	96	90-110	ug/L
Zinc	40.0	38.6	97	90-110	ug/L

* Values outside of QC limits

BLANKS
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120103

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 114
Calibration: 8L01014

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
8120103-CCB1	Barium	-0.00096	0.40	0.047	ug/L	U	12/01/08 09:07
	Beryllium	0.0018	0.40	0.046	ug/L	U	12/01/08 09:07
	Cadmium	-0.00042	0.040	0.011	ug/L	U	12/01/08 09:07
	Chromium	0.037	0.40	0.065	ug/L	U	12/01/08 09:07
	Copper	-0.00072	0.20	0.058	ug/L	U	12/01/08 09:07
	Lead	0.0032	0.20	0.058	ug/L	U	12/01/08 09:07
	Manganese	-0.00037	0.60	0.059	ug/L	U	12/01/08 09:07
	Nickel	-0.0016	0.40	0.070	ug/L	U	12/01/08 09:07
	Selenium	-0.074	0.60	0.061	ug/L	J	12/01/08 09:07
	Silver	0.0015	0.10	0.012	ug/L	U	12/01/08 09:07
	Thallium	0.00099	0.040	0.0099	ug/L	U	12/01/08 09:07
	Zinc	0.000030	2.0	0.36	ug/L	U	12/01/08 09:07
8120103-CCB2	Barium	-0.0028	0.40	0.047	ug/L	U	12/01/08 09:55
	Beryllium	-0.0034	0.40	0.046	ug/L	U	12/01/08 09:55
	Cadmium	-0.0015	0.040	0.011	ug/L	U	12/01/08 09:55
	Chromium	-0.029	0.40	0.065	ug/L	U	12/01/08 09:55
	Copper	-0.000080	0.20	0.058	ug/L	U	12/01/08 09:55
	Lead	0.0020	0.20	0.058	ug/L	U	12/01/08 09:55
	Manganese	-0.00024	0.60	0.059	ug/L	U	12/01/08 09:55
	Nickel	-0.0017	0.40	0.070	ug/L	U	12/01/08 09:55
	Selenium	-0.018	0.60	0.061	ug/L	U	12/01/08 09:55
	Silver	0.00053	0.10	0.012	ug/L	U	12/01/08 09:55
	Thallium	0.0012	0.040	0.0099	ug/L	U	12/01/08 09:55
	Zinc	-0.016	2.0	0.36	ug/L	U	12/01/08 09:55
0813681-BLK1	Barium, Total	2.0	2.0	0.23	ug/L	U	12/01/08 10:00
	Beryllium, Total	2.0	2.0	0.23	ug/L	U	12/01/08 10:00
	Cadmium, Total	0.20	0.20	0.056	ug/L	U	12/01/08 10:00
	Chromium, Total	2.0	2.0	0.33	ug/L	U	12/01/08 10:00
	Copper, Total	1.0	1.0	0.29	ug/L	U	12/01/08 10:00
	Lead, Total	1.0	1.0	0.29	ug/L	U	12/01/08 10:00
	Manganese, Total	3.0	3.0	0.30	ug/L	U	12/01/08 10:00
	Nickel, Total	2.0	2.0	0.35	ug/L	U	12/01/08 10:00
	Selenium, Total	3.0	3.0	0.30	ug/L	U	12/01/08 10:00

: 831142

BLANKS
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8120103
Instrument ID: 114
Calibration: 8L01014

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
0813681-BLK1	Silver, Total	0.50	0.50	0.061	ug/L	U	12/01/08 10:00
	Thallium, Total	0.20	0.20	0.050	ug/L	U	12/01/08 10:00
	Zinc, Total	10	10	1.8	ug/L	U	12/01/08 10:00
8120103-CCB3	Barium	-0.0026	0.40	0.047	ug/L	U	12/01/08 10:45
	Beryllium	-0.0046	0.40	0.046	ug/L	U	12/01/08 10:45
	Cadmium	0.0013	0.040	0.011	ug/L	U	12/01/08 10:45
	Chromium	-0.090	0.40	0.065	ug/L	J	12/01/08 10:45
	Copper	-0.0032	0.20	0.058	ug/L	U	12/01/08 10:45
	Lead	0.00078	0.20	0.058	ug/L	U	12/01/08 10:45
	Manganese	-0.0040	0.60	0.059	ug/L	U	12/01/08 10:45
	Nickel	-0.0020	0.40	0.070	ug/L	U	12/01/08 10:45
	Selenium	-0.0084	0.60	0.061	ug/L	U	12/01/08 10:45
	Silver	0.00045	0.10	0.012	ug/L	U	12/01/08 10:45
	Thallium	0.00013	0.040	0.0099	ug/L	U	12/01/08 10:45
	Zinc	-0.018	2.0	0.36	ug/L	U	12/01/08 10:45

* Values outside of QC limits

ICP INTERFERENCE CHECK SAMPLE

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Sequence: 8120103

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Instrument ID: 114

Calibration: 8L01014

Lab Sample ID	Analyte	2 x MDL	True	Found	%R	Units
8120103-IFA1	Barium	0.094	0.00	0.133		ug/L
	Beryllium	0.092	0.00	-0.000760		ug/L
	Cadmium	0.022	0.00	0.0410		ug/L
	Chromium	0.13	0.00	0.260		ug/L
	Copper	0.116	0.00	0.256		ug/L
	Lead	0.116	0.00	0.0163		ug/L
	Manganese	0.118	0.00	0.238		ug/L
	Nickel	0.14	0.00	0.264		ug/L
	Selenium	0.122	0.00	-0.243		ug/L
	Silver	0.024	0.00	0.00631		ug/L
	Thallium	0.0198	0.00	0.00185		ug/L
	Zinc	0.72	0.00	0.530		ug/L
8120103-IFB1	Barium		20.0	19.0	95	ug/L
	Beryllium		20.0	18.4	92	ug/L
	Cadmium		20.0	19.5	98	ug/L
	Chromium		20.0	21.2	106	ug/L
	Copper		20.0	18.9	95	ug/L
	Lead		20.0	19.7	99	ug/L
	Manganese		20.0	21.5	108	ug/L
	Nickel		20.0	18.7	94	ug/L
	Selenium		20.0	18.9	94	ug/L
	Silver		20.0	19.7	98	ug/L
	Thallium		20.0	19.9	100	ug/L
	Zinc		20.0	19.3	97	ug/L

* Values outside of QC limits

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120103

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 114
Calibration: 8L01014

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Cal Standard	8120103-CAL1	8120103-001	12/01/08 08:22
Cal Standard	8120103-CAL2	8120103-002	12/01/08 08:27
Cal Standard	8120103-CAL3	8120103-003	12/01/08 08:31
Cal Standard	8120103-CAL4	8120103-004	12/01/08 08:35
Cal Standard	8120103-CAL5	8120103-005	12/01/08 08:40
Cal Standard	8120103-CAL6	8120103-006	12/01/08 08:44
Cal Standard	8120103-CAL7	8120103-007	12/01/08 08:49
Cal Standard	8120103-CAL8	8120103-008	12/01/08 08:53
Secondary Cal Check	8120103-SCV1	8120103-009	12/01/08 08:57
Calibration Check	8120103-CCV1	8120103-009	12/01/08 08:57
Calibration Blank	8120103-CCB1	8120103-010	12/01/08 09:07
Interference Check A	8120103-IFA1	8120103-011	12/01/08 09:16
Interference Check B	8120103-IFB1	8120103-013	12/01/08 09:31
Calibration Check	8120103-CCV2	8120103-014	12/01/08 09:35
Calibration Blank	8120103-CCB2	8120103-016	12/01/08 09:55
Blank	0813681-BLK1	8120103-017	12/01/08 10:00
LCS	0813681-BS1	8120103-018	12/01/08 10:04
EQBK-1	0811328-05	8120103-019	12/01/08 10:14
EQBK-1	0811328-05	8120103-019	12/01/08 10:14
EQBK-1	0811328-05	8120103-019	12/01/08 10:14
EQBK-1	0811328-05	8120103-019	12/01/08 10:14
EQBK-1	0811328-05	8120103-019	12/01/08 10:14
EQBK-1	0811328-05	8120103-019	12/01/08 10:14
EQBK-1	0811328-05	8120103-019	12/01/08 10:14
EQBK-1	0811328-05	8120103-019	12/01/08 10:14
EQBK-1	0811328-05	8120103-019	12/01/08 10:14
EQBK-1	0811328-05	8120103-019	12/01/08 10:14
EQBK-1	0811328-05	8120103-019	12/01/08 10:14
EQBK-1	0811328-05	8120103-019	12/01/08 10:14
EQBK-5	0811328-13	8120103-020	12/01/08 10:20
EQBK-5	0811328-13	8120103-020	12/01/08 10:20
EQBK-5	0811328-13	8120103-020	12/01/08 10:20

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8120103

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 114
Calibration: 8L01014

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
EQBK-5	0811328-13	8120103-020	12/01/08 10:20
EQBK-5	0811328-13	8120103-020	12/01/08 10:20
EQBK-5	0811328-13	8120103-020	12/01/08 10:20
EQBK-5	0811328-13	8120103-020	12/01/08 10:20
EQBK-5	0811328-13	8120103-020	12/01/08 10:20
EQBK-5	0811328-13	8120103-020	12/01/08 10:20
EQBK-5	0811328-13	8120103-020	12/01/08 10:20
EQBK-5	0811328-13	8120103-020	12/01/08 10:20
EQBK-5	0811328-13	8120103-020	12/01/08 10:20
EQBK-6	0811331-01	8120103-021	12/01/08 10:25
EQBK-6	0811331-01	8120103-021	12/01/08 10:25
EQBK-6	0811331-01	8120103-021	12/01/08 10:25
EQBK-6	0811331-01	8120103-021	12/01/08 10:25
EQBK-6	0811331-01	8120103-021	12/01/08 10:25
EQBK-6	0811331-01	8120103-021	12/01/08 10:25
EQBK-6	0811331-01	8120103-021	12/01/08 10:25
EQBK-6	0811331-01	8120103-021	12/01/08 10:25
EQBK-6	0811331-01	8120103-021	12/01/08 10:25
EQBK-6	0811331-01	8120103-021	12/01/08 10:25
EQBK-6	0811331-01	8120103-021	12/01/08 10:25
EQBK-6	0811331-01	8120103-021	12/01/08 10:25
LCS	0813681-BS1	8120103-022	12/01/08 10:29
Calibration Blank	8120103-CCB3	8120103-024	12/01/08 10:45
Calibration Check	8120103-CCV3	8120103-025	12/01/08 10:54

INITIAL AND CONTINUING CALIBRATION CHECK

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8120139
Instrument ID: 114
Control Limt: +/- 10.00%
Calibration: 8L01017

Lab Sample ID	Analyte	True	Found	%R	Units	Analyzed
8120139-CCV1	Antimony	40.0	38.1	95	ug/L	12/01/08 11:32
	Arsenic	40.0	40.6	102	ug/L	12/01/08 11:32
	Cobalt	40.0	39.3	98	ug/L	12/01/08 11:32
	Vanadium	40.0	37.7	94	ug/L	12/01/08 11:32
8120139-CCV2	Antimony	40.0	39.8	99	ug/L	12/01/08 11:59
	Arsenic	40.0	42.2	106	ug/L	12/01/08 11:59
	Cobalt	40.0	40.9	102	ug/L	12/01/08 11:59
	Vanadium	40.0	39.9	100	ug/L	12/01/08 11:59
8120139-CCV3	Antimony	40.0	37.7	94	ug/L	12/01/08 12:36
	Arsenic	40.0	40.7	102	ug/L	12/01/08 12:36
	Cobalt	40.0	39.6	99	ug/L	12/01/08 12:36
	Vanadium	40.0	38.1	95	ug/L	12/01/08 12:36

* Values outside of QC limits

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8120139
Instrument: 114
Laboratory ID: 8120139-SCV1
Calibration: 8L01017

Analyte	Expected	Found	% R	QC Limit	Units
Antimony	40.0	38.1	95	90-110	ug/L
Arsenic	40.0	40.6	102	90-110	ug/L
Cobalt	40.0	39.3	98	90-110	ug/L
Vanadium	40.0	37.7	94	90-110	ug/L

* Values outside of QC limits

BLANKS
USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8120139
Instrument ID: 114
Calibration: 8L01017

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
8120139-CCB1	Antimony	0.062	0.60	0.065	ug/L	U	12/01/08 11:41
	Arsenic	0.016	0.60	0.048	ug/L	U	12/01/08 11:41
	Cobalt	-0.00014	0.20	0.010	ug/L	U	12/01/08 11:41
	Vanadium	-0.0068	1.0	0.054	ug/L	U	12/01/08 11:41
8120139-CCB2	Antimony	0.033	0.60	0.065	ug/L	U	12/01/08 12:07
	Arsenic	0.052	0.60	0.048	ug/L	J	12/01/08 12:07
	Cobalt	0.00083	0.20	0.010	ug/L	U	12/01/08 12:07
	Vanadium	-0.0093	1.0	0.054	ug/L	U	12/01/08 12:07
0813681-BLK2	Antimony, Total	3.0	3.0	0.32	ug/L	U	12/01/08 12:16
	Arsenic, Total	3.0	3.0	0.24	ug/L	U	12/01/08 12:16
	Cobalt, Total	1.0	1.0	0.050	ug/L	U	12/01/08 12:16
	Vanadium, Total	5.0	5.0	0.27	ug/L	U	12/01/08 12:16
8120139-CCB3	Antimony	0.017	0.60	0.065	ug/L	U	12/01/08 12:44
	Arsenic	0.024	0.60	0.048	ug/L	U	12/01/08 12:44
	Cobalt	0.00024	0.20	0.010	ug/L	U	12/01/08 12:44
	Vanadium	-0.0013	1.0	0.054	ug/L	U	12/01/08 12:44

* Values outside of QC limits

ICP INTERFERENCE CHECK SAMPLE

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Sequence: 8120139

Instrument ID: 114

Calibration: 8L01017

Lab Sample ID	Analyte 2XMDL	True	Found	%R	Units
8120139-IFA1	Antimony 0.13	0.00	0.0139		ug/L
	Arsenic 0.096	0.00	0.0150		ug/L
	Cobalt 0.02	0.00	0.00738		ug/L
	Vanadium 0.108	0.00	-0.0224		ug/L
8120139-IFB1	Antimony	20.0	19.1	95	ug/L
	Arsenic	20.0	20.2	101	ug/L
	Cobalt	20.0	19.0	95	ug/L
	Vanadium	20.0	18.8	94	ug/L

* Values outside of QC limits

ANALYSIS BATCH (SEQUENCE) SUMMARY

USEPA-6020A

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Sequence: 8120139

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Instrument: 114

Calibration: 8L01017

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Cal Standard	8120139-CAL1	8120139-001	12/01/08 11:08
Cal Standard	8120139-CAL2	8120139-003	12/01/08 11:14
Cal Standard	8120139-CAL3	8120139-004	12/01/08 11:17
Cal Standard	8120139-CAL4	8120139-005	12/01/08 11:20
Cal Standard	8120139-CAL5	8120139-006	12/01/08 11:23
Cal Standard	8120139-CAL6	8120139-007	12/01/08 11:26
Cal Standard	8120139-CAL7	8120139-008	12/01/08 11:29
Secondary Cal Check	8120139-SCV1	8120139-009	12/01/08 11:32
Calibration Check	8120139-CCV1	8120139-009	12/01/08 11:32
Calibration Blank	8120139-CCB1	8120139-010	12/01/08 11:41
Interference Check A	8120139-IFA1	8120139-011	12/01/08 11:49
Interference Check B	8120139-IFB1	8120139-012	12/01/08 11:52
Calibration Check	8120139-CCV2	8120139-014	12/01/08 11:59
Calibration Blank	8120139-CCB2	8120139-015	12/01/08 12:07
Blank	0813681-BLK2	8120139-016	12/01/08 12:16
LCS	0813681-BS2	8120139-017	12/01/08 12:19
EQBK-1	0811328-05	8120139-018	12/01/08 12:27
EQBK-1	0811328-05	8120139-018	12/01/08 12:27
EQBK-1	0811328-05	8120139-018	12/01/08 12:27
EQBK-1	0811328-05	8120139-018	12/01/08 12:27
EQBK-5	0811328-13	8120139-019	12/01/08 12:30
EQBK-5	0811328-13	8120139-019	12/01/08 12:30
EQBK-5	0811328-13	8120139-019	12/01/08 12:30
EQBK-5	0811328-13	8120139-019	12/01/08 12:30
EQBK-6	0811331-01	8120139-020	12/01/08 12:33
EQBK-6	0811331-01	8120139-020	12/01/08 12:33
EQBK-6	0811331-01	8120139-020	12/01/08 12:33
EQBK-6	0811331-01	8120139-020	12/01/08 12:33
Calibration Check	8120139-CCV3	8120139-021	12/01/08 12:36
Calibration Blank	8120139-CCB3	8120139-022	12/01/08 12:44

Metals, Soil, 3050B Digestion

0813642

Batch comments:

MAS 11/19/08 7:30AM-3:00PM
INST#218 @94C#194
HOTBLOCK VESSEL LOT#A805LS309

Lab Number	*Container*	*Prepared*	*By*	*Initial (g)*	*Final (mL)*	*Client* Source ID	Spike ID	uL Spike	Comments			
0811328-01	A	Nov-19-08 07:30	MAS	0.5004	250	URS Corporation						
Ag Total 6020 (DoD)	*As Total 6020 (DoD)*	*Cu Total 6020 (DoD)*	*Ni Total 6020 (DoD)*	*Pb Total 6020 (DoD)*	*Se Total 6020 (DoD)*	*Tl Total 6020 (DoD)*	*V Total 6020 (DoD)*					
0811328-02	A	Nov-19-08 07:30	MAS	0.5002	250	URS Corporation						
Ag Total 6020 (DoD)	*As Total 6020 (DoD)*	*Cu Total 6020 (DoD)*	*Ni Total 6020 (DoD)*	*Pb Total 6020 (DoD)*	*Se Total 6020 (DoD)*	*Tl Total 6020 (DoD)*	*V Total 6020 (DoD)*					
0811328-03	A	Nov-19-08 07:30	MAS	0.5001	250	URS Corporation						
Ag Total 6020 (DoD)	*As Total 6020 (DoD)*	*Cu Total 6020 (DoD)*	*Ni Total 6020 (DoD)*	*Pb Total 6020 (DoD)*	*Se Total 6020 (DoD)*	*Tl Total 6020 (DoD)*	*V Total 6020 (DoD)*					
0811328-04	A	Nov-19-08 07:30	MAS	0.4998	250	URS Corporation						
Ag Total 6020 (DoD)	*As Total 6020 (DoD)*	*Cu Total 6020 (DoD)*	*Ni Total 6020 (DoD)*	*Pb Total 6020 (DoD)*	*Se Total 6020 (DoD)*	*Tl Total 6020 (DoD)*	*V Total 6020 (DoD)*					
0811328-06	A	Nov-19-08 07:30	MAS	0.5004	250	URS Corporation						
Ag Total 6020 (DoD)	*As Total 6020 (DoD)*	*Cu Total 6020 (DoD)*	*Ni Total 6020 (DoD)*	*Pb Total 6020 (DoD)*	*Se Total 6020 (DoD)*	*Tl Total 6020 (DoD)*	*V Total 6020 (DoD)*					
0811328-07	A	Nov-19-08 07:30	MAS	0.5005	250	URS Corporation						
Ag Total 6020 (DoD)	*As Total 6020 (DoD)*	*Cu Total 6020 (DoD)*	*Ni Total 6020 (DoD)*	*Pb Total 6020 (DoD)*	*Se Total 6020 (DoD)*	*Tl Total 6020 (DoD)*	*V Total 6020 (DoD)*					
0811328-08	A	Nov-19-08 07:30	MAS	0.5005	250	URS Corporation						
Ag Total 6020 (DoD)	*As Total 6020 (DoD)*	*Cu Total 6020 (DoD)*	*Ni Total 6020 (DoD)*	*Pb Total 6020 (DoD)*	*Se Total 6020 (DoD)*	*Tl Total 6020 (DoD)*	*V Total 6020 (DoD)*					
0811328-09	A	Nov-19-08 07:30	MAS	0.5004	250	URS Corporation						
Ag Total 6020 (DoD)	*As Total 6020 (DoD)*	*Cu Total 6020 (DoD)*	*Ni Total 6020 (DoD)*	*Pb Total 6020 (DoD)*	*Se Total 6020 (DoD)*	*Tl Total 6020 (DoD)*	*V Total 6020 (DoD)*					
0811328-10	A	Nov-19-08 07:30	MAS	0.4998	250	URS Corporation						
Ag Total 6020 (DoD)	*As Total 6020 (DoD)*	*Cu Total 6020 (DoD)*	*Ni Total 6020 (DoD)*	*Pb Total 6020 (DoD)*	*Se Total 6020 (DoD)*	*Tl Total 6020 (DoD)*	*V Total 6020 (DoD)*					
0811328-11	A	Nov-19-08 07:30	MAS	0.5002	250	URS Corporation						
Ag Total 6020 (DoD)	*As Total 6020 (DoD)*	*Cu Total 6020 (DoD)*	*Ni Total 6020 (DoD)*	*Pb Total 6020 (DoD)*	*Se Total 6020 (DoD)*	*Tl Total 6020 (DoD)*	*V Total 6020 (DoD)*					
0811328-12	A	Nov-19-08 07:30	MAS	0.5005	250	URS Corporation						
Ag Total 6020 (DoD)	*As Total 6020 (DoD)*	*Cu Total 6020 (DoD)*	*Ni Total 6020 (DoD)*	*Pb Total 6020 (DoD)*	*Se Total 6020 (DoD)*	*Tl Total 6020 (DoD)*	*V Total 6020 (DoD)*					
0811328-14	A	Nov-19-08 07:30	MAS	0.5002	250	URS Corporation						
Ag Total 6020 (DoD)	*As Total 6020 (DoD)*	*Cu Total 6020 (DoD)*	*Ni Total 6020 (DoD)*	*Pb Total 6020 (DoD)*	*Se Total 6020 (DoD)*	*Tl Total 6020 (DoD)*	*V Total 6020 (DoD)*					

Comments:	Analyst Initials

Metals, Soil, 3050B Digestion

Batch comments:
MAS 11/19/08 7:30AM-3:00PM
INST#218 @94C#194
HOTBLOCK VESSEL LOT#A805LS309

Lab Number	*Container*	*Prepared*	*By*	*Initial (g)*	*Final (mL)*	*Client* Source ID	*Client* Spike ID	*Client* uL Spike	*Comments*
0811328-15	A	Nov-19-08 07:30	MAS	0.5	250	URS Corporation			
Ag Total 6020 (DoD)	*As Total 6020 (DoD)*	*Cu Total 6020 (DoD)*	*Ni Total 6020 (DoD)*	*Pb Total 6020 (DoD)*	*Se Total 6020 (DoD)*	*Tl Total 6020 (DoD)*	*V Total 6020 (DoD)*		
0813642-BLK1		Nov-19-08 07:30	MAS	0.5	250				
0813642-BLK2		Nov-19-08 07:30	MAS	0.5	250				
0813642-BS1		Nov-19-08 07:30	MAS	0.5	250		7110434	100	
0813642-BS2		Nov-19-08 07:30	MAS	0.5	250		7110434	100	
0813642-MS1		Nov-19-08 07:30	MAS	0.4999	250	0811328-15	7110434	100	
0813642-MS2		Nov-19-08 07:30	MAS	0.4999	250	0811328-15	7110434	100	
0813642-MSD1		Nov-19-08 07:30	MAS	0.5002	250	0811328-15	7110434	100	
0813642-MSD2		Nov-19-08 07:30	MAS	0.5002	250	0811328-15	7110434	100	
0813642-PS1		Nov-24-08 12:25	DSC	0.02	10	0811328-15	7110622	50	[Spk] 0.5g->250mL; 10mL->10mL; Spikec
0813642-PS2		Nov-24-08 12:25	DSC	0.02	10	0811328-15	7110622	100	[Spk] 0.5g->250mL; 10mL->10mL; Spikec
0813642-PS3		Nov-24-08 12:25	DSC	0.02	10	0811328-15	7110622	50	[Spk] 0.5g->250mL; 10mL->10mL; Spikec

Comments:	Analyst Initials:

Metals, Water, 3020A Digestion

Batch comments:
mas 11/20/08 7:30AM-3:00PM
INST#217 @94C#195
HOTBLOCK VESSEL LOT#A805LS309

Lab Number	*Container*	*Prepared*	*By*	*Initial (mL)*	*Final (mL)*	*Client* Source ID	Spike ID	uL Spike	Comments			
0811328 - 05	E	Nov-20-08 07:30	MAS	25	125	URS Corporation						
Ag Total 6020 (DoD)	*As Total 6020 (DoD)*	*Ba Total 6020 (DoD)*	*Be Total 6020 (DoD)*	*Cd Total 6020 (DoD)*	*Co Total 6020 (DoD)*	*Cr Total 6020 (DoD)*	*Cu Total 6020 (DoD)*					
Mn Total 6020 (DoD)	*Ni Total 6020 (DoD)*	*Pb Total 6020 (DoD)*	*Sb Total 6020 (DoD)*	*Se Total 6020 (DoD)*	*Tl Total 6020 (DoD)*	*V Total 6020 (DoD)*	*Zn Total 6020 (DoD)*					
0811328 - 13	D	Nov-20-08 07:30	MAS	25	125	URS Corporation						
Ag Total 6020 (DoD)	*As Total 6020 (DoD)*	*Ba Total 6020 (DoD)*	*Be Total 6020 (DoD)*	*Cd Total 6020 (DoD)*	*Co Total 6020 (DoD)*	*Cr Total 6020 (DoD)*	*Cu Total 6020 (DoD)*					
Mn Total 6020 (DoD)	*Ni Total 6020 (DoD)*	*Pb Total 6020 (DoD)*	*Sb Total 6020 (DoD)*	*Se Total 6020 (DoD)*	*Tl Total 6020 (DoD)*	*V Total 6020 (DoD)*	*Zn Total 6020 (DoD)*					
0811331 - 01	D	Nov-20-08 07:30	MAS	25	125	URS Corporation						
Ag Total 6020 (DoD)	*As Total 6020 (DoD)*	*Ba Total 6020 (DoD)*	*Be Total 6020 (DoD)*	*Cd Total 6020 (DoD)*	*Co Total 6020 (DoD)*	*Cr Total 6020 (DoD)*	*Cu Total 6020 (DoD)*					
Mn Total 6020 (DoD)	*Ni Total 6020 (DoD)*	*Pb Total 6020 (DoD)*	*Sb Total 6020 (DoD)*	*Se Total 6020 (DoD)*	*Tl Total 6020 (DoD)*	*V Total 6020 (DoD)*	*Zn Total 6020 (DoD)*					
0813681 - BLK1		Nov-20-08 07:30	MAS	25	125							
0813681 - BLK2		Nov-20-08 07:30	MAS	25	125							
0813681 - BS1		Nov-20-08 07:30	MAS	25	125		8110378	25				
0813681 - BS2		Nov-20-08 07:30	MAS	25	125		8110378	25				

Comments	Analyst Initials:

Metals, Soil, 3050B Digestion

Batch comments:
RDB 11-21-08 9:00AM-10:30AM
INST#218 @93C #194
HOTBLOCK VESSEL LOT#A805LS309

Lab Number	*Container*	*Prepared*	*By*	*Initial (g)*	*Final (mL)*	*Client* Source ID	Spike ID	uL Spike	Comments
0811328-01	A	Nov-21-08 09:00	RDB	0.5001	250	URS Corporation			
Sb Total 6020 (DoD)									
0811328-02	A	Nov-21-08 09:00	RDB	0.5002	250	URS Corporation			
Sb Total 6020 (DoD)									
0811328-03	A	Nov-21-08 09:00	RDB	0.5002	250	URS Corporation			
Sb Total 6020 (DoD)									
0811328-04	A	Nov-21-08 09:00	RDB	0.4995	250	URS Corporation			
Sb Total 6020 (DoD)									
0811328-06	A	Nov-21-08 09:00	RDB	0.4996	250	URS Corporation			
Sb Total 6020 (DoD)									
0811328-07	A	Nov-21-08 09:00	RDB	0.4997	250	URS Corporation			
Sb Total 6020 (DoD)									
0811328-08	A	Nov-21-08 09:00	RDB	0.4997	250	URS Corporation			
Sb Total 6020 (DoD)									
0811328-09	A	Nov-21-08 09:00	RDB	0.5003	250	URS Corporation			
Sb Total 6020 (DoD)									
0811328-10	A	Nov-21-08 09:00	RDB	0.4996	250	URS Corporation			
Sb Total 6020 (DoD)									
0811328-11	A	Nov-21-08 09:00	RDB	0.5002	250	URS Corporation			
Sb Total 6020 (DoD)									
0811328-12	A	Nov-21-08 09:00	RDB	0.5005	250	URS Corporation			
Sb Total 6020 (DoD)									
0811328-14	A	Nov-21-08 09:00	RDB	0.5001	250	URS Corporation			
Sb Total 6020 (DoD)									

Comments	Analyst Initials

Metals, Soil, 3050B Digestion

Batch comments:

RDB 11-21-08 9:00AM-10:30AM
INST#218 @93C #194
HOTBLOCK VESSEL LOT#A805LS309

Lab Number	*Container*	*Prepared*	*By*	*Initial (g)*	*Final (mL)*	*Client* Source ID	*Client* Spike ID	*Client* uL Spike	*Comments*
0811328-15	A	Nov-21-08 09:00	RDB	0.4999	250	URS Corporation			
Sb Total 6020 (DoD)									
0813766-BLK1		Nov-21-08 09:00	RDB	0.5	250				
0813766-BS1		Nov-21-08 09:00	RDB	0.5	250		7110434	100	
0813766-MS1		Nov-21-08 09:00	RDB	0.5004	250	0811328-15	7110434	100	
0813766-MSD1		Nov-21-08 09:00	RDB	0.4999	250	0811328-15	7110434	100	
0813766-PS1		Nov-25-08 13:40	MSM	).00999(	5	0811328-15	7110623	25	[Spk] 0.4999g->250mL; 5mL->5mL; Spike

Comments:	Analyst Initials:

Metals, Soil, 3050B Digestion

Batch comments:

RDB 11-21-08 10:30AM-12:00PM
INST#218 @93C #194
HOTBLOCK VESSEL LOT#A805LS309

Lab Number	Container	Prepared	By	Initial (g)	Final (mL)	Client Source ID	Client Spike ID	Client uL Spike	Comments
0811331-02	A	Nov-21-08 10:30	RDB	0.4998	250	URS Corporation			
Sb Total 6020 (DoD)									
0811331-03	A	Nov-21-08 10:30	RDB	0.5003	250	URS Corporation			
Sb Total 6020 (DoD)									
0811331-04	A	Nov-21-08 10:30	RDB	0.5004	250	URS Corporation			
Sb Total 6020 (DoD)									
0811331-05	A	Nov-21-08 10:30	RDB	0.5002	250	URS Corporation			
Sb Total 6020 (DoD)									
0811331-06	A	Nov-21-08 10:30	RDB	0.4997	250	URS Corporation			
Sb Total 6020 (DoD)									
0811331-07	A	Nov-21-08 10:30	RDB	0.5	250	URS Corporation			
Sb Total 6020 (DoD)									
0813767-BLK1		Nov-21-08 10:30	RDB	0.5	250				
0813767-BS1		Nov-21-08 10:30	RDB	0.5	250		7110434	100	
0813767-MS1		Nov-21-08 10:30	RDB	0.4998	250	0811331-03	7110434	100	
0813767-MSD1		Nov-21-08 10:30	RDB	0.4997	250	0811331-03	7110434	100	
0813767-PS1		Nov-25-08 13:40	MSM	.01000(	5	0811331-03	7110623	25	[Spk] 0.5003g->250mL; 5mL->5mL; Spike

Comments	Analyst Initials

Metals, Soil, 3050B Digestion

Batch comments:
MAS 11/21/08 7:30AM-3:30PM
INST#218 @94C#194
HOTBLOCK VESSEL LOT#A805LS309

Lab Number	Container	Prepared	By	Initial (g)	Final (mL)	Client Source ID	Spike ID	uL Spike	Comments
0811331-02	A	Nov-21-08 07:30	MAS	0.4999	250	URS Corporation			
Ag Total 6020 (DoD)	*As Total 6020 (DoD)*	*Cu Total 6020 (DoD)*	*Ni Total 6020 (DoD)*	*Pb Total 6020 (DoD)*	*Se Total 6020 (DoD)*	*Tl Total 6020 (DoD)*	*V Total 6020 (DoD)*		
0811331-03	A	Nov-21-08 07:30	MAS	0.5002	250	URS Corporation			
Ag Total 6020 (DoD)	*As Total 6020 (DoD)*	*Cu Total 6020 (DoD)*	*Ni Total 6020 (DoD)*	*Pb Total 6020 (DoD)*	*Se Total 6020 (DoD)*	*Tl Total 6020 (DoD)*	*V Total 6020 (DoD)*		
0811331-04	A	Nov-21-08 07:30	MAS	0.5002	250	URS Corporation			
Ag Total 6020 (DoD)	*As Total 6020 (DoD)*	*Cu Total 6020 (DoD)*	*Ni Total 6020 (DoD)*	*Pb Total 6020 (DoD)*	*Se Total 6020 (DoD)*	*Tl Total 6020 (DoD)*	*V Total 6020 (DoD)*		
0811331-05	A	Nov-21-08 07:30	MAS	0.5005	250	URS Corporation			
Ag Total 6020 (DoD)	*As Total 6020 (DoD)*	*Cu Total 6020 (DoD)*	*Ni Total 6020 (DoD)*	*Pb Total 6020 (DoD)*	*Se Total 6020 (DoD)*	*Tl Total 6020 (DoD)*	*V Total 6020 (DoD)*		
0811331-06	A	Nov-21-08 07:30	MAS	0.5001	250	URS Corporation			
Ag Total 6020 (DoD)	*As Total 6020 (DoD)*	*Cu Total 6020 (DoD)*	*Ni Total 6020 (DoD)*	*Pb Total 6020 (DoD)*	*Se Total 6020 (DoD)*	*Tl Total 6020 (DoD)*	*V Total 6020 (DoD)*		
0811331-07	A	Nov-21-08 07:30	MAS	0.5004	250	URS Corporation			
Ag Total 6020 (DoD)	*As Total 6020 (DoD)*	*Cu Total 6020 (DoD)*	*Ni Total 6020 (DoD)*	*Pb Total 6020 (DoD)*	*Se Total 6020 (DoD)*	*Tl Total 6020 (DoD)*	*V Total 6020 (DoD)*		
0813780-BLK1		Nov-21-08 07:30	MAS	0.5	250				
0813780-BLK2		Nov-21-08 07:30	MAS	0.5	250				
0813780-BS1		Nov-21-08 07:30	MAS	0.5	250		7110434	100	
0813780-BS2		Nov-21-08 07:30	MAS	0.5	250		7110434	100	
0813780-MS1		Nov-21-08 07:30	MAS	0.4995	250	0811331-03	7110434	100	
0813780-MS2		Nov-21-08 07:30	MAS	0.4995	250	0811331-03	7110434	100	
0813780-MSD1		Nov-21-08 07:30	MAS	0.4998	250	0811331-03	7110434	100	
0813780-MSD2		Nov-21-08 07:30	MAS	0.4998	250	0811331-03	7110434	100	
0813780-PS1		Nov-24-08 12:40	DSC	.02000	10	0811331-03	7110622	50	[Spk] 0.5002g->250mL; 10mL->10mL; Sp
0813780-PS2		Nov-24-08 12:40	DSC	.02000	10	0811331-03	7110622	250	[Spk] 0.5002g->250mL; 10mL->10mL; Sp
0813780-PS3		Nov-24-08 12:40	DSC	.02000	10	0811331-03	7110622	50	[Spk] 0.5002g->250mL; 10mL->10mL; Sp

Comments	Analyst Initials

QC BATCH SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61

Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008

QC Batch: 0813680
QC Batch Matrix: Water
Preparation: 3010A Digestion

Sample Name	Lab Sample ID	Date Prepared	Observations
EQBK-1	0811328-05	11/20/08 07:30	
EQBK-5	0811328-13	11/20/08 07:30	
EQBK-6	0811331-01	11/20/08 07:30	
Blank	0813680-BLK1	11/20/08 07:30	
Blank	0813680-BLK2	11/20/08 07:30	
LCS	0813680-BS1	11/20/08 07:30	
LCS	0813680-BS2	11/20/08 07:30	

METHOD BLANK DATA SHEET
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Water
Laboratory ID: 0813680-BLK1
File ID: 8112508-027
Prepared: 11/20/08 07:30
Preparation: 3010A Digestion
Initial/Final: 25 mL / 25 mL
Analyzed: 11/25/08 11:07
Instrument: 311
QC Batch: 0813680
Sequence: 8112508
Calibration: 8K25019

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
7440-70-2	Calcium, Total	69	500	500	ug/L	U
7439-89-6	Iron, Total	9.6	20	20	ug/L	U
7439-95-4	Magnesium, Total	63	500	500	ug/L	U
7440-09-7	Potassium, Total	62	200	200	ug/L	U
7440-23-5	Sodium, Total	210	500	500	ug/L	U

METHOD BLANK DATA SHEET
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Water
Laboratory ID: 0813680-BLK2
File ID: 8112641-017
Prepared: 11/20/08 07:30
Preparation: 3010A Digestion
Initial/Final: 25 mL / 25 mL
Analyzed: 11/26/08 13:34
Instrument: 311
QC Batch: 0813680
Sequence: 8112641
Calibration: 8K26024

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
7429-90-5	Aluminum, Total	20	50	50	ug/L	U

LCS / LCS DUPLICATE RECOVERY

USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Water

Laboratory ID: 0813680-BS1

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3010A Digestion

Initial/Final: 25 mL / 25 mL

QC Batch: 0813680

Sequence: 8112508

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
Calcium, Total	20000	20000	100	80 - 120	ug/L
Iron, Total	400	408	102	80 - 120	ug/L
Magnesium, Total	20000	19500	97	80 - 120	ug/L
Potassium, Total	20000	18800	94	80 - 120	ug/L
Sodium, Total	20000	19600	98	80 - 120	ug/L

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

LCS / LCS DUPLICATE RECOVERY

USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Water

Laboratory ID: 0813680-BS2

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3010A Digestion

Initial/Final: 25 mL / 25 mL

QC Batch: 0813680

Sequence: 8112641

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
Aluminum, Total	2000	1880	94	80 - 120	ug/L

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

QC BATCH SUMMARY

USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

QC Batch: 0813643 QC Batch Matrix: Soil

Preparation: 3050B Digestion

Sample Name	Lab Sample ID	Date Prepared	Observations
13SB13A	0811328-01	11/19/08 07:30	
13SB13C	0811328-02	11/19/08 07:30	
13SB21C	0811328-03	11/19/08 07:30	
13SB14A	0811328-04	11/19/08 07:30	
13SB20A	0811328-06	11/19/08 07:30	
13SB20C	0811328-07	11/19/08 07:30	
13SB22A	0811328-08	11/19/08 07:30	
13SB22C	0811328-09	11/19/08 07:30	
13SB21A	0811328-10	11/19/08 07:30	
13SB18A	0811328-11	11/19/08 07:30	
13SB18C	0811328-12	11/19/08 07:30	
13SB19A	0811328-14	11/19/08 07:30	
13SB19C	0811328-15	11/19/08 07:30	
Blank	0813643-BLK1	11/19/08 07:30	
LCS	0813643-BS1	11/19/08 07:30	
13SB19C	0813643-MS1	11/19/08 07:30	
13SB19C	0813643-MSD1	11/19/08 07:30	
13SB19C	0813643-PS1	11/24/08 07:30	[Spk] 0.4995g->50mL; 4mL->4mL; Spiked 4mL
13SB19C	0813643-PS2	11/24/08 07:30	[Spk] 0.4995g->50mL; 0.05mL->0.05mL; Spiked 0.05mL
13SB19C	0813643-PS3	11/24/08 07:30	[Spk] 0.4995g->50mL; 0.2mL->0.2mL; Spiked 0.2mL

METHOD BLANK DATA SHEET
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0813643-BLK1
File ID: 8112407-014
Prepared: 11/19/08 07:30
Preparation: 3050B Digestion
Initial/Final: 0.5 g / 50 mL
Analyzed: 11/24/08 08:55
Instrument: 311
QC Batch: 0813643
Sequence: 8112407
Calibration: 8K25004

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
7429-90-5	Aluminum, Total	2.0	10	10	mg/kg dry wt.	U
7440-39-3	Barium, Total	0.33	1.0	1.0	mg/kg dry wt.	U
7440-70-2	Calcium, Total	9.8	50	50	mg/kg dry wt.	U
7439-89-6	Iron, Total	0.98	10	10	mg/kg dry wt.	U
7439-95-4	Magnesium, Total	2.8	50	50	mg/kg dry wt.	U
7440-09-7	Potassium, Total	14	50	50	mg/kg dry wt.	U
7440-23-5	Sodium, Total	18	100	100	mg/kg dry wt.	U

METHOD BLANK DATA SHEET
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0813643-BLK1
File ID: 8112407-014
Prepared: 11/19/08 07:30
Preparation: 3050B Digestion
Initial/Final: 0.5 g / 50 mL
Analyzed: 11/24/08 08:56
Instrument: 311
QC Batch: 0813643
Sequence: 8112407
Calibration: 8K25004

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
7440-41-7	Beryllium, Total	0.061	1.0	1.0	mg/kg dry wt.	U
7440-43-9	Cadmium, Total	0.45	2.0	2.0	mg/kg dry wt.	U
7440-47-3	Chromium, Total	0.80	5.0	5.0	mg/kg dry wt.	U
7440-48-4	Cobalt, Total	0.53	2.0	2.0	mg/kg dry wt.	U
7439-96-5	Manganese, Total	0.18	1.0	1.0	mg/kg dry wt.	U
7440-66-6	Zinc, Total	0.49	5.0	0.53	mg/kg dry wt.	J

LCS / LCS DUPLICATE RECOVERY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil

Laboratory ID: 0813643-BS1

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Initial/Final: 0.5 g / 50 mL
QC Batch: 0813643
Sequence: 8112407

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
Aluminum, Total	125	120	96	80 - 120	mg/kg dry wt.
Barium, Total	25.0	24.4	98	80 - 120	mg/kg dry wt.
Beryllium, Total	2.50	2.44	97	80 - 120	mg/kg dry wt.
Cadmium, Total	25.0	23.6	95	80 - 120	mg/kg dry wt.
Calcium, Total	1250	1240	99	80 - 120	mg/kg dry wt.
Chromium, Total	25.0	25.2	101	80 - 120	mg/kg dry wt.
Cobalt, Total	25.0	24.1	96	80 - 120	mg/kg dry wt.
Iron, Total	25.0	25.8	103	80 - 120	mg/kg dry wt.
Magnesium, Total	1250	1220	98	80 - 120	mg/kg dry wt.
Manganese, Total	25.0	24.7	99	80 - 120	mg/kg dry wt.
Potassium, Total	1250	1170	94	80 - 120	mg/kg dry wt.
Sodium, Total	1250	1230	99	80 - 120	mg/kg dry wt.
Zinc, Total	25.0	24.6	99	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6010B

13SB19C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.4997 g / 50 mL

Laboratory ID: 0813643-MS1

QC Batch: 0813643

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Aluminum, Total	125	4920	7260	1870 *	80 - 120	mg/kg dry wt.
Barium, Total	25.0	54.4	83.9	118	80 - 120	mg/kg dry wt.
Beryllium, Total	2.50	ND	2.26	90	80 - 120	mg/kg dry wt.
Cadmium, Total	25.0	ND	24.0	96	80 - 120	mg/kg dry wt.
Calcium, Total	1250	1150	2690	123 *	80 - 120	mg/kg dry wt.
Chromium, Total	25.0	10.2	36.6	106	80 - 120	mg/kg dry wt.
Cobalt, Total	25.0	4.71	28.5	95	80 - 120	mg/kg dry wt.
Iron, Total	25.0	10400	11200	2860 *	80 - 120	mg/kg dry wt.
Magnesium, Total	1250	1470	2930	116	80 - 120	mg/kg dry wt.
Manganese, Total	25.0	216	236	81	80 - 120	mg/kg dry wt.
Potassium, Total	1250	604	2030	114	80 - 120	mg/kg dry wt.
Sodium, Total	1250	41.1	1300	100	80 - 120	mg/kg dry wt.
Zinc, Total	25.0	158	178	77 *	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6010B

13SB19C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.4997 g / 50 mL

Laboratory ID: 0813643-MSD1

QC Batch: 0813643

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Aluminum, Total	125	6860	1560 *	6	20	80 - 120	mg/kg dry wt.
Barium, Total	25.0	78.6	97	6	20	80 - 120	mg/kg dry wt.
Beryllium, Total	2.50	2.46	98	8	20	80 - 120	mg/kg dry wt.
Cadmium, Total	25.0	24.8	99	3	20	80 - 120	mg/kg dry wt.
Calcium, Total	1250	2760	128 *	3	20	80 - 120	mg/kg dry wt.
Chromium, Total	25.0	37.9	111	3	20	80 - 120	mg/kg dry wt.
Cobalt, Total	25.0	29.1	97	2	20	80 - 120	mg/kg dry wt.
Iron, Total	25.0	10000	-1640 *	11	20	80 - 120	mg/kg dry wt.
Magnesium, Total	1250	2840	109	3	20	80 - 120	mg/kg dry wt.
Manganese, Total	25.0	200	-64 *	17	20	80 - 120	mg/kg dry wt.
Potassium, Total	1250	1980	110	3	20	80 - 120	mg/kg dry wt.
Sodium, Total	1250	1320	102	1	20	80 - 120	mg/kg dry wt.
Zinc, Total	25.0	153	-21 *	15	20	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

POST DIGEST SPIKE SAMPLE RECOVERY

USEPA-6010B

13SB19C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
% Solids: 76.14
Laboratory ID: 0813643-PS1
Lab Source ID: 0811328-15

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Initial/Final: 0.03996 g / 4 mL
QC Batch: 0813643
Sequence: 8112407

Analyte	Control Limit %R	Spike Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R	Units
Barium, Total	75 - 125	0.801	0.543	0.250	103	mg/L
Beryllium, Total	75 - 125	0.0250	-0.000817	0.0250	103	mg/L
Cadmium, Total	75 - 125	0.256	0.00271	0.250	101	mg/L
Calcium, Total	75 - 125	24.8	11.5	12.5	106	mg/L
Chromium, Total	75 - 125	0.372	0.102	0.250	108	mg/L
Cobalt, Total	75 - 125	0.302	0.0470	0.250	102	mg/L
Magnesium, Total	75 - 125	27.4	14.7	12.5	101	mg/L
Manganese, Total	75 - 125	2.36	2.15	0.250	84	mg/L
Potassium, Total	75 - 125	19.1	6.04	12.5	104	mg/L
Sodium, Total	75 - 125	13.7	0.411	12.5	106	mg/L
Zinc, Total	75 - 125	1.78	1.58	0.250	79	mg/L

* Values outside of QC limits

POST DIGEST SPIKE SAMPLE RECOVERY

USEPA-6010B

13SB19C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
% Solids: 76.14
Laboratory ID: 0813643-PS2
Lab Source ID: 0811328-15

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Initial/Final: 0.0004995 g / 0.05 mL
QC Batch: 0813643
Sequence: 8112407

Analyte	Control Limit %R	Spike Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R	Units
Iron, Total	75 - 125	155	104	50.0	100	mg/L

* Values outside of QC limits

POST DIGEST SPIKE SAMPLE RECOVERY

USEPA-6010B

13SB19C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Preparation: 3050B Digestion
% Solids: 76.14
Initial/Final: 0.001998 g / 0.2 mL
Laboratory ID: 0813643-PS3
QC Batch: 0813643
Lab Source ID: 0811328-15
Sequence: 8112407

Analyte	Control Limit %R	Spike Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R	Units
Aluminum, Total	75 - 125	79.5	49.1	31.2	97	mg/L

* Values outside of QC limits

SERIAL DILUTION
USEPA-6010B

13SB19C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
% Solids: 76.14
Laboratory ID: 8112407-SRD1
QC Batch: 8112407
Lab Source ID: 0811328-15
Sequence: 8112407

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Units	QC Limits % Difference
Barium, Total	0.543		0.533		2.0		mg/L	10
Beryllium, Total	-0.000817	U	0.00203	U	348.0 #		mg/L	10
Cadmium, Total	0.00271	U	-0.0103	U	480.0 #		mg/L	10
Calcium, Total	11.5		11.3		2.0		mg/L	10
Chromium, Total	0.102		0.0956	J	6.0 #		mg/L	10
Cobalt, Total	0.0470		0.0586	J	25.0 #		mg/L	10
Magnesium, Total	14.7		14.7		0.0		mg/L	10
Manganese, Total	2.15		2.19		2.0		mg/L	10
Potassium, Total	6.04		6.43		6.0 #		mg/L	10
Sodium, Total	0.411	J	0.225	U	45.0 #		mg/L	10
Zinc, Total	1.58		1.64		4.0		mg/L	10

* Values outside of QC limits

Initial Sample Result (I) was less than 50xMDL (for 6010) or 100xMDL (for 6020), therefore serial dilution is not required.

SERIAL DILUTION

USEPA-6010B

13SB19C

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil

% Solids: 76.14

Laboratory ID: 8112407-SRD3

QC Batch: 8112407

Lab Source ID: 0811328-15

Sequence: 8112407

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Units	QC Limits % Difference
Iron, Total	0.522		0.549		5.0		mg/L	10

* Values outside of QC limits

Initial Sample Result (I) was less than 50xMDL (for 6010) or 100xMDL (for 6020), therefore serial dilution is not required.

SERIAL DILUTION

USEPA-6010B

13SB19C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

% Solids: 76.14

Laboratory ID: 8112407-SRD4

Lab Source ID: 0811328-15

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

QC Batch: 8112407

Sequence: 8112407

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Units	QC Limits % Difference
Aluminum, Total	1.96		2.07		6.0		mg/L	10

* Values outside of QC limits

Initial Sample Result (I) was less than 50xMDL (for 6010) or 100xMDL (for 6020), therefore serial dilution is not required.

QC BATCH SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

QC Batch: 0813708 QC Batch Matrix: Soil Preparation: 3050B Digestion

Sample Name	Lab Sample ID	Date Prepared	Observations
13SB17A	0811331-02	11/20/08 07:00	
13SB17C	0811331-03	11/20/08 07:00	
13SB16A	0811331-04	11/20/08 07:00	
13SB16C	0811331-05	11/20/08 07:00	
13SB15A	0811331-06	11/20/08 07:00	
DUP-13	0811331-07	11/20/08 07:00	
Blank	0813708-BLK1	11/20/08 07:00	
LCS	0813708-BS1	11/20/08 07:00	
13SB17C	0813708-MS1	11/20/08 07:00	
13SB17C	0813708-MSD1	11/20/08 07:00	
13SB17C	0813708-PS1	11/24/08 07:00	[Spk] 0.4998g->50mL; 4mL->4mL; Spiked 4mL
13SB17C	0813708-PS2	11/24/08 07:00	[Spk] 0.4998g->50mL; 0.02mL->0.02mL; Spiked 0.02mL
13SB17C	0813708-PS3	11/24/08 07:00	[Spk] 0.4998g->50mL; 0.1mL->0.1mL; Spiked 0.1mL
13SB17C	0813708-PS4	11/24/08 07:00	[Spk] 0.4998g->50mL; 1mL->1mL; Spiked 1mL

METHOD BLANK DATA SHEET
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0813708-BLK1
File ID: 8112407-035
Prepared: 11/20/08 07:00
Preparation: 3050B Digestion
Initial/Final: 0.5 g / 50 mL
Analyzed: 11/24/08 10:20
Instrument: 311
QC Batch: 0813708
Sequence: 8112407
Calibration: 8K25004

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
7429-90-5	Aluminum, Total	2.0	10	10	mg/kg dry wt.	U
7440-39-3	Barium, Total	0.33	1.0	1.0	mg/kg dry wt.	U
7439-95-4	Magnesium, Total	2.8	50	50	mg/kg dry wt.	U
7440-09-7	Potassium, Total	14	50	50	mg/kg dry wt.	U
7440-23-5	Sodium, Total	18	100	100	mg/kg dry wt.	U

METHOD BLANK DATA SHEET
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0813708-BLK1
File ID: 8112407-035
Prepared: 11/20/08 07:00
Preparation: 3050B Digestion
Initial/Final: 0.5 g / 50 mL
Analyzed: 11/24/08 10:22
Instrument: 311
QC Batch: 0813708
Sequence: 8112407
Calibration: 8K25004

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
7440-41-7	Beryllium, Total	0.061	1.0	1.0	mg/kg dry wt.	U
7440-43-9	Cadmium, Total	0.45	2.0	2.0	mg/kg dry wt.	U
7440-47-3	Chromium, Total	0.80	5.0	5.0	mg/kg dry wt.	U
7440-48-4	Cobalt, Total	0.53	2.0	2.0	mg/kg dry wt.	U
7439-96-5	Manganese, Total	0.18	1.0	1.0	mg/kg dry wt.	U
7440-66-6	Zinc, Total	0.49	5.0	2.1	mg/kg dry wt.	J

METHOD BLANK DATA SHEET
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0813708-BLK1
File ID: 8112407-051
Prepared: 11/20/08 07:00
Preparation: 3050B Digestion
Initial/Final: 0.5 g / 50 mL
Analyzed: 11/24/08 11:29
Instrument: 311
QC Batch: 0813708
Sequence: 8112407
Calibration: 8K25004

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
7440-70-2	Calcium, Total	9.8	50	59	mg/kg dry wt.	
7439-89-6	Iron, Total	0.98	10	2.3	mg/kg dry wt.	J

LCS / LCS DUPLICATE RECOVERY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil

Laboratory ID: 0813708-BS1

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Initial/Final: 0.5 g / 50 mL
QC Batch: 0813708
Sequence: 8112407

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
Aluminum, Total	125	119	95	80 - 120	mg/kg dry wt.
Barium, Total	25.0	24.6	99	80 - 120	mg/kg dry wt.
Beryllium, Total	2.50	2.55	102	80 - 120	mg/kg dry wt.
Cadmium, Total	25.0	24.7	99	80 - 120	mg/kg dry wt.
Calcium, Total	1250	1260	101	80 - 120	mg/kg dry wt.
Chromium, Total	25.0	26.4	106	80 - 120	mg/kg dry wt.
Cobalt, Total	25.0	25.4	102	80 - 120	mg/kg dry wt.
Iron, Total	25.0	26.4	105	80 - 120	mg/kg dry wt.
Magnesium, Total	1250	1230	99	80 - 120	mg/kg dry wt.
Manganese, Total	25.0	25.7	103	80 - 120	mg/kg dry wt.
Potassium, Total	1250	1280	102	80 - 120	mg/kg dry wt.
Sodium, Total	1250	1230	99	80 - 120	mg/kg dry wt.
Zinc, Total	25.0	25.7	103	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6010B

13SB17C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.4996 g / 50 mL

Laboratory ID: 0813708-MS1

QC Batch: 0813708

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Aluminum, Total	125	10200	12700	2010 *	80 - 120	mg/kg dry wt.
Barium, Total	25.0	94.5	124	117	80 - 120	mg/kg dry wt.
Beryllium, Total	2.50	ND	1.88	75 *	80 - 120	mg/kg dry wt.
Cadmium, Total	25.0	0.509	23.5	92	80 - 120	mg/kg dry wt.
Calcium, Total	1250	2060	3280	98	80 - 120	mg/kg dry wt.
Chromium, Total	25.0	18.9	43.8	99	80 - 120	mg/kg dry wt.
Cobalt, Total	25.0	7.96	31.4	94	80 - 120	mg/kg dry wt.
Iron, Total	25.0	24300	24300	-83 *	80 - 120	mg/kg dry wt.
Magnesium, Total	1250	2440	3780	108	80 - 120	mg/kg dry wt.
Manganese, Total	25.0	723	747	97	80 - 120	mg/kg dry wt.
Potassium, Total	1250	1170	2490	105	80 - 120	mg/kg dry wt.
Sodium, Total	1250	43.6	1250	97	80 - 120	mg/kg dry wt.
Zinc, Total	25.0	270	299	117	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6010B

13SB17C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.5004 g / 50 mL

Laboratory ID: 0813708-MSD1

QC Batch: 0813708

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Aluminum, Total	125	13300	2510 *	5	20	80 - 120	mg/kg dry wt.
Barium, Total	25.0	130	141 *	5	20	80 - 120	mg/kg dry wt.
Beryllium, Total	2.50	1.93	77 *	3	20	80 - 120	mg/kg dry wt.
Cadmium, Total	25.0	24.2	95	3	20	80 - 120	mg/kg dry wt.
Calcium, Total	1250	3470	113	6	20	80 - 120	mg/kg dry wt.
Chromium, Total	25.0	45.7	107	4	20	80 - 120	mg/kg dry wt.
Cobalt, Total	25.0	32.9	100	4	20	80 - 120	mg/kg dry wt.
Iron, Total	25.0	25800	6110 *	6	20	80 - 120	mg/kg dry wt.
Magnesium, Total	1250	3930	120	4	20	80 - 120	mg/kg dry wt.
Manganese, Total	25.0	799	304 *	7	20	80 - 120	mg/kg dry wt.
Potassium, Total	1250	2550	110	2	20	80 - 120	mg/kg dry wt.
Sodium, Total	1250	1300	101	4	20	80 - 120	mg/kg dry wt.
Zinc, Total	25.0	305	140 *	2	20	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

POST DIGEST SPIKE SAMPLE RECOVERY

USEPA-6010B

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
% Solids: 84.26
Laboratory ID: 0813708-PS1
Lab Source ID: 0811331-03

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Initial/Final: 0.039984 g / 4 mL
QC Batch: 0813708
Sequence: 8112407

Analyte	Control Limit %R	Spike Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R	Units
Barium, Total	75 - 125	1.20	0.945	0.250	103	mg/L
Beryllium, Total	75 - 125	0.0234	-0.00405	0.0250	110	mg/L
Cadmium, Total	75 - 125	0.261	0.00509	0.250	102	mg/L
Calcium, Total	75 - 125	33.9	20.6	12.5	107	mg/L
Chromium, Total	75 - 125	0.458	0.189	0.250	108	mg/L
Cobalt, Total	75 - 125	0.336	0.0796	0.250	102	mg/L
Magnesium, Total	75 - 125	37.1	24.4	12.5	102	mg/L
Manganese, Total	75 - 125	7.42	7.23	0.250	77	mg/L
Potassium, Total	75 - 125	24.6	11.7	12.5	103	mg/L
Sodium, Total	75 - 125	13.9	0.436	12.5	108	mg/L

* Values outside of QC limits

POST DIGEST SPIKE SAMPLE RECOVERY

USEPA-6010B

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
% Solids: 84.26
Laboratory ID: 0813708-PS2
Lab Source ID: 0811331-03

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Initial/Final: 1.9992E-04 g / 0.02 mL
QC Batch: 0813708
Sequence: 8112407

Analyte	Control Limit %R	Spike Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R	Units
Iron, Total	75 - 125	372	243	125	104	mg/L

* Values outside of QC limits

POST DIGEST SPIKE SAMPLE RECOVERY

USEPA-6010B

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
% Solids: 84.26
Laboratory ID: 0813708-PS3
Lab Source ID: 0811331-03

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Initial/Final: 0.0009996 g / 0.1 mL
QC Batch: 0813708
Sequence: 8112407

Analyte	Control Limit %R	Spike Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R	Units
Aluminum, Total	75 - 125	223	102	125	97	mg/L

* Values outside of QC limits

POST DIGEST SPIKE SAMPLE RECOVERY

USEPA-6010B

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Preparation: 3050B Digestion
% Solids: 84.26
Initial/Final: 0.009996 g / 1 mL
Laboratory ID: 0813708-PS4
QC Batch: 0813708
Lab Source ID: 0811331-03
Sequence: 8112407

Analyte	Control Limit %R	Spike Sample Result (SSR)	Sample Result (SR)	Spike Added (SA)	%R	Units
Zinc, Total	75 - 125	5.23	2.70	2.50	101	mg/L

* Values outside of QC limits

SERIAL DILUTION
USEPA-6010B

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
% Solids: 84.26
Laboratory ID: 8112407-SRD2
QC Batch: 8112407
Lab Source ID: 0811331-03
Sequence: 8112407

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Units	QC Limits % Difference
Barium, Total	0.945		0.936		1.0		mg/L	10
Beryllium, Total	-0.00405	U	-0.00355	U	12.0 #		mg/L	10
Cadmium, Total	0.00509	J	-0.00438	U	186.0 #		mg/L	10
Calcium, Total	20.6		20.1		2.0		mg/L	10
Chromium, Total	0.189		0.180	J	5.0 #		mg/L	10
Cobalt, Total	0.0796		0.0909	J	14.0 #		mg/L	10
Magnesium, Total	24.4		24.0		2.0		mg/L	10
Manganese, Total	7.23		7.26		0.0		mg/L	10
Potassium, Total	11.7		11.7		0.0		mg/L	10
Sodium, Total	0.436	J	0.392	U	10.0 #		mg/L	10

* Values outside of QC limits

Initial Sample Result (I) was less than 50xMDL (for 6010) or 100xMDL (for 6020), therefore serial dilution is not required.

SERIAL DILUTION
USEPA-6010B

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
% Solids: 84.26
Laboratory ID: 8112407-SRD5
QC Batch: 8112407
Lab Source ID: 0811331-03
Sequence: 8112407

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Units	QC Limits % Difference
Iron, Total	0.486		0.493	J	1.0 #		mg/L	10

* Values outside of QC limits

Initial Sample Result (I) was less than 50xMDL (for 6010) or 100xMDL (for 6020), therefore serial dilution is not required.

SERIAL DILUTION

USEPA-6010B

13SB17C

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Matrix: Soil

% Solids: 84.26

Laboratory ID: 8112407-SRD6

QC Batch: 8112407

Lab Source ID: 0811331-03

Sequence: 8112407

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Units	QC Limits % Difference
Aluminum, Total	1.02		0.910		11.0	*	mg/L	10

* Values outside of QC limits

Initial Sample Result (I) was less than 50xMDL (for 6010) or 100xMDL (for 6020), therefore serial dilution is not required.

SERIAL DILUTION
USEPA-6010B

13SB17C

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
% Solids: 84.26
Laboratory ID: 8112407-SRD7
QC Batch: 8112407
Lab Source ID: 0811331-03
Sequence: 8112407

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	Units	QC Limits % Difference
Zinc, Total	0.270		0.260		4.0		mg/L	10

* Values outside of QC limits

Initial Sample Result (I) was less than 50xMDL (for 6010) or 100xMDL (for 6020), therefore serial dilution is not required.

ICP INTERFERENCE CHECK SAMPLE

USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Sequence: 8112407

Instrument ID: 311

Calibration: 8K25004

Lab Sample ID	Analyte	True	Found	%R	Units
8112407-IFA1	Aluminum All	100	106	106	mg/L
	Barium	0.00	-0.000254		mg/L
	Calcium only 6010A	100	107	107	mg/L
	Iron All	40.0	41.9	105	mg/L
	Magnesium only 6010A	100	101	101	mg/L
	Potassium	0.00	0.0582		mg/L
	Sodium	0.00	0.0310		mg/L
	Beryllium	0.00	-0.00287		mg/L
	Cadmium	0.00	-0.000954		mg/L
	Chromium	0.00	-0.00197		mg/L
	Cobalt	0.00	0.00230		mg/L
	Manganese	0.00	0.00238	< 2x MDL	mg/L
	Zinc	0.00	-0.00794	< 2x MDL	mg/L
8112407-IFA2	Aluminum	0.00	0.0433		mg/L
	Barium	0.00	-0.000894		mg/L
	Potassium	0.00	0.00464		mg/L
	Sodium	0.00	0.0154		mg/L
	Calcium	0.00	-0.00734		mg/L
	Chromium none	20.0	20.6	103	mg/L
	Iron	0.00	0.00886		mg/L
	Magnesium	0.00	-0.0203		mg/L
	Manganese	20.0	20.2	101	mg/L
	Zinc	0.00	0.0212		mg/L
	Beryllium	0.00	-0.000401		mg/L
	Cadmium	0.00	0.0000912		mg/L
	Cobalt	0.00	0.00252		mg/L
8112407-IFB1	Aluminum	100	101	101	mg/L
	Barium	0.500	0.499	100	mg/L
	Beryllium	0.0500	0.0460	92	mg/L

ICP INTERFERENCE CHECK SAMPLE

USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Sequence: 8112407

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Instrument ID: 311

Calibration: 8K25004

Lab Sample ID	Analyte	True	Found	%R	Units
8112407-IFB1	Cadmium	1.00	0.917	92	mg/L
	Calcium	100	102	102	mg/L
	Iron	40.0	39.8	100	mg/L
	Magnesium	100	95.7	96	mg/L
	Manganese	0.500	0.512	102	mg/L
	Chromium	0.500	0.494	99	mg/L
	Cobalt	0.500	0.474	95	mg/L
	Zinc	1.00	0.952	95	mg/L
8112407-IFB2	Aluminum	1.00	1.01	101	mg/L
	Calcium	5.00	4.96	99	mg/L
	Magnesium	5.00	4.94	99	mg/L
	Sodium	5.00	5.10	102	mg/L
	Chromium	20.0	20.6	103	mg/L
	Manganese	20.0	19.8	99	mg/L

* Values outside of QC limits

BLANKS
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112407

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 311
Calibration: 8K25004

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
8112407-CCB1	Aluminum	-0.016	0.10	0.020	mg/L	U	11/24/08 08:25
	Barium	-0.00048	0.010	0.0033	mg/L	U	11/24/08 08:25
	Potassium	-0.087	0.50	0.14	mg/L	U	11/24/08 08:25
	Sodium	0.016	1.0	0.18	mg/L	U	11/24/08 08:25
	Calcium	-0.061	0.50	0.098	mg/L	U	11/24/08 08:25
	Iron	0.0030	0.10	0.0098	mg/L	U	11/24/08 08:25
	Magnesium	-0.0042	0.50	0.028	mg/L	U	11/24/08 08:25
	Beryllium	-0.000080	0.010	0.00061	mg/L	U	11/24/08 08:26
	Cadmium	-0.0016	0.020	0.0045	mg/L	U	11/24/08 08:26
	Chromium	-0.0016	0.050	0.0080	mg/L	U	11/24/08 08:26
	Cobalt	0.0016	0.020	0.0053	mg/L	U	11/24/08 08:26
	Manganese	-0.0012	0.010	0.0018	mg/L	U	11/24/08 08:26
	Zinc	-0.00081	0.050	0.0049	mg/L	U	11/24/08 08:26
8112407-CCB2	Aluminum	-0.039	0.10	0.020	mg/L	J	11/24/08 08:51
	Barium	-0.00085	0.010	0.0033	mg/L	U	11/24/08 08:51
	Potassium	-0.028	0.50	0.14	mg/L	U	11/24/08 08:51
	Sodium	0.0097	1.0	0.18	mg/L	U	11/24/08 08:51
	Calcium	-0.067	0.50	0.098	mg/L	U	11/24/08 08:51
	Iron	0.0042	0.10	0.0098	mg/L	U	11/24/08 08:51
	Magnesium	-0.012	0.50	0.028	mg/L	U	11/24/08 08:51
	Beryllium	0.00000014	0.010	0.00061	mg/L	U	11/24/08 08:52
	Cadmium	-0.000091	0.020	0.0045	mg/L	U	11/24/08 08:52
	Chromium	-0.0019	0.050	0.0080	mg/L	U	11/24/08 08:52
	Cobalt	0.00045	0.020	0.0053	mg/L	U	11/24/08 08:52
	Manganese	-0.00068	0.010	0.0018	mg/L	U	11/24/08 08:52
	Zinc	0.0013	0.050	0.0049	mg/L	U	11/24/08 08:52
081364-3-BLK1	Aluminum, Total	10	10	2.0	mg/kg dry wt.	U	11/24/08 08:55
	Barium, Total	1.0	1.0	0.33	mg/kg dry wt.	U	11/24/08 08:55
	Potassium, Total	50	50	14	mg/kg dry wt.	U	11/24/08 08:55
	Sodium, Total	100	100	18	mg/kg dry wt.	U	11/24/08 08:55
	Calcium, Total	50	50	9.8	mg/kg dry wt.	U	11/24/08 08:55
	Iron, Total	10	10	0.98	mg/kg dry wt.	U	11/24/08 08:55
	Magnesium, Total	50	50	2.8	mg/kg dry wt.	U	11/24/08 08:55

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BLANKS
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112407

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 311
Calibration: 8K25004

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
0813643-BLK1	Beryllium, Total	1.0	1.0	0.061	mg/kg dry wt.	U	11/24/08 08:56
	Cadmium, Total	2.0	2.0	0.45	mg/kg dry wt.	U	11/24/08 08:56
	Chromium, Total	5.0	5.0	0.80	mg/kg dry wt.	U	11/24/08 08:56
	Cobalt, Total	2.0	2.0	0.53	mg/kg dry wt.	U	11/24/08 08:56
	Manganese, Total	1.0	1.0	0.18	mg/kg dry wt.	U	11/24/08 08:56
	Zinc, Total	0.53	5.0	0.49	mg/kg dry wt.	J	11/24/08 08:56
8112407-CCB3	Aluminum	-0.0079	0.10	0.020	mg/L	U	11/24/08 09:40
	Barium	-0.00073	0.010	0.0033	mg/L	U	11/24/08 09:40
	Potassium	-0.043	0.50	0.14	mg/L	U	11/24/08 09:40
	Sodium	-0.00041	1.0	0.18	mg/L	U	11/24/08 09:40
	Calcium	-0.066	0.50	0.098	mg/L	U	11/24/08 09:41
	Iron	0.019	0.10	0.0098	mg/L	J	11/24/08 09:41
	Magnesium	0.0067	0.50	0.028	mg/L	U	11/24/08 09:41
	Beryllium	0.00010	0.010	0.00061	mg/L	U	11/24/08 09:42
	Cadmium	-0.0013	0.020	0.0045	mg/L	U	11/24/08 09:42
	Chromium	-0.0038	0.050	0.0080	mg/L	U	11/24/08 09:42
	Cobalt	0.00041	0.020	0.0053	mg/L	U	11/24/08 09:42
	Manganese	-0.00079	0.010	0.0018	mg/L	U	11/24/08 09:42
	Zinc	0.0047	0.050	0.0049	mg/L	U	11/24/08 09:42
0813708-BLK1	Aluminum, Total	10	10	2.0	mg/kg dry wt.	U	11/24/08 10:20
	Barium, Total	1.0	1.0	0.33	mg/kg dry wt.	U	11/24/08 10:20
	Potassium, Total	50	50	14	mg/kg dry wt.	U	11/24/08 10:20
	Sodium, Total	100	100	18	mg/kg dry wt.	U	11/24/08 10:20
	Magnesium, Total	50	50	2.8	mg/kg dry wt.	U	11/24/08 10:20
	Beryllium, Total	1.0	1.0	0.061	mg/kg dry wt.	U	11/24/08 10:22
	Cadmium, Total	2.0	2.0	0.45	mg/kg dry wt.	U	11/24/08 10:22
	Chromium, Total	5.0	5.0	0.80	mg/kg dry wt.	U	11/24/08 10:22
	Cobalt, Total	2.0	2.0	0.53	mg/kg dry wt.	U	11/24/08 10:22
	Manganese, Total	1.0	1.0	0.18	mg/kg dry wt.	U	11/24/08 10:22
	Zinc, Total	2.1	5.0	0.49	mg/kg dry wt.	J	11/24/08 10:22
8112407-CCB4	Aluminum	-0.028	0.10	0.020	mg/L	J	11/24/08 10:29
	Barium	-0.00091	0.010	0.0033	mg/L	U	11/24/08 10:29
	Potassium	-0.061	0.50	0.14	mg/L	U	11/24/08 10:29

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BLANKS
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112407

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 311
Calibration: 8K25004

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
8112407-CCB4	Sodium	-0.012	1.0	0.18	mg/L	U	11/24/08 10:29
	Calcium	-0.070	0.50	0.098	mg/L	U	11/24/08 10:29
	Iron	0.012	0.10	0.0098	mg/L	J	11/24/08 10:29
	Magnesium	-0.0074	0.50	0.028	mg/L	U	11/24/08 10:29
	Beryllium	0.00015	0.010	0.00061	mg/L	U	11/24/08 10:30
	Cadmium	-0.0012	0.020	0.0045	mg/L	U	11/24/08 10:30
	Chromium	-0.0024	0.050	0.0080	mg/L	U	11/24/08 10:30
	Cobalt	0.0020	0.020	0.0053	mg/L	U	11/24/08 10:30
	Manganese	-0.0010	0.010	0.0018	mg/L	U	11/24/08 10:30
	Zinc	0.0023	0.050	0.0049	mg/L	U	11/24/08 10:30
8112407-CCB5	Aluminum	-0.034	0.10	0.020	mg/L	J	11/24/08 11:18
	Barium	-0.0011	0.010	0.0033	mg/L	U	11/24/08 11:18
	Potassium	-0.021	0.50	0.14	mg/L	U	11/24/08 11:18
	Sodium	-0.046	1.0	0.18	mg/L	U	11/24/08 11:18
	Calcium	-0.078	0.50	0.098	mg/L	U	11/24/08 11:18
	Iron	0.010	0.10	0.0098	mg/L	J	11/24/08 11:18
	Magnesium	-0.021	0.50	0.028	mg/L	U	11/24/08 11:18
	Beryllium	0.00031	0.010	0.00061	mg/L	U	11/24/08 11:19
	Cadmium	-0.0018	0.020	0.0045	mg/L	U	11/24/08 11:19
	Chromium	-0.0019	0.050	0.0080	mg/L	U	11/24/08 11:19
	Cobalt	0.0026	0.020	0.0053	mg/L	U	11/24/08 11:19
	Manganese	-0.0010	0.010	0.0018	mg/L	U	11/24/08 11:19
	Zinc	0.0027	0.050	0.0049	mg/L	U	11/24/08 11:19
0813708-BLK1	Calcium, Total	59	50	9.8	mg/kg dry wt.	*	11/24/08 11:29
	Iron, Total	2.3	10	0.98	mg/kg dry wt.	J	11/24/08 11:29
8112407-CCB6	Aluminum	-0.036	0.10	0.020	mg/L	J	11/24/08 11:39
	Barium	-0.0010	0.010	0.0033	mg/L	U	11/24/08 11:39
	Potassium	0.014	0.50	0.14	mg/L	U	11/24/08 11:39
	Sodium	-0.033	1.0	0.18	mg/L	U	11/24/08 11:39
	Calcium	-0.082	0.50	0.098	mg/L	U	11/24/08 11:39
	Iron	0.011	0.10	0.0098	mg/L	J	11/24/08 11:39
	Magnesium	-0.029	0.50	0.028	mg/L	J	11/24/08 11:39
	Beryllium	0.00027	0.010	0.00061	mg/L	U	11/24/08 11:40

BLANKS
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112407

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 311
Calibration: 8K25004

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
8112407-CCB6	Cadmium	-0.0025	0.020	0.0045	mg/L	U	11/24/08 11:40
	Chromium	-0.00066	0.050	0.0080	mg/L	U	11/24/08 11:40
	Cobalt	0.0019	0.020	0.0053	mg/L	U	11/24/08 11:40
	Manganese	-0.0011	0.010	0.0018	mg/L	U	11/24/08 11:40
	Zinc	0.0022	0.050	0.0049	mg/L	U	11/24/08 11:40
8112407-CCB7	Aluminum	-0.019	0.10	0.020	mg/L	U	11/24/08 12:34
	Barium	-0.0011	0.010	0.0033	mg/L	U	11/24/08 12:34
	Potassium	0.026	0.50	0.14	mg/L	U	11/24/08 12:34
	Sodium	-0.030	1.0	0.18	mg/L	U	11/24/08 12:34
	Calcium	-0.080	0.50	0.098	mg/L	U	11/24/08 12:34
	Iron	0.0078	0.10	0.0098	mg/L	U	11/24/08 12:34
	Magnesium	-0.028	0.50	0.028	mg/L	U	11/24/08 12:34
	Beryllium	0.00018	0.010	0.00061	mg/L	U	11/24/08 12:36
	Cadmium	-0.0021	0.020	0.0045	mg/L	U	11/24/08 12:36
	Chromium	-0.0025	0.050	0.0080	mg/L	U	11/24/08 12:36
	Cobalt	0.0029	0.020	0.0053	mg/L	U	11/24/08 12:36
	Manganese	-0.0012	0.010	0.0018	mg/L	U	11/24/08 12:36
	Zinc	0.00044	0.050	0.0049	mg/L	U	11/24/08 12:36
8112407-CCB8	Aluminum	-0.025	0.10	0.020	mg/L	J	11/24/08 13:21
	Barium	-0.00075	0.010	0.0033	mg/L	U	11/24/08 13:21
	Potassium	-0.077	0.50	0.14	mg/L	U	11/24/08 13:21
	Sodium	0.0070	1.0	0.18	mg/L	U	11/24/08 13:21
	Calcium	-0.071	0.50	0.098	mg/L	U	11/24/08 13:22
	Iron	0.0078	0.10	0.0098	mg/L	U	11/24/08 13:22
	Magnesium	0.0025	0.50	0.028	mg/L	U	11/24/08 13:22
	Beryllium	0.00017	0.010	0.00061	mg/L	U	11/24/08 13:23
	Cadmium	-0.0018	0.020	0.0045	mg/L	U	11/24/08 13:23
	Chromium	-0.0018	0.050	0.0080	mg/L	U	11/24/08 13:23
	Cobalt	0.0025	0.020	0.0053	mg/L	U	11/24/08 13:23
	Manganese	-0.0011	0.010	0.0018	mg/L	U	11/24/08 13:23
	Zinc	0.0015	0.050	0.0049	mg/L	U	11/24/08 13:23

* Values outside of QC limits

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112407
Instrument: 311
Laboratory ID: 8112407-SCV1
Calibration: 8K25004

Analyte	Expected	Found	% R	QC Limit	Units
Aluminum	2.50	2.42	97	90-110	mg/L
Barium	0.500	0.484	97	90-110	mg/L
Beryllium	0.0500	0.0490	98	90-110	mg/L
Cadmium	0.500	0.480	96	90-110	mg/L
Calcium	5.00	4.95	99	90-110	mg/L
Chromium	0.500	0.512	102	90-110	mg/L
Cobalt	0.500	0.479	96	90-110	mg/L
Iron	0.500	0.496	99	90-110	mg/L
Magnesium	5.00	4.97	99	90-110	mg/L
Manganese	0.500	0.496	99	90-110	mg/L
Potassium	5.00	4.93	99	90-110	mg/L
Sodium	5.00	4.88	98	90-110	mg/L
Zinc	0.500	0.495	99	90-110	mg/L

* Values outside of QC limits

INITIAL AND CONTINUING CALIBRATION CHECK

USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112407
Instrument ID:311
Control Limt: +/- 10.00%
Calibration: 8K25004

Lab Sample ID	Analyte	True	Found	%R	Units	Analyzed
8112407-CCV1	Aluminum	2.50	2.42	97	mg/L	11/24/08 08:21
	Barium	0.500	0.484	97	mg/L	11/24/08 08:21
	Calcium	5.00	4.95	99	mg/L	11/24/08 08:21
	Iron	0.500	0.496	99	mg/L	11/24/08 08:21
	Magnesium	5.00	4.97	99	mg/L	11/24/08 08:21
	Potassium	5.00	4.93	99	mg/L	11/24/08 08:21
	Sodium	5.00	4.88	98	mg/L	11/24/08 08:21
	Beryllium	0.0500	0.0490	98	mg/L	11/24/08 08:22
	Cadmium	0.500	0.480	96	mg/L	11/24/08 08:22
	Chromium	0.500	0.512	102	mg/L	11/24/08 08:22
	Cobalt	0.500	0.479	96	mg/L	11/24/08 08:22
	Manganese	0.500	0.496	99	mg/L	11/24/08 08:22
	Zinc	0.500	0.495	99	mg/L	11/24/08 08:22
8112407-CCV2	Aluminum	2.50	2.52	101	mg/L	11/24/08 08:46
	Barium	0.500	0.504	101	mg/L	11/24/08 08:46
	Calcium	5.00	4.93	99	mg/L	11/24/08 08:46
	Potassium	5.00	4.70	94	mg/L	11/24/08 08:46
	Sodium	5.00	5.05	101	mg/L	11/24/08 08:46
	Cadmium	0.500	0.489	98	mg/L	11/24/08 08:47
	Iron	0.500	0.501	100	mg/L	11/24/08 08:47
	Magnesium	5.00	5.01	100	mg/L	11/24/08 08:47
	Manganese	0.500	0.497	99	mg/L	11/24/08 08:47
	Beryllium	0.0500	0.0490	98	mg/L	11/24/08 08:48
	Chromium	0.500	0.493	99	mg/L	11/24/08 08:48
	Cobalt	0.500	0.482	96	mg/L	11/24/08 08:48
	Zinc	0.500	0.488	98	mg/L	11/24/08 08:48
8112407-CCV3	Aluminum	2.50	2.55	102	mg/L	11/24/08 09:36
	Barium	0.500	0.513	103	mg/L	11/24/08 09:36
	Calcium	5.00	5.04	101	mg/L	11/24/08 09:36
	Iron	0.500	0.537	107	mg/L	11/24/08 09:36
	Magnesium	5.00	5.04	101	mg/L	11/24/08 09:36
	Potassium	5.00	4.77	95	mg/L	11/24/08 09:36
	Sodium	5.00	5.13	103	mg/L	11/24/08 09:36
	Beryllium	0.0500	0.0504	101	mg/L	11/24/08 09:37
	Cadmium	0.500	0.501	100	mg/L	11/24/08 09:37
	Chromium	0.500	0.499	100	mg/L	11/24/08 09:37
	Cobalt	0.500	0.487	97	mg/L	11/24/08 09:37
	Manganese	0.500	0.502	100	mg/L	11/24/08 09:37

INITIAL AND CONTINUING CALIBRATION CHECK

USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112407
Instrument ID: 311
Control Limt: +/- 10.00%
Calibration: 8K25004

Lab Sample ID	Analyte	True	Found	%R	Units	Analyzed
8112407-CCV3	Zinc	0.500	0.503	101	mg/L	11/24/08 09:37
8112407-CCV4	Aluminum	2.50	2.49	100	mg/L	11/24/08 10:25
	Barium	0.500	0.500	100	mg/L	11/24/08 10:25
	Calcium	5.00	4.87	97	mg/L	11/24/08 10:25
	Iron	0.500	0.505	101	mg/L	11/24/08 10:25
	Magnesium	5.00	4.90	98	mg/L	11/24/08 10:25
	Potassium	5.00	4.71	94	mg/L	11/24/08 10:25
	Sodium	5.00	5.01	100	mg/L	11/24/08 10:25
	Beryllium	0.0500	0.0483	97	mg/L	11/24/08 10:26
	Cadmium	0.500	0.482	96	mg/L	11/24/08 10:26
	Chromium	0.500	0.486	97	mg/L	11/24/08 10:26
	Cobalt	0.500	0.474	95	mg/L	11/24/08 10:26
	Manganese	0.500	0.490	98	mg/L	11/24/08 10:26
	Zinc	0.500	0.480	96	mg/L	11/24/08 10:26
8112407-CCV5	Aluminum	2.50	2.52	101	mg/L	11/24/08 11:13
	Barium	0.500	0.507	101	mg/L	11/24/08 11:13
	Calcium	5.00	4.99	100	mg/L	11/24/08 11:13
	Potassium	5.00	5.01	100	mg/L	11/24/08 11:13
	Sodium	5.00	5.03	101	mg/L	11/24/08 11:13
	Cadmium	0.500	0.499	100	mg/L	11/24/08 11:14
	Iron	0.500	0.519	104	mg/L	11/24/08 11:14
	Magnesium	5.00	5.00	100	mg/L	11/24/08 11:14
	Manganese	0.500	0.506	101	mg/L	11/24/08 11:14
	Beryllium	0.0500	0.0500	100	mg/L	11/24/08 11:15
	Chromium	0.500	0.504	101	mg/L	11/24/08 11:15
	Cobalt	0.500	0.492	98	mg/L	11/24/08 11:15
	Zinc	0.500	0.502	100	mg/L	11/24/08 11:15
8112407-CCV6	Aluminum	2.50	2.49	100	mg/L	11/24/08 11:35
	Barium	0.500	0.505	101	mg/L	11/24/08 11:35
	Calcium	5.00	4.91	98	mg/L	11/24/08 11:35
	Iron	0.500	0.512	102	mg/L	11/24/08 11:35
	Magnesium	5.00	4.95	99	mg/L	11/24/08 11:35
	Potassium	5.00	4.74	95	mg/L	11/24/08 11:35
	Sodium	5.00	5.05	101	mg/L	11/24/08 11:35
	Beryllium	0.0500	0.0486	97	mg/L	11/24/08 11:36
	Cadmium	0.500	0.487	97	mg/L	11/24/08 11:36
	Chromium	0.500	0.489	98	mg/L	11/24/08 11:36
	Cobalt	0.500	0.476	95	mg/L	11/24/08 11:36

INITIAL AND CONTINUING CALIBRATION CHECK

USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112407
Instrument ID: 311
Control Limt: +/- 10.00%
Calibration: 8K25004

Lab Sample ID	Analyte	True	Found	%R	Units	Analyzed
8112407-CCV6	Manganese	0.500	0.496	99	mg/L	11/24/08 11:36
	Zinc	0.500	0.482	96	mg/L	11/24/08 11:36
8112407-CCV7	Aluminum	2.50	2.48	99	mg/L	11/24/08 12:30
	Barium	0.500	0.504	101	mg/L	11/24/08 12:30
	Calcium	5.00	4.94	99	mg/L	11/24/08 12:30
	Iron	0.500	0.508	102	mg/L	11/24/08 12:30
	Magnesium	5.00	4.94	99	mg/L	11/24/08 12:30
	Potassium	5.00	5.01	100	mg/L	11/24/08 12:30
	Sodium	5.00	4.98	100	mg/L	11/24/08 12:30
	Beryllium	0.0500	0.0494	99	mg/L	11/24/08 12:31
	Cadmium	0.500	0.494	99	mg/L	11/24/08 12:31
	Chromium	0.500	0.498	100	mg/L	11/24/08 12:31
	Cobalt	0.500	0.483	97	mg/L	11/24/08 12:31
	Manganese	0.500	0.501	100	mg/L	11/24/08 12:31
	Zinc	0.500	0.490	98	mg/L	11/24/08 12:31
8112407-CCV8	Aluminum	2.50	2.49	99	mg/L	11/24/08 13:17
	Barium	0.500	0.505	101	mg/L	11/24/08 13:17
	Calcium	5.00	4.87	97	mg/L	11/24/08 13:17
	Iron	0.500	0.503	101	mg/L	11/24/08 13:17
	Magnesium	5.00	4.87	97	mg/L	11/24/08 13:17
	Potassium	5.00	4.69	94	mg/L	11/24/08 13:17
	Sodium	5.00	5.04	101	mg/L	11/24/08 13:17
	Beryllium	0.0500	0.0491	98	mg/L	11/24/08 13:18
	Cadmium	0.500	0.487	97	mg/L	11/24/08 13:18
	Chromium	0.500	0.495	99	mg/L	11/24/08 13:18
	Cobalt	0.500	0.478	96	mg/L	11/24/08 13:18
	Manganese	0.500	0.498	100	mg/L	11/24/08 13:18
	Zinc	0.500	0.481	96	mg/L	11/24/08 13:18

* Values outside of QC limits

All analyte(s) passed QC.

Analytical Sequence
Method: DODSolid_6010C_311

Seq.	Loc.	ID	Status			
1	1	8112407-CAL1	Applied			
2	2	8112407-CAL2	Applied			
3	3	8112407-CAL3	Applied			
4	4	8112407-CAL4	Applied			
5	5	8112407-CAL5	Applied			
6	9	8112407-SCV1	QC Failed			
7	1	8112407-CCB1	QC Passed			
8	11	8112407-IFA1	QC Failed			
9	12	8112407-IFA2	QC Failed			
10	13	8112407-IFB1	QC Passed			
11	14	8112407-IFB2	QC Passed			
12	4	8112407-CCV2	QC Passed			
13	1	8112407-CCB2	QC Failed	-0.039 mg/L Al	-19.5	>
14	17	0813643-blk1	Analyzed			
15	18	0813643-bs1	Analyzed			
16	19	0811328-01	Analyzed			
17	20	0811328-02	Analyzed			
18	21	0811328-03	Analyzed			
19	22	0811328-04	Analyzed			
20	23	0811328-06	Analyzed			
21	24	0811328-07	Analyzed			
22	25	0811328-08	Analyzed			
23	26	0811328-09	Analyzed			
24	4	8112407-CCV3	QC Passed			
25	1	8112407-CCB3	QC Passed	0.019 mg/L Fe	95	>
26	27	0811328-10	Analyzed			
27	28	0811328-11	Analyzed			
28	29	0811328-12	Analyzed			
29	30	0811328-14	Analyzed			
30	31	0811328-15	Analyzed			
31	32	0813643-ms1	Analyzed			
32	33	0813643-msd1	Analyzed			
33	34	8112407-srd1	Analyzed			
34	35	0813643-ps1	Analyzed			
35	36	0813708-blk1	Analyzed			
36	4	8112407-CCV4	QC Passed			
37	1	8112407-CCB4	QC Passed	-0.028 mg/L Al	-14	>
38	37	0813708-bs1	Analyzed	0.012 mg/L Fe	6	>
39	38	0811331-02	Analyzed			
40	39	0811331-03	Analyzed			
41	40	0813708-ms1	Analyzed			
42	41	0813708-msd1	Analyzed			
43	42	8112407-srd2	Analyzed			
44	43	0813708-ps1	Analyzed			
45	44	0811331-04	Analyzed			
46	45	0811331-05	Analyzed			
47	46	0811331-06	Analyzed			
48	4	8112407-CCV5	QC Passed			
49	1	8112407-CCB5	QC Passed	-0.034 mg/L Al	-17	>
50	47	0811331-07	Analyzed	0.010 mg/L Fe	5	>
51	4	8112407-CCV6	QC Passed			
52	1	8112407-CCB6	QC Passed			
				-0.036 mg/L Al	-18	>
				0.011 mg/L Fe	5.5	>
				-0.029 mg/L Mg	-14.5	>

5x in mg/kg samples

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   QC value within limits for B 249.677  Recovery = Not calculated
Ba 455.398†              89.3  -0.0007483 mg/L    0.00011889  -0.0007483 mg/L    0.00011889  15.89%
   QC value within limits for Ba 455.398  Recovery = Not calculated
Be 234.861†              45.5   0.0001683 mg/L    0.00010508   0.0001683 mg/L    0.00010508  62.44%
   QC value within limits for Be 234.861  Recovery = Not calculated
Ca 315.887†               0.6  -0.0707379 mg/L    0.00170294  -0.0707379 mg/L    0.00170294   2.41%
   QC value within limits for Ca 315.887  Recovery = Not calculated
Cd 214.437†               4.3  -0.0017917 mg/L    0.00035760  -0.0017917 mg/L    0.00035760  19.96%
   QC value within limits for Cd 214.437  Recovery = Not calculated
Ce 413.764†             -93.4  -0.0044411 mg/L    0.00055776  -0.0044411 mg/L    0.00055776  12.56%
Co 228.616†               0.2   0.0025091 mg/L    0.00146320   0.0025091 mg/L    0.00146320  58.31%
   QC value within limits for Co 228.616  Recovery = Not calculated
Cr 205.557†              -2.0  -0.0018305 mg/L    0.00206012  -0.0018305 mg/L    0.00206012 112.54%
   QC value within limits for Cr 205.557  Recovery = Not calculated
Cu 324.753†              63.4   0.0036758 mg/L    0.00107217   0.0036758 mg/L    0.00107217  29.17%
   QC value within limits for Cu 324.753  Recovery = Not calculated
Fe 238.204†              20.9   0.0077738 mg/L    0.00106594   0.0077738 mg/L    0.00106594  13.71%
   QC value within limits for Fe 238.204  Recovery = Not calculated
K 766.490               -41.7  -0.0768360 mg/L    0.01673374  -0.0768360 mg/L    0.01673374  21.78%
   QC value within limits for K 766.490  Recovery = Not calculated
Li 670.784†              -4.0  -0.0016028 mg/L    0.00102376  -0.0016028 mg/L    0.00102376  63.87%
   QC value within limits for Li 670.784  Recovery = Not calculated
Mg 279.071†              13.4   0.0024898 mg/L    0.02561816   0.0024898 mg/L    0.02561816 >999.9%
   QC value within limits for Mg 279.071  Recovery = Not calculated
Mn 257.610†              -8.3  -0.0011419 mg/L    0.00007181  -0.0011419 mg/L    0.00007181   6.29%
   QC value within limits for Mn 257.610  Recovery = Not calculated
Mo 202.031†               4.4   0.0016288 mg/L    0.00061938   0.0016288 mg/L    0.00061938  38.03%
   QC value within limits for Mo 202.031  Recovery = Not calculated
Na 589.592†             129.6   0.0069941 mg/L    0.00160741   0.0069941 mg/L    0.00160741  22.98%
   QC value within limits for Na 589.592  Recovery = Not calculated
Ni 231.604†              10.2   0.0005707 mg/L    0.00008628   0.0005707 mg/L    0.00008628  15.12%
   QC value within limits for Ni 231.604  Recovery = Not calculated
Pb 220.353†               1.8   0.0002848 mg/L    0.00292193   0.0002848 mg/L    0.00292193 >999.9%
   QC value within limits for Pb 220.353  Recovery = Not calculated
Sb 217.584†             -11.2  -0.0154173 mg/L    0.01702593  -0.0154173 mg/L    0.01702593 110.43%
   QC value within limits for Sb 217.584  Recovery = Not calculated
Se 196.026†               9.3   0.0403146 mg/L    0.00100832   0.0403146 mg/L    0.00100832   2.50%
   QC value within limits for Se 196.026  Recovery = Not calculated
Si 251.611†            -130.6  -0.0321682 mg/L    0.00093766  -0.0321682 mg/L    0.00093766   2.91%
   QC value within limits for Si 251.611  Recovery = Not calculated
Sn 189.927†              11.5   0.0136258 mg/L    0.00084650   0.0136258 mg/L    0.00084650   6.21%
   QC value within limits for Sn 189.927  Recovery = Not calculated
Sr 407.771†             146.1  -0.0009548 mg/L    0.00013977  -0.0009548 mg/L    0.00013977  14.64%
   QC value within limits for Sr 407.771  Recovery = Not calculated
Ti 334.940†              -8.1   0.0004658 mg/L    0.00007029   0.0004658 mg/L    0.00007029  15.09%
   QC value within limits for Ti 334.940  Recovery = Not calculated
Tl 190.801†              -4.0  -0.0097260 mg/L    0.01151397  -0.0097260 mg/L    0.01151397 118.38%
   QC value within limits for Tl 190.801  Recovery = Not calculated
V 292.395†               79.8   0.0026200 mg/L    0.00009738   0.0026200 mg/L    0.00009738   3.72%
   QC value within limits for V 292.395  Recovery = Not calculated
Zn 206.200†              12.7   0.0015205 mg/L    0.00060433   0.0015205 mg/L    0.00060433  39.75%
   QC value within limits for Zn 206.200  Recovery = Not calculated
All analyte(s) passed QC.
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Analytical Sequence
Method: DODSolid_6010C_311

Seq.	Loc.	ID	Status
1	9	8112407-SCV1	
2	1	8112407-CCB1	
3	11	8112407-IFA1	
4	12	8112407-IFA2	
5	13	8112407-IFB1	
6	14	8112407-IFB2	
7	4	8112407-CCV	
8	1	8112407-CCB	
9	48	0811328-03	Analyzed
10	49	0811328-04	Analyzed
11	50	0811328-07	Analyzed
12	51	0811328-14	Analyzed
13	52	0811328-15	Analyzed

14	53	8112407-srd3	Analyzed
15	54	0813643-ps2	Analyzed
16	55	0811328-15	Analyzed DF20 A1
17	56	8112407-srd4	Analyzed
18	57	0813643-ps3	Analyzed
19	4	8112407-CCV	QC Passed
20	1	8112407-CCB	QC Failed Clean
21	58	0811331-03	Analyzed DF50 Fe
22	59	8112407-srd5	Analyzed
23	60	0813708-ps2	Analyzed
24	61	0811331-03	Analyzed DF100 A1
25	62	8112407-srd6	Analyzed
26	63	0813708-ps3	Analyzed
27	64	0811331-03	Analyzed DF10 Zn
28	65	8112407-srd7	Analyzed
29	66	0813708-ps4	Analyzed
30	4	8112407-CCV	QC Passed
31	1	8112407-CCB	QC Passed ~0.025 mg/L A1 -12.5 >

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112407

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 311
Calibration: 8K25004

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Cal Standard	8112407-CAL1	8112407-001	11/24/08 07:58
Cal Standard	8112407-CAL1	8112407-001	11/24/08 07:59
Cal Standard	8112407-CAL1	8112407-001	11/24/08 08:00
Cal Standard	8112407-CAL2	8112407-002	11/24/08 08:03
Cal Standard	8112407-CAL2	8112407-002	11/24/08 08:05
Cal Standard	8112407-CAL3	8112407-003	11/24/08 08:08
Cal Standard	8112407-CAL3	8112407-003	11/24/08 08:09
Cal Standard	8112407-CAL4	8112407-004	11/24/08 08:12
Cal Standard	8112407-CAL4	8112407-004	11/24/08 08:13
Cal Standard	8112407-CAL5	8112407-005	11/24/08 08:16
Cal Standard	8112407-CAL5	8112407-005	11/24/08 08:17
Cal Standard	8112407-CAL5	8112407-005	11/24/08 08:18
Secondary Cal Check	8112407-SCV1	8112407-006	11/24/08 08:21
Calibration Check	8112407-CCV1	8112407-006	11/24/08 08:21
Secondary Cal Check	8112407-SCV1	8112407-006	11/24/08 08:22
Calibration Check	8112407-CCV1	8112407-006	11/24/08 08:22
Calibration Blank	8112407-CCB1	8112407-007	11/24/08 08:25
Calibration Blank	8112407-CCB1	8112407-007	11/24/08 08:26
Interference Check A	8112407-IFA1	8112407-008	11/24/08 08:29
Interference Check A	8112407-IFA1	8112407-008	11/24/08 08:30
Interference Check A	8112407-IFA2	8112407-009	11/24/08 08:33
Interference Check A	8112407-IFA2	8112407-009	11/24/08 08:34
Interference Check A	8112407-IFA2	8112407-009	11/24/08 08:35
Interference Check B	8112407-IFB1	8112407-010	11/24/08 08:38
Interference Check B	8112407-IFB1	8112407-010	11/24/08 08:39
Interference Check B	8112407-IFB2	8112407-011	11/24/08 08:42
Interference Check B	8112407-IFB2	8112407-011	11/24/08 08:43
Calibration Check	8112407-CCV2	8112407-012	11/24/08 08:46
Calibration Check	8112407-CCV2	8112407-012	11/24/08 08:47
Calibration Check	8112407-CCV2	8112407-012	11/24/08 08:48
Calibration Blank	8112407-CCB2	8112407-013	11/24/08 08:51
Calibration Blank	8112407-CCB2	8112407-013	11/24/08 08:52

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112407

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 311
Calibration: 8K25004

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Blank	0813643-BLK1	8112407-014	11/24/08 08:55
Blank	0813643-BLK1	8112407-014	11/24/08 08:56
LCS	0813643-BS1	8112407-015	11/24/08 08:59
LCS	0813643-BS1	8112407-015	11/24/08 09:00
LCS	0813643-BS1	8112407-015	11/24/08 09:01
13SB13A	0811328-01	8112407-016	11/24/08 09:03
13SB13A	0811328-01	8112407-016	11/24/08 09:03
13SB13A	0811328-01	8112407-016	11/24/08 09:03
13SB13A	0811328-01	8112407-016	11/24/08 09:04
13SB13A	0811328-01	8112407-016	11/24/08 09:04
13SB13A	0811328-01	8112407-016	11/24/08 09:04
13SB13A	0811328-01	8112407-016	11/24/08 09:04
13SB13A	0811328-01	8112407-016	11/24/08 09:04
13SB13A	0811328-01	8112407-016	11/24/08 09:04
13SB13A	0811328-01	8112407-016	11/24/08 09:04
13SB13A	0811328-01	8112407-016	11/24/08 09:05
13SB13A	0811328-01	8112407-016	11/24/08 09:05
13SB13A	0811328-01	8112407-016	11/24/08 09:05
13SB13C	0811328-02	8112407-017	11/24/08 09:08
13SB13C	0811328-02	8112407-017	11/24/08 09:08
13SB13C	0811328-02	8112407-017	11/24/08 09:08
13SB13C	0811328-02	8112407-017	11/24/08 09:08
13SB13C	0811328-02	8112407-017	11/24/08 09:08
13SB13C	0811328-02	8112407-017	11/24/08 09:08
13SB13C	0811328-02	8112407-017	11/24/08 09:08
13SB13C	0811328-02	8112407-017	11/24/08 09:08
13SB13C	0811328-02	8112407-017	11/24/08 09:08
13SB13C	0811328-02	8112407-017	11/24/08 09:09
13SB13C	0811328-02	8112407-017	11/24/08 09:09
13SB13C	0811328-02	8112407-017	11/24/08 09:09
13SB13C	0811328-02	8112407-017	11/24/08 09:09
13SB21C	0811328-03	8112407-018	11/24/08 09:12

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112407

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 311
Calibration: 8K25004

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
13SB21C	0811328-03	8112407-018	11/24/08 09:12
13SB21C	0811328-03	8112407-018	11/24/08 09:12
13SB21C	0811328-03	8112407-018	11/24/08 09:12
13SB21C	0811328-03	8112407-018	11/24/08 09:12
13SB21C	0811328-03	8112407-018	11/24/08 09:12
13SB21C	0811328-03	8112407-018	11/24/08 09:12
13SB21C	0811328-03	8112407-018	11/24/08 09:12
13SB21C	0811328-03	8112407-018	11/24/08 09:13
13SB21C	0811328-03	8112407-018	11/24/08 09:13
13SB21C	0811328-03	8112407-018	11/24/08 09:13
13SB21C	0811328-03	8112407-018	11/24/08 09:13
13SB14A	0811328-04	8112407-019	11/24/08 09:16
13SB14A	0811328-04	8112407-019	11/24/08 09:16
13SB14A	0811328-04	8112407-019	11/24/08 09:16
13SB14A	0811328-04	8112407-019	11/24/08 09:16
13SB14A	0811328-04	8112407-019	11/24/08 09:16
13SB14A	0811328-04	8112407-019	11/24/08 09:16
13SB14A	0811328-04	8112407-019	11/24/08 09:16
13SB14A	0811328-04	8112407-019	11/24/08 09:16
13SB14A	0811328-04	8112407-019	11/24/08 09:16
13SB14A	0811328-04	8112407-019	11/24/08 09:17
13SB14A	0811328-04	8112407-019	11/24/08 09:17
13SB14A	0811328-04	8112407-019	11/24/08 09:17
13SB20A	0811328-06	8112407-020	11/24/08 09:19
13SB20A	0811328-06	8112407-020	11/24/08 09:19
13SB20A	0811328-06	8112407-020	11/24/08 09:19
13SB20A	0811328-06	8112407-020	11/24/08 09:20
13SB20A	0811328-06	8112407-020	11/24/08 09:20
13SB20A	0811328-06	8112407-020	11/24/08 09:20
13SB20A	0811328-06	8112407-020	11/24/08 09:20
13SB20A	0811328-06	8112407-020	11/24/08 09:20
13SB20A	0811328-06	8112407-020	11/24/08 09:20

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112407

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 311
Calibration: 8K25004

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
13SB20A	0811328-06	8112407-020	11/24/08 09:20
13SB20A	0811328-06	8112407-020	11/24/08 09:21
13SB20A	0811328-06	8112407-020	11/24/08 09:21
13SB20A	0811328-06	8112407-020	11/24/08 09:21
13SB20C	0811328-07	8112407-021	11/24/08 09:23
13SB20C	0811328-07	8112407-021	11/24/08 09:23
13SB20C	0811328-07	8112407-021	11/24/08 09:24
13SB20C	0811328-07	8112407-021	11/24/08 09:24
13SB20C	0811328-07	8112407-021	11/24/08 09:24
13SB20C	0811328-07	8112407-021	11/24/08 09:24
13SB20C	0811328-07	8112407-021	11/24/08 09:24
13SB20C	0811328-07	8112407-021	11/24/08 09:24
13SB20C	0811328-07	8112407-021	11/24/08 09:24
13SB20C	0811328-07	8112407-021	11/24/08 09:25
13SB20C	0811328-07	8112407-021	11/24/08 09:25
13SB20C	0811328-07	8112407-021	11/24/08 09:25
13SB22A	0811328-08	8112407-022	11/24/08 09:28
13SB22A	0811328-08	8112407-022	11/24/08 09:28
13SB22A	0811328-08	8112407-022	11/24/08 09:28
13SB22A	0811328-08	8112407-022	11/24/08 09:28
13SB22A	0811328-08	8112407-022	11/24/08 09:28
13SB22A	0811328-08	8112407-022	11/24/08 09:28
13SB22A	0811328-08	8112407-022	11/24/08 09:28
13SB22A	0811328-08	8112407-022	11/24/08 09:28
13SB22A	0811328-08	8112407-022	11/24/08 09:28
13SB22A	0811328-08	8112407-022	11/24/08 09:29
13SB22A	0811328-08	8112407-022	11/24/08 09:29
13SB22A	0811328-08	8112407-022	11/24/08 09:29
13SB22A	0811328-08	8112407-022	11/24/08 09:29
13SB22C	0811328-09	8112407-023	11/24/08 09:32
13SB22C	0811328-09	8112407-023	11/24/08 09:32
13SB22C	0811328-09	8112407-023	11/24/08 09:32

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112407

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 311
Calibration: 8K25004

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
13SB22C	0811328-09	8112407-023	11/24/08 09:32
13SB22C	0811328-09	8112407-023	11/24/08 09:32
13SB22C	0811328-09	8112407-023	11/24/08 09:32
13SB22C	0811328-09	8112407-023	11/24/08 09:32
13SB22C	0811328-09	8112407-023	11/24/08 09:33
13SB22C	0811328-09	8112407-023	11/24/08 09:33
13SB22C	0811328-09	8112407-023	11/24/08 09:33
13SB22C	0811328-09	8112407-023	11/24/08 09:33
13SB22C	0811328-09	8112407-023	11/24/08 09:33
13SB22C	0811328-09	8112407-023	11/24/08 09:33
Calibration Check	8112407-CCV3	8112407-024	11/24/08 09:36
Calibration Check	8112407-CCV3	8112407-024	11/24/08 09:37
Calibration Blank	8112407-CCB3	8112407-025	11/24/08 09:40
Calibration Blank	8112407-CCB3	8112407-025	11/24/08 09:41
Calibration Blank	8112407-CCB3	8112407-025	11/24/08 09:42
13SB21A	0811328-10	8112407-026	11/24/08 09:44
13SB21A	0811328-10	8112407-026	11/24/08 09:44
13SB21A	0811328-10	8112407-026	11/24/08 09:44
13SB21A	0811328-10	8112407-026	11/24/08 09:44
13SB21A	0811328-10	8112407-026	11/24/08 09:44
13SB21A	0811328-10	8112407-026	11/24/08 09:44
13SB21A	0811328-10	8112407-026	11/24/08 09:44
13SB21A	0811328-10	8112407-026	11/24/08 09:45
13SB21A	0811328-10	8112407-026	11/24/08 09:45
13SB21A	0811328-10	8112407-026	11/24/08 09:45
13SB21A	0811328-10	8112407-026	11/24/08 09:46
13SB21A	0811328-10	8112407-026	11/24/08 09:46
13SB21A	0811328-10	8112407-026	11/24/08 09:46
13SB18A	0811328-11	8112407-027	11/24/08 09:48
13SB18A	0811328-11	8112407-027	11/24/08 09:48
13SB18A	0811328-11	8112407-027	11/24/08 09:48
13SB18A	0811328-11	8112407-027	11/24/08 09:49

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112407

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 311
Calibration: 8K25004

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
13SB18A	0811328-11	8112407-027	11/24/08 09:49
13SB18A	0811328-11	8112407-027	11/24/08 09:49
13SB18A	0811328-11	8112407-027	11/24/08 09:49
13SB18A	0811328-11	8112407-027	11/24/08 09:49
13SB18A	0811328-11	8112407-027	11/24/08 09:49
13SB18A	0811328-11	8112407-027	11/24/08 09:49
13SB18A	0811328-11	8112407-027	11/24/08 09:50
13SB18A	0811328-11	8112407-027	11/24/08 09:50
13SB18A	0811328-11	8112407-027	11/24/08 09:50
13SB18C	0811328-12	8112407-028	11/24/08 09:52
13SB18C	0811328-12	8112407-028	11/24/08 09:52
13SB18C	0811328-12	8112407-028	11/24/08 09:52
13SB18C	0811328-12	8112407-028	11/24/08 09:52
13SB18C	0811328-12	8112407-028	11/24/08 09:52
13SB18C	0811328-12	8112407-028	11/24/08 09:52
13SB18C	0811328-12	8112407-028	11/24/08 09:52
13SB18C	0811328-12	8112407-028	11/24/08 09:53
13SB18C	0811328-12	8112407-028	11/24/08 09:53
13SB18C	0811328-12	8112407-028	11/24/08 09:53
13SB18C	0811328-12	8112407-028	11/24/08 09:53
13SB18C	0811328-12	8112407-028	11/24/08 09:53
13SB18C	0811328-12	8112407-028	11/24/08 09:53
13SB19A	0811328-14	8112407-029	11/24/08 09:56
13SB19A	0811328-14	8112407-029	11/24/08 09:56
13SB19A	0811328-14	8112407-029	11/24/08 09:56
13SB19A	0811328-14	8112407-029	11/24/08 09:56
13SB19A	0811328-14	8112407-029	11/24/08 09:56
13SB19A	0811328-14	8112407-029	11/24/08 09:56
13SB19A	0811328-14	8112407-029	11/24/08 09:57
13SB19A	0811328-14	8112407-029	11/24/08 09:57
13SB19A	0811328-14	8112407-029	11/24/08 09:57
13SB19A	0811328-14	8112407-029	11/24/08 09:57

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112407

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 311
Calibration: 8K25004

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
13SB19A	0811328-14	8112407-029	11/24/08 09:57
13SB19A	0811328-14	8112407-029	11/24/08 09:57
13SB19C	0811328-15	8112407-030	11/24/08 10:00
13SB19C	0811328-15	8112407-030	11/24/08 10:00
13SB19C	0811328-15	8112407-030	11/24/08 10:00
13SB19C	0811328-15	8112407-030	11/24/08 10:00
13SB19C	0811328-15	8112407-030	11/24/08 10:00
13SB19C	0811328-15	8112407-030	11/24/08 10:01
13SB19C	0811328-15	8112407-030	11/24/08 10:01
13SB19C	0811328-15	8112407-030	11/24/08 10:01
13SB19C	0811328-15	8112407-030	11/24/08 10:01
13SB19C	0811328-15	8112407-030	11/24/08 10:01
13SB19C	0811328-15	8112407-030	11/24/08 10:01
13SB19C	0813643-MS1	8112407-031	11/24/08 10:04
13SB19C	0813643-MS1	8112407-031	11/24/08 10:05
13SB19C	0813643-MSD1	8112407-032	11/24/08 10:08
13SB19C	0813643-MSD1	8112407-032	11/24/08 10:09
13SB19C	8112407-SRD1	8112407-033	11/24/08 10:12
13SB19C	8112407-SRD1	8112407-033	11/24/08 10:13
13SB19C	0813643-PS1	8112407-034	11/24/08 10:16
13SB19C	0813643-PS1	8112407-034	11/24/08 10:17
Blank	0813708-BLK1	8112407-035	11/24/08 10:20
Blank	0813708-BLK1	8112407-035	11/24/08 10:22
Calibration Check	8112407-CCV4	8112407-036	11/24/08 10:25
Calibration Check	8112407-CCV4	8112407-036	11/24/08 10:26
Calibration Blank	8112407-CCB4	8112407-037	11/24/08 10:29
Calibration Blank	8112407-CCB4	8112407-037	11/24/08 10:30
LCS	0813708-BS1	8112407-038	11/24/08 10:33
LCS	0813708-BS1	8112407-038	11/24/08 10:34
LCS	0813708-BS1	8112407-038	11/24/08 10:35
13SB17A	0811331-02	8112407-039	11/24/08 10:37
13SB17A	0811331-02	8112407-039	11/24/08 10:37

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112407

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 311
Calibration: 8K25004

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
13SB17A	0811331-02	8112407-039	11/24/08 10:37
13SB17A	0811331-02	8112407-039	11/24/08 10:38
13SB17A	0811331-02	8112407-039	11/24/08 10:38
13SB17A	0811331-02	8112407-039	11/24/08 10:38
13SB17A	0811331-02	8112407-039	11/24/08 10:38
13SB17A	0811331-02	8112407-039	11/24/08 10:38
13SB17A	0811331-02	8112407-039	11/24/08 10:38
13SB17A	0811331-02	8112407-039	11/24/08 10:39
13SB17A	0811331-02	8112407-039	11/24/08 10:39
13SB17A	0811331-02	8112407-039	11/24/08 10:39
13SB17A	0811331-02	8112407-039	11/24/08 10:39
13SB17C	0811331-03	8112407-040	11/24/08 10:41
13SB17C	0811331-03	8112407-040	11/24/08 10:42
13SB17C	0811331-03	8112407-040	11/24/08 10:42
13SB17C	0811331-03	8112407-040	11/24/08 10:42
13SB17C	0811331-03	8112407-040	11/24/08 10:42
13SB17C	0811331-03	8112407-040	11/24/08 10:42
13SB17C	0811331-03	8112407-040	11/24/08 10:42
13SB17C	0811331-03	8112407-040	11/24/08 10:43
13SB17C	0811331-03	8112407-040	11/24/08 10:43
13SB17C	0811331-03	8112407-040	11/24/08 10:43
13SB17C	0813708-MS1	8112407-041	11/24/08 10:45
13SB17C	0813708-MS1	8112407-041	11/24/08 10:46
13SB17C	0813708-MS1	8112407-041	11/24/08 10:47
13SB17C	0813708-MSD1	8112407-042	11/24/08 10:49
13SB17C	0813708-MSD1	8112407-042	11/24/08 10:50
13SB17C	8112407-SRD2	8112407-043	11/24/08 10:53
13SB17C	8112407-SRD2	8112407-043	11/24/08 10:54
13SB17C	0813708-PS1	8112407-044	11/24/08 10:57
13SB17C	0813708-PS1	8112407-044	11/24/08 10:58
13SB16A	0811331-04	8112407-045	11/24/08 11:01
13SB16A	0811331-04	8112407-045	11/24/08 11:01

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112407

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 311
Calibration: 8K25004

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
13SB16A	0811331-04	8112407-045	11/24/08 11:01
13SB16A	0811331-04	8112407-045	11/24/08 11:01
13SB16A	0811331-04	8112407-045	11/24/08 11:01
13SB16A	0811331-04	8112407-045	11/24/08 11:01
13SB16A	0811331-04	8112407-045	11/24/08 11:01
13SB16A	0811331-04	8112407-045	11/24/08 11:02
13SB16A	0811331-04	8112407-045	11/24/08 11:02
13SB16A	0811331-04	8112407-045	11/24/08 11:02
13SB16A	0811331-04	8112407-045	11/24/08 11:02
13SB16A	0811331-04	8112407-045	11/24/08 11:02
13SB16A	0811331-04	8112407-045	11/24/08 11:02
13SB16C	0811331-05	8112407-046	11/24/08 11:05
13SB16C	0811331-05	8112407-046	11/24/08 11:05
13SB16C	0811331-05	8112407-046	11/24/08 11:05
13SB16C	0811331-05	8112407-046	11/24/08 11:05
13SB16C	0811331-05	8112407-046	11/24/08 11:05
13SB16C	0811331-05	8112407-046	11/24/08 11:05
13SB16C	0811331-05	8112407-046	11/24/08 11:05
13SB16C	0811331-05	8112407-046	11/24/08 11:06
13SB16C	0811331-05	8112407-046	11/24/08 11:06
13SB16C	0811331-05	8112407-046	11/24/08 11:06
13SB16C	0811331-05	8112407-046	11/24/08 11:06
13SB16C	0811331-05	8112407-046	11/24/08 11:06
13SB15A	0811331-06	8112407-047	11/24/08 11:09
13SB15A	0811331-06	8112407-047	11/24/08 11:09
13SB15A	0811331-06	8112407-047	11/24/08 11:09
13SB15A	0811331-06	8112407-047	11/24/08 11:09
13SB15A	0811331-06	8112407-047	11/24/08 11:09
13SB15A	0811331-06	8112407-047	11/24/08 11:09
13SB15A	0811331-06	8112407-047	11/24/08 11:10

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112407

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 311
Calibration: 8K25004

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
13SB15A	0811331-06	8112407-047	11/24/08 11:10
13SB15A	0811331-06	8112407-047	11/24/08 11:10
13SB15A	0811331-06	8112407-047	11/24/08 11:10
13SB15A	0811331-06	8112407-047	11/24/08 11:10
13SB15A	0811331-06	8112407-047	11/24/08 11:10
Calibration Check	8112407-CCV5	8112407-048	11/24/08 11:13
Calibration Check	8112407-CCV5	8112407-048	11/24/08 11:14
Calibration Check	8112407-CCV5	8112407-048	11/24/08 11:15
Calibration Blank	8112407-CCB5	8112407-049	11/24/08 11:18
Calibration Blank	8112407-CCB5	8112407-049	11/24/08 11:19
DUP-13	0811331-07	8112407-050	11/24/08 11:22
DUP-13	0811331-07	8112407-050	11/24/08 11:22
DUP-13	0811331-07	8112407-050	11/24/08 11:22
DUP-13	0811331-07	8112407-050	11/24/08 11:22
DUP-13	0811331-07	8112407-050	11/24/08 11:22
DUP-13	0811331-07	8112407-050	11/24/08 11:22
DUP-13	0811331-07	8112407-050	11/24/08 11:22
DUP-13	0811331-07	8112407-050	11/24/08 11:22
DUP-13	0811331-07	8112407-050	11/24/08 11:22
DUP-13	0811331-07	8112407-050	11/24/08 11:22
DUP-13	0811331-07	8112407-050	11/24/08 11:23
DUP-13	0811331-07	8112407-050	11/24/08 11:23
DUP-13	0811331-07	8112407-050	11/24/08 11:23
Blank	0813708-BLK1	8112407-051	11/24/08 11:29
Calibration Check	8112407-CCV6	8112407-052	11/24/08 11:35
Calibration Check	8112407-CCV6	8112407-052	11/24/08 11:36
Calibration Blank	8112407-CCB6	8112407-053	11/24/08 11:39
Calibration Blank	8112407-CCB6	8112407-053	11/24/08 11:40
13SB21C	0811328-03	8112407-054	11/24/08 11:47
13SB14A	0811328-04	8112407-055	11/24/08 11:51
13SB20C	0811328-07	8112407-056	11/24/08 11:56
13SB19A	0811328-14	8112407-057	11/24/08 12:00

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112407

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 311
Calibration: 8K25004

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
13SB19C	0811328-15	8112407-058	11/24/08 12:04
13SB19C	8112407-SRD3	8112407-059	11/24/08 12:09
13SB19C	0813643-PS2	8112407-060	11/24/08 12:13
13SB19C	0811328-15	8112407-061	11/24/08 12:18
13SB19C	8112407-SRD4	8112407-062	11/24/08 12:22
13SB19C	0813643-PS3	8112407-063	11/24/08 12:26
Calibration Check	8112407-CCV7	8112407-064	11/24/08 12:30
Calibration Check	8112407-CCV7	8112407-064	11/24/08 12:31
Calibration Blank	8112407-CCB7	8112407-065	11/24/08 12:34
Calibration Blank	8112407-CCB7	8112407-065	11/24/08 12:36
13SB17C	0811331-03	8112407-066	11/24/08 12:39
13SB17C	8112407-SRD5	8112407-067	11/24/08 12:43
13SB17C	0813708-PS2	8112407-068	11/24/08 12:48
13SB17C	0811331-03	8112407-069	11/24/08 12:52
13SB17C	8112407-SRD6	8112407-070	11/24/08 12:56
13SB17C	0813708-PS3	8112407-071	11/24/08 13:00
13SB17C	0811331-03	8112407-072	11/24/08 13:06
13SB17C	8112407-SRD7	8112407-073	11/24/08 13:10
13SB17C	0813708-PS4	8112407-074	11/24/08 13:14
Calibration Check	8112407-CCV8	8112407-075	11/24/08 13:17
Calibration Check	8112407-CCV8	8112407-075	11/24/08 13:18
Calibration Blank	8112407-CCB8	8112407-076	11/24/08 13:21
Calibration Blank	8112407-CCB8	8112407-076	11/24/08 13:22
Calibration Blank	8112407-CCB8	8112407-076	11/24/08 13:23

ICP INTERFERENCE CHECK SAMPLE

USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Sequence: 8112508

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Instrument ID: 311

Calibration: 8K25019

Lab Sample ID	Analyte 2xMDL	True	Found	%R	Units
8112508-IFA1	Calcium	100	102	102	mg/L
	Iron	40000	39400	98	ug/L
	Magnesium	100	96.9	97	mg/L
	Potassium 0.124	0.00	0.149		mg/L
	Sodium 0.42	0.00	0.000758		mg/L
8112508-IFA2	Calcium 0.138	0.00	-0.105		mg/L
	Iron 19.2	0.00	3.60		ug/L
	Magnesium 0.126	0.00	-0.182		mg/L
	Potassium 0.124	0.00	0.00904		mg/L
	Sodium 0.42	0.00	0.0339		mg/L
8112508-IFB1	Calcium	100	102	102	mg/L
	Iron	40000	39300	98	ug/L
	Magnesium	100	96.2	96	mg/L
8112508-IFB2	Calcium	5.00	4.86	97	mg/L
	Magnesium	5.00	4.73	95	mg/L
	Sodium	5.00	4.96	99	mg/L

* Values outside of QC limits

BLANKS
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112508

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 311
Calibration: 8K25019

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
8112508-CCB1	Potassium	-0.034	0.20	0.062	mg/L	U	11/25/08 10:33
	Sodium	0.0017	0.50	0.21	mg/L	U	11/25/08 10:33
	Calcium	-0.081	0.50	0.069	mg/L	J	11/25/08 10:33
	Iron	-2.8	20	9.6	ug/L	U	11/25/08 10:33
	Magnesium	0.0056	0.50	0.063	mg/L	U	11/25/08 10:33
8112508-CCB2	Potassium	-0.021	0.20	0.062	mg/L	U	11/25/08 11:03
	Sodium	0.0014	0.50	0.21	mg/L	U	11/25/08 11:03
	Calcium	-0.083	0.50	0.069	mg/L	J	11/25/08 11:03
	Iron	0.052	20	9.6	ug/L	U	11/25/08 11:03
	Magnesium	0.0011	0.50	0.063	mg/L	U	11/25/08 11:03
0813680-BLK1	Potassium, Total	200	200	62	ug/L	U	11/25/08 11:07
	Sodium, Total	500	500	210	ug/L	U	11/25/08 11:07
	Calcium, Total	500	500	69	ug/L	U	11/25/08 11:07
	Iron, Total	20	20	9.6	ug/L	U	11/25/08 11:07
	Magnesium, Total	500	500	63	ug/L	U	11/25/08 11:07
8112508-CCB3	Potassium	0.062	0.20	0.062	mg/L	J	11/25/08 11:51
	Sodium	-0.010	0.50	0.21	mg/L	U	11/25/08 11:51
	Calcium	-0.087	0.50	0.069	mg/L	J	11/25/08 11:51
	Iron	0.77	20	9.6	ug/L	U	11/25/08 11:51
	Magnesium	0.0070	0.50	0.063	mg/L	U	11/25/08 11:51
8112508-CCB4	Potassium	0.045	0.20	0.062	mg/L	U	11/25/08 12:03
	Sodium	-0.023	0.50	0.21	mg/L	U	11/25/08 12:03
	Calcium	-0.089	0.50	0.069	mg/L	J	11/25/08 12:03
	Iron	-2.0	20	9.6	ug/L	U	11/25/08 12:03
	Magnesium	0.011	0.50	0.063	mg/L	U	11/25/08 12:03

* Values outside of QC limits

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112508
Instrument: 311
Laboratory ID: 8112508-SCV1
Calibration: 8K25019

Analyte	Expected	Found	% R	QC Limit	Units
Calcium	5.00	5.03	101	90-110	mg/L
Iron	500	490	98	90-110	ug/L
Magnesium	5.00	4.85	97	90-110	mg/L
Potassium	5.00	4.92	98	90-110	mg/L
Sodium	5.00	4.80	96	90-110	mg/L

* Values outside of QC limits

INITIAL AND CONTINUING CALIBRATION CHECK

USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112508
Control Limt: +/- 10.00%

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID:311
Calibration: 8K25019

Lab Sample ID	Analyte	True	Found	%R	Units	Analyzed
8112508-CCV1	Calcium	5.00	5.03	101	mg/L	11/25/08 10:29
	Iron	500	490	98	ug/L	11/25/08 10:29
	Magnesium	5.00	4.85	97	mg/L	11/25/08 10:29
	Potassium	5.00	4.92	98	mg/L	11/25/08 10:29
	Sodium	5.00	4.80	96	mg/L	11/25/08 10:29
8112508-CCV2	Calcium	5.00	4.89	98	mg/L	11/25/08 10:59
	Iron	500	489	98	ug/L	11/25/08 10:59
	Magnesium	5.00	4.87	97	mg/L	11/25/08 10:59
	Potassium	5.00	5.01	100	mg/L	11/25/08 10:59
	Sodium	5.00	4.94	99	mg/L	11/25/08 10:59
8112508-CCV3	Calcium	5.00	4.88	98	mg/L	11/25/08 11:47
	Iron	500	491	98	ug/L	11/25/08 11:47
	Magnesium	5.00	4.90	98	mg/L	11/25/08 11:47
	Potassium	5.00	4.98	100	mg/L	11/25/08 11:47
	Sodium	5.00	4.96	99	mg/L	11/25/08 11:47
8112508-CCV4	Calcium	5.00	4.81	96	mg/L	11/25/08 11:59
	Iron	500	482	96	ug/L	11/25/08 11:59
	Magnesium	5.00	4.81	96	mg/L	11/25/08 11:59
	Potassium	5.00	4.84	97	mg/L	11/25/08 11:59
	Sodium	5.00	4.91	98	mg/L	11/25/08 11:59

* Values outside of QC limits

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112508

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 311
Calibration: 8K25019

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Cal Standard	8112508-CAL1	8112508-014	11/25/08 10:09
Cal Standard	8112508-CAL2	8112508-015	11/25/08 10:13
Cal Standard	8112508-CAL3	8112508-016	11/25/08 10:17
Cal Standard	8112508-CAL4	8112508-017	11/25/08 10:21
Cal Standard	8112508-CAL5	8112508-018	11/25/08 10:25
Secondary Cal Check	8112508-SCV1	8112508-019	11/25/08 10:29
Calibration Check	8112508-CCV1	8112508-019	11/25/08 10:29
Calibration Blank	8112508-CCB1	8112508-020	11/25/08 10:33
Interference Check A	8112508-IFA1	8112508-021	11/25/08 10:37
Interference Check A	8112508-IFA2	8112508-022	11/25/08 10:42
Interference Check B	8112508-IFB1	8112508-023	11/25/08 10:48
Interference Check B	8112508-IFB2	8112508-024	11/25/08 10:53
Calibration Check	8112508-CCV2	8112508-025	11/25/08 10:59
Calibration Blank	8112508-CCB2	8112508-026	11/25/08 11:03
Blank	0813680-BLK1	8112508-027	11/25/08 11:07
LCS	0813680-BS1	8112508-028	11/25/08 11:11
EQBK-1	0811328-05	8112508-029	11/25/08 11:15
EQBK-1	0811328-05	8112508-029	11/25/08 11:15
EQBK-1	0811328-05	8112508-029	11/25/08 11:15
EQBK-1	0811328-05	8112508-029	11/25/08 11:15
EQBK-1	0811328-05	8112508-029	11/25/08 11:15
EQBK-5	0811328-13	8112508-030	11/25/08 11:19
EQBK-5	0811328-13	8112508-030	11/25/08 11:19
EQBK-5	0811328-13	8112508-030	11/25/08 11:19
EQBK-5	0811328-13	8112508-030	11/25/08 11:19
EQBK-5	0811328-13	8112508-030	11/25/08 11:19
EQBK-6	0811331-01	8112508-034	11/25/08 11:35
EQBK-6	0811331-01	8112508-034	11/25/08 11:35
EQBK-6	0811331-01	8112508-034	11/25/08 11:35
EQBK-6	0811331-01	8112508-034	11/25/08 11:35
EQBK-6	0811331-01	8112508-034	11/25/08 11:35
Calibration Check	8112508-CCV3	8112508-037	11/25/08 11:47

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112508

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 311
Calibration: 8K25019

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Calibration Blank	8112508-CCB3	8112508-038	11/25/08 11:51
Calibration Check	8112508-CCV4	8112508-040	11/25/08 11:59
Calibration Blank	8112508-CCB4	8112508-041	11/25/08 12:03

ICP INTERFERENCE CHECK SAMPLE

USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Sequence: 8112641

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Instrument ID: 311

Calibration: 8K26024

Lab Sample ID	Analyte	True	Found	%R	Units
8112641-IFA1	Aluminum	100000	104000	104	ug/L
8112641-IFA2	Aluminum	0.00	-35.8		ug/L
8112641-IFB1	Aluminum	100000	104000	104	ug/L
8112641-IFB2	Aluminum	1000	957	96	ug/L

* Values outside of QC limits

BLANKS
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112641

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 311
Calibration: 8K26024

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
8112641-CCB1	Aluminum	6.9	50	20	ug/L	U	11/26/08 13:03
8112641-CCB2	Aluminum	20	50	20	ug/L	U	11/26/08 13:30
0813680-BLK2	Aluminum, Total	50	50	20	ug/L	U	11/26/08 13:34
8112641-CCB3	Aluminum	8.1	50	20	ug/L	U	11/26/08 14:17

* Values outside of QC limits

: 026678

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112641
Instrument: 311
Laboratory ID: 8112641-SCV1
Calibration: 8K26024

Analyte	Expected	Found	% R	QC Limit	Units
Aluminum	2500	2470	99	90-110	ug/L

* Values outside of QC limits

INITIAL AND CONTINUING CALIBRATION CHECK

USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Sequence: 8112641

Control Limt: +/- 10.00%

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Instrument ID:311

Calibration: 8K26024

Lab Sample ID	Analyte	True	Found	%R	Units	Analyzed
8112641-CCV1	Aluminum	2500	2470	99	ug/L	11/26/08 12:59
8112641-CCV2	Aluminum	2500	2440	97	ug/L	11/26/08 13:26
8112641-CCV3	Aluminum	2500	2460	99	ug/L	11/26/08 14:13

* Values outside of QC limits

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112641

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 311
Calibration: 8K26024

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Cal Standard	8112641-CAL1	8112641-001	11/26/08 12:21
Cal Standard	8112641-CAL2	8112641-002	11/26/08 12:25
Cal Standard	8112641-CAL3	8112641-003	11/26/08 12:29
Cal Standard	8112641-CAL4	8112641-004	11/26/08 12:33
Cal Standard	8112641-CAL5	8112641-005	11/26/08 12:37
Secondary Cal Check	8112641-SCV1	8112641-009	11/26/08 12:59
Calibration Check	8112641-CCV1	8112641-009	11/26/08 12:59
Calibration Blank	8112641-CCB1	8112641-010	11/26/08 13:03
Interference Check A	8112641-IFA1	8112641-011	11/26/08 13:07
Interference Check A	8112641-IFA2	8112641-012	11/26/08 13:12
Interference Check B	8112641-IFB1	8112641-013	11/26/08 13:16
Interference Check B	8112641-IFB2	8112641-014	11/26/08 13:22
Calibration Check	8112641-CCV2	8112641-015	11/26/08 13:26
Calibration Blank	8112641-CCB2	8112641-016	11/26/08 13:30
Blank	0813680-BLK2	8112641-017	11/26/08 13:34
LCS	0813680-BS2	8112641-018	11/26/08 13:38
EQBK-1	0811328-05	8112641-019	11/26/08 13:42
EQBK-5	0811328-13	8112641-020	11/26/08 13:46
EQBK-6	0811331-01	8112641-021	11/26/08 13:50
Calibration Check	8112641-CCV3	8112641-022	11/26/08 14:13
Calibration Blank	8112641-CCB3	8112641-023	11/26/08 14:17

HOLDING TIME SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB13A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	

HOLDING TIME SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB13C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB13C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB14A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB14A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB14A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	

HOLDING TIME SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB14A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB14A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB14A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB14A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB14A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB14A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB14A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB14A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB14A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB14A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
EQBK-1	11/12/08	11/14/08		11/20/08	8	NA	11/25/08	13	180	
EQBK-1	11/12/08	11/14/08		11/20/08	8	NA	11/25/08	13	180	
EQBK-1	11/12/08	11/14/08		11/20/08	8	NA	11/25/08	13	180	
EQBK-1	11/12/08	11/14/08		11/20/08	8	NA	11/25/08	13	180	
EQBK-1	11/12/08	11/14/08		11/20/08	8	NA	11/25/08	13	180	
EQBK-1	11/12/08	11/14/08		11/20/08	8	NA	11/26/08	14	180	
13SB20A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	

HOLDING TIME SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB20A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB20C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	

HOLDING TIME SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB22A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	

HOLDING TIME SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc. SDG: 36440-61

Client: URS Corporation Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB22C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB22C	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB21A	11/12/08	11/14/08		11/19/08	7	NA	11/24/08	12	180	
13SB18A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	

HOLDING TIME SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB18A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	

HOLDING TIME SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB18C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB18C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
EQBK-5	11/13/08	11/14/08		11/20/08	7	NA	11/25/08	12	180	
EQBK-5	11/13/08	11/14/08		11/20/08	7	NA	11/25/08	12	180	
EQBK-5	11/13/08	11/14/08		11/20/08	7	NA	11/25/08	12	180	
EQBK-5	11/13/08	11/14/08		11/20/08	7	NA	11/25/08	12	180	
EQBK-5	11/13/08	11/14/08		11/20/08	7	NA	11/25/08	12	180	
EQBK-5	11/13/08	11/14/08		11/20/08	7	NA	11/26/08	13	180	
13SB19A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19A	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	

HOLDING TIME SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB19C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
13SB19C	11/13/08	11/14/08		11/19/08	6	NA	11/24/08	11	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	11/25/08	11	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	11/25/08	11	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	11/25/08	11	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	11/25/08	11	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	11/25/08	11	180	
EQBK-6	11/14/08	11/15/08		11/20/08	6	NA	11/26/08	12	180	
13SB17A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB17A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	

HOLDING TIME SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB17A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB17A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB17A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB17A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB17A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB17A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB17A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB17A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB17A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB17A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB17A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB17C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB17C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB17C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB17C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB17C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB17C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB17C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB17C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB17C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB17C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	

HOLDING TIME SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB17C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB17C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB17C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	

HOLDING TIME SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB16C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB16C	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB15A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB15A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB15A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB15A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB15A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB15A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB15A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB15A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB15A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB15A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB15A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB15A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
13SB15A	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	

HOLDING TIME SUMMARY
USEPA-6010B

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Total Metals

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
DUP-13	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
DUP-13	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
DUP-13	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
DUP-13	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
DUP-13	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
DUP-13	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
DUP-13	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
DUP-13	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
DUP-13	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
DUP-13	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
DUP-13	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
DUP-13	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	
DUP-13	11/14/08	11/15/08		11/20/08	6	NA	11/24/08	10	180	

Metals, Soil, 3050B Digestion

Batch comments:

MAS 11/19/08 7:30AM-3:30PM
INST#218 @94C#194
HOTBLOCK VESSEL LOT#A805LS309

Lab Number	*Container*	*Prepared*	*By*	*Initial (g)*	*Final (mL)*	*Client* Source ID	Spike ID	uL Spike	Comments		
0811328 - 01	A	Nov-19-08 07:30	MAS	0.5005	50	URS Corporation					
Al Total 6010B (DoD)	*Ba Total 6010B (DoD)*	*Be Total 6010B (DoD)*	*Ca Total 6010B (DoD)*	*Cd Total 6010B (DoD)*	*Co Total 6010B (DoD)*	*Cr Total 6010B (DoD)*	*Fe Total 6010B (DoD)*				
K Total 6010B (DoD)	*Mg Total 6010B (DoD)*	*Mn Total 6010B (DoD)*	*Na Total 6010B (DoD)*	*Zn Total 6010B (DoD)*							
0811328 - 02	A	Nov-19-08 07:30	MAS	0.5001	50	URS Corporation					
Al Total 6010B (DoD)	*Ba Total 6010B (DoD)*	*Be Total 6010B (DoD)*	*Ca Total 6010B (DoD)*	*Cd Total 6010B (DoD)*	*Co Total 6010B (DoD)*	*Cr Total 6010B (DoD)*	*Fe Total 6010B (DoD)*				
K Total 6010B (DoD)	*Mg Total 6010B (DoD)*	*Mn Total 6010B (DoD)*	*Na Total 6010B (DoD)*	*Zn Total 6010B (DoD)*							
0811328 - 03	A	Nov-19-08 07:30	MAS	0.5002	50	URS Corporation					
Al Total 6010B (DoD)	*Ba Total 6010B (DoD)*	*Be Total 6010B (DoD)*	*Ca Total 6010B (DoD)*	*Cd Total 6010B (DoD)*	*Co Total 6010B (DoD)*	*Cr Total 6010B (DoD)*	*Fe Total 6010B (DoD)*				
K Total 6010B (DoD)	*Mg Total 6010B (DoD)*	*Mn Total 6010B (DoD)*	*Na Total 6010B (DoD)*	*Zn Total 6010B (DoD)*							
0811328 - 04	A	Nov-19-08 07:30	MAS	0.5001	50	URS Corporation					
Al Total 6010B (DoD)	*Ba Total 6010B (DoD)*	*Be Total 6010B (DoD)*	*Ca Total 6010B (DoD)*	*Cd Total 6010B (DoD)*	*Co Total 6010B (DoD)*	*Cr Total 6010B (DoD)*	*Fe Total 6010B (DoD)*				
K Total 6010B (DoD)	*Mg Total 6010B (DoD)*	*Mn Total 6010B (DoD)*	*Na Total 6010B (DoD)*	*Zn Total 6010B (DoD)*							
0811328 - 06	A	Nov-19-08 07:30	MAS	0.5002	50	URS Corporation					
Al Total 6010B (DoD)	*Ba Total 6010B (DoD)*	*Be Total 6010B (DoD)*	*Ca Total 6010B (DoD)*	*Cd Total 6010B (DoD)*	*Co Total 6010B (DoD)*	*Cr Total 6010B (DoD)*	*Fe Total 6010B (DoD)*				
K Total 6010B (DoD)	*Mg Total 6010B (DoD)*	*Mn Total 6010B (DoD)*	*Na Total 6010B (DoD)*	*Zn Total 6010B (DoD)*							
0811328 - 07	A	Nov-19-08 07:30	MAS	0.5001	50	URS Corporation					
Al Total 6010B (DoD)	*Ba Total 6010B (DoD)*	*Be Total 6010B (DoD)*	*Ca Total 6010B (DoD)*	*Cd Total 6010B (DoD)*	*Co Total 6010B (DoD)*	*Cr Total 6010B (DoD)*	*Fe Total 6010B (DoD)*				
K Total 6010B (DoD)	*Mg Total 6010B (DoD)*	*Mn Total 6010B (DoD)*	*Na Total 6010B (DoD)*	*Zn Total 6010B (DoD)*							
0811328 - 08	A	Nov-19-08 07:30	MAS	0.5003	50	URS Corporation					
Al Total 6010B (DoD)	*Ba Total 6010B (DoD)*	*Be Total 6010B (DoD)*	*Ca Total 6010B (DoD)*	*Cd Total 6010B (DoD)*	*Co Total 6010B (DoD)*	*Cr Total 6010B (DoD)*	*Fe Total 6010B (DoD)*				
K Total 6010B (DoD)	*Mg Total 6010B (DoD)*	*Mn Total 6010B (DoD)*	*Na Total 6010B (DoD)*	*Zn Total 6010B (DoD)*							
0811328 - 09	A	Nov-19-08 07:30	MAS	0.4998	50	URS Corporation					
Al Total 6010B (DoD)	*Ba Total 6010B (DoD)*	*Be Total 6010B (DoD)*	*Ca Total 6010B (DoD)*	*Cd Total 6010B (DoD)*	*Co Total 6010B (DoD)*	*Cr Total 6010B (DoD)*	*Fe Total 6010B (DoD)*				
K Total 6010B (DoD)	*Mg Total 6010B (DoD)*	*Mn Total 6010B (DoD)*	*Na Total 6010B (DoD)*	*Zn Total 6010B (DoD)*							

Comments	Analyst Initials

Metals, Soil, 3050B Digestion

Batch comments:

MAS 11/19/08 7:30AM-3:30PM
INST#218 @94C#194
HOTBLOCK VESSEL LOT#A805LS309

Lab Number	Container	Prepared	By	Initial (g)	Final (mL)	Client Source ID	Spike ID	uL Spike	Comments
0811328-10	A	Nov-19-08 07:30	MAS	0.5003	50	URS Corporation			
Al Total 6010B (DoD)	*Ba Total 6010B (DoD)*	*Be Total 6010B (DoD)*	*Ca Total 6010B (DoD)*	*Cd Total 6010B (DoD)*	*Co Total 6010B (DoD)*	*Cr Total 6010B (DoD)*	*Fe Total 6010B (DoD)*		
K Total 6010B (DoD)	*Mg Total 6010B (DoD)*	*Mn Total 6010B (DoD)*	*Na Total 6010B (DoD)*	*Zn Total 6010B (DoD)*					
0811328-11	A	Nov-19-08 07:30	MAS	0.5002	50	URS Corporation			
Al Total 6010B (DoD)	*Ba Total 6010B (DoD)*	*Be Total 6010B (DoD)*	*Ca Total 6010B (DoD)*	*Cd Total 6010B (DoD)*	*Co Total 6010B (DoD)*	*Cr Total 6010B (DoD)*	*Fe Total 6010B (DoD)*		
K Total 6010B (DoD)	*Mg Total 6010B (DoD)*	*Mn Total 6010B (DoD)*	*Na Total 6010B (DoD)*	*Zn Total 6010B (DoD)*					
0811328-12	A	Nov-19-08 07:30	MAS	0.5002	50	URS Corporation			
Al Total 6010B (DoD)	*Ba Total 6010B (DoD)*	*Be Total 6010B (DoD)*	*Ca Total 6010B (DoD)*	*Cd Total 6010B (DoD)*	*Co Total 6010B (DoD)*	*Cr Total 6010B (DoD)*	*Fe Total 6010B (DoD)*		
K Total 6010B (DoD)	*Mg Total 6010B (DoD)*	*Mn Total 6010B (DoD)*	*Na Total 6010B (DoD)*	*Zn Total 6010B (DoD)*					
0811328-14	A	Nov-19-08 07:30	MAS	0.5005	50	URS Corporation			
Al Total 6010B (DoD)	*Ba Total 6010B (DoD)*	*Be Total 6010B (DoD)*	*Ca Total 6010B (DoD)*	*Cd Total 6010B (DoD)*	*Co Total 6010B (DoD)*	*Cr Total 6010B (DoD)*	*Fe Total 6010B (DoD)*		
K Total 6010B (DoD)	*Mg Total 6010B (DoD)*	*Mn Total 6010B (DoD)*	*Na Total 6010B (DoD)*	*Zn Total 6010B (DoD)*					
0811328-15	A	Nov-19-08 07:30	MAS	0.4995	50	URS Corporation			
Al Total 6010B (DoD)	*Ba Total 6010B (DoD)*	*Be Total 6010B (DoD)*	*Ca Total 6010B (DoD)*	*Cd Total 6010B (DoD)*	*Co Total 6010B (DoD)*	*Cr Total 6010B (DoD)*	*Fe Total 6010B (DoD)*		
K Total 6010B (DoD)	*Mg Total 6010B (DoD)*	*Mn Total 6010B (DoD)*	*Na Total 6010B (DoD)*	*Zn Total 6010B (DoD)*					
0813643-BLK1		Nov-19-08 07:30	MAS	0.5	50				
0813643-BS1		Nov-19-08 07:30	MAS	0.5	50		8050387	250	
0813643-MS1		Nov-19-08 07:30	MAS	0.4997	50	0811328-15	8050387	250	
0813643-MSD1		Nov-19-08 07:30	MAS	0.4997	50	0811328-15	8050387	250	
0813643-PS1		Nov-24-08 07:30	JMF	0.03996	4	0811328-15	7120437	20	[Spk] 0.4995g->50mL; 4mL->4mL; Spikec
0813643-PS2		Nov-24-08 07:30	JMF	.000499	0.05	0811328-15	7120437	50	[Spk] 0.4995g->50mL; 0.05mL->0.05mL; :
0813643-PS3		Nov-24-08 07:30	JMF	.00199	0.2	0811328-15	7120437	25	[Spk] 0.4995g->50mL; 0.2mL->0.2mL; Sp

Comments:

Analyst Initials

Metals, Water, 3010A Digestion

Batch comments:

MAS 11/20/08 7:30AM-3:00PM
INST#217 @94C#194
HOTBLOCK VESSEL LOT#A805LS309

Lab Number	Container	Prepared	By	Initial (mL)	Final (mL)	Client Source ID	Spike ID	uL Spike	Comments
0811328-05	E	Nov-20-08 07:30	MAS	25	25	URS Corporation			
Al Total 6010B (DoD)	*Ca Total 6010B (DoD)*	*Fe Total 6010B (DoD)*	*K Total 6010B (DoD)*	*Mg Total 6010B (DoD)*	*Na Total 6010B (DoD)*				
0811328-13	D	Nov-20-08 07:30	MAS	25	25	URS Corporation			
Al Total 6010B (DoD)	*Ca Total 6010B (DoD)*	*Fe Total 6010B (DoD)*	*K Total 6010B (DoD)*	*Mg Total 6010B (DoD)*	*Na Total 6010B (DoD)*				
0811329-58	A	Nov-20-08 07:30	MAS	25	25	URS Corporation			
Pb Total 6010B (DoD)									
0811329-59	A	Nov-20-08 07:30	MAS	25	25	URS Corporation			
Pb Total 6010B (DoD)									
0811330-42	A	Nov-20-08 07:30	MAS	25	25	URS Corporation			
Pb Total 6010B (DoD)									
0811331-01	D	Nov-20-08 07:30	MAS	25	25	URS Corporation			
Al Total 6010B (DoD)	*Ca Total 6010B (DoD)*	*Fe Total 6010B (DoD)*	*K Total 6010B (DoD)*	*Mg Total 6010B (DoD)*	*Na Total 6010B (DoD)*				
0811332-59	A	Nov-20-08 07:30	MAS	25	25	URS Corporation			
Pb Total 6010B (DoD)									
0811332-60	A	Nov-20-08 07:30	MAS	25	25	URS Corporation			
Pb Total 6010B (DoD)									
0811332-61	A	Nov-20-08 07:30	MAS	25	25	URS Corporation			
Pb Total 6010B (DoD)									
0813680-BLK1		Nov-20-08 07:30	MAS	25	25				
0813680-BLK2		Nov-20-08 07:30	MAS	25	25				
0813680-BS1		Nov-20-08 07:30	MAS	25	25		8050387	200	
0813680-BS2		Nov-20-08 07:30	MAS	25	25		8050386	200	

Comments:	Analyst Initials

Metals, Soil, 3050B Digestion

Batch comments:

MAS 11/20/08 7:00AM-3:30PM
INST#219 @94C#199
HOTBLOCK VESSEL LOT#A805LS309

Lab Number	*Container*	*Prepared*	*By*	*Initial (g)*	*Final (mL)*	*Client* Source ID	Spike ID	uL Spike	Comments
0811331-02	A	Nov-20-08 07:00	MAS	0.5001	50	URS Corporation			
Al Total 6010B (DoD)	*Ba Total 6010B (DoD)*	*Be Total 6010B (DoD)*	*Ca Total 6010B (DoD)*	*Cd Total 6010B (DoD)*	*Co Total 6010B (DoD)*	*Cr Total 6010B (DoD)*	*Fe Total 6010B (DoD)*		
K Total 6010B (DoD)	*Mg Total 6010B (DoD)*	*Mn Total 6010B (DoD)*	*Na Total 6010B (DoD)*	*Zn Total 6010B (DoD)*					
0811331-03	A	Nov-20-08 07:00	MAS	0.4998	50	URS Corporation			
Al Total 6010B (DoD)	*Ba Total 6010B (DoD)*	*Be Total 6010B (DoD)*	*Ca Total 6010B (DoD)*	*Cd Total 6010B (DoD)*	*Co Total 6010B (DoD)*	*Cr Total 6010B (DoD)*	*Fe Total 6010B (DoD)*		
K Total 6010B (DoD)	*Mg Total 6010B (DoD)*	*Mn Total 6010B (DoD)*	*Na Total 6010B (DoD)*	*Zn Total 6010B (DoD)*					
0811331-04	A	Nov-20-08 07:00	MAS	0.4996	50	URS Corporation			
Al Total 6010B (DoD)	*Ba Total 6010B (DoD)*	*Be Total 6010B (DoD)*	*Ca Total 6010B (DoD)*	*Cd Total 6010B (DoD)*	*Co Total 6010B (DoD)*	*Cr Total 6010B (DoD)*	*Fe Total 6010B (DoD)*		
K Total 6010B (DoD)	*Mg Total 6010B (DoD)*	*Mn Total 6010B (DoD)*	*Na Total 6010B (DoD)*	*Zn Total 6010B (DoD)*					
0811331-05	C	Nov-20-08 07:00	MAS	0.5002	50	URS Corporation			
Al Total 6010B (DoD)	*Ba Total 6010B (DoD)*	*Be Total 6010B (DoD)*	*Ca Total 6010B (DoD)*	*Cd Total 6010B (DoD)*	*Co Total 6010B (DoD)*	*Cr Total 6010B (DoD)*	*Fe Total 6010B (DoD)*		
K Total 6010B (DoD)	*Mg Total 6010B (DoD)*	*Mn Total 6010B (DoD)*	*Na Total 6010B (DoD)*	*Zn Total 6010B (DoD)*					
0811331-06	C	Nov-20-08 07:00	MAS	0.4997	50	URS Corporation			
Al Total 6010B (DoD)	*Ba Total 6010B (DoD)*	*Be Total 6010B (DoD)*	*Ca Total 6010B (DoD)*	*Cd Total 6010B (DoD)*	*Co Total 6010B (DoD)*	*Cr Total 6010B (DoD)*	*Fe Total 6010B (DoD)*		
K Total 6010B (DoD)	*Mg Total 6010B (DoD)*	*Mn Total 6010B (DoD)*	*Na Total 6010B (DoD)*	*Zn Total 6010B (DoD)*					
0811331-07	C	Nov-20-08 07:00	MAS	0.5004	50	URS Corporation			
Al Total 6010B (DoD)	*Ba Total 6010B (DoD)*	*Be Total 6010B (DoD)*	*Ca Total 6010B (DoD)*	*Cd Total 6010B (DoD)*	*Co Total 6010B (DoD)*	*Cr Total 6010B (DoD)*	*Fe Total 6010B (DoD)*		
K Total 6010B (DoD)	*Mg Total 6010B (DoD)*	*Mn Total 6010B (DoD)*	*Na Total 6010B (DoD)*	*Zn Total 6010B (DoD)*					
0813708-BLK1		Nov-20-08 07:00	MAS	0.5	50				
0813708-BS1		Nov-20-08 07:00	MAS	0.5	50		8050387	250	
0813708-MS1		Nov-20-08 07:00	MAS	0.4996	50	0811331-03	8050387	250	
0813708-MSD1		Nov-20-08 07:00	MAS	0.5004	50	0811331-03	8050387	250	
0813708-PS1		Nov-24-08 07:00	JMF	).03998	4	0811331-03	7120437	20	[Spk] 0.4998g->50mL; 4mL->4mL; Spikec
0813708-PS2		Nov-24-08 07:00	JMF	000199	0.02	0811331-03	7120437	50	[Spk] 0.4998g->50mL; 0.02mL->0.02mL; :
0813708-PS3		Nov-24-08 07:00	JMF	.000999	0.1	0811331-03	7120437	50	[Spk] 0.4998g->50mL; 0.1mL->0.1mL; Sp

Comments	Analyst Initials

Metals, Soil, 3050B Digestion

Batch comments:

MAS 11/20/08 7:00AM-3:30PM
INST#219 @94C#199
HOTBLOCK VESSEL LOT#A805LS309

Lab Number	*Container*	*Prepared*	*By*	*Initial (g)*	*Final (mL)*	*Client* Source ID	*Client* Spike ID	*Client* uL Spike	*Comments*
0813708 - PS4		Nov-24-08 07:00	JMF	1.00999(	1	0811331-03	7120437	50	[Spk] 0.4998g->50mL; 1mL->1mL; Spikec

Comments:	Analyst Initials

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-7471A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8111967

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 216
Calibration: 8K19011

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Cal Standard	8111967-CAL1	v19so-a2-001	11/19/08 07:32
Cal Standard	8111967-CAL2	v19so-a2-004	11/19/08 07:37
Cal Standard	8111967-CAL3	v19so-a2-007	11/19/08 07:42
Cal Standard	8111967-CAL4	v19so-a2-010	11/19/08 07:47
Cal Standard	8111967-CAL5	v19so-a2-013	11/19/08 07:51
Cal Standard	8111967-CAL6	v19so-a2-016	11/19/08 07:56
Secondary Cal Check	8111967-SCV1	v19so-a2-019	11/19/08 08:05
Calibration Check	8111967-CCV1	v19so-a2-019	11/19/08 08:05
Calibration Blank	8111967-CCB1	v19so-a2-022	11/19/08 08:09
Calibration Check	8111967-CCV2	v19so-a2-172	11/19/08 12:16
Calibration Blank	8111967-CCB2	v19so-a2-175	11/19/08 12:21
Blank	0813602-BLK1	v19so-a2-187	11/19/08 13:02
LCS	0813602-BS1	v19so-a2-190	11/19/08 13:07
13SB13A	0811328-01	v19so-a2-193	11/19/08 13:13
13SB13C	0811328-02	v19so-a2-196	11/19/08 13:18
13SB21C	0811328-03	v19so-a2-199	11/19/08 13:23
13SB14A	0811328-04	v19so-a2-202	11/19/08 13:28
Calibration Check	8111967-CCV3	v19so-a2-208	11/19/08 13:38
Calibration Blank	8111967-CCB3	v19so-a2-211	11/19/08 13:43
13SB20C	0811328-07	v19so-a2-214	11/19/08 13:54
13SB22A	0811328-08	v19so-a2-217	11/19/08 13:59
13SB22C	0811328-09	v19so-a2-220	11/19/08 14:04
13SB21A	0811328-10	v19so-a2-223	11/19/08 14:10
13SB18A	0811328-11	v19so-a2-226	11/19/08 14:15
13SB18C	0811328-12	v19so-a2-229	11/19/08 14:20
13SB19A	0811328-14	v19so-a2-232	11/19/08 14:25
13SB19C	0811328-15	v19so-a2-235	11/19/08 14:30
13SB19C	0813602-MS1	v19so-a2-238	11/19/08 14:35
13SB19C	0813602-MSD1	v19so-a2-241	11/19/08 14:40
Calibration Check	8111967-CCV4	v19so-a2-244	11/19/08 14:45
Calibration Blank	8111967-CCB4	v19so-a2-247	11/19/08 14:50
13SB20A	0811328-06	v19so-a2-250	11/19/08 14:56

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-7471A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8111967

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 216
Calibration: 8K19011

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Calibration Check	8111967-CCV5	v19so-a2-256	11/19/08 15:06
Calibration Blank	8111967-CCB5	v19so-a2-259	11/19/08 15:11

INITIAL AND CONTINUING CALIBRATION CHECK

USEPA-7471A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8111967
Instrument ID:216
Control Limt: +/- 20.00%
Calibration: 8K19011

Lab Sample ID	Analyte	True	Found	%R	Units	Analyzed
8111967-CCV1	Mercury	3.00	3.10	103	ug/L	11/19/08 08:05
8111967-CCV2	Mercury	2.00	1.88	94	ug/L	11/19/08 12:16
8111967-CCV3	Mercury	2.00	1.84	92	ug/L	11/19/08 13:38
8111967-CCV4	Mercury	2.00	1.90	95	ug/L	11/19/08 14:45
8111967-CCV5	Mercury	2.00	1.92	96	ug/L	11/19/08 15:06

* Values outside of QC limits

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-7471A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8111967
Instrument: 216
Laboratory ID: 8111967-SCV1
Calibration: 8K19011

Analyte	Expected	Found	% R	QC Limit	Units
Mercury	3.00	3.10	103	90-110	ug/L

* Values outside of QC limits

BLANKS
USEPA-7471A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8111967

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument ID: 216
Calibration: 8K19011

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
8111967-CCB1	Mercury	-0.024	0.30	0.056	ug/L	U	11/19/08 08:09
8111967-CCB2	Mercury	-0.013	0.30	0.056	ug/L	U	11/19/08 12:21
0813602-BLK1	Mercury, Total	0.050	0.050	0.0093	mg/kg dry wt.	U	11/19/08 13:02
8111967-CCB3	Mercury	-0.020	0.30	0.056	ug/L	U	11/19/08 13:43
8111967-CCB4	Mercury	-0.017	0.30	0.056	ug/L	U	11/19/08 14:50
8111967-CCB5	Mercury	-0.0011	0.30	0.056	ug/L	U	11/19/08 15:11

* Values outside of QC limits

QC BATCH SUMMARY
USEPA-7471A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

QC Batch: 0813602 QC Batch Matrix: Soil

Preparation: 7471A Mercury Digestion

Sample Name	Lab Sample ID	Date Prepared	Observations
13SB13A	0811328-01	11/18/08 10:30	
13SB13C	0811328-02	11/18/08 10:30	
13SB21C	0811328-03	11/18/08 10:30	
13SB14A	0811328-04	11/18/08 10:30	
13SB20A	0811328-06	11/18/08 10:30	
13SB20C	0811328-07	11/18/08 10:30	
13SB22A	0811328-08	11/18/08 10:30	
13SB22C	0811328-09	11/18/08 10:30	
13SB21A	0811328-10	11/18/08 10:30	
13SB18A	0811328-11	11/18/08 10:30	
13SB18C	0811328-12	11/18/08 10:30	
13SB19A	0811328-14	11/18/08 10:30	
13SB19C	0811328-15	11/18/08 10:30	
Blank	0813602-BLK1	11/18/08 10:30	
LCS	0813602-BS1	11/18/08 10:30	
13SB19C	0813602-MS1	11/18/08 10:30	
13SB19C	0813602-MSD1	11/18/08 10:30	

METHOD BLANK DATA SHEET
USEPA-7471A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0813602-BLK1
File ID: v19so-a2-187
Prepared: 11/18/08 10:30
Preparation: 7471A Mercury Digestior
Initial/Final: 0.3 g / 50 mL
Analyzed: 11/19/08 13:02
Instrument: 216
QC Batch: 0813602
Sequence: 8111967
Calibration: 8K19011

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
7439-97-6	Mercury, Total	0.0093	0.050	0.050	mg/kg dry wt.	U

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-7471A

13SB19C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 7471A Mercury Digestion

Initial/Final: 0.3003 g / 50 mL

Laboratory ID: 0813602-MS1

QC Batch: 0813602

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Mercury, Total	0.333	ND	0.332	100	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-7471A

13SB19C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 7471A Mercury Digestion

Initial/Final: 0.3005 g / 50 mL

Laboratory ID: 0813602-MSD1

QC Batch: 0813602

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Mercury, Total	0.333	0.317	95	5	20	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

LCS / LCS DUPLICATE RECOVERY

USEPA-7471A

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

Laboratory ID: 0813602-BS1

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 7471A Mercury Digestion

Initial/Final: 0.3 g / 50 mL

QC Batch: 0813602

Sequence: 8111967

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
Mercury, Total	0.333	0.312	94	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

ANALYSIS BATCH (SEQUENCE) SUMMARY
USEPA-7471A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112634

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 216
Calibration: 8K26012

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Cal Standard	8112634-CAL1	v26so-a2-001	11/26/08 06:46
Cal Standard	8112634-CAL2	v26so-a2-004	11/26/08 06:51
Cal Standard	8112634-CAL3	v26so-a2-007	11/26/08 06:56
Cal Standard	8112634-CAL4	v26so-a2-010	11/26/08 07:00
Cal Standard	8112634-CAL5	v26so-a2-013	11/26/08 07:05
Cal Standard	8112634-CAL6	v26so-a2-016	11/26/08 07:10
Secondary Cal Check	8112634-SCV1	v26so-a2-019	11/26/08 07:15
Calibration Check	8112634-CCV1	v26so-a2-019	11/26/08 07:15
Calibration Blank	8112634-CCB1	v26so-a2-022	11/26/08 07:20
Calibration Check	8112634-CCV2	v26so-a2-028	11/26/08 07:30
Calibration Blank	8112634-CCB2	v26so-a2-031	11/26/08 07:35
Blank	0813957-BLK1	v26so-a2-052	11/26/08 08:09
LCS	0813957-BS1	v26so-a2-055	11/26/08 08:14
13SB17A	0811331-02	v26so-a2-058	11/26/08 08:19
13SB17C	0811331-03	v26so-a2-061	11/26/08 08:23
Calibration Check	8112634-CCV3	v26so-a2-064	11/26/08 08:31
Calibration Blank	8112634-CCB3	v26so-a2-067	11/26/08 08:36
13SB17C	0813957-MS1	v26so-a2-070	11/26/08 08:41
13SB17C	0813957-MSD1	v26so-a2-073	11/26/08 08:46
13SB16A	0811331-04	v26so-a2-076	11/26/08 08:51
13SB16C	0811331-05	v26so-a2-079	11/26/08 08:55
13SB15A	0811331-06	v26so-a2-082	11/26/08 09:00
DUP-13	0811331-07	v26so-a2-085	11/26/08 09:05
Calibration Check	8112634-CCV4	v26so-a2-100	11/26/08 09:30
Calibration Blank	8112634-CCB4	v26so-a2-103	11/26/08 09:35

INITIAL AND CONTINUING CALIBRATION CHECK

USEPA-7471A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112634
Instrument ID:216
Control Limt: +/- 20.00%
Calibration: 8K26012

Lab Sample ID	Analyte	True	Found	%R	Units	Analyzed
8112634-CCV1	Mercury	3.00	2.99	100	ug/L	11/26/08 07:15
8112634-CCV2	Mercury	2.00	1.97	98	ug/L	11/26/08 07:30
8112634-CCV3	Mercury	2.00	1.92	96	ug/L	11/26/08 08:31
8112634-CCV4	Mercury	2.00	1.90	95	ug/L	11/26/08 09:30

* Values outside of QC limits

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-7471A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112634
Instrument: 216
Laboratory ID: 8112634-SCV1
Calibration: 8K26012

Analyte	Expected	Found	% R	QC Limit	Units
Mercury	3.00	2.99	100	90-110	ug/L

* Values outside of QC limits

BLANKS
USEPA-7471A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112634
Instrument ID: 216
Calibration: 8K26012

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
8112634-CCB1	Mercury	0.0052	0.30	0.056	ug/L	U	11/26/08 07:20
8112634-CCB2	Mercury	0.00024	0.30	0.056	ug/L	U	11/26/08 07:35
0813957-BLK1	Mercury, Total	0.050	0.050	0.0093	mg/kg dry wt.	U	11/26/08 08:09
8112634-CCB3	Mercury	-0.0036	0.30	0.056	ug/L	U	11/26/08 08:36
8112634-CCB4	Mercury	-0.0024	0.30	0.056	ug/L	U	11/26/08 09:35

* Values outside of QC limits

QC BATCH SUMMARY
USEPA-7471A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61

Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008

QC Batch: 0813957
QC Batch Matrix: Soil
Preparation: 7471A Mercury Digestion

Sample Name	Lab Sample ID	Date Prepared	Observations
13SB17A	0811331-02	11/25/08 14:00	
13SB17C	0811331-03	11/25/08 14:00	
13SB16A	0811331-04	11/25/08 14:00	
13SB16C	0811331-05	11/25/08 14:00	
13SB15A	0811331-06	11/25/08 14:00	
DUP-13	0811331-07	11/25/08 14:00	
Blank	0813957-BLK1	11/25/08 14:00	
LCS	0813957-BS1	11/25/08 14:00	
13SB17C	0813957-MS1	11/25/08 14:00	
13SB17C	0813957-MSD1	11/25/08 14:00	

METHOD BLANK DATA SHEET
USEPA-7471A

Laboratory:	TriMatrix Laboratories, Inc.	SDG:	36440-61
Client:	URS Corporation	Project:	RFAAP SWMU 13 RFI/CMS, WO 008
Matrix:	Soil	Laboratory ID:	0813957-BLK1
Prepared:	11/25/08 14:00	Preparation:	7471A Mercury Digestion
Analyzed:	11/26/08 08:09	Instrument:	216
QC Batch:	0813957	Sequence:	8112634
File ID:	v26so-a2-052	Initial/Final:	0.3 g / 50 mL
		Calibration:	8K26012

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
7439-97-6	Mercury, Total	0.0093	0.050	0.050	mg/kg dry wt.	U

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-7471A

13SB17C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 7471A Mercury Digestion

Initial/Final: 0.3001 g / 50 mL

Laboratory ID: 0813957-MS1

QC Batch: 0813957

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Mercury, Total	0.333	0.267	0.574	92	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-7471A

13SB17C

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 7471A Mercury Digestion

Initial/Final: 0.2999 g / 50 mL

Laboratory ID: 0813957-MSD1

QC Batch: 0813957

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Mercury, Total	0.333	0.573	92	0.2	20	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

LCS / LCS DUPLICATE RECOVERY

USEPA-7471A

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

Laboratory ID: 0813957-BS1

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 7471A Mercury Digestion

Initial/Final: 0.3 g / 50 mL

QC Batch: 0813957

Sequence: 8112634

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
Mercury, Total	0.333	0.321	96	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

HOLDING TIME SUMMARY
USEPA-7471A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Analyte: Mercury

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB13A	11/12/08	11/14/08		11/18/08	6	NA	11/19/08	7	28	
13SB13C	11/12/08	11/14/08		11/18/08	6	NA	11/19/08	7	28	
13SB21C	11/12/08	11/14/08		11/18/08	6	NA	11/19/08	7	28	
13SB14A	11/12/08	11/14/08		11/18/08	6	NA	11/19/08	7	28	
13SB20A	11/12/08	11/14/08		11/18/08	6	NA	11/19/08	7	28	
13SB20C	11/12/08	11/14/08		11/18/08	6	NA	11/19/08	7	28	
13SB22A	11/12/08	11/14/08		11/18/08	6	NA	11/19/08	7	28	
13SB22C	11/12/08	11/14/08		11/18/08	6	NA	11/19/08	7	28	
13SB21A	11/12/08	11/14/08		11/18/08	6	NA	11/19/08	7	28	
13SB18A	11/13/08	11/14/08		11/18/08	5	NA	11/19/08	6	28	
13SB18C	11/13/08	11/14/08		11/18/08	5	NA	11/19/08	6	28	
13SB19A	11/13/08	11/14/08		11/18/08	5	NA	11/19/08	6	28	
13SB19C	11/13/08	11/14/08		11/18/08	5	NA	11/19/08	6	28	
13SB17A	11/14/08	11/15/08		11/25/08	11	NA	11/26/08	12	28	
13SB17C	11/14/08	11/15/08		11/25/08	11	NA	11/26/08	12	28	
13SB16A	11/14/08	11/15/08		11/25/08	11	NA	11/26/08	12	28	
13SB16C	11/14/08	11/15/08		11/25/08	11	NA	11/26/08	12	28	
13SB15A	11/14/08	11/15/08		11/25/08	11	NA	11/26/08	12	28	
DUP-13	11/14/08	11/15/08		11/25/08	12	NA	11/26/08	12	28	

Metals, Soil, 7471A Mercury Digestion

Batch comments:

RDB 11-18-08 10:30AM-11:00AM
INST#218 @93C #194
HOTBLOCK VESSEL LOT#A805LS309

Lab Number	Container	Prepared	By	Initial (g)	Final (mL)	Client Source ID	Client Spike ID	Client uL Spike	Client Comments
0811328-01 *Hg Total 7471A (DoD)*	A	Nov-18-08 10:30	RDB	0.3002	50	URS Corporation			
0811328-02 *Hg Total 7471A (DoD)*	A	Nov-18-08 10:30	RDB	0.2996	50	URS Corporation			
0811328-03 *Hg Total 7471A (DoD)*	A	Nov-18-08 10:30	RDB	0.2999	50	URS Corporation			
0811328-04 *Hg Total 7471A (DoD)*	A	Nov-18-08 10:30	RDB	0.3002	50	URS Corporation			
0811328-06 *Hg Total 7471A (DoD)*	A	Nov-18-08 10:30	RDB	0.3005	50	URS Corporation			
0811328-07 *Hg Total 7471A (DoD)*	A	Nov-18-08 10:30	RDB	0.3001	50	URS Corporation			
0811328-08 *Hg Total 7471A (DoD)*	A	Nov-18-08 10:30	RDB	0.2996	50	URS Corporation			
0811328-09 *Hg Total 7471A (DoD)*	A	Nov-18-08 10:30	RDB	0.3001	50	URS Corporation			
0811328-10 *Hg Total 7471A (DoD)*	A	Nov-18-08 10:30	RDB	0.3005	50	URS Corporation			
0811328-11 *Hg Total 7471A (DoD)*	A	Nov-18-08 10:30	RDB	0.3001	50	URS Corporation			
0811328-12 *Hg Total 7471A (DoD)*	A	Nov-18-08 10:30	RDB	0.3003	50	URS Corporation			
0811328-14 *Hg Total 7471A (DoD)*	A	Nov-18-08 10:30	RDB	0.3001	50	URS Corporation			

Comments:	Analyst Initials:

Metals, Soil, 7471A Mercury Digestion

Batch comments:

RDB 11-18-08 10:30AM-11:00AM
INST#218 @93C #194
HOTBLOCK VESSEL LOT#A805LS309

Lab Number	*Container*	*Prepared*	*By*	*Initial (g)*	*Final (mL)*	*Client* Source ID	*Client* Spike ID	*Client* uL Spike	*Comments*
0811328-15	A	Nov-18-08 10:30	RDB	0.3003	50	URS Corporation			
Hg Total 7471A (DoD)									
0813602-BLK1		Nov-18-08 10:30	RDB	0.3	50				
0813602-BS1		Nov-18-08 10:30	RDB	0.3	50		8100309	100	
0813602-MS1		Nov-18-08 10:30	RDB	0.3003	50	0811328-15	8100309	100	
0813602-MSD1		Nov-18-08 10:30	RDB	0.3005	50	0811328-15	8100309	100	

Comments:	Analyst Initials

Metals, Soil, 7471A Mercury Digestion

Batch comments:
mas 11/25/08 2:00-2:30pm
inst#218 @94c#194
hotblock vessel lot#a805ls309

Lab Number	*Container*	*Prepared*	*By*	*Initial (g)*	*Final (mL)*	*Client* Source ID	*Client* Spike ID	*Client* uL Spike	*Comments*
0811331-02	A	Nov-25-08 14:00	MAS	0.3003	50	URS Corporation			
Hg Total 7471A (DoD)									
0811331-03	A	Nov-25-08 14:00	MAS	0.2997	50	URS Corporation			
Hg Total 7471A (DoD)									
0811331-04	A	Nov-25-08 14:00	MAS	0.2997	50	URS Corporation			
Hg Total 7471A (DoD)									
0811331-05	A	Nov-25-08 14:00	MAS	0.3004	50	URS Corporation			
Hg Total 7471A (DoD)									
0811331-06	A	Nov-25-08 14:00	MAS	0.2997	50	URS Corporation			
Hg Total 7471A (DoD)									
0811331-07	A	Nov-25-08 14:00	MAS	0.3001	50	URS Corporation			
Hg Total 7471A (DoD)									
0813957-BLK1		Nov-25-08 14:00	MAS	0.3	50				
0813957-BS1		Nov-25-08 14:00	MAS	0.3	50		8100309	100	
0813957-MS1		Nov-25-08 14:00	MAS	0.3001	50	0811331-03	8100309	100	
0813957-MSD1		Nov-25-08 14:00	MAS	0.2999	50	0811331-03	8100309	100	

Comments:	Analyst Initials:

ANALYSIS BATCH (SEQUENCE) SUMMARY

USEPA-7470A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Sequence: 8112165

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Instrument: 216
Calibration: 8K25003

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Cal Standard	8112165-CAL1	v20wt-a2-001	11/20/08 07:22
Cal Standard	8112165-CAL2	v20wt-a2-004	11/20/08 07:27
Cal Standard	8112165-CAL3	v20wt-a2-007	11/20/08 07:32
Cal Standard	8112165-CAL4	v20wt-a2-010	11/20/08 07:37
Cal Standard	8112165-CAL5	v20wt-a2-013	11/20/08 07:41
Cal Standard	8112165-CAL6	v20wt-a2-016	11/20/08 07:46
Secondary Cal Check	8112165-SCV1	v20wt-a2-019	11/20/08 07:51
Calibration Check	8112165-CCV1	v20wt-a2-019	11/20/08 07:51
Calibration Blank	8112165-CCB1	v20wt-a2-022	11/20/08 07:56
Calibration Check	8112165-CCV2	v20wt-a2-028	11/20/08 08:06
Calibration Blank	8112165-CCB2	v20wt-a2-031	11/20/08 08:10
Calibration Check	8112165-CCV3	v20wt-a2-064	11/20/08 09:04
Calibration Blank	8112165-CCB3	v20wt-a2-067	11/20/08 09:09
Calibration Check	8112165-CCV4	v20wt-a2-172	11/20/08 12:03
Calibration Blank	8112165-CCB4	v20wt-a2-175	11/20/08 12:08
Blank	0813648-BLK1	v20wt-a2-184	11/20/08 12:23
LCS	0813648-BS1	v20wt-a2-190	11/20/08 12:33
EQBK-1	0811328-05	v20wt-a2-193	11/20/08 12:38
EQBK-5	0811328-13	v20wt-a2-196	11/20/08 12:43
EQBK-6	0811331-01	v20wt-a2-199	11/20/08 12:49
Calibration Check	8112165-CCV5	v20wt-a2-208	11/20/08 13:04
Calibration Blank	8112165-CCB5	v20wt-a2-211	11/20/08 13:09

INITIAL AND CONTINUING CALIBRATION CHECK

USEPA-7470A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112165
Instrument ID:216
Control Limt: +/- 20.00%
Calibration: 8K25003

Lab Sample ID	Analyte	True	Found	%R	Units	Analyzed
8112165-CCV1	Mercury	3.00	3.11	104	ug/L	11/20/08 07:51
8112165-CCV2	Mercury	2.00	1.99	99	ug/L	11/20/08 08:06
8112165-CCV3	Mercury	2.00	2.04	102	ug/L	11/20/08 09:04
8112165-CCV4	Mercury	2.00	1.99	99	ug/L	11/20/08 12:03
8112165-CCV5	Mercury	2.00	2.06	103	ug/L	11/20/08 13:04

* Values outside of QC limits

SECOND-SOURCE CALIBRATION VERIFICATION

USEPA-7470A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112165
Instrument: 216
Laboratory ID: 8112165-SCV1
Calibration: 8K25003

Analyte	Expected	Found	% R	QC Limit	Units
Mercury	3.00	3.11	104	90-110	ug/L

* Values outside of QC limits

BLANKS
USEPA-7470A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112165
Instrument ID: 216
Calibration: 8K25003

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
8112165-CCB1	Mercury	-0.0098	0.20	0.043	ug/L	U	11/20/08 07:56
8112165-CCB2	Mercury	-0.012	0.20	0.043	ug/L	U	11/20/08 08:10
8112165-CCB3	Mercury	-0.013	0.20	0.043	ug/L	U	11/20/08 09:09
8112165-CCB4	Mercury	0.0046	0.20	0.043	ug/L	U	11/20/08 12:08
0813648-BLK1	Mercury, Total	0.20	0.20	0.043	ug/L	U	11/20/08 12:23
8112165-CCB5	Mercury	-0.0075	0.20	0.043	ug/L	U	11/20/08 13:09

* Values outside of QC limits

QC BATCH SUMMARY

USEPA-7470A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

QC Batch: 0813648 QC Batch Matrix: Water

Preparation: 7470A Digestion - Total

Sample Name	Lab Sample ID	Date Prepared	Observations
EQBK-1	0811328-05	11/19/08 14:00	
EQBK-5	0811328-13	11/19/08 14:00	
EQBK-6	0811331-01	11/19/08 14:00	
Blank	0813648-BLK1	11/19/08 14:00	
LCS	0813648-BS1	11/19/08 14:00	

METHOD BLANK DATA SHEET
USEPA-7470A

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Water
Laboratory ID: 0813648-BLK1
File ID: v20wt-a2-184
Prepared: 11/19/08 14:00
Preparation: 7470A Digestion - Total
Initial/Final: 30 mL / 30 mL
Analyzed: 11/20/08 12:23
Instrument: 216
QC Batch: 0813648
Sequence: 8112165
Calibration: 8K25003

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
7439-97-6	Mercury, Total	0.043	0.20	0.20	ug/L	U

LCS / LCS DUPLICATE RECOVERY

USEPA-7470A

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Water

Laboratory ID: 0813648-BS1

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 7470A Digestion - Total

Initial/Final: 30 mL / 30 mL

QC Batch: 0813648

Sequence: 8112165

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
Mercury, Total	2.00	2.16	108	80 - 120	ug/L

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

HOLDING TIME SUMMARY
USEPA-7470A

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Analyte: Mercury

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
EQBK-1	11/12/08	11/14/08		11/19/08	7	NA	11/20/08	8	28	
EQBK-5	11/13/08	11/14/08		11/19/08	6	NA	11/20/08	7	28	
EQBK-6	11/14/08	11/15/08		11/19/08	5	NA	11/20/08	6	28	

Metals, Water, 7470A Digestion - Total

Batch comments:

MAS 11/19/08 2:00-4:00PM
INST#218 @92C#194
HOTBLOCK VESSEL LOT#A805LS309

Lab Number	*Container*	*Prepared*	*By*	*Initial (mL)*	*Final (mL)*	*Client* Source ID	Spike ID	uL Spike	Comments
0811328 - 05	E	Nov-19-08 14:00	MAS	30	30	URS Corporation			
Hg Total 7470A (DoD)									
0811328 - 13	D	Nov-19-08 14:00	MAS	30	30	URS Corporation			
Hg Total 7470A (DoD)									
0811331 - 01	D	Nov-19-08 14:00	MAS	30	30	URS Corporation			
Hg Total 7470A (DoD)									
0813648 - BLK1		Nov-19-08 14:00	MAS	30	30				
0813648 - BS1		Nov-19-08 14:00	MAS	30	30		8100309	60	

Comments:	Analyst Initials:

DATA VALIDATION WORKSHEET

Total Organic Carbon

Reviewer: Andrea Sansom
Date: 1/30/2009
DV Level: II III IV

Project Name: Radford SWMU13
Project Number: 11656367.3
Laboratory: TriMatrix
SDG No.: 36440-61
Test Name: TOC
Method No.: Walkley Black

Review Document:

_X__ Region III Modified for National Functional Guidelines
_X__ SW-846 for aqueous by SW9060 or Methods of Soil Analyses for soil by Walkley Black
_X__ Project QAPP/SAP

1.0 Laboratory Deliverables		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do sample preservation, collection and storage condition meet method requirement? (4C and <2)	X		
	If samples were received with the cooler temperature exceeding 20°C, then flag L(+)/UL(-).			
1.4	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	

Notes:

2.0 Holding Times		Yes	No	NA
2.1	Have any technical holding times (28 days), determined from date of sampling to date of analysis, been exceeded? If yes, J(+)/UJ(-).		X	
2.2	Have any technical holding time grossly (twice the holding time) been exceeded? If yes, J(+)/R(-) .		X	

Notes:

3.0 Blanks (Laboratory and Field)		Yes	No	NA
3.1	Were method blanks (MB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix?)	X		
3.2	Do any method blanks have positive results? Action: If Yes, positive sample results< 5 Xblank conc. in the associated should be reported and qualified "B".		X	
3.3	Do any field equipment blanks/trip blanks have positive results? If yes, use same rules above.			X

Notes:

4.0 Initial and Continuing Calibration		Yes	No	NA
4.1	Are two standards included in the calibration curve run with four injections each? If no, flag "R".			X
4.2	Was a second source calibration verification analyzed for each calibration curve? If no, flag "R".			X
4.3	Were continuing calibration standards analyzed every 10 samples? If no, flag "R".			X
4.4	Are all calibration standard %RSD (<20%, r>0.995, or r^2<0.99), second source (±10%) or %D(≤10%) within			X
For initial calibration: %RSD > 20%, but < 50%, J(+), only; %RSD > 50%, but < 80%, J(+)/UJ(-); for %RSD > + 80%, J(+)/R(-).				
For second source: %D>10%, J(+)/R(-).				
For continuing calibration: Positive Bias - %D >+ 10%, J(+), only. Negative Bias - %D>-10% but <-50%, J(+)/UJ(-) and %D>-50%, J(+)/R(-).				

Notes: TITRATION

5.0 Laboratory Control Sample (LCS)		Yes	No	NA
5.1	Were LCS/LCSD analyzed at required frequency (one per 20 samples per batch) for each matrix?	X		
5.2	Are there any %R for LCS/LCSD recoveries outside the QC limits?		X	
	Action: If Yes, for %R > UCL, J(+) only; for %R < LCL, J(+)/R(-).			
5.3	Are there any RPD for LCS/LCSD recoveries outside the QC limits? If Yes, J(+) only.			X

Notes:

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD)		Yes	No	NA
6.1	Were matrix spikes analyzed at required frequency (one per 20 samples per batch) for each matrix?			X
6.2	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the QC limits?			X
6.3	Are there any RPD for matrix spike and matrix spike duplicate recoveries outside the QC limits?		X	
	Action: No action is required based on MS/MSd failure alone. Note in the report and use professional judgement.			

Notes: MATRIX DUPLICATE

7.0 Field Duplicate		Yes	No	NA
7.1	Evaluate field duplicate results? Generally, no action is taken on the basis of field duplicate results. Results that fall outside criteria recommended should be noted during data validation and discussed in the DV report.	X		

Notes:

8.0 Compound Identification and Detection Limit Verification		Yes	No	NA
8.1	Do detection limits meet those required by the project QAPP and were they properly adjusted for dilution factors and moisture (including adjustment of wet weight aliquot)?	X		

Notes:

9.0 Data Completeness		Yes	No	NA
9.1	Is % completeness for certainty? (Control limit 90%)	X		
9.1.1	Number of samples: 6			
9.1.2	Number of target compounds in each analysis: 1			
9.1.3	Number of results that are uncertain at comparison criteria standard: 0			
	% Completeness = (10.1.1 x 10.1.2 - 10.1.3) x 100/(10.1.1 x 10.1.2)			
	% Completeness = 100%			

Notes:

ANALYSIS BATCH (SEQUENCE) SUMMARY

MSA 29-3.5.2

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Sequence: 8112629

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Instrument: 176

Calibration: UNASSIGNED

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
13SB13A	0811328-01		11/26/08 10:20
13SB20C	0811328-07		11/26/08 10:20
13SB18A	0811328-11		11/26/08 10:20
13SB16C	0811331-05		11/26/08 10:20
13SB15A	0811331-06		11/26/08 10:20
DUP-13	0811331-07		11/26/08 10:20
13SB16C	0814041-DUP1		11/26/08 10:20
Blank	0814041-BLK1		11/26/08 10:20
LCS	0814041-BS1		11/26/08 10:20

BLANKS
MSA 29-3.5.2

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Sequence: 8112629
Instrument ID: 176
Calibration: UNASSIGNED

Lab Sample ID	Analyte	Found	MRL	MDL	Units	C	Analyzed
0814041-BLK1	Carbon, Total Organic	0.10	0.10	0.0080	%	U	11/26/08 10:20

* Values outside of QC limits

QC BATCH SUMMARY

MSA 29-3.5.2

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

QC Batch: 0814041 QC Batch Matrix: Soil

Preparation: Method-Specific Preparation

Sample Name	Lab Sample ID	Date Prepared	Observations
13SB13A	0811328-01	11/26/08 10:16	
13SB20C	0811328-07	11/26/08 10:16	
13SB18A	0811328-11	11/26/08 10:16	
13SB16C	0811331-05	11/26/08 10:16	
13SB15A	0811331-06	11/26/08 10:16	
DUP-13	0811331-07	11/26/08 10:16	
Blank	0814041-BLK1	11/26/08 10:16	
LCS	0814041-BS1	11/26/08 10:16	
13SB16C	0814041-DUP1	11/26/08 10:16	

METHOD BLANK DATA SHEET
MSA 29-3.5.2

Laboratory: TriMatrix Laboratories, Inc.
SDG: 36440-61
Client: URS Corporation
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Matrix: Soil
Laboratory ID: 0814041-BLK1
File ID:
Prepared: 11/26/08 10:16
Preparation: Method-Specific Preparat
Initial/Final: 10 g / 10 mL
Analyzed: 11/26/08 10:20
Instrument: 176
QC Batch: 0814041
Sequence: 8112629
Calibration: UNASSIGNED

CAS No.	Analyte	MDL	MRL	Concentration	Unit	Q
7440-44-0	Carbon, Total Organic	0.0080	0.10	0.10	%	U

DUPLICATES
MSA 29-3.5.2

13SB16C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
QC Batch: 0814041
Preparation: Method-Specific Preparation
Source Sample Name: 13SB16C

SDG: 36440-61
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Laboratory ID: 0814041-DUP1
Lab Source ID: 0811331-05
Initial/Final: 0.36 g / 0.36 mL
% Solids: 80.70

Analyte	Control Limit	Sample Conc.	C	Dup. Conc.	C	RPD %	Q	Method	Units
Carbon, Total Organic	20	1.47		1.44		2		MSA 29-3.5.2	%

* Values outside of QC limits

LCS / LCS DUPLICATE RECOVERY

MSA 29-3.5.2

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

Laboratory ID: 0814041-BS1

SDG: 36440-61

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: Method-Specific Preparation

Initial/Final: 1 g / 1 mL

QC Batch: 0814041

Sequence: 8112629

Analyte	Spike Added	LCS Conc.	LCS % Rec. #	QC Limits Rec.	Units
Carbon, Total Organic	1.00	1.19	119	92 - 138	%

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

HOLDING TIME SUMMARY
MSA 29-3.5.2

Laboratory: TriMatrix Laboratories, Inc.

SDG: 36440-61

Client: URS Corporation

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Analyte: Carbon, Total Organic

Sample Name	Date Collected	Date Received	Date Leached	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
13SB13A	11/12/08	11/14/08		11/26/08	14	NA	11/26/08	14	28	
13SB20C	11/12/08	11/14/08		11/26/08	14	NA	11/26/08	14	28	
13SB18A	11/13/08	11/14/08		11/26/08	13	NA	11/26/08	13	28	
13SB16C	11/14/08	11/15/08		11/26/08	12	NA	11/26/08	12	28	
13SB15A	11/14/08	11/15/08		11/26/08	12	NA	11/26/08	12	28	
DUP-13	11/14/08	11/15/08		11/26/08	12	NA	11/26/08	12	28	

TriMatrix Laboratories, Inc.

PREPARATION BATCH 0814041

Printed: 11/26/2008 10:20:15AM

Inorganic - Wet Chemistry, Soil, Method-Specific Preparation

(No Surrogate)

Due 12-1-08
LV4

Batch Comments: (none)

Work Order	Analysis	Work Order	Analysis	Work Order	Analysis
0811328	TOC MSA 29-3.5.2	0811331	TOC MSA 29-3.5.2		

QA 11/26/08

Lab Number	*Contain*	*Prepared*	*By*	*Initial (g)*	*Final (mL)*	*uL Surrogate*	*Source ID*	*Spike ID*	*uL Spike*	*Client / QC Type*	*Extraction Comments*
0814041-BLK1		Nov-26-08 10:16	HLB	10	10					BLANK	
0814041-DUP1		Nov-26-08 10:16	HLB	0.36	0.36		0811331-05			DUPLICATE	
0814041-BS1		Nov-26-08 10:16	HLB	1	1			8080467	1000	LCS	
0811328-01	A	Nov-26-08 10:16	HLB	1	1					URS Corporation	
0811328-07	A	Nov-26-08 10:16	HLB	0.74	0.74					URS Corporation	
0811328-11	A	Nov-26-08 10:16	HLB	0.99	0.99					URS Corporation	
0811331-05	C	Nov-26-08 10:16	HLB	0.36	0.36					URS Corporation	
0811331-06	C	Nov-26-08 10:16	HLB	0.85	0.85					URS Corporation	
0811331-07	C	Nov-26-08 10:16	HLB	0.63	0.63					URS Corporation	

Comments:

Analyst Initials:

TriMatrix Laboratories, Inc.

Walkley-Black Total Organic Carbon in Soil

Analyst: NLB

Date/Time/Temperature Oven Drying Began: 11/21/08 19:00 103°C

Date/Time/Temperature Oven Drying Ended: 11/22/08 10:15 104°C

Balance Used: 205

Date Batch Opened: 11-26-08

Supervisor: JG

Instrument Number: 1760

mL Titrant Used: 20.3

Ferrous Sulfate Normality =

$$\text{Normality } Fe^{2+} = \frac{10 \text{ mL } Cr_2O_7^{2-}}{x \text{ mL } Fe^{2+}} \times 1N\ Cr_2O_7^{2-}$$

	Sample Number	Dish (g)	g of Soil + Dish Before Drying	g of Soil + Dish After Drying	Calculated Percent Solids	g of Oven Dried Sample Used	mL of Titrant Used	Reported Concentration (%)
A	0811328-01	11.37	66.69	60.10		1.00	17.00	
A	↓ -07	11.57	78.97	64.81		0.74	17.40	
A	↓ -11	11.35	103.45	84.20		0.99	17.90	
C	0811331-05	11.38	60.54	49.15		0.36	17.55	
C	↓ -06	11.35	59.02	53.42		0.85	15.70	
C	↓ -07	11.15	55.39	50.96		0.63	16.50	
	0811331-05dup	11.38	60.54	49.15		0.36	17.60	
	BIK					10	20.25	
	BS					1	14.10	

Reagent and Standard Numbers

Ferroin Indicator: INR1.50-13

Potassium Dichromate: INR5.61-14

Ferrous Sulfate: INR9.18-2

H_2SO_4 Lot #: 085201

Spike Standard: IN24.69-15

TriMatrix Laboratories, Inc.

Walkley-Black Total Organic Carbon in Soil

Analyst: HLB

Date Batch Opened: 11/26/2008

Date/Time/Temperature Oven Drying Began: 11/21/08 19::00 103C

Supervisor: JG

Date/Time/Temperature Oven Drying Ended: 11/22/08 10:15 104C

Instrument Number: 176

Balance Used: 205

$$\text{Normality } Fe^{2+} = \frac{10 \text{ mL } Cr_2O_7^{2-}}{x \text{ mL } Fe^{2+}} \times 1N\ Cr_2O_7^{2-}$$

mL Titrant Used: 20.3

Ferrous Sulfate Normality = 0.49261

Sample Number	Dish (g)	g of Soil + Dish Before Drying	g of Soil + Dish After Drying	Calculated Percent Solids	g of Oven Dried Sample Used	mL of Titrant Used	Reported Concentration (%)
0811328-01	11.37	66.69	60.10	88.1	1.00	17.00	0.634
0811328-07	11.57	78.97	64.81	79.0	0.74	17.40	0.753
0811328-11	11.35	103.45	84.20	79.1	0.99	17.90	0.466
0811331-05	11.38	60.54	49.15	76.8	0.36	17.55	1.47
0811331-06	11.35	59.02	53.62	88.7	0.85	15.70	1.04
0811331-07	11.15	55.39	50.96	90.0	0.63	16.50	1.16
0811331-05DUP	11.38	60.54	49.15	76.8	0.36	17.60	1.44
BLK					10.00	20.25	0.001
BS					1.00	14.10	1.19

Reagent and Standard Numbers

Ferroin Indicator: INR1.50.13

Potassium Dichromate: INR5.61-14

Ferrous Sulfate: INR9.18-2 H_2SO_4 Lot #: 85201 Spike Standard: IN24.69-15

SDG CASE NARRATIVE

URS Corporation
RFAAP SWMU 13 RFI/CMS, WO 008

SDG Executive Summary

This case narrative applies to samples received on November 14, 2008 through November 15, 2008. All samples were scheduled for analysis in accordance with parameters outlined on the field chain of custody record, the TriMatrix bid form, and/or oral and written correspondence between URS Corporation and TriMatrix Laboratories, Inc..

Each sample receipt event was assigned a unique TriMatrix work order number. Sample receipt documentation is included in section A of this data package.

Project Technical Issues/Problems

Project-related data qualification designations and reporting conventions are included in Attachment 1 - *Project Technical Narrative.*

QA/QC Data Qualifications/Narrations

Quality assurance issues and/or quality control data qualifications and narrations related to the analysis and reporting of this SDG are presented in Attachment 2 - *Statement of Data Qualifications*. The absence of a statement page for a particular analyte group (*e.g.* Percent Solids) implies that no qualifying statements were generated for that analyte.

Data Review and Approval

All data was peer-reviewed by a second analyst, and then by appropriate data management staff against laboratory quality control requirements and project specifications. It was then reviewed and approved by the group supervisor/manager prior to further review by the project chemist.

Data Deliverables

The data deliverables, both hardcopy and/or electronic (EDD), that comprise this data package are intended to comply with the documents referenced in the introductory section of this narrative. The EDD, if requested, will be issued separately from this hardcopy report. Hold time reports for each test procedure are presented following the CLP-like forms section of this report.

This report relates only to the sample(s) as received. Test results are in compliance with the requirements of the National Environmental Laboratory Accreditation Conference (NELAC). Estimates of analytical uncertainties for the test results contained within the report are available upon request.

Lisa M. Harvey, Project Chemist

12-15-2008
Date

SDG: 36440-61

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Individual sample results relate only to the sample tested.

SDG CASE NARRATIVE

Sample Receipt and Login -- Work Order: 0811328

TriMatrix Laboratories received the cooler(s) for this work order on November 14, 2008, at 09:00am. Receiving documents include field chain-of-custody (COC) record(s), sample receipt form(s), and FedEx shipping document(s). The condition of the custody seals, the type and location of the coolant, and the temperatures recorded for each cooler are presented on the TriMatrix *Sample Receiving / Log-In Checklist* provided in section A of this package. The receipt temperature of the samples was determined by using an infrared thermometer to record the temperature of three random samples of varying container types and the accompanying temperature blank, if present.

Samples were scheduled for the analyses listed on the corresponding COC form. Field IDs and assigned laboratory identifiers are presented in the table below.

Field Sample Name	Laboratory Sample ID	Matrix	Date Sampled
13SB13A	0811328-01	Soil	11/12/2008
13SB13C	0811328-02	Soil	11/12/2008
13SB21C	0811328-03	Soil	11/12/2008
13SB14A	0811328-04	Soil	11/12/2008
EQBK-1	0811328-05	Water	11/12/2008
13SB20A	0811328-06	Soil	11/12/2008
13SB20C	0811328-07	Soil	11/12/2008
13SB22A	0811328-08	Soil	11/12/2008
13SB22C	0811328-09	Soil	11/12/2008
13SB21A	0811328-10	Soil	11/12/2008
13SB18A	0811328-11	Soil	11/13/2008
13SB18C	0811328-12	Soil	11/13/2008
EQBK-5	0811328-13	Water	11/13/2008
13SB19A	0811328-14	Soil	11/13/2008
13SB19C	0811328-15	Soil	11/13/2008

No administrative issues were encountered during the receipt and analysis of this work order.

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SDG CASE NARRATIVE

Sample Receipt and Login -- Work Order: 0811331

TriMatrix Laboratories received the cooler(s) for this work order on November 15, 2008, at 08:50am. Receiving documents include field chain-of-custody (COC) record(s), sample receipt form(s), and FedEx shipping document(s). The condition of the custody seals, the type and location of the coolant, and the temperatures recorded for each cooler are presented on the TriMatrix *Sample Receiving / Log-In Checklist* provided in section A of this package. The receipt temperature of the samples was determined by using an infrared thermometer to record the temperature of three random samples of varying container types and the accompanying temperature blank, if present.

Samples were scheduled for the analyses listed on the corresponding COC form. Field IDs and assigned laboratory identifiers are presented in the table below.

Field Sample Name	Laboratory Sample ID	Matrix	Date Sampled
EQBK-6	0811331-01	Water	11/14/2008
13SB17A	0811331-02	Soil	11/14/2008
13SB17C	0811331-03	Soil	11/14/2008
13SB16A	0811331-04	Soil	11/14/2008
13SB16C	0811331-05	Soil	11/14/2008
13SB15A	0811331-06	Soil	11/14/2008
DUP-13	0811331-07	Soil	11/14/2008

No administrative issues were encountered during the receipt and analysis of this work order.

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Individual sample results relate only to the sample tested.
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SDG CASE NARRATIVE

Attachment 1
Project Technical Narrative

Sample Result Reporting Convention

Sample results are reported as RL "U" (e.g. 0.001 U) if the target analyte was not detected above the MDL.

If a sample for an organic analyte is reanalyzed and also reported, the second analysis includes the suffix "RE*n*" where *n* = the first, second, etc. reanalysis.

Data Qualifier Designation

If applicable, sample results are qualified with:

a "J" flag if the analyte was detected, but the concentration is greater than the MDL and less than the RL;

a "B" flag if the analyte was also detected at or above the RL in the associated method blank, and the sample concentration was less than five times the method blank result;

an "E" flag if the analyte exceeded the instrument calibration range;

an asterisk (*) if a report-generated statement of qualification applies; qualifying statements, if any, will be found in Attachment 2 to this narrative.

Batch and Analytical Batch Designation

A Quality Control (QC) Batch is a seven-digit number that associates all samples that have been prepared together (or analyzed together if there is no preparation). Quality Control batches are limited to no more than twenty samples, excluding batch QC (method blanks, control spikes, etc.). Some batches may contain multiple sets of method blanks (BLK) and laboratory control samples (BS), where a set of method quality control analyses were prepared in concert with each set of samples on a given day.

An Analytical Batch (or Sequence) is a seven-digit number that associates all samples analyzed as a set under one analytical run.

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Individual sample results relate only to the sample tested.
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SDG CASE NARRATIVE

Attachment 2
Statement of Data Qualifications

Semivolatile Organic Compounds by EPA Method 8270C

Qualification: The MS and/or MSD recovery was outside the control limit. The non-spiked sample concentration for the same analyte was less than 4 times the spiked amount; the non-spiked sample result is considered estimated.

Analysis: USEPA-8270C

Sample/Analyte:	
0811328-15 13SB19C	Benzo(b)fluoranthene
0811328-15 13SB19C	Bis(2-ethylhexyl) Phthalate
0811328-15 13SB19C	Butyl Benzyl Phthalate
0811328-15 13SB19C	Di-n-octyl Phthalate
0811328-15RE1 13SB19C	Di-n-butyl Phthalate
0811331-03 13SB17C	3-Nitroaniline
0811331-03 13SB17C	Benzo(b)fluoranthene
0811331-03 13SB17C	Bis(2-ethylhexyl) Phthalate
0811331-03 13SB17C	Diethyl Phthalate
0811331-03 13SB17C	Di-n-butyl Phthalate
0811331-03 13SB17C	Indeno(1,2,3-cd)pyrene
0811331-03RE1 13SB17C	Bis(2-ethylhexyl) Phthalate

Qualification: The RPD between the MS and MSD results exceeded the control limit. The non-spiked sample concentration for the same analyte was less than 4 times the spiked amount; the non-spiked sample result is considered estimated.

Analysis: USEPA-8270C

Sample/Analyte:	
0811328-15 13SB19C	4-Nitrophenol
0811328-15 13SB19C	Caprolactam
0811328-15 13SB19C	Hexachloroethane
0811331-03 13SB17C	3,3'-Dichlorobenzidine
0811331-03 13SB17C	3-Nitroaniline
0811331-03 13SB17C	4-Chloroaniline
0811331-03 13SB17C	4-Nitrophenol
0811331-03 13SB17C	Diethyl Phthalate
0811331-03 13SB17C	Di-n-butyl Phthalate
0811331-03 13SB17C	Pentachlorophenol

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SDG CASE NARRATIVE

Attachment 2
Statement of Data Qualifications

Semivolatile Organic Compounds by EPA Method 8270C

Qualification: The MS or MSD recovery, but not both, was outside the control limit. The RPD is within the control limit. The unspiked sample result is considered estimated.

Analysis: USEPA-8270C

Sample/Analyte:	
0811331-03 13SB17C	Benzo(a)pyrene
0811331-03RE1 13SB17C	Di-n-butyl Phthalate

Qualification: The MS and/or MSD recovery was less than 10%. The non-spiked sample concentration for the same analyte was less than 4 times the spiked amount. The non-spiked sample result is considered unusable.

Analysis: USEPA-8270C

Sample/Analyte:	
0811328-15 13SB19C	2,4-Dinitrophenol
0811328-15 13SB19C	4,6-Dinitro-2-methylphenol
0811328-15 13SB19C	4-Nitrophenol
0811328-15 13SB19C	Hexachlorocyclopentadiene
0811328-15 13SB19C	Hexachloroethane
0811328-15RE1 13SB19C	Bis(2-ethylhexyl) Phthalate
0811331-03 13SB17C	2,4-Dinitrophenol
0811331-03 13SB17C	4,6-Dinitro-2-methylphenol
0811331-03 13SB17C	4-Chloroaniline
0811331-03 13SB17C	4-Nitrophenol
0811331-03 13SB17C	Hexachlorocyclopentadiene
0811331-03 13SB17C	Hexachloroethane

Qualification: The LCS recovery exceeded the control limit but it was within the marginal exceedance for a compound that is not a project-specific analyte of concern. The result for this analyte in any sample from the associated QC batch is not considered qualified.

Analysis: USEPA-8270C

Sample/Analyte:	
0811328-01 13SB13A	Bis(2-ethylhexyl) Phthalate
0811328-01RE1 13SB13A	Bis(2-ethylhexyl) Phthalate

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SDG CASE NARRATIVE

Attachment 2
Statement of Data Qualifications

Semivolatile Organic Compounds by EPA Method 8270C

Sample/Analyte:		
	0811328-02 13SB13C	Bis(2-ethylhexyl) Phthalate
	0811328-03 13SB21C	Bis(2-ethylhexyl) Phthalate
	0811328-04 13SB14A	Bis(2-ethylhexyl) Phthalate
	0811328-05 EQBK-1	Caprolactam
	0811328-06 13SB20A	Bis(2-ethylhexyl) Phthalate
	0811328-07 13SB20C	Bis(2-ethylhexyl) Phthalate
	0811328-08 13SB22A	Bis(2-ethylhexyl) Phthalate
	0811328-09 13SB22C	Bis(2-ethylhexyl) Phthalate
	0811328-10 13SB21A	Bis(2-ethylhexyl) Phthalate
	0811328-11 13SB18A	Bis(2-ethylhexyl) Phthalate
	0811328-12 13SB18C	Bis(2-ethylhexyl) Phthalate
	0811328-13 EQBK-5	Caprolactam
	0811328-14 13SB19A	Bis(2-ethylhexyl) Phthalate
	0811328-15 13SB19C	Bis(2-ethylhexyl) Phthalate
	0811331-01 EQBK-6	Caprolactam
	0811331-02 13SB17A	Bis(2-ethylhexyl) Phthalate
	0811331-03 13SB17C	Bis(2-ethylhexyl) Phthalate
	0811331-04 13SB16A	Bis(2-ethylhexyl) Phthalate
	0811331-05 13SB16C	Bis(2-ethylhexyl) Phthalate
	0811331-06 13SB15A	Bis(2-ethylhexyl) Phthalate
	0811331-07 DUP-13	Bis(2-ethylhexyl) Phthalate

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SDG CASE NARRATIVE

Attachment 2
Statement of Data Qualifications

Semivolatile Organic Compounds by EPA Method 8270C

Sample/Analyte: 0811331-07RE1 DUP-13 — Bis(2-ethylhexyl) Phthalate

Qualification: The LCS recovery exceeded both the control limit and the marginal exceedance for a compound that is not a project-specific analyte of concern. The result for this analyte in any sample from the associated QC batch is considered qualified.

Analysis: USEPA-8270C

Sample/Analyte:	
0811328-01 13SB13A	Di-n-butyl Phthalate
0811328-01RE1 13SB13A	Di-n-butyl Phthalate
0811328-02 13SB13C	Di-n-butyl Phthalate
0811328-03 13SB21C	Di-n-butyl Phthalate
0811328-04 13SB14A	Di-n-butyl Phthalate
0811328-06 13SB20A	Di-n-butyl Phthalate
0811328-07 13SB20C	Di-n-butyl Phthalate
0811328-08 13SB22A	Di-n-butyl Phthalate
0811328-09 13SB22C	Di-n-butyl Phthalate
0811328-10 13SB21A	Di-n-butyl Phthalate
0811328-11 13SB18A	Di-n-butyl Phthalate
0811328-12 13SB18C	Di-n-butyl Phthalate
0811328-14 13SB19A	Di-n-butyl Phthalate
0811328-15 13SB19C	Di-n-butyl Phthalate
0811331-02 13SB17A	Di-n-butyl Phthalate
0811331-03 13SB17C	Di-n-butyl Phthalate
0811331-04 13SB16A	Di-n-butyl Phthalate
0811331-05 13SB16C	Di-n-butyl Phthalate
0811331-06 13SB15A	Di-n-butyl Phthalate
0811331-07 DUP-13	Di-n-butyl Phthalate
0811331-07RE1 DUP-13	Di-n-butyl Phthalate

Qualification: The analyte concentration in the associated MB for this common lab contaminant was greater than or equal to the RL. The positive sample result, which was less than 5 times the MB value, is considered estimated.

Analysis: USEPA-8270C

Sample/Analyte: 0811328-01 13SB13A — Bis(2-ethylhexyl) Phthalate

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SDG CASE NARRATIVE

Attachment 2
Statement of Data Qualifications

Semivolatile Organic Compounds by EPA Method 8270C

Sample/Analyte:	0811328-01RE1 13SB13A	Bis(2-ethylhexyl) Phthalate
	0811328-02 13SB13C	Bis(2-ethylhexyl) Phthalate
	0811328-03 13SB21C	Bis(2-ethylhexyl) Phthalate
	0811328-04 13SB14A	Bis(2-ethylhexyl) Phthalate
	0811328-06 13SB20A	Bis(2-ethylhexyl) Phthalate
	0811328-07 13SB20C	Bis(2-ethylhexyl) Phthalate
	0811328-08 13SB22A	Bis(2-ethylhexyl) Phthalate
	0811328-09 13SB22C	Bis(2-ethylhexyl) Phthalate
	0811328-10 13SB21A	Bis(2-ethylhexyl) Phthalate
	0811328-11 13SB18A	Bis(2-ethylhexyl) Phthalate
	0811328-12 13SB18C	Bis(2-ethylhexyl) Phthalate
	0811328-14 13SB19A	Bis(2-ethylhexyl) Phthalate
	0811328-15 13SB19C	Bis(2-ethylhexyl) Phthalate
	0811331-02 13SB17A	Bis(2-ethylhexyl) Phthalate
	0811331-03 13SB17C	Bis(2-ethylhexyl) Phthalate
	0811331-04 13SB16A	Bis(2-ethylhexyl) Phthalate
	0811331-05 13SB16C	Bis(2-ethylhexyl) Phthalate
	0811331-06 13SB15A	Bis(2-ethylhexyl) Phthalate
	0811331-07 DUP-13	Bis(2-ethylhexyl) Phthalate

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SDG CASE NARRATIVE

Attachment 2
Statement of Data Qualifications

Semivolatile Organic Compounds by EPA Method 8270C

Qualification: The analyte concentration in the MB for this common lab contaminant was greater than 1/2 the RL, but less than the RL. The positive sample result, which was less than 5 times the MB value, is considered estimated.

Analysis: USEPA-8270C

Sample/Analyte:	
0811328-02 13SB13C	Di-n-butyl Phthalate
0811328-03 13SB21C	Di-n-butyl Phthalate
0811328-04 13SB14A	Di-n-butyl Phthalate
0811328-06 13SB20A	Di-n-butyl Phthalate
0811328-07 13SB20C	Di-n-butyl Phthalate
0811328-08 13SB22A	Di-n-butyl Phthalate
0811328-09 13SB22C	Di-n-butyl Phthalate
0811328-10 13SB21A	Di-n-butyl Phthalate
0811328-11 13SB18A	Di-n-butyl Phthalate
0811328-12 13SB18C	Di-n-butyl Phthalate
0811328-14 13SB19A	Di-n-butyl Phthalate
0811328-15 13SB19C	Di-n-butyl Phthalate
0811331-02 13SB17A	Di-n-butyl Phthalate
0811331-03 13SB17C	Di-n-butyl Phthalate
0811331-04 13SB16A	Di-n-butyl Phthalate
0811331-05 13SB16C	Di-n-butyl Phthalate
0811331-06 13SB15A	Di-n-butyl Phthalate

Qualification: Concentration exceeds calibration range

Analysis: USEPA-8270C

Sample/Analyte:	
0811328-01 13SB13A	Diethyl Phthalate
0811328-01 13SB13A	Di-n-butyl Phthalate
0811331-07 DUP-13	2,4-Dinitrotoluene
0811331-07 DUP-13	Diethyl Phthalate
0811331-07 DUP-13	Di-n-butyl Phthalate
0811331-07 DUP-13	N-Nitroso-diphenylamine

Qualification: The EPA hold time for analysis was exceeded and the sample result(s) are considered estimated.

Analysis: USEPA-8270C

Sample/Analyte: 0811328-01RE2 13SB13A

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SDG CASE NARRATIVE

Attachment 2
Statement of Data Qualifications

Semivolatile Organic Compounds by EPA Method 8270C

Sample/Analyte: 0811328-02RE1 13SB13C
0811328-03RE1 13SB21C
0811328-04RE1 13SB14A
0811328-06RE1 13SB20A
0811328-06RE2 13SB20A
0811328-07RE1 13SB20C
0811328-08RE1 13SB22A
0811328-09RE1 13SB22C
0811328-10RE1 13SB21A
0811328-11RE1 13SB18A
0811328-12RE1 13SB18C
0811328-14RE1 13SB19A
0811328-15RE1 13SB19C
0811331-02RE1 13SB17A
0811331-02RE2 13SB17A
0811331-03RE1 13SB17C
0811331-04RE1 13SB16A
0811331-05RE1 13SB16C
0811331-06RE1 13SB15A
0811331-07RE2 DUP-13

Qualification: The analyte concentration in the associated MB for this common lab contaminant was greater than or equal to 1/2 the RL. The positive sample result, which was greater than 5 times the MB value, is not considered estimated.

Analysis: USEPA-8270C

Sample/Analyte: 0811328-01RE1 13SB13A — Di-n-butyl Phthalate
0811331-07RE1 DUP-13 — Di-n-butyl Phthalate

Qualification: The result for 2,4-dinitrotoluene is significantly lower in the re-extract.

Analysis: USEPA-8270C

Sample/Analyte: 0811331-07RE2 DUP-13

Qualification: The result for this compound is considered estimated due to internal standard failure.

Analysis: USEPA-8270C

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SDG CASE NARRATIVE

Attachment 2
Statement of Data Qualifications

Semivolatile Organic Compounds by EPA Method 8270C

Sample/Analyte:	0811328-06RE1 13SB20A	Bis(2-ethylhexyl) Phthalate
	0811328-06RE1 13SB20A	Di-n-butyl Phthalate
	0811331-02RE1 13SB17A	Bis(2-ethylhexyl) Phthalate

Qualification: This sample was analyzed at a dilution due to internal standard failure.

Analysis: USEPA-8270C

Sample/Analyte: 0811328-06RE2 13SB20A
0811331-02RE2 13SB17A

Qualification: The analyte concentration in the sample exceeded the calibrated range of the instrument. The sample result is considered estimated.

Analysis: USEPA-8270C

Sample/Analyte:	0811328-01 13SB13A	Diethyl Phthalate
	0811328-01 13SB13A	Di-n-butyl Phthalate
	0811331-07 DUP-13	2,4-Dinitrotoluene
	0811331-07 DUP-13	Diethyl Phthalate
	0811331-07 DUP-13	Di-n-butyl Phthalate
	0811331-07 DUP-13	N-Nitroso-diphenylamine

Qualification: One or more surrogate recoveries in the GC/MS SVOC acid and/or base-neutral fraction(s) for the sample exceeded the upper control limit. Positive results from the same fraction are considered estimated, non-detect results are not qualified.

Analysis: USEPA-8270C

Sample/Analyte: 0811328-06RE1 13SB20A

Qualification: Surrogate results are unavailable due to positive results in the sample, resulting in a dilution. Surrogate concentrations were diluted below the calibration range.

Analysis: USEPA-8270C

Sample/Analyte: 0811331-07RE1 DUP-13

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SDG CASE NARRATIVE

Attachment 2
Statement of Data Qualifications

Nitroaromatics & Nitramines by EPA Method 8330

Qualification: The MS and/or MSD recovery was outside the control limit. The non-spiked sample concentration for the same analyte was less than 4 times the spiked amount; the non-spiked sample result is considered estimated.

Analysis: USEPA-8330

Sample/Analyte: 0811331-03 13SB17C — 2,4-Dinitrotoluene

Qualification: The RPD between the MS and MSD results exceeded the control limit. The non-spiked sample concentration for the same analyte was less than 4 times the spiked amount; the non-spiked sample result is considered estimated.

Analysis: USEPA-8330

Sample/Analyte: 0811331-03 13SB17C — 2,4-Dinitrotoluene

Qualification: The MS or MSD recovery, but not both, was outside the control limit. The RPD is within the control limit. The unspiked sample result is considered estimated.

Analysis: USEPA-8330

Sample/Analyte: 0811328-15 13SB19C — 2,6-Dinitrotoluene

Qualification: The RPD between the detected values from the primary and confirmation analyses exceeded 40%. The higher concentration result has been reported.

Analysis: USEPA-8330

Sample/Analyte: 0811328-01 13SB13A — 2,4,6-Trinitrotoluene
0811331-06 13SB15A — 2,6-Dinitrotoluene

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SDG CASE NARRATIVE

Attachment 2
Statement of Data Qualifications

Nitroglycerine by EPA Method 8332

Qualification: The RPD between the detected values from the primary and confirmation analyses exceeded 40%. The higher concentration result has been reported.

Analysis: USEPA-8332

Sample/Analyte: 0811328-02 13SB13C Nitroglycerin

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SDG CASE NARRATIVE

Attachment 2
Statement of Data Qualifications

Total Metals by EPA 6000/7000 Series Methods

Qualification: The MS and/or MSD recovery was outside the control limit. The non-spiked sample concentration for the same analyte was less than 4 times the spiked amount; the non-spiked sample result is considered estimated.

Analysis: USEPA-6020A

Sample/Analyte:	
0811328-15 13SB19C	Lead
0811331-03 13SB17C	Selenium

Qualification: The MS or MSD recovery, but not both, was outside the control limit. The RPD is within the control limit. The unspiked sample result is considered estimated.

Analysis: USEPA-6010B

Sample/Analyte:	
0811331-03 13SB17C	Barium

Analysis: USEPA-6020A

Sample/Analyte:	
0811331-03 13SB17C	Arsenic

Qualification: The analyte concentration in the associated MB was greater than or equal to 1/2 the RL. The positive sample result, which was greater than 5 times the MB value, is not considered estimated.

Analysis: USEPA-6010B

Sample/Analyte:	
0811331-02 13SB17A	Calcium
0811331-03 13SB17C	Calcium
0811331-04 13SB16A	Calcium
0811331-05 13SB16C	Calcium
0811331-06 13SB15A	Calcium
0811331-07 DUP-13	Calcium

Qualification: The % difference in results between the sample and a serial dilution of the sample exceeded the control limit. Sample matrix interference is suspected and the reported result is considered estimated.

Analysis: USEPA-6010B

Sample/Analyte:	
0811331-03 13SB17C	Aluminum

Analysis: USEPA-6020A

Sample/Analyte:	
0811331-03 13SB17C	Nickel

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SDG CASE NARRATIVE

Attachment 2
Statement of Data Qualifications

Total Metals by EPA 6000/7000 Series Methods

Qualification: This analyte was not present in this sample at a concentration greater than 50 times the MDL, therefore serial dilution is not required.

Analysis: USEPA-6010B

Sample/Analyte:		
	0811328-15 13SB19C	Cobalt
	0811331-03 13SB17C	Cobalt

Qualification: This analyte was not present in this sample at a concentration greater than 100 times the MDL, therefore serial dilution is not required.

Analysis: USEPA-6020A

Sample/Analyte:		
	0811331-03 13SB17C	Selenium
	0811331-03 13SB17C	Silver
	0811331-03 13SB17C	Thallium

Qualification: The MS and/or MSD recovery was outside the control limit. The non-spiked sample result is considered estimated.

Analysis: USEPA-6010B

Sample/Analyte:		
	0811328-15 13SB19C	Calcium
	0811331-03 13SB17C	Beryllium

Qualification: The MS and/or MSD recovery was outside the control limit. The non-spiked sample concentration for the same analyte was greater than or equal to 4 times the spiked amount; the non-spiked sample result is not qualified.

Analysis: USEPA-6010B

Sample/Analyte:		
	0811328-15 13SB19C	Aluminum
	0811328-15 13SB19C	Iron
	0811328-15 13SB19C	Manganese
	0811328-15 13SB19C	Zinc
	0811331-03 13SB17C	Aluminum
	0811331-03 13SB17C	Iron
	0811331-03 13SB17C	Manganese
	0811331-03 13SB17C	Zinc

Analysis: USEPA-6020A

Sample/Analyte:		
	0811331-03 13SB17C	Lead

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Chain of Custody Record

COC No. 126463 (B)

360440-161 (A1)

Page 4 of 4

For Lab Use Only	Client Name	Project Name
Cart: 6	URS Corp	RFAAP Swmu 13
VOA Rack/Tray:	Address: 5540 Falmouth St #201	Client Project No./P.O. No.: 11656367
Receipt Log No.: ~~25-10-26-22~~	Richmond, VA 23230	Invoice No.: ☒ Client ☐ Other (comments)
Project Chemist: MH	Phone: 804 965 9000	Contact/Report To: Lee Ann Marcel
Laboratory Project No.: 0811328	Fax: 804 965 9704	

Analyses Requested

Container Type (corresponds to Container Packing List)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted											Total	Sample Comments
											A	A	A	A									
											PB 6010B	TAL Metals	SVOCs Exp Mthd	TCL									
X	X	X	1	13SB81A	1897	11/12/08	0944		✓	SO	1												
X	X	X	2	13SB81B			0950		✓		1												
X	X	X	3	13SB80A			1210		✓		1												
X	X	X	4	13SB80B MS/MSD			1213		✓		1												
X	X	X	5	13SB83A			0930		✓		1												
X	X	X	6	13SB83B			0933		✓		1												
(2)	SO	01	7	13SB13A			1000		✓			1	1	1									
(1)	|	02	8	13SB13C			1018		✓			1	1										
(1)	|	03	9	13SB21C			1226		✓			1	1										
(1)	|	04	10	13SB14A			1600		✓			1	1										

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Sampled By (print)	How Shipped? Hand Carrier FedEx	Comments
Kelly Hicks	Tracking No.	
Sampler's Signature		

Company	1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
URS Corp		11/13/08	1657						
	1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
								11/14/08	0900

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Chain of Custody Record

COC No. 126474 (B)

36440-101 (All)

For Lab Use Only
Cart: 4
VOA Rack/Tray:
Receipt Log No.: ~~25-10~~ 26-22
Project Chemist: CMH
Laboratory Project No.: 0811328

Client Name: URS Corp
Address: 5540 Falmouth St #201
Richmond, VA 23230
Phone: 804 965 9000
Fax: 804 965 9764

Project Name: KFTAP Summ 13
Client Project No./P.O. No.: 11655367
Invoice No.: ~~Client~~ Other (comments)
Contact/Report To: Leeann Marek

Page 1 of 1

⇦ PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Analyses Requested

Container Type (corresponds to Container Packing List)	B	A	A	A	X	B						
	TAL Metals	SVOCs	NG	Explosives	Extra	PD Metals						
Number of Containers Submitted	1	1	1	1	2	1					Total	

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix											Sample Comments
04	WQ	05	1	EGBK-1	2144	11/12/08	1700		✓	W	1	1	1	1	2						*
x	x	x x	2	EGBK-2	↓	↓	1715		✓	↓						1					
x	x	x x	3	EGBK-3	↓	↓	1720		✓	↓						1					
			4																		
			5																		
			6																		
			7																		
			8																		
			9																		
			10																		

Sampled By (print): Kelly Hicks
Sampler's Signature:
Company: URS Corp

How Shipped? Hand Carrier
Tracking No.

Comments: * Expln number received without label.

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	11/13/08	1607						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
							11/14/08	0900

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Chain of Custody Record

COC No. 126486 (B)

36440-61 (All)

Page 3 of 4

For Lab Use Only
Cart: 6
VOA Rack/Tray: —
Receipt Log No.: ~~25-44~~ 26-22
Project Chemist: LMH
Laboratory Project No.: 0811328

Client Name: URS
Address: Richmond
Phone:
Fax:

Project Name: RRAAP SWMU 13
Client Project No./P.O. No.:
Invoice No.: ☐ Client ☐ Other (comments)
Contact/Report To:

Analyses Requested

Container Type (corresponds to Container Packing List): Pb 6010B; SVOC 8270C; Nitro 8330; Explosives 8330; TRHwMRB 418.1; TOC

PRESERVATIVES
A NONE pH<7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted									Total	Sample Comments
X	X	X	1	135B29A	2173	11/12/08	1335		X	S	1									1	
X	X	X	2	135B32A			1450		X		1									1	
(1)	(SO)	06	3	135B20A			1434		X			1	1	1	1					4	
(2)		07	4	135B20C			1449		X			1	1	1	1	1				5	
(1)		08	5	135B22A			1320		X			1	1	1	1					4	
(1)		09	6	135B22C			1325		X			1	1	1	1					4	
(1)		10	7	135B21A			1321		X			1	1	1	1					4	
X	X	X	8	Dup-3			—		X		(1)	+ LMH								1	
X	X	X	9	Dup-4			—		X		(1)	+ LMH								1	
X	X	X	10	Dup-5			—		X		(1)	+ LMH								1	

Sampled By (print): Kelly Hicks LMH
Sampler's Signature:
How Shipped? Hand Carrier
Tracking No.

Comments

Company

1. Relinquished By: [signature] Date: 11/13/08 Time: 1607
1. Received By: Date: Time:
2. Relinquished By: Date: Time:
2. Received By: Date: Time:
3. Relinquished By: Date: Time:
3. Received For Lab By: [signature] Date: 11/14/08 Time: 0900

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Chain of Custody Record

COC No. 126476 (B)

36440-61

Page 2 of 2

For Lab Use Only

Cart: 6

VOA Rack/Tray:

Receipt Log No.: ~~25-10~~-2622

Project Chemist: (MH

Laboratory Project No.: 0811328

Client Name: URS Corp

Address: 5540 Falmouth St. #201

Richmond, VA 23230

Phone: 804 965 9000

Fax: 804 965 9764

Project Name: RFHAP Summ 13

Client Project No./P.O. No.: 11650367

Invoice No.: ☒ Client ☐ Other (comments)

Contact/Report To: Lee Ann Munck

Analyses Requested

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted									Total	Sample Comments
											Pb 6010B	SVOC 8270C	NO & 332	Exp 18 330	TAL Metals	TOC					
X	X	X	1	DUP-8	1257	11/13/08			✓	SO	1									1	
X	X	X	2	13SB38C	1257	11/13/08	1435		✓	SO	1									1	
X	X	X	3	13SB67A 13SB67A		11/13/08	1444		✓	SO	1									1	
X	X	X	4	13SB67B 13SB67B		11/13/08	1448		✓	SO	1									1	
X	X	X	5	13SB41A	1257	11/13/08	1502		✓	SO	1									1	
X	X	X	6	13SB41B	1257	11/13/08	1508		✓	SO	1									1	
(2)	SO	11	7	13SB18A	1257	11/13/08	1521		✓	SO		1	1	1	1	1				3	
(1)	SO	12	8	13SB18C 13SB18C	1257	11/13/08	1529		✓	SO		1	1	1	1					2	
(04)	WQ	13	9	EQBK-5		11/13/08	1600			WQ		1	1	1	1					4	(MH)
			10																		

Container Type (corresponds to Container Packing List)

Number of Containers Submitted

PRESERVATIVES

A NONE pH<2
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Sampled By (print): Kelly Hicks

Sampler's Signature: K Hicks

Company: URS Corp

How Shipped? Hand Carrier FedEx

Tracking No.:

Comments:

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
K Hicks	11/13/08	1614						
1. Received By	**Date**	**Time**	**2. Received By**	**Date**	**Time**	**3. Received For Lab By**	**Date**	**Time**
						Lisa Tomeyer	11/14/08	0900

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Chain of Custody Record

COC No. 126470 (B)

36440-61

Page 1 of 3

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Cart: 6
VOA Rack/Tray: /
Receipt Log No.: ~~2510~~ 26-22
Project Chemist: MH
Laboratory Project No.: 0811328

Client Name: URS Corp
Address: 5540 Falmouth St #201
Richmond, VA 23230
Phone: 804 965 9000
Fax: 804 965 9764

Project Name: RFAAP Slump 13
Client Project No./P.O. No.: 11056307
Invoice No.: ☒ Client ☐ Other (comments)
Contact/Report To: Lee Ann Mancuso

Analyses Requested

A	A	A								
PD 6010B	TAL Metals	SVOCs, NB, Expl								

Container Type (corresponds to Container Packing List)

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted										Total	Sample Comments
X	X	X	1	13SB72A	2145	11/3/08	1145		✓	SO	1											
X	X	X	2	13SB72B			1148		✓		1											
X	X	X	3	13SB72C			1150		✓		1											
X	X	X	4	13SB35A			1156		✓		1											
X	X	X	5	13SB35B			1205		✓		1											
X	X	X	6	13SB35C			1212		✓		1											
(1)	SO	14	7	13SB19A			1222		✓			1	1									
(B)	SO	15	8	13SB19C MS/MSD			1227		✓			1	1									Spike
X	X	X	9	13SB39(6)A			1237		✓		1											
X	X	X	10	DUP-7					✓		1											

Sampled By (print): Kelly Hicks
Sampler's Signature: [signature]
Company: URS Corp

How Shipped? Hand Carrier FedEx
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
[signature]	11/13/08	1600						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						[signature]	11/14/08	0900

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Chain of Custody Record

COC No. 126466 B

360440-61

Page 1 of 1

For Lab Use Only

Cart: 7

VOA Rack/Tray: —

Receipt Log No.: 27-34

Project Chemist: LMH

Laboratory Project No.: 0811331

Client Name: URS Corp

Address: 5540 Falmouth St #201

Richmond, VA 23230

Phone: 804 965 9000

Fax: 804 965 9764

Project Name: RFAAP SWMU 13

Client Project No./P.O. No.: 11656367

Invoice No.: ~~Client~~ Other (comments)

Contact/Report To: Lee Anne Marcek

Analyses Requested

B	A	A	A	B					
TAL Metals	Explosives	SVOCs	NG	Pb 6010B					

Container Type (corresponds to Container Packing List)

PRESERVATIVES
A NONE pH<7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID LMH	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted										Total	Sample Comments
04	WO	01	1	EQBK-56	1851	11/14/08	1520		✓	W	1	1	1	1								
X	XX		2	EQBK-57	↓	↓	1525		✓	↓					1							
	X	XX	3	EQBK-58			1530		✓						1							
	X	XX	4	EQBK-59			1535		✓						1							
			5																			
			6																			
			7																			
			8																			
			9																			
			10																			

Sampled By (print): Kelly Hicks

Sampler's Signature: [signature]

Company: URS Corp

How Shipped? Hand Carrier FedEx

Tracking No.:

Comments:

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
[signature]	11/14/08	1630						
1. Received By	**Date**	**Time**	**2. Received By**	**Date**	**Time**	**3. Received For Lab By**	**Date**	**Time**
						[signature]	11/15/08	0850

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Chain of Custody Record

COC No. 126467B

Page 2 of 4

3d4L1D-101

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Cart: 7
VOA Rack/Tray: —
Receipt Log No.: 27-34
Project Chemist: MH
Laboratory Project No.: 0811331

Client Name: URS Corp
Address: 5540 Falmouth St. #201
Richmond, VA 23230
Phone: 804 965 9000
Fax: 804 965 9764

Project Name: RFAAP SWMU 13
Client Project No./P.O. No.: 11653367
Invoice No.: ☒ Client ☐ Other (comments)
Contact/Report To: Lee Ann Mareck

Analyses Requested

A	A	A									
6010/7000	TAL Metals	SVOCs, Expl. NG									

Container Type (corresponds to Container Packing List)

PRESERVATIVES
A NONE pH>7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted			Total	Sample Comments
X	X	X	1	135B48A	1564	11/4/08	0948		✓	SO	1				
X	X	X	2	135B48B			0950		✓		1				
X	X	X	3	135B48C			0956		✓		1				
①	SO	02	4	135B17A			1005		✓			1	1		
②	SO	03	5	135B17C MS/MSD			1015		✓			1	1		
X	X	X	6	135B48A			1216		✓		1				
X	X	X	7	135B48B			1220		✓		1				
X	X	X	8	135B48C			1225		✓		1				
X	X	X	9	135B58A			1240		✓		1				
X	X	X	10	DUP-12			—		✓		1				

Sampled By (print): Kelly Hicks
Sampler's Signature: [signature]
Company: URS Corp

How Shipped? Hand Carrier FedEx
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
1. Received By	**Date**	**Time**	**2. Received By**	**Date**	**Time**	**3. Received For Lab By**	**Date**	**Time**
						Lyn Lomeyer	11/15/08	0850

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Chain of Custody Record

COC No. 126461 B

360440-61

Page 3 of 4

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Cart: 7
VOA Rack/Tray:
Receipt Log No.: 27-3 4
Project Chemist: MH
Laboratory Project No.: 0811331

Client Name: URS Corp
Address: 5540 Falmouth St. #201
Richmond, VA 23230
Phone: 804 965 9000
Fax: 804 965 9764

Project Name: RFAAP SWMU 13
Client Project No./P.O. No.: 11651367
Invoice No.: ☑ Client ☐ Other (comments)
Contact/Report To: Leeanne Marcek

Analyses Requested

Container Type (corresponds to Container Packing List)	A	A	A	A								
	Pb, Cr, CB	TAL Metals	SVOCs, NG, Expl	TOC								

PRESERVATIVES
A NONE pH<2
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted										Total	Sample Comments
X		x x	1	13SB58B	1566	11/14/08	1245		✓	SO	1											
X		x x	2	13SB51A			1250		✓		1											
X		x x	3	13SB51B			1255		✓		1											
D	SO	04	4	13SB16A			1300		✓			1	1									
D2	SO	05	5	13SB16C			1308		✓			1	1	1								
X		x x	6	13SB52A			1325		✓		1											
X		x x	7	13SB52B			1330		✓		1											
X		x x	8	13SB56A			1335		✓		1											
X		x x	9	13SB56B			1340		✓		1											
X		x x	10	DUP-14			—		✓		1											

Sampled By (print): Kelly Hicks
Sampler's Signature:
Company: URS Corp

How Shipped? Hand Carrier: FedEx
Tracking No.:

Comments:

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	11/14/08	1504						
1. Received By	**Date**	**Time**	**2. Received By**	**Date**	**Time**	**3. Received For Lab By**	**Date**	**Time**
							11/15/08	0850

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Chain of Custody Record

COC No. 126477B

36440-61

For Lab Use Only

Cart: 7
VOA Rack/Tray:
Receipt Log No.: 27-4
Project Chemist: CMH
Laboratory Project No.: 0811331

Client Name: URS
Address: 5540 Falmouth St. Suite 201
Richmond, VA 23230
Phone 804.965.9000
Fax 804.965.9764

Project Name: RF AAP SWMU 13
~~11656367~~
Client Project No./P.O. No.: 11656367
Invoice No. ☑ Client ☐ Other (comments)
Contact/Report To: Lee Anne Mareck

Page 2 of 4

Analyses Requested

A	A	A	A	A	A
PB 6010B	SVOC 8270C	NG 8332	EXP 6010	TAL Metals	TOC

⇦ PRESERVATIVE
A NONE pH<7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<
E NaOH pH>12
F ZnAc/NaOH pH>
G MeOH
H Other (note below

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Container Type (corresponds to Container Packing List)	Number of Containers Submitted										Total	Sample Comments
X	X	X	1	135B61A	1422	11/14/08	1008		✓	SO		1										1	
X	X	X	2	135B61B		11/14/08	1011		✓	SO		1										1	
X	X	X	3	135B47A		11/14/08	1017		✓	SO		1										1	
X	X	X	4	135B47B		11/14/08	1021		✓	SO		1										1	
X	X	X	5	135B60A		11/14/08	1219		✓	SO		1										1	
X	X	X	6	135B60B		11/14/08	1223		✓	SO		1										1	
X	X	X	7	135B49A		11/14/08	1230		✓	SO		1										1	
(2)	SO		8	135B15A		11/14/08	1253		✓	SO		1	0	0	1	1						3	
(DS)	SO		9	DUP-13		11/14/08	—		✓	SO		1	1	1	1	1						3	
X	X	X	10	135B59A		11/14/08	1302		✓	SO		1										1	

Sampled By (print): Kelly Hicks
Sampler's Signature:
Company: URS Corp

How Shipped? Hand Carrier FedEx
Tracking No.

Comments: per K.H. 11.17.08

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	11/14/08	1506						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
							11/15/08	0850

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TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST
ADDITIONAL COOLER INFORMATION 364076

Recorded by (initials/date)	Client	Project-Submittal No.
LL 11/14/08	URS Corp	0811328
	Receipt Log No. ~~25~~ 1026-22 / Sample Nos. 01-15	Project Chemist MH

Cooler No. 2145 — Time 1350

Custody Seals
- ☐ none
- ☑ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant/Temperature Taken Via:
- ☑ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1	2.8	—	2.8
2	5.5	—	5.5
3	7.1		7.1
		Average °C	5.1

- ☑ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant/Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
		Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Comments

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: LyES Corp
Project-Submittal No.: new / add to 0811328
Receipt Record Page/Line No.: ~~25-10~~ 26-22
Project Chemist: MH
Sample Nos.: 01-15 30440-41

Coolers Received

Received by (initials/date): LR 11/14/08

- [x] Cooler
- [ ] Box
- [ ] Other

Qty Received: 5

Thermometer Used: [x] IR Gun (#202) [ ] Digital Thermometer (#54) [ ] Other (#_____)

[ ] See Additional Cooler Information Form

Cooler No.	Time	Custody Seals	Coolant Location	Coolant/Temperature Taken Via	Alternate Temperature Taken Via	Recorded °C	Correction Factor °C	Actual °C	Average °C	Cooler ID on COC?	VOC trip blank received?
1897	1220	[x] present / intact	Dispersed / Top / Middle / Bottom	[x] loose ice / avg 2-3 containers	[ ] temperature blank (tb)	tb: 7.8	–	7.8	6.6	[x]	[ ]
						1: 7.8	–	7.8			
						2: 8.4	–	8.4			
						3: 3.7	–	3.7			
2173	1256	[x] present / intact	Dispersed / Top / Middle / Bottom	[x] loose ice / avg 2-3 containers	[x] temperature blank (tb)	tb: 7.0	–	7.0	7.7	[ ]	[ ]
						1: 4.7	–	4.7			
						2: 8.9	–	8.9			
						3: 7.6	–	7.6			
1257	1320	[x] present / intact	Dispersed / Top / Middle / Bottom	[x] loose ice / avg 2-3 containers	[ ] temperature blank (tb)	tb: 4.0	–	4.0	4.4	[x]	[ ]
						1: 4.6	–	4.6 low			
						2: 4.8	–	4.8			
						3: 3.8	–	3.8			
2144	1328	[x] present / intact	Dispersed / Top / Middle / Bottom	[x] loose ice / avg 2-3 containers	[x] temperature blank (tb)	tb: 3.8	–	3.8	4.8	[x]	[ ]
						1: 4.8	–	4.8			
						2: 5.4	–	5.4			
						3: 4.1	–	4.1			

If any shaded areas checked, complete Sample Receiving Non-Conformance Form

Paperwork Received

[ ] No COC received

N/A	Yes	No	
	[x]	[ ]	Chain of Custody Record(s)?
	[ ]	[x]	If No, COC initiated by _____
	[x]		Rec'd for Lab signed/date/time?
[ ]	[x]		Shipping Document?
[x]	[ ]		Other _____

COC ID Nos.

[x] TriMatrix

[ ] Other (name or ID#)_____

Check COC for Accuracy

[ ] No analysis requested

Yes	No	
[x]	[ ]	Sample ID matches COC?
[x]	[ ]	Sample date and time matches COC?
[x]		Container type completed on COC?
[x]	[ ]	All container types indicated are received?

Sample Condition Summary

[ ] Non-TriMatrix containers, see Notes

N/A	Yes	No	
	[ ]	[x]	Broken containers/lids?
	[ ]	[x]	Missing or incomplete labels?
	[ ]	[x]	Illegible information on labels?
	[ ]	[x]	Low volume received?
	[ ]	[x]	Inappropriate containers received?
[x]	[ ]	[ ]	VOC vials / TOX containers have headspace?
[ ]	[ ]	[ ]	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
	[ ]	[x]	Average sample temperature ≤6° C?
[ ]	[x]		Completed Sample Preservation Verification Form?
[ ]	[x]		Samples preserved correctly?
[x]	[ ]		If "No", added orange tag?
[x]	[ ]		Received pre-preserved VOC soils?

[ ] MeOH [ ] Na_2SO_4

Check for Short Hold-Time Prep/Analyses

- [ ] Bacteriological
- [ ] Air Bags
- [ ] EnCores / Methanol Pre-Preserved
- [ ] Formaldehyde/Aldehyde
- [ ] Green-tagged Containers
- [ ] Yellow/White-tagged 1L Ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
- [x] NONE RECEIVED
- [ ] RECEIVED, COCs TO LAB(S)

Notes

- [ ] Trip blank received [ ] Trip blank not listed on COC
- [ ] No COC received, Proj. Chemist reviewed (init./date) _____
- [ ] No analysis requested, Proj. Chemist completed (init./date) _____

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	24 Hour Clock?
11/14/08 0900	11/14/08 1355	Yes (No)

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: URS | Project-Submittal No.: new / add to 081331
Receipt Record Page/Line No.: 27-3 | Project Chemist: MH | Sample Nos.: 01-07

Coolers Received

Recorded by (initials/date): WA 11/15/08

☒ Cooler ☐ Box ☐ Other ____ | Qty Received: 3

Thermometer Used: ☒ IR Gun (#202) ☐ Digital Thermometer (#54) ☐ Other (#____) | ☐ See Additional Cooler Information Form

Cooler No.	Time	Custody Seals	Coolant Location	Coolant/Temperature Taken Via	Alternate Temperature Taken Via	Recorded °C	Correction Factor °C	Actual °C
1566	1027	☐ none ☒ present / intact ☐ present / not intact	(Dispersed) / Top / Middle / Bottom	☒ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers	☒ temperature blank (tb) ☐ 1 container	tb 3.8	—	3.8
						tb location: (representative) / in ice		
						1 5.8	—	5.8
						2 4.7	—	4.7
						3 4.8	—	4.8
							Average °C	5.1
						☒ Cooler ID on COC? ☐ VOC trip blank received?		

Cooler No.	Time	Custody Seals	Coolant Location	Coolant / Temperature Taken Via	Alternate Temperature Taken Via	Recorded °C	Correction Factor °C	Actual °C
1422	1047	☐ none ☒ present / intact ☐ present / not intact	(Dispersed) / Top / Middle / Bottom	☒ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers	☒ temperature blank (tb) ☐ 1 container	tb 3.3	—	3.3
						tb location: (representative) / in ice		
						1 4.9	—	4.9
						2 2.4	—	2.4
						3 2.3	—	2.3
							Average °C	3.2
						☒ Cooler ID on COC? ☐ VOC trip blank received?		

Cooler No.	Time	Custody Seals	Coolant Location	Coolant / Temperature Taken Via	Alternate Temperature Taken Via	Recorded °C	Correction Factor °C	Actual °C
1851	11:00	☐ none ☒ present / intact ☐ present / not intact	(Dispersed) / Top / Middle / Bottom	☒ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers	☒ temperature blank (tb) ☐ 1 container	tb 2.4	—	2.4
						tb location: (representative) / in ice		
						1 2.4	—	2.4
						2 2.2	—	2.2
						3 2.2	—	2.3
							Average °C	2.3
						☒ Cooler ID on COC? ☐ VOC trip blank received?		

Cooler No.	Time	Custody Seals	Coolant Location	Coolant / Temperature Taken Via	Alternate Temperature Taken Via	Recorded °C	Correction Factor °C	Actual °C
		☐ none ☐ present / intact ☐ present / not intact	Dispersed / Top / Middle / Bottom	☐ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers	☐ temperature blank (tb) ☐ 1 container	tb		
						tb location: representative / in ice		
						1		
						2		
						3		
							Average °C	
						☐ Cooler ID on COC? ☐ VOC trip blank received?		

If any shaded areas checked, complete Sample Receiving Non-Conformance Form

Paperwork Received

☐ No COC received

N/A	Yes	No	
	☒	☐	Chain of Custody Record(s)?
	☐		If No, COC initiated by ____
	☒		Rec'd for Lab signed/date/time?
☐	☒	☐	Shipping Document?
☒	☐		Other ____

COC ID Nos.

☒ TriMatrix

☐ Other (name or ID#)____

Check COC for Accuracy

☐ No analysis requested

Yes	No	
☒	■	Sample ID matches COC?
☒	■	Sample date and time matches COC?
☒		Container type completed on COC?
☒	■	All container types indicated are received?

Sample Condition Summary

☐ Non-TriMatrix containers, see Notes

N/A	Yes	No	
	■	☒	Broken containers/lids?
	■	☒	Missing or incomplete labels?
	■	☒	Illegible information on labels?
	■	☒	Low volume received?
	■	☒	Inappropriate containers received?
☒	■	☐	VOC vials / TOX containers have headspace?
☒	■	☐	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
	☒	■	Average sample temperature ≤6° C?
☐	☒		Completed Sample Preservation Verification Form?
☐	☒	■	Samples preserved correctly?
☒	☐		If "No", added orange tag?
☒	☐		Received pre-preserved VOC soils?

☐ MeOH ☐ Na_2SO_4

Check for Short Hold-Time Prep/Analyses

☐ Bacteriological
☐ Air Bags
☐ EnCores / Methanol Pre-Preserved
☐ Formaldehyde/Aldehyde
☐ Green-tagged Containers
☐ Yellow/White-tagged 1L Ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
☒ NONE RECEIVED
☐ RECEIVED, COCs TO LAB(S)

Notes

☐ Trip blank received ☐ Trip blank not listed on COC
☐ No COC received, Proj. Chemist reviewed (init./date) ____
☐ No analysis requested, Proj. Chemist completed (init./date) ____

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	8 Hour Goal Met?
11/15/08 0850	11/15/08 1108	Yes (No)

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING NON-CONFORMANCE REPORT

Client	URS Corp	Project-Submittal No.
Receipt Log No. 25-10	Completed By (initials/date) CR 11/14/08	Project Chemist VMH

List non-conformance issues associated with this submittal in the chart below/left. Identify discrepancies between the COC and sample tags in the chart below/right. Add comments as needed. Give to Project Chemist for immediate action.

COC ID No.	Line No.	Type of Problem: Discrepancy	Missing Container	Broken Container	Label Missing/ Incomplete	Label Illegible	Low Volume	Inappropriate Container	Headspace	Not Listed on COC	Preservation
1264716B										✓	

COC: Sample Field ID	Date Sampled	Time Sampled	Container Type	Qty	Sample Tag: Sample Field ID	Date Sampled	Time Sampled	Container Type	Qty	Line Item Comments
					EQBK-5	11/13	1600		4	3-#2 1-#6

General Comments:

T WDR EBS on COC 1264716B

Project Chemist (initials/date): VMH 11-17-08

TriMatrix Laboratories, Inc.

SAMPLE PRESERVATION VERIFICATION FORM

page ___ of ____

Client	URS Corp	Project-Submittal No.	0811328
Receipt Log No.	25-10-26-22	Completed By (initials/date)	LR 11/14/08
		Project Chemist	VM1

COC ID No. 126474

Adjusted by:_____ Date:_____

Container Type	5	4	13		3	6	15	
Tag Color	Lt. Blue	Blue	Brown		Green	Red	Red Stripe	
Preservative	NaOH	H_2SO_4	H_2SO_4		None	HNO_3	HNO_3	
Expected pH	>12	<2	<2		~7	<2	<2	
COC Line No. 1						✓		
COC Line No. 2						✓		
COC Line No. 3						✓		
COC Line No. 4								
COC Line No. 5								
COC Line No. 6								
COC Line No. 7								
COC Line No. 8								
COC Line No. 9								
COC Line No. 10								

DO NOT ADJUST pH FOR THESE CONTAINER TYPES

Comments

COC ID No. 126473

Adjusted by:_____ Date:_____

Container Type	5	4	13		3	6	15	
Tag Color	Lt. Blue	Blue	Brown		Green	Red	Red Stripe	
Preservative	NaOH	H_2SO_4	H_2SO_4		None	HNO_3	HNO_3	
Expected pH	>12	<2	<2		~7	<2	<2	
COC Line No. 1								
COC Line No. 2								
COC Line No. 3								
COC Line No. 4								
COC Line No. 5								
COC Line No. 6								
COC Line No. 7						✓		
COC Line No. 8								
COC Line No. 9								
COC Line No. 10								

DO NOT ADJUST pH FOR THESE CONTAINER TYPES

Comments

pH strip lot No. HC896537

Aqueous Samples: For each sample and container type, check the box if pH is acceptable. **If pH is not acceptable for any sample container, record pH in box, and note on Sample Receiving Checklist and on Sample Receiving Non-Conformance Form.** If approved by Project Chemist, add acid or base to the sample to achieve the correct pH. Add up to, but do not exceed 2x the volume initially added at container prep (see table below for initial volumes used). **Add orange pH tag to sample container and record information requested. Record adjusted pH on this form. Do not adjust pH for container types 3, 6, and 15.**

Container Size (mL)	Original Vol. of Preservative (mL)
Container Type 5:	NaOH
500	2.5
1000	5.0
Container Type 4:	H_2SO_4
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H_2SO_4
500	2.5

TriMatrix Laboratories, Inc.

SAMPLE PRESERVATION VERIFICATION FORM

page ___ of ___

Client	URS	Project-Submittal No.	081331
Receipt Log No.	27-3	Completed By (initials/date)	LR 11/15/08
		Project Chemist	MH

COC ID No. 126466

Adjusted by:_____ Date:_____

Container Type	5	4	13		3	6	15	
Tag Color	Lt. Blue	Blue	Brown		Green	Red	Red Stripe	
Preservative	NaOH	H_2SO_4	H_2SO_4		None	HNO_3	HNO_3	
Expected pH	>12	<2	<2		~7	<2	<2	
COC Line No. 1						✓		
COC Line No. 2						✓		
COC Line No. 3						✓		
COC Line No. 4						✓		
COC Line No. 5								
COC Line No. 6								
COC Line No. 7								
COC Line No. 8								
COC Line No. 9								
COC Line No. 10								

DO NOT ADJUST pH FOR THESE CONTAINER TYPES

Comments

COC ID No.

Adjusted by:_____ Date:_____

Container Type	5	4	13		3	6	15	
Tag Color	Lt. Blue	Blue	Brown		Green	Red	Red Stripe	
Preservative	NaOH	H_2SO_4	H_2SO_4		None	HNO_3	HNO_3	
Expected pH	>12	<2	<2		~7	<2	<2	
COC Line No. 1								
COC Line No. 2								
COC Line No. 3								
COC Line No. 4								
COC Line No. 5								
COC Line No. 6								
COC Line No. 7								
COC Line No. 8								
COC Line No. 9								
COC Line No. 10								

DO NOT ADJUST pH FOR THESE CONTAINER TYPES

Comments

pH strip lot No. ☑ HC896537 ☐

Aqueous Samples: For each sample and container type, check the box if pH is acceptable. **If pH is not acceptable for any sample container, record pH in box, and note on Sample Receiving Checklist and on Sample Receiving Non-Conformance Form.** If approved by Project Chemist, add acid or base to the sample to achieve the correct pH. Add up to, but do not exceed 2x the volume initially added at container prep (see table below for initial volumes used). **Add orange pH tag to sample container and record information requested. Record adjusted pH on this form. Do not adjust pH for container types 3, 6, and 15.**

Container Size (mL)	Original Vol. of Preservative (mL)
Container Type 5:	NaOH
500	2.5
1000	5.0
Container Type 4:	H_2SO_4
125	0.5
250	1.0
500	2.0
1000	4.0
Container Type 13	H_2SO_4
500	2.5

Official Sample Seal
CUSTODY SEAL
Signature
Site EHAPSUMW13
Date 11/13/08
TriMatrix Laboratories, Inc.
(616) 975-4500
Official Sample Seal
CUSTODY SEAL
Signature
Site EHAPSUMW13
Date 11/13/08
TriMatrix Laboratories, Inc.
(616) 975-4500
Official Sample Seal
CUSTODY SEAL
Signature
Site EHAPSUMW13
Date 11/13/08
TriMatrix Laboratories, Inc.
(616) 975-4500
Official Sample Seal
CUSTODY SEAL
Signature
Site EHAPSUMW13
Date 11/13/08
TriMatrix Laboratories, Inc.
(616) 975-4500
Official Sample Seal
CUSTODY SEAL
Signature
Site EHAPSUMW13
Date 11/13/08
TriMatrix Laboratories, Inc.
(616) 975-4500

FedEx Express US Airbill

849702868047

0200 Form ID No.

FedEx Retrieval Copy

From

Date 11/15/18 Sender's FedEx Account Number 203[illegible]27

Sender's Name Kelly Hicks Phone [illegible]

Company [illegible]

Address [illegible] Dept/Room/Suite/Room

City [illegible] State VA ZIP [illegible]

Your Internal Billing Reference [illegible]

To

Recipient's Name [illegible] Phone [illegible]

Company [illegible]

Recipient's Address [illegible] Dept/Room/Suite/Room

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address

To request a package be held at a specific FedEx location, print FedEx address here.

City [illegible] State MI ZIP [illegible]

8497 0286 8047

4a Express Package Service — Packages up to 150 lbs. * To most locations

1 [x] FedEx Priority Overnight — Next business morning* | 5 [ ] FedEx Standard Overnight — Next business afternoon* | 6 [ ] FedEx First Overnight — Earliest next business morning delivery to select locations*

3 [ ] FedEx 2Day — Second business day* | 20 [ ] FedEx Express Saver — Third business day*

FedEx Envelope rate not available. Minimum charge: One-pound rate

4b Express Freight Service — Packages over 150 lbs. ** To most locations

7 [ ] FedEx 1Day Freight* — Next business day** | 8 [ ] FedEx 2Day Freight — Second business day** | 83 [ ] FedEx 3Day Freight — Third business day**

* Call for Confirmation:

5 Packaging — * Declared value limit $500

6 [ ] FedEx Envelope* | 2 [ ] FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak | 3 [ ] FedEx Box | 4 [ ] FedEx Tube | 1 [ ] Other

6 Special Handling — Include FedEx address in Section 3.

3 [ ] SATURDAY Delivery — Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1Day Freight, and FedEx 2Day Freight to select ZIP codes

1 [ ] HOLD Weekday at FedEx Location — Not available for FedEx First Overnight

31 [ ] HOLD Saturday at FedEx Location — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.

1 [ ] No | 4 [ ] Yes — As per attached Shipper's Declaration | [ ] Yes — Shipper's Declaration not required

6 [ ] Dry Ice — Dry Ice, 9, UN 1845 ____ x ____ kg

Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging. [ ] Cargo Aircraft Only

7 Payment Bill to: Enter FedEx Acct. No. or Credit Card No. below. Obtain Recip. Acct. No. [ ]

1 [x] Sender — Acct. No. in Section 1 will be billed | 2 [ ] Recipient | 3 [ ] Third Party | 4 [ ] Credit Card | 5 [ ] Cash/Check

FedEx Acct. No. / Credit Card No. Exp. Date

Total Packages: 5 Total Weight: 175.40 Total Charges Credit Card Auth.

Our liability is limited to $100 unless you declare a higher value. See the FedEx Service Guide for details.

8 Sign to Authorize Delivery Without a Signature

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

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[illegible]037

FedEx Express US Airbill

8497028 68047

0200 Form ID No.

FedEx Retrieval Copy

From

Date 11/13/18 Sender's FedEx Account Number 203483127

Sender's Name [illegible] Phone [illegible]

Company [illegible]

Address [illegible] Dept./Floor/Suite/Room

City [illegible] State VA ZIP [illegible]

Your Internal Billing Reference [illegible]

To

Recipient's Name [illegible] Phone [illegible]

Company [illegible]

Recipient's Address [illegible]

We cannot deliver to P.O. boxes or P.O. ZIP codes. Dept./Floor/Suite/Room

Address

To request a package be held at a specific FedEx location, print FedEx address here.

City [illegible] State MI ZIP 49512

8497 0286 8047

4a Express Package Service — *Packages up to 150 lbs.* * To most locations

1 [x] FedEx Priority Overnight — Next business morning* | 5 [ ] FedEx Standard Overnight — Next business afternoon* | 6 [ ] FedEx First Overnight — Earliest next business morning delivery to select locations*

3 [ ] FedEx 2Day — Second business day* | 20 [ ] FedEx Express Saver — Third business day*

FedEx Envelope rate not available. Minimum charge: One-pound rate

4b Express Freight Service — *Packages over 150 lbs.* ** To most locations

7 [ ] FedEx 1Day Freight — Next business day** | 8 [ ] FedEx 2Day Freight — Second business day** | 83 [ ] FedEx 3Day Freight — Third business day**

* Call for Confirmation:

5 Packaging * Declared value limit $500

6 [ ] FedEx Envelope* | 2 [ ] FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak | 3 [ ] FedEx Box | 4 [ ] FedEx Tube | 1 [ ] Other

6 Special Handling — Include FedEx address in Section 3.

3 [ ] SATURDAY Delivery — Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1Day Freight, and FedEx 2Day Freight to select ZIP codes

1 [ ] HOLD Weekday at FedEx Location — Not available for FedEx First Overnight

31 [ ] HOLD Saturday at FedEx Location — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.

No [x] | Yes [ ] As per attached Shipper's Declaration | Yes [ ] Shipper's Declaration not required | 6 [ ] Dry Ice — Dry Ice, 9, UN 1845 ____ x ____ kg

Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging. [ ] Cargo Aircraft Only

7 Payment *Bill to:* Enter FedEx Acct. No. or Credit Card No. below. Obtain Recip. Acct. No. [ ]

1 [x] Sender — Acct. No. in Section 1 will be billed | 2 [ ] Recipient | 3 [ ] Third Party | 4 [ ] Credit Card | 5 [ ] Cash/Check

FedEx Acct. No. / Credit Card No. Exp. Date

Total Packages	Total Weight	Total Charges
5	175.40	Credit Card Auth.

†Our liability is limited to $100 unless you declare a higher value. See the *FedEx Service Guide* for details.

8 Sign to Authorize Delivery Without a Signature

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

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000238

FedEx Express US Airbill

849702868047

0200 Form ID No.

FedEx Retrieval Copy

From

Date 11/13/08 Sender's FedEx Account Number 403127

Sender's Name [illegible] Phone [illegible]

Company [illegible]

Address [illegible] Dept./Floor/Suite/Room

City [illegible] State VA ZIP [illegible]

Your Internal Billing Reference [illegible]

To

Recipient's Name [illegible] Phone [illegible]

Company [illegible]

Recipient's Address [illegible]

We cannot deliver to P.O. boxes or P.O. ZIP codes. Dept./Floor/Suite/Room

Address

To request a package be held at a specific FedEx location, print FedEx address here.

City [illegible] State MI ZIP 49512

4a Express Package Service — Packages up to 150 lbs. * To most locations

1 [✓] FedEx Priority Overnight — Next business morning* 5 [ ] FedEx Standard Overnight — Next business afternoon* 6 [ ] FedEx First Overnight — Earliest next business morning delivery to select locations*

3 [ ] FedEx 2Day — Second business day* 20 [ ] FedEx Express Saver — Third business day*

FedEx Envelope rate not available. Minimum charges: One-pound rate

4b Express Freight Service — Packages over 150 lbs. ** To most locations

7 [ ] FedEx 1Day Freight — Next business day** 8 [ ] FedEx 2Day Freight — Second business day** 83 [ ] FedEx 3Day Freight — Third business day**

* Call for Confirmation:

5 Packaging — * Declared value limit $500

6 [ ] FedEx Envelope* 2 [ ] FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak 3 [ ] FedEx Box 4 [ ] FedEx Tube 1 [ ] Other

6 Special Handling — Include FedEx address in Section 3.

3 [ ] SATURDAY Delivery — Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1Day Freight, and FedEx 2Day Freight to select ZIP codes 1 [ ] HOLD Weekday at FedEx Location — Not available for FedEx First Overnight 31 [ ] HOLD Saturday at FedEx Location — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.

1 [ ] No 4 [ ] Yes — As per attached Shipper's Declaration Yes — Shipper's Declaration not required 6 [ ] Dry Ice — Dry Ice, 9, UN 1845 ____ x ____ kg

Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging. [ ] Cargo Aircraft Only

7 Payment Bill to: — Enter FedEx Acct. No. or Credit Card No. below. Obtain Recip. Acct. No. [ ]

1 [✓] Sender — Acct. No. in Section 1 will be billed. 2 [ ] Recipient 3 [ ] Third Party 4 [ ] Credit Card 5 [ ] Cash/Check

FedEx Acct. No. Credit Card No. Exp. Date

Total Packages: 5 Total Weight: 175.40 Total Charges: Credit Card Auth.

†Our liability is limited to $100 unless you declare a higher value. See the *FedEx Service Guide* for details.

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By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

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8497 0286 8047

FedEx Express US Airbill

849702868047

0200 Form ID No.

FedEx Retrieval Copy

From

Date 11/13/18 Sender's FedEx Account Number 203[illegible]27

Sender's Name [illegible] Phone [illegible]

Company [illegible]

Address [illegible] Dept/Room/Suite/Room

City [illegible] State VA ZIP [illegible]

Your Internal Billing Reference [illegible]

To

Recipient's Name [illegible] Phone [illegible]

Company [illegible]

Recipient's Address [illegible]

We cannot deliver to P.O. boxes or P.O. ZIP codes. Dept/Room/Suite/Room

Address

To request a package be held at a specific FedEx location, print FedEx address here.

City [illegible] State MI ZIP [illegible]

8497 0286 8047

4a Express Package Service — *Packages up to 150 lbs.* * To most locations

1 [x] FedEx Priority Overnight — Next business morning* | 5 [ ] FedEx Standard Overnight — Next business afternoon* | 6 [ ] FedEx First Overnight — Earliest next business morning delivery to select locations*

3 [ ] FedEx 2Day — Second business day* | 20 [ ] FedEx Express Saver — Third business day*

FedEx Envelope rate not available. Minimum charge: One-pound rate

4b Express Freight Service — *Packages over 150 lbs.* ** To most locations

7 [ ] FedEx 1Day Freight — Next business day** | 8 [ ] FedEx 2Day Freight — Second business day** | 83 [ ] FedEx 3Day Freight — Third business day**

* Call for Confirmation:

5 Packaging — * Declared value limit $500

6 [ ] FedEx Envelope* | 2 [ ] FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak | 3 [ ] FedEx Box | 4 [ ] FedEx Tube | 1 [ ] Other

6 Special Handling — Include FedEx address in Section 3.

3 [ ] SATURDAY Delivery — Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1Day Freight, and FedEx 2Day Freight to select ZIP codes

1 [ ] HOLD Weekday at FedEx Location — Not available for FedEx First Overnight

31 [ ] HOLD Saturday at FedEx Location — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.

1 [x] No | 3 [ ] Yes — As per attached Shipper's Declaration | [ ] Yes — Shipper's Declaration not required | 6 [ ] Dry Ice — Dry Ice, 9, UN 1845 ____ x ____ kg

Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging. [ ] Cargo Aircraft Only

7 Payment Bill to: Enter FedEx Acct. No. or Credit Card No. below. Obtain Recip. Acct. No. [ ]

1 [x] Sender — Acct. No. in Section 1 will be billed. | 2 [ ] Recipient | 3 [ ] Third Party | 4 [ ] Credit Card | 5 [ ] Cash/Check

FedEx Acct. No. / Credit Card No. Exp. Date

Total Packages 5 | Total Weight 175.40 | Total Charges | Credit Card Auth.

†Our liability is limited to $100 unless you declare a higher value. See the *FedEx Service Guide* for details.

8 Sign to Authorize Delivery Without a Signature

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

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FedEx Express US Airbill

FedEx Tracking Number 849702868047

Form ID No. 0209

Recipient's Copy

er's

e Phone

oany

ddress

Dept./Floor/Suite/Room

ty State ZIP

Your Internal Billing Reference

To

Recipient's Name Phone

Company

Recipient's Address

We cannot deliver to P.O. boxes or P.O. ZIP codes. Dept./Floor/Suite/Room

Address

To request a package be held at a specific FedEx location, print FedEx address here.

City State ZIP

8497 0286 8047

4a Express Package Service *Packages up to 150 lbs.* *To most locations

- ☐ FedEx Priority Overnight — Next business morning*
- ☐ FedEx Standard Overnight — Next business afternoon*
- ☐ FedEx First Overnight — Earliest next business morning delivery to select locations*
- ☐ FedEx 2Day — Second business day*
- ☐ FedEx Express Saver — Third business day*

FedEx Envelope rate not available. Minimum charge: One-pound rate

4b Express Freight Service *Packages over 150 lbs.* ** To most locations

- ☐ FedEx 1Day Freight* — Next business day**
- ☐ FedEx 2Day Freight — Second business day**
- ☐ FedEx 3Day Freight — Third business day**

* Call for Confirmation:

5 Packaging *Declared value limit $500

- ☐ FedEx Envelope*
- ☐ FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak
- ☐ FedEx Box
- ☐ FedEx Tube*
- ☐ Other

6 Special Handling Include FedEx address in Section 3.

- ☐ **SATURDAY Delivery** — Available ONLY for FedEx Priority Overnight, FedEx 2Day, FedEx 1Day Freight, and FedEx 2Day Freight to select ZIP codes
- ☐ **HOLD Weekday at FedEx Location** — Not available for FedEx First Overnight
- ☐ **HOLD Saturday at FedEx Location** — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations

Does this shipment contain dangerous goods? One box must be checked.

- ☐ No
- ☐ Yes — As per attached Shipper's Declaration
- ☐ Yes — Shipper's Declaration not required
- ☐ Dry Ice — Dry Ice, 9, UN 1845 ____ x ____ kg

Dangerous goods (including Dry Ice) cannot be shipped in FedEx packaging. ☐ Cargo Aircraft Only

7 Payment *Bill to:* Enter FedEx Acct. No. or Credit Card No. below. Obtain Recip. Acct. No. ☐

- ☐ Sender — Acct. No. in Section 1 will be billed
- ☐ Recipient
- ☐ Third Party
- ☐ Credit Card
- ☐ Cash/Check

Total Packages	Total Weight	Total Declared Value†	Total Charges
	175.40	$ .00	Credit Card Auth.

†Our liability is limited to $100 unless you declare a higher value. See back for details.

8 Sign to Authorize Delivery Without a Signature

By signing you authorize us to deliver this shipment without obtaining a signature and agree to indemnify and hold us harmless from any resulting claims.

Questions? Visit our Web site at fedex.com or call 1.800.GoFedEx 1.800.463.3339.

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FedEx Express US Airbill

8587 2908 5163

0200 Form ID No.

FedEx Retrieval Copy

1 From

Date 11/14/08 Sender's FedEx Account Number 203013027

Sender's Name Kelly Hicks Phone 804-444-4600

Company Unidep

Address 5546 Fairmount St. Suite 201

Dept/Floor/Suite/Room

City Richmond State VA ZIP 23230

2 Your Internal Billing Reference HUD 7307.5421C.20000

3 To

Recipient's Name Simple Recycling Phone 616-775-4500

Company Tri-Matrix Laboratories, Inc.

Recipient's Address 5510 Jefferson Ave. S.E.

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Dept/Floor/Suite/Room

Address

To request a package be held at a specific FedEx location, print FedEx address here.

City Grand Rapids State MI ZIP 49512

8587 2908 5163

4a Express Package Service *Packages up to 150 lbs.*

1 ☒ FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

5 ☐ FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.

6 ☐ FedEx First Overnight — Earliest next business morning delivery to select locations.* Saturday Delivery NOT available.

3 ☐ FedEx 2Day — Second business day.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

20 ☐ FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

FedEx Envelope rate not available. Minimum charge: One-pound rate.

* To most locations.

4b Express Freight Service *Packages over 150 lbs.*

7 ☐ FedEx 1Day Freight* — Next business day.** Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

8 ☐ FedEx 2Day Freight — Second business day.** Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

83 ☐ FedEx 3Day Freight — Third business day.** Saturday Delivery NOT available.

* Call for Confirmation:

** To most locations.

5 Packaging

6 ☐ FedEx Envelope* 2 ☐ FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak. 3 ☐ FedEx Box 4 ☐ FedEx Tube 1 ☒ Other

* Declared value limit $500.

6 Special Handling — Include FedEx address in Section 3.

3 ☒ SATURDAY Delivery — Not available for FedEx Standard Overnight, FedEx First Overnight, FedEx Express Saver, or FedEx 3Day Freight.

1 ☐ HOLD Weekday at FedEx Location — Not available for FedEx First Overnight.

31 ☐ HOLD Saturday at FedEx Location — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

Does this shipment contain dangerous goods? One box must be checked.

☐ No 4 ☐ Yes — As per attached Shipper's Declaration. ☐ Yes — Shipper's Declaration not required. 6 ☐ Dry Ice — Dry ice, 9, UN 1845 ____ x ____ kg

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging. ☐ Cargo Aircraft Only

7 Payment *Bill to:* — Enter FedEx Acct. No. or Credit Card No. below. Obtain Recip. Acct. No. ☐

1 ☒ Sender — Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☐ Third Party 4 ☐ Credit Card 5 ☐ Cash/Check

Total Packages	Total Weight	Total Charges
3		Credit Card Auth.

[1]Our liability is limited to $100 unless you declare a higher value. See the current FedEx Service Guide for details.

8 *NEW* Residential Delivery Signature Options If you require a signature, check Direct or Indirect.

☐ No Signature Required — Package may be left without obtaining a signature for delivery.

10 ☐ Direct Signature — Anyone at recipient's address may sign for delivery. *Fee applies.*

34 ☐ Indirect Signature — If no one is available at recipient's address, anyone at a neighboring address may sign for delivery. *Fee applies.*

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FedEx Express® US Airbill

8587 2908 5163

0200 Form ID No.

FedEx Retrieval Copy

1 From

Date 11/14/08 Sender's FedEx Account Number 2030130277

Sender's Name Kelly Hicks Phone (804) 444-[illegible]

Company [illegible]

Address 554[illegible] Palmyra Mill Pt. Suite 201

Dept./Floor/Suite/Room

City Richmond State VA ZIP 23236

2 Your Internal Billing Reference PO: 7307.5421c.20000

3 To

Recipient's Name Sample Receiving Phone (616) 772-4500

Company TriMatrix Laboratories, Inc.

Recipient's Address 5150 Division Ave. S.E.

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Dept./Floor/Suite/Room

Address

To request a package be held at a specific FedEx location, print FedEx address here.

City Grand Rapids State MI ZIP 49512

8587 2908 5163

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5 ☐ FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.

6 ☐ FedEx First Overnight — Earliest next business morning delivery to select locations.* Saturday Delivery NOT available.

3 ☐ FedEx 2Day — Second business day.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

20 ☐ FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

FedEx Envelope rate not available. Minimum charge: One-pound rate.

* To most locations.

4b Express Freight Service — *Packages over 150 lbs.*

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8 ☐ FedEx 2Day Freight — Second business day.** Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.

83 ☐ FedEx 3Day Freight — Third business day.** Saturday Delivery NOT available.

* Call for Confirmation:

** To most locations.

5 Packaging

6 ☐ FedEx Envelope* 2 ☐ FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak. 3 ☐ FedEx Box 4 ☐ FedEx Tube 1 ☑ Other

* Declared value limit $500.

6 Special Handling — Include FedEx address in Section 3.

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1 ☐ HOLD Weekday at FedEx Location — Not available for FedEx First Overnight.

31 ☐ HOLD Saturday at FedEx Location — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

Does this shipment contain dangerous goods? One box must be checked.

☐ No 4 ☐ Yes — As per attached Shipper's Declaration. ☐ Yes — Shipper's Declaration not required. 6 ☐ Dry Ice — Dry Ice, 9, UN 1845 ____ x ____ kg

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging. ☐ Cargo Aircraft Only

7 Payment *Bill to:* — Enter FedEx Acct. No. or Credit Card No. below. Obtain Recip. Acct. No. ☐

1 ☑ Sender — Acct. No. in Section 1 will be billed. 2 ☐ Recipient 3 ☐ Third Party 4 ☐ Credit Card 5 ☐ Cash/Check

Total Packages	Total Weight	Total Charges
3		

†Our liability is limited to $100 unless you declare a higher value. See the current FedEx Service Guide for details. Credit Card Auth.

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☐ No Signature Required — Package may be left without obtaining a signature for delivery.

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34 ☐ Indirect Signature — If no one is available at recipient's address, anyone at a neighboring address may sign for delivery. *Fee applies.*

520

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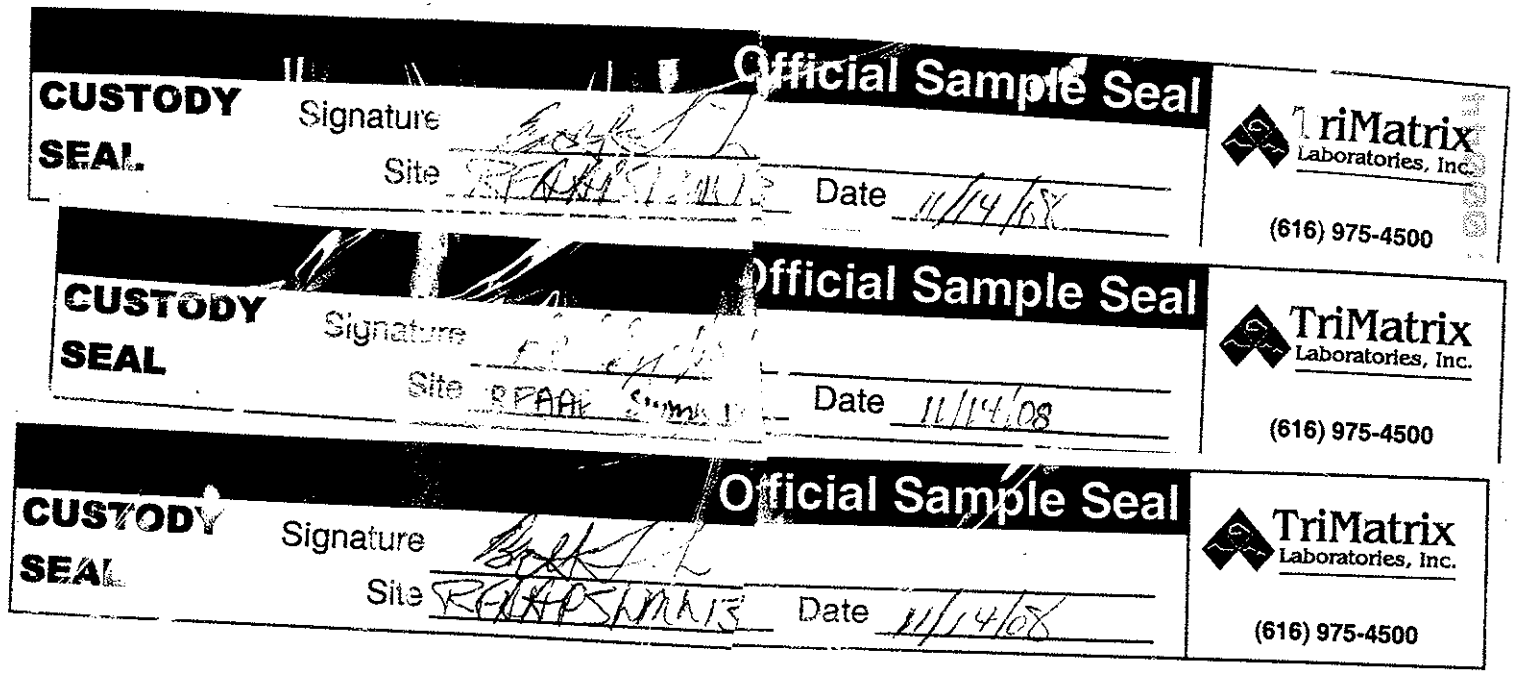

FedEx Express **US Airbill** FedEx Tracking Number **8587 2908 5163**

Form 0200 — Recipient's Copy

1 From

Date

Sender's Name — Phone

Company

Address — Dept./Floor/Suite/Room

City — State — ZIP

2 Your Internal Billing Reference

3 To

Recipient's Name — Phone

Company

Recipient's Address — Dept./Floor/Suite/Room

We cannot deliver to P.O. boxes or P.O. ZIP codes.

Address

To request a package be held at a specific FedEx location, print FedEx address here.

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- ☐ FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- ☐ FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.
- ☐ FedEx First Overnight — Earliest next business morning delivery to select locations.* Saturday Delivery NOT available.
- ☐ FedEx 2Day — Second business day.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- ☐ FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

FedEx Envelope rate not available. Minimum charge: One-pound rate. * To most locations.

4b Express Freight Service — *Packages over 150 lbs.*

- ☐ FedEx 1Day Freight* — Next business day.** Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- ☐ FedEx 2Day Freight — Second business day.** Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- ☐ FedEx 3Day Freight — Third business day.** Saturday Delivery NOT available.

* Call for Confirmation. ** To most locations.

5 Packaging

- ☐ FedEx Envelope*
- ☐ FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak.
- ☐ FedEx Box
- ☐ FedEx Tube
- ☐ Other

* Declared value limit $500.

6 Special Handling

- ☐ SATURDAY Delivery — Not available for FedEx Standard Overnight, FedEx First Overnight, FedEx Express Saver, or FedEx 3Day Freight.
- ☐ HOLD Weekday at FedEx Location — Not available for FedEx First Overnight.
- ☐ HOLD Saturday at FedEx Location — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

Does this shipment contain dangerous goods?

- ☐ No
- ☐ Yes — As per attached Shipper's Declaration.
- ☐ Yes — Shipper's Declaration not required.
- ☐ Dry Ice — Dry ice, 9, UN 1845 ____ x ____ kg

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7 Payment *Bill to:* Enter FedEx Acct. No. or Credit Card No. below.

- ☐ Sender — Acct. No. in Section 1 will be billed
- ☐ Recipient
- ☐ Third Party
- ☐ Credit Card
- ☐ Cash/Check

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Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.:_____36440-62_____ **Fraction:_____Lead_____**

Lab:_____TriMatrix_____ **Project Name:___Radford SWMU 13___**

Reviewer:____Lee Anne Mareck___ **Date:_____January 14, 2009_____**

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the Region III Modifications to the USEPA National Functional Guidelines for Inorganic Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: Samples were received at temperatures greater than the storage requirement of 4°C ±2°C (6.6°C and 7.7°C). No qualifying action was taken since temperatures were less than 10°C.

The matrix spike analyzed for sample 13SB66B (55%) displayed a percent recovery (%R) less than the lower control limit of 75% for lead. All associated field sample results were positive and were flagged "L,m." The matrix spike duplicates analyzed for samples 13SB90B (176%), 13SB42A (155%), and 13SB86B (127%) displayed percent recoveries greater than the upper control limit of 125% for lead. All associated field sample results were positive and were flagged "K,m." The matrix spike pair analyzed for samples 13SB35A (5%/36%) and 13SB53B (58%/60%) displayed percent recoveries less than the lower control limit of 75% for lead. All associated field sample results were positive and were flagged "L,m."

Two field duplicate pairs (13SB33A/DUP-6 and 13SB56B/DUP-14) displayed relative percent differences greater than the control limit of 35%. The lead results were flagged "J,f" in these samples unless previously flagged for a matrix spike anomaly.

Correctable Anomalies: None.

Comments: On the basis of this evaluation, the laboratory appears to have followed the specified method. All data are usable, as qualified, for their intended purpose based on the data reviewed.

Signed: Lee Anne Mareck

Radford SWMU 13
36440-62

Laboratory Sample Identification	Field Sample Identification	Date Sampled	Parameters Requested
0811329-01	13SB77A	11/12/208	Lead
0811329-02	13SB77B	11/12/208	Lead
0811329-03	13SB76A	11/12/208	Lead
0811329-04	13SB76B	11/12/208	Lead
0811329-05	13SB76C	11/12/208	Lead
0811329-06	13SB78A	11/12/208	Lead
0811329-07	13SB78B	11/12/208	Lead
0811329-08	13SB79A	11/12/208	Lead
0811329-09	13SB79B	11/12/208	Lead
0811329-10	DUP-2	11/12/208	Lead
0811329-11	13SB27A	11/12/208	Lead
0811329-12	13SB82A	11/12/208	Lead
0811329-13	13SB82B	11/12/208	Lead
0811329-14	13SB82C	11/12/208	Lead
0811329-15	13SB25A	11/12/208	Lead
0811329-16	13SB25B	11/12/208	Lead
0811329-17	13SB25C	11/12/208	Lead
0811329-18	13SB26A	11/12/208	Lead
0811329-19	13SB26B	11/12/208	Lead
0811329-20	DUP-1	11/12/208	Lead
0811329-21	13SB23A	11/12/208	Lead
0811329-22	13SB23B	11/12/208	Lead
0811329-23	13SB23C	11/12/208	Lead
0811329-24	13SB24A	11/12/208	Lead
0811329-25	13SB24B	11/12/208	Lead
0811329-26	13SB24C	11/12/208	Lead
0811329-27	13SB30A	11/12/208	Lead
0811329-28	13SB31A	11/12/208	Lead
0811329-29	13SB28A	11/12/208	Lead
0811329-30	13SB33A	11/12/208	Lead
0811329-31	13SB81A	11/12/208	Lead
0811329-32	13SB81B	11/12/208	Lead
0811329-33	13SB80A	11/12/208	Lead

Radford SWMU 13
36440-62

Laboratory Sample Identification	Field Sample Identification	Date Sampled	Parameters Requested
0811329-34	13SB80B	11/12/208	Lead
0811329-35	13SB83A	11/12/208	Lead
0811329-36	13SB83B	11/12/208	Lead
0811329-37	13SB74A	11/12/208	Lead
0811329-38	13SB74B	11/12/208	Lead
0811329-39	13SB74C	11/12/208	Lead
0811329-40	13SB90A	11/12/208	Lead
0811329-41	13SB90B	11/12/208	Lead
0811329-42	13SB75A	11/12/208	Lead
0811329-43	13SB75B	11/12/208	Lead
0811329-44	13SB75C	11/12/208	Lead
0811329-45	13SB89A	11/12/208	Lead
0811329-46	13SB89B	11/12/208	Lead
0811329-47	13SB88A	11/12/208	Lead
0811329-48	13SB88B	11/12/208	Lead
0811329-49	13SB86A	11/12/208	Lead
0811329-50	13SB86B	11/12/208	Lead
0811329-51	13SB87A	11/12/208	Lead
0811329-52	13SB87B	11/12/208	Lead
0811329-53	13SB87C	11/12/208	Lead
0811329-54	13SB85A	11/12/208	Lead
0811329-55	13SB85B	11/12/208	Lead
0811329-56	13SB85C	11/12/208	Lead
0811329-57	DUP-6	11/12/208	Lead
0811329-58	EQBK-2	11/12/208	Lead
0811329-59	EQBK-3	11/12/208	Lead
0811329-60	13SB29A	11/12/208	Lead
0811329-61	13SB32A	11/12/208	Lead
0811329-62	DUP-3	11/12/208	Lead
0811329-63	DUP-4	11/12/208	Lead
0811329-64	DUP-5	11/12/208	Lead
0811330-01	13SB73A	11/13/2008	Lead
0811330-02	13SB73B	11/13/2008	Lead

Radford SWMU 13
36440-62

Laboratory Sample Identification	Field Sample Identification	Date Sampled	Parameters Requested
0811330-03	13SB73C	11/13/2008	Lead
0811330-04	13SB34A	11/13/2008	Lead
0811330-05	13SB34B	11/13/2008	Lead
0811330-06	13SB71A	11/13/2008	Lead
0811330-07	13SB71B	11/13/2008	Lead
0811330-08	13SB71C	11/13/2008	Lead
0811330-09	13SB38A	11/13/2008	Lead
0811330-10	13SB38B	11/13/2008	Lead
0811330-11	DUP-8	11/13/2008	Lead
0811330-12	13SB38C	11/13/2008	Lead
0811330-13	13SB67A	11/13/2008	Lead
0811330-14	13SB67B	11/13/2008	Lead
0811330-15	13SB41A	11/13/2008	Lead
0811330-16	13SB41B	11/13/2008	Lead
0811330-17	No sample	11/13/2008	Lead
0811330-18	13SB72A	11/13/2008	Lead
0811330-19	13SB72B	11/13/2008	Lead
0811330-20	13SB72C	11/13/2008	Lead
0811330-21	13SB35A	11/13/2008	Lead
0811330-22	13SB35B	11/13/2008	Lead
0811330-23	13SB35C	11/13/2008	Lead
0811330-24	13SB36A	11/13/2008	Lead
0811330-25	DUP-7	11/13/2008	Lead
0811330-26	13SB36B	11/13/2008	Lead
0811330-27	13SB36C	11/13/2008	Lead
0811330-28	13SB70A	11/13/2008	Lead
0811330-29	13SB70B	11/13/2008	Lead
0811330-30	13SB37A	11/13/2008	Lead
0811330-31	13SB69A	11/13/2008	Lead
0811330-32	13SB68A	11/13/2008	Lead
0811330-33	13SB68B	11/13/2008	Lead
0811330-34	13SB39A	11/13/2008	Lead
0811330-35	DUP-9	11/13/2008	Lead

Radford SWMU 13
36440-62

Laboratory Sample Identification	Field Sample Identification	Date Sampled	Parameters Requested
0811330-36	13SB39B	11/13/2008	Lead
0811330-37	13SB39C	11/13/2008	Lead
0811330-38	13SB40A	11/13/2008	Lead
0811330-39	13SB40B	11/13/2008	Lead
0811330-40	13SB66A	11/13/2008	Lead
0811330-41	13SB66B	11/13/2008	Lead
0811330-42	EQBK-4	11/13/2008	Lead
0811332-01	13SB42A	11/14/2008	Lead
0811332-02	13SB42B	11/14/2008	Lead
0811332-03	13SB43A	11/14/2008	Lead
0811332-04	13SB43B	11/14/2008	Lead
0811332-05	13SB43C	11/14/2008	Lead
0811332-06	13SB63A	11/14/2008	Lead
0811332-07	13SB45A	11/14/2008	Lead
0811332-08	13SB45B	11/14/2008	Lead
0811332-09	13SB62A	11/14/2008	Lead
0811332-10	DUP-11	11/14/2008	Lead
0811332-11	13SB46A	11/14/2008	Lead
0811332-12	13SB46B	11/14/2008	Lead
0811332-13	13SB46C	11/14/2008	Lead
0811332-14	13SB48A	11/14/2008	Lead
0811332-15	13SB48B	11/14/2008	Lead
0811332-16	13SB48C	11/14/2008	Lead
0811332-17	13SB58A	11/14/2008	Lead
0811332-18	DUP-12	11/14/2008	Lead
0811332-19	13SB58B	11/14/2008	Lead
0811332-20	13SB51A	11/14/2008	Lead
0811332-21	13SB51B	11/14/2008	Lead
0811332-22	13SB52A	11/14/2008	Lead
0811332-23	13SB52B	11/14/2008	Lead
0811332-24	13SB56A	11/14/2008	Lead
0811332-25	13SB56B	11/14/2008	Lead
0811332-26	DUP-14	11/14/2008	Lead

Radford SWMU 13
36440-62

Laboratory Sample Identification	Field Sample Identification	Date Sampled	Parameters Requested
0811332-27	13SB54A	11/14/2008	Lead
0811332-28	13SB54B	11/14/2008	Lead
0811332-29	13SB55A	11/14/2008	Lead
0811332-30	13SB84A	11/14/2008	Lead
0811332-31	DUP-10	11/14/2008	Lead
0811332-32	13SB84B	11/14/2008	Lead
0811332-33	13SB86A	11/14/2008	Lead
0811332-34	13SB86B	11/14/2008	Lead
0811332-35	13SB64A	11/14/2008	Lead
0811332-36	13SB64B	11/14/2008	Lead
0811332-37	13SB44A	11/14/2008	Lead
0811332-38	13SB44B	11/14/2008	Lead
0811332-39	13SB44C	11/14/2008	Lead
0811332-40	13SB61A	11/14/2008	Lead
0811332-41	13SB61B	11/14/2008	Lead
0811332-42	13SB47A	11/14/2008	Lead
0811332-43	13SB47B	11/14/2008	Lead
0811332-44	13SB60A	11/14/2008	Lead
0811332-45	13SB60B	11/14/2008	Lead
0811332-46	13SB49A	11/14/2008	Lead
0811332-47	13SB59A	11/14/2008	Lead
0811332-48	13SB59B	11/14/2008	Lead
0811332-49	13SB50A	11/14/2008	Lead
0811332-50	13SB50B	11/14/2008	Lead
0811332-51	13SB50C	11/14/2008	Lead
0811332-52	13SB57A	11/14/2008	Lead
0811332-53	13SB57B	11/14/2008	Lead
0811332-54	13SB57C	11/14/2008	Lead
0811332-55	13SB53A	11/14/2008	Lead
0811332-56	13SB53B	11/14/2008	Lead
0811332-57	13SB65A	11/14/2008	Lead
0811332-58	13SB65B	11/14/2008	Lead
0811332-59	EQBK-7	11/14/2008	Lead

Radford SWMU 13
36440-62

Laboratory Sample Identification	Field Sample Identification	Date Sampled	Parameters Requested
0811332-60	EQBK-8	11/14/2008	Lead
0811332-61	EQBK-9	11/14/2008	Lead

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB77A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:32
Solids: 0.00
Laboratory ID: 0811329-01

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0813644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	85	mg/kg dry wt.	1	10	2.9		11/22/08 11:21

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB77B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:35
Solids: 0.00
Laboratory ID: 0811329-02

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.4999 g / 50 mL
QC Batch: 0813644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	110	mg/kg dry wt.	1	10	2.9		11/22/08 11:49

00112

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB76A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:50
Solids: 0.00
Laboratory ID: 0811329-03

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	89	mg/kg dry wt.	1	10	2.9		11/22/08 11:53

: 00113

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB76B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:55
Solids: 0.00
Laboratory ID: 0811329-04

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5003 g / 50 mL
QC Batch: 0813644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	170	mg/kg dry wt.	1	10	2.9		11/22/08 11:57

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB76C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 14:05
Solids: 0.00
Laboratory ID: 0811329-05

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0813644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	190	mg/kg dry wt.	1	10	2.9		11/22/08 12:01

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB78A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:09
Solids: 0.00
Laboratory ID: 0811329-06

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0813644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	600	mg/kg dry wt.	1	10	2.9		11/22/08 12:05

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB78B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:11
Solids: 0.00
Laboratory ID: 0811329-07

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5003 g / 50 mL
QC Batch: 0813644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	120	mg/kg dry wt.	1	10	2.9		11/22/08 12:09

00117

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB79A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:00
Solids: 0.00
Laboratory ID: 0811329-08

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0813644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	130	mg/kg dry wt.	1	10	2.9		11/22/08 12:13

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB79B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:05
Solids: 0.00
Laboratory ID: 0811329-09

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5 g / 50 mL
QC Batch: 0813644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	150	mg/kg dry wt.	1	10	2.9		11/22/08 12:17

: 08119

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DUP-2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 00:00
Solids: 0.00
Laboratory ID: 0811329-10

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.4497 g / 50 mL
QC Batch: 0813644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	190	mg/kg dry wt.	1	11	3.2		11/22/08 12:21

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB27A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 12:36
Solids: 0.00
Laboratory ID: 0811329-11

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0813644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	27	mg/kg dry wt.	1	10	2.9		11/22/08 12:25

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB82A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 09:34
Solids: 0.00
Laboratory ID: 0811329-12

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5003 g / 50 mL
QC Batch: 0813644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	110	mg/kg dry wt.	1	10	2.9		11/22/08 12:37

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB82B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 09:41
Solids: 0.00
Laboratory ID: 0811329-13

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0813644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	170	mg/kg dry wt.	1	10	2.9		11/22/08 12:42

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB82C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 09:51
Solids: 0.00
Laboratory ID: 0811329-14

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.4998 g / 50 mL
QC Batch: 0813644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	220	mg/kg dry wt.	1	10	2.9		11/22/08 12:46

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB25A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 10:00
Solids: 0.00
Laboratory ID: 0811329-15

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.4998 g / 50 mL
QC Batch: 0813644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	180	mg/kg dry wt.	1	10	2.9		11/22/08 12:50

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB25B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 10:05
Solids: 0.00
Laboratory ID: 0811329-16

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.4998 g / 50 mL
QC Batch: 0813644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	760	mg/kg dry wt.	1	10	2.9		11/22/08 12:53

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB25C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 10:15
Solids: 0.00
Laboratory ID: 0811329-17

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.4999 g / 50 mL
QC Batch: 0813644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	1300	mg/kg dry wt.	1	10	2.9		11/22/08 12:58

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB26A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 12:14
Solids: 0.00
Laboratory ID: 0811329-18

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0813644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	300	mg/kg dry wt.	1	10	2.9		11/22/08 13:02

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB26B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 12:28
Solids: 0.00
Laboratory ID: 0811329-19

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0813644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	220	mg/kg dry wt.	1	10	2.9		11/22/08 13:06

: 081329

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DUP-1

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 00:00
Solids: 0.00
Laboratory ID: 0811329-20

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.4998 g / 50 mL
QC Batch: 0813644

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	230	mg/kg dry wt.	1	10	2.9		11/22/08 13:10

: 29130

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB23A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 09:12
Solids: 0.00
Laboratory ID: 0811329-21

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0813646

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	140	mg/kg dry wt.	1	10	2.9		11/22/08 13:31

00131

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB23B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 09:18
Solids: 0.00
Laboratory ID: 0811329-22

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0813646

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	190	mg/kg dry wt.	1	10	2.9		11/22/08 13:35

00132

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB23C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 09:27
Solids: 0.00
Laboratory ID: 0811329-23

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5003 g / 50 mL
QC Batch: 0813646

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	220	mg/kg dry wt.	1	10	2.9		11/22/08 13:39

00133

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB24A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 09:12
Solids: 0.00
Laboratory ID: 0811329-24

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0813646

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	190	mg/kg dry wt.	1	10	2.9		11/22/08 13:43

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB24B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 09:19
Solids: 0.00
Laboratory ID: 0811329-25

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813646

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	200	mg/kg dry wt.	1	10	2.9		11/22/08 13:47

: 001135

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB24C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 09:25
Solids: 0.00
Laboratory ID: 0811329-26

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5 g / 50 mL
QC Batch: 0813646

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	170	mg/kg dry wt.	1	10	2.9		11/22/08 13:51

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB30A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 14:24
Solids: 0.00
Laboratory ID: 0811329-27

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813646

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	250	mg/kg dry wt.	1	10	2.9		11/22/08 13:55

080137

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB31A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 14:28
Solids: 0.00
Laboratory ID: 0811329-28

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0813646

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	80	mg/kg dry wt.	1	10	2.9		11/22/08 13:59

002128

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB28A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 12:45
Solids: 0.00
Laboratory ID: 0811329-29

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0813646

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	92	mg/kg dry wt.	1	10	2.9		11/22/08 14:03

00135

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB33A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 16:08
Solids: 0.00
Laboratory ID: 0811329-30

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813646

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	1600	mg/kg dry wt.	1	10	2.9		11/22/08 14:15

J,P

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB81A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 09:44
Solids: 0.00
Laboratory ID: 0811329-31

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0813646

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	170	mg/kg dry wt.	1	10	2.9		11/22/08 14:20

00141

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB81B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 09:50
Solids: 0.00
Laboratory ID: 0811329-32

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5003 g / 50 mL
QC Batch: 0813646

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	290	mg/kg dry wt.	1	10	2.9		11/22/08 14:24

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB80A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 12:10
Solids: 0.00
Laboratory ID: 0811329-33

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.4998 g / 50 mL
QC Batch: 0813646

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	170	mg/kg dry wt.	1	10	2.9		11/22/08 14:28

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB80B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 12:13
Solids: 0.00
Laboratory ID: 0811329-34

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0813646

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	460	mg/kg dry wt.	10	100	29		11/24/08 15:59

00194

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB83A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 09:30
Solids: 0.00
Laboratory ID: 0811329-35

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.4999 g / 50 mL
QC Batch: 0813646

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	100	mg/kg dry wt.	1	10	2.9		11/22/08 14:52

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB83B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 09:33
Solids: 0.00
Laboratory ID: 0811329-36

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813646

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	180	mg/kg dry wt.	1	10	2.9		11/22/08 15:05

00146

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB74A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 15:35
Solids: 0.00
Laboratory ID: 0811329-37

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0813646

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	97	mg/kg dry wt.	1	10	2.9		11/22/08 15:09

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB74B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 15:40
Solids: 0.00
Laboratory ID: 0811329-38

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.4998 g / 50 mL
QC Batch: 0813646

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	180	mg/kg dry wt.	1	10	2.9		11/22/08 15:13

00148

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB74C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 15:50
Solids: 0.00
Laboratory ID: 0811329-39

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0813646

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	190	mg/kg dry wt.	1	10	2.9		11/22/08 15:17

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB90A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 15:42
Solids: 0.00
Laboratory ID: 0811329-40

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/19/08 07:30
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0813646

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	130	mg/kg dry wt.	1	10	2.9		11/22/08 15:21

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB90B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 15:48
Solids: 0.00
Laboratory ID: 0811329-41

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5 g / 50 mL
QC Batch: 0813703

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	170	mg/kg dry wt.	1	10	2.9		11/22/08 15:34

KLM

00151

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB75A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 14:25
Solids: 0.00
Laboratory ID: 0811329-42

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813703

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	100	mg/kg dry wt.	1	10	2.9		11/22/08 16:03

KM

: 00152

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB75B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 14:30
Solids: 0.00
Laboratory ID: 0811329-43

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4998 g / 50 mL
QC Batch: 0813703

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	210	mg/kg dry wt.	1	10	2.9		11/22/08 16:07

Kim

00153

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB75C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 14:40
Solids: 0.00
Laboratory ID: 0811329-44

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0813703

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	190	mg/kg dry wt.	1	10	2.9		11/22/08 16:12

KM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB89A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 15:17
Solids: 0.00
Laboratory ID: 0811329-45

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4999 g / 50 mL
QC Batch: 0813703

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	130	mg/kg dry wt.	1	10	2.9		11/22/08 16:16

KJM

: 001155

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB89B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 15:21
Solids: 0.00
Laboratory ID: 0811329-46

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813703

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	320	mg/kg dry wt.	1	10	2.9		11/22/08 16:20

KM

00156

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB88A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 15:08
Solids: 0.00
Laboratory ID: 0811329-47

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0813703

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	160	mg/kg dry wt.	1	10	2.9		11/22/08 16:24

K,m

00157

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB88B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 15:15
Solids: 0.00
Laboratory ID: 0811329-48

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0813703

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	140	mg/kg dry wt.	1	10	2.9		11/22/08 16:28

KJM

00158

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB86A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:45
Solids: 0.00
Laboratory ID: 0811329-49

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4998 g / 50 mL
QC Batch: 0813703

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	120	mg/kg dry wt.	1	10	2.9		11/22/08 16:33

KJM

00159

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB86B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:50
Solids: 0.00
Laboratory ID: 0811329-50

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4998 g / 50 mL
QC Batch: 0813703

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	350	mg/kg dry wt.	1	10	2.9		11/22/08 16:46

KJM

002158

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB87A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 14:00
Solids: 0.00
Laboratory ID: 0811329-51

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0813703

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	120	mg/kg dry wt.	1	10	2.9		11/22/08 16:50

KM

00151

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB87B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 14:05
Solids: 0.00
Laboratory ID: 0811329-52

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4999 g / 50 mL
QC Batch: 0813703

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	110	mg/kg dry wt.	1	10	2.9		11/22/08 16:54

Kim

001652

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB87C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 14:15
Solids: 0.00
Laboratory ID: 0811329-53

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4999 g / 50 mL
QC Batch: 0813703

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	190	mg/kg dry wt.	1	10	2.9		11/22/08 16:58

KJM

00153

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB85A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:10
Solids: 0.00
Laboratory ID: 0811329-54

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0813703

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	83	mg/kg dry wt.	1	10	2.9		11/22/08 17:02

KJM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB85B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:14
Solids: 0.00
Laboratory ID: 0811329-55

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0813703

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	150	mg/kg dry wt.	1	10	2.9		11/22/08 17:06

KJM

00165

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB85C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:20
Solids: 0.00
Laboratory ID: 0811329-56

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5 g / 50 mL
QC Batch: 0813703

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	170	mg/kg dry wt.	1	10	2.9		11/22/08 17:10

KJM

00156

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DUP-6

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 00:00
Solids: 0.00
Laboratory ID: 0811329-57

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0813703

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	210	mg/kg dry wt.	1	10	2.9		11/22/08 17:14

Kim

00157

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

EQBK-2

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water
Sampled: 11/12/08 17:15
Solids: 0.00
Laboratory ID: 0811329-58

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3010A Digestion
Prepared: 11/20/08 07:30
Initial/Final: 25 mL / 25 mL
QC Batch: 0813680

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	75	ug/L	1	75	25	U	11/25/08 11:24

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

EQBK-3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water
Sampled: 11/12/08 17:20
Solids: 0.00
Laboratory ID: 0811329-59

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3010A Digestion
Prepared: 11/20/08 07:30
Initial/Final: 25 mL / 25 mL
QC Batch: 0813680

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	75	ug/L	1	75	25	U	11/25/08 11:28

00155

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB29A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 13:35
Solids: 0.00
Laboratory ID: 0811329-60

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5003 g / 50 mL
QC Batch: 0813703

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	76	mg/kg dry wt.	1	10	2.9		11/22/08 17:17

Kim

00170

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB32A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 14:50
Solids: 0.00
Laboratory ID: 0811329-61

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0813703

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	90	mg/kg dry wt.	1	10	2.9		11/22/08 17:21

KJM

: 00171

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DUP-3

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 00:00
Solids: 0.00
Laboratory ID: 0811329-62

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0813703

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	270	mg/kg dry wt.	1	10	2.9		11/22/08 17:34

Kim

00172

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DUP-4

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 00:00
Solids: 0.00
Laboratory ID: 0811329-63

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0813704

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	200	mg/kg dry wt.	1	10	2.9		11/22/08 17:48

4m

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DUP-5

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/12/08 00:00
Solids: 0.00
Laboratory ID: 0811329-64

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813704

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	150	mg/kg dry wt.	1	10	2.9		11/22/08 17:52

LM

: 001 74

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB73A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 11:30
Solids: 0.00
Laboratory ID: 0811330-01

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0813705

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	83	mg/kg dry wt.	1	10	2.9		11/24/08 16:20

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB73B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 11:40
Solids: 0.00
Laboratory ID: 0811330-02

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0813705

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	100	mg/kg dry wt.	1	10	2.9		11/24/08 16:24

: 00175

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB73C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 11:50
Solids: 0.00
Laboratory ID: 0811330-03

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0813705

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	270	mg/kg dry wt.	1	10	2.9		11/24/08 16:37

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB34A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 12:00
Solids: 0.00
Laboratory ID: 0811330-04

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0813705

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	230	mg/kg dry wt.	1	10	2.9		11/24/08 16:41

000178

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB34B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 12:04
Solids: 0.00
Laboratory ID: 0811330-05

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0813705

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	190	mg/kg dry wt.	1	10	2.9		11/24/08 16:45

00179

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB71A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 12:15
Solids: 0.00
Laboratory ID: 0811330-06

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5003 g / 50 mL
QC Batch: 0813705

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	66	mg/kg dry wt.	1	10	2.9		11/24/08 16:49

00186

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB71B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 12:19
Solids: 0.00
Laboratory ID: 0811330-07

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0813705

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	93	mg/kg dry wt.	1	10	2.9		11/24/08 16:52

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB71C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 12:23
Solids: 0.00
Laboratory ID: 0811330-08

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4999 g / 50 mL
QC Batch: 0813705

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	200	mg/kg dry wt.	1	10	2.9		11/24/08 16:57

001332

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB38A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 14:20
Solids: 0.00
Laboratory ID: 0811330-09

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813705

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	740	mg/kg dry wt.	1	10	2.9		11/24/08 17:01

00183

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB38B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 14:26
Solids: 0.00
Laboratory ID: 0811330-10

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0813705

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	460	mg/kg dry wt.	10	100	29		11/25/08 14:03

001854

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DUP-8

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 00:00
Solids: 0.00
Laboratory ID: 0811330-11

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0813705

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	370	mg/kg dry wt.	1	10	2.9		11/24/08 17:34

00195

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB38C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 14:35
Solids: 0.00
Laboratory ID: 0811330-12

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0813705

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	240	mg/kg dry wt.	1	10	2.9		11/24/08 17:38

00156

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB67A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 14:44
Solids: 0.00
Laboratory ID: 0811330-13

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0813705

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	220	mg/kg dry wt.	1	10	2.9		11/24/08 17:42

0187

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB67B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 14:48
Solids: 0.00
Laboratory ID: 0811330-14

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0813705

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	130	mg/kg dry wt.	1	10	2.9		11/24/08 17:46

00138

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB41A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 15:02
Solids: 0.00
Laboratory ID: 0811330-15

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0813705

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	400	mg/kg dry wt.	1	10	2.9		11/24/08 17:50

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB41B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 15:08
Solids: 0.00
Laboratory ID: 0811330-16

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0813705

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	300	mg/kg dry wt.	1	10	2.9		11/24/08 17:54

001330

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB72A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 11:45
Solids: 0.00
Laboratory ID: 0811330-18

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5003 g / 50 mL
QC Batch: 0813705

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	97	mg/kg dry wt.	1	10	2.9		11/24/08 17:58

00131

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB72B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 11:48
Solids: 0.00
Laboratory ID: 0811330-19

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813705

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	110	mg/kg dry wt.	1	10	2.9		11/24/08 18:02

00192

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB72C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 11:50
Solids: 0.00
Laboratory ID: 0811330-20

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5003 g / 50 mL
QC Batch: 0813705

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	230	mg/kg dry wt.	1	10	2.9		11/24/08 18:15

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB35A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 11:56
Solids: 0.00
Laboratory ID: 0811330-21

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0813707

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	230	mg/kg dry wt.	1	10	2.9		11/24/08 18:27

LIM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB35B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 12:05
Solids: 0.00
Laboratory ID: 0811330-22

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0813707

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	130	mg/kg dry wt.	1	10	2.9		11/24/08 18:47

LIM

: 00195

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB35C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 12:12
Solids: 0.00
Laboratory ID: 0811330-23

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813707

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	100	mg/kg dry wt.	1	10	2.9		11/24/08 18:51

LM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB36A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 12:37
Solids: 0.00
Laboratory ID: 0811330-24

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813707

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	400	mg/kg dry wt.	1	10	2.9		11/24/08 19:04

LIM

00157

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DUP-7

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 00:00
Solids: 0.00
Laboratory ID: 0811330-25

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0813707

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	250	mg/kg dry wt.	1	10	2.9		11/24/08 19:08

LM

00198

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB36B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 12:42
Solids: 0.00
Laboratory ID: 0811330-26

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5 g / 50 mL
QC Batch: 0813707

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	250	mg/kg dry wt.	1	10	2.9		11/24/08 19:12

Lm

001389

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB36C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 12:46
Solids: 0.00
Laboratory ID: 0811330-27

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4999 g / 50 mL
QC Batch: 0813707

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	290	mg/kg dry wt.	1	10	2.9		11/24/08 19:16

LM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB70A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 12:56
Solids: 0.00
Laboratory ID: 0811330-28

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0813707

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	780	mg/kg dry wt.	1	10	2.9		11/24/08 19:20

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB70B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 13:01
Solids: 0.00
Laboratory ID: 0811330-29

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0813707

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	240	mg/kg dry wt.	1	10	2.9		11/24/08 19:24

LM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB37A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 13:15
Solids: 0.00
Laboratory ID: 0811330-30

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0813707

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	390	mg/kg dry wt.	1	10	2.9		11/24/08 19:28

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB69A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 13:30
Solids: 0.00
Laboratory ID: 0811330-31

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0813707

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	280	mg/kg dry wt.	1	10	2.9		11/24/08 19:32

L,m

002284

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB68A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 14:02
Solids: 0.00
Laboratory ID: 0811330-32

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0813707

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	280	mg/kg dry wt.	1	10	2.9		11/24/08 19:36

LJM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB68B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 14:09
Solids: 0.00
Laboratory ID: 0811330-33

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0813707

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	220	mg/kg dry wt.	1	10	2.9		11/24/08 19:40

L,m

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB39A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 14:30
Solids: 0.00
Laboratory ID: 0811330-34

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4999 g / 50 mL
QC Batch: 0813707

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	330	mg/kg dry wt.	1	10	2.9		11/24/08 19:53

L,m

000297

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DUP-9

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 00:00
Solids: 0.00
Laboratory ID: 0811330-35

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0813707

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	360	mg/kg dry wt.	1	10	2.9		11/24/08 19:56

LM

002338

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB39B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 14:35
Solids: 0.00
Laboratory ID: 0811330-36

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0813707

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	210	mg/kg dry wt.	1	10	2.9		11/24/08 20:00

LM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB39C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 14:40
Solids: 0.00
Laboratory ID: 0811330-37

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4999 g / 50 mL
QC Batch: 0813707

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	200	mg/kg dry wt.	1	10	2.9		11/24/08 20:04

LM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB40A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 14:50
Solids: 0.00
Laboratory ID: 0811330-38

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0813707

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	170	mg/kg dry wt.	1	10	2.9		11/24/08 20:08

LJM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB40B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 14:56
Solids: 0.00
Laboratory ID: 0811330-39

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0813707

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	300	mg/kg dry wt.	1	10	2.9		11/24/08 20:12

L, m

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB66A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 15:10
Solids: 0.00
Laboratory ID: 0811330-40

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4999 g / 50 mL
QC Batch: 0813707

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	200	mg/kg dry wt.	1	10	2.9		11/24/08 20:17

Lm

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB66B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/13/08 15:16
Solids: 0.00
Laboratory ID: 0811330-41

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/20/08 07:00
Initial/Final: 0.4998 g / 50 mL
QC Batch: 0813704

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	38	mg/kg dry wt.	1	10	2.9		11/22/08 17:56

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

EQBK-4

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water
Sampled: 11/13/08 15:58
Solids: 0.00
Laboratory ID: 0811330-42

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3010A Digestion
Prepared: 11/20/08 07:30
Initial/Final: 25 mL / 25 mL
QC Batch: 0813680

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	75	ug/L	1	75	25	U	11/25/08 11:32

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB42A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 08:40
Solids: 0.00
Laboratory ID: 0811332-01

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813781

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	400	mg/kg dry wt.	1	10	2.9		11/25/08 14:24

Km

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB42B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 08:45
Solids: 0.00
Laboratory ID: 0811332-02

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5 g / 50 mL
QC Batch: 0813781

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	430	mg/kg dry wt.	1	10	2.9		11/25/08 14:52

Km

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB43A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 08:58
Solids: 0.00
Laboratory ID: 0811332-03

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.4998 g / 50 mL
QC Batch: 0813781

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	240	mg/kg dry wt.	1	10	2.9		11/25/08 14:56

KJM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB43B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 09:01
Solids: 0.00
Laboratory ID: 0811332-04

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.4999 g / 50 mL
QC Batch: 0813781

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	92	mg/kg dry wt.	1	10	2.9		11/25/08 15:00

Kim

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB43C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 09:06
Solids: 0.00
Laboratory ID: 0811332-05

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0813781

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	250	mg/kg dry wt.	1	10	2.9		11/25/08 15:04

KJM

00228

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB63A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 09:15
Solids: 0.00
Laboratory ID: 0811332-06

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5 g / 50 mL
QC Batch: 0813781

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	1300	mg/kg dry wt.	1	10	2.9		11/25/08 15:08

KJM

002221

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB45A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 09:23
Solids: 0.00
Laboratory ID: 0811332-07

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813781

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	440	mg/kg dry wt.	1	10	2.9		11/25/08 15:12

KJM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB45B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 09:30
Solids: 0.00
Laboratory ID: 0811332-08

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0813781

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	210	mg/kg dry wt.	1	10	2.9		11/25/08 15:16

KJM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB62A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 09:45
Solids: 0.00
Laboratory ID: 0811332-09

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813781

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	460	mg/kg dry wt.	1	10	2.9		11/25/08 15:20

KJM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DUP-11

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 00:00
Solids: 0.00
Laboratory ID: 0811332-10

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0813781

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	610	mg/kg dry wt.	1	10	2.9		11/25/08 15:33

KJM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB46A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 09:48
Solids: 0.00
Laboratory ID: 0811332-11

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5 g / 50 mL
QC Batch: 0813781

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	300	mg/kg dry wt.	1	10	2.9		11/25/08 15:37

KJM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB46B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 09:50
Solids: 0.00
Laboratory ID: 0811332-12

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0813781

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	240	mg/kg dry wt.	1	10	2.9		11/25/08 15:41

Kim

00227

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB46C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 09:56
Solids: 0.00
Laboratory ID: 0811332-13

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5 g / 50 mL
QC Batch: 0813781

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	160	mg/kg dry wt.	1	10	2.9		11/25/08 15:45

Km

000228

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB48A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 12:16
Solids: 0.00
Laboratory ID: 0811332-14

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0813781

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	110	mg/kg dry wt.	1	10	2.9		11/25/08 15:49

KJM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB48B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 12:20
Solids: 0.00
Laboratory ID: 0811332-15

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5003 g / 50 mL
QC Batch: 0813781

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	170	mg/kg dry wt.	1	10	2.9		11/25/08 15:53

KM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB48C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 12:25
Solids: 0.00
Laboratory ID: 0811332-16

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.4998 g / 50 mL
QC Batch: 0813781

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	420	mg/kg dry wt.	1	10	2.9		11/25/08 15:57

K, m

80231

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB58A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 12:40
Solids: 0.00
Laboratory ID: 0811332-17

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0813781

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	120	mg/kg dry wt.	1	10	2.9		11/25/08 16:01

K,m

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DUP-12

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 00:00
Solids: 0.00
Laboratory ID: 0811332-18

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.4999 g / 50 mL
QC Batch: 0813781

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	110	mg/kg dry wt.	1	10	2.9		11/25/08 16:05

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB58B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 12:45
Solids: 0.00
Laboratory ID: 0811332-19

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5 g / 50 mL
QC Batch: 0813781

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	130	mg/kg dry wt.	1	10	2.9		11/25/08 16:09

KJM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB51A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 12:50
Solids: 0.00
Laboratory ID: 0811332-20

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5003 g / 50 mL
QC Batch: 0813781

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	100	mg/kg dry wt.	1	10	2.9		11/25/08 16:22

KM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB51B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 12:55
Solids: 0.00
Laboratory ID: 0811332-21

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:35
Initial/Final: 0.5003 g / 50 mL
QC Batch: 0813782

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	190	mg/kg dry wt.	1	10	2.9		11/25/08 16:34

KIM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB52A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:25
Solids: 0.00
Laboratory ID: 0811332-22

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:35
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0813782

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	52	mg/kg dry wt.	1	10	2.9		11/25/08 16:38

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB52B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:30
Solids: 0.00
Laboratory ID: 0811332-23

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:35
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813782

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	34	mg/kg dry wt.	1	10	2.9		11/25/08 16:42

Kim

002235

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB56A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:35
Solids: 0.00
Laboratory ID: 0811332-24

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:35
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0813782

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	560	mg/kg dry wt.	1	10	2.9		11/25/08 16:46

KJM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB56B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:40
Solids: 0.00
Laboratory ID: 0811332-25

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:35
Initial/Final: 0.5 g / 50 mL
QC Batch: 0813782

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	870	mg/kg dry wt.	1	10	2.9		11/25/08 16:50

K,m

00249

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DUP-14

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 00:00
Solids: 0.00
Laboratory ID: 0811332-26

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:35
Initial/Final: 0.5 g / 50 mL
QC Batch: 0813782

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	530	mg/kg dry wt.	1	10	2.9		11/25/08 16:54

Km

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB54A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:50
Solids: 0.00
Laboratory ID: 0811332-27

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:35
Initial/Final: 0.4998 g / 50 mL
QC Batch: 0813782

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	100	mg/kg dry wt.	1	10	2.9		11/25/08 16:58

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB54B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:55
Solids: 0.00
Laboratory ID: 0811332-28

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:35
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813782

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	110	mg/kg dry wt.	1	10	2.9		11/25/08 17:10

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB55A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 14:05
Solids: 0.00
Laboratory ID: 0811332-29

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:35
Initial/Final: 0.5003 g / 50 mL
QC Batch: 0813782

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	140	mg/kg dry wt.	1	10	2.9		11/25/08 17:14

KJM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB84A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 08:50
Solids: 0.00
Laboratory ID: 0811332-30

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:35
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0813782

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	210	mg/kg dry wt.	1	10	2.9		11/25/08 17:35

KJM

002415

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DUP-10

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 08:50
Solids: 0.00
Laboratory ID: 0811332-31

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:35
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0813782

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	210	mg/kg dry wt.	1	10	2.9		11/25/08 17:39

KM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB84B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 08:55
Solids: 0.00
Laboratory ID: 0811332-32

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:35
Initial/Final: 0.4999 g / 50 mL
QC Batch: 0813782

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	370	mg/kg dry wt.	1	10	2.9		11/25/08 17:43

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB86A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 09:10
Solids: 0.00
Laboratory ID: 0811332-33

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:35
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0813782

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	290	mg/kg dry wt.	1	10	2.9		11/25/08 17:47

KJM

002418

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB86B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 09:15
Solids: 0.00
Laboratory ID: 0811332-34

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:35
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0813782

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	280	mg/kg dry wt.	1	10	2.9		12/01/08 21:01

KJM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB64A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 09:32
Solids: 0.00
Laboratory ID: 0811332-35

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:35
Initial/Final: 0.4999 g / 50 mL
QC Batch: 0813782

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	240	mg/kg dry wt.	1	10	2.9		12/01/08 18:15

Kim

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB64B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 09:36
Solids: 0.00
Laboratory ID: 0811332-36

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:35
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0813782

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	260	mg/kg dry wt.	1	10	2.9		12/01/08 18:19

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB44A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 09:52
Solids: 0.00
Laboratory ID: 0811332-37

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:35
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0813782

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	330	mg/kg dry wt.	1	10	2.9		12/01/08 18:23

K,m

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB44B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 09:59
Solids: 0.00
Laboratory ID: 0811332-38

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:35
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813782

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	190	mg/kg dry wt.	1	10	2.9		12/01/08 18:27

KM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB44C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 10:01
Solids: 0.00
Laboratory ID: 0811332-39

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:35
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0813782

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7439-92-1	Lead, Total	610	mg/kg dry wt.	1	10	2.9		12/01/08 18:40	K, m

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB61A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 10:08
Solids: 0.00
Laboratory ID: 0811332-40

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:35
Initial/Final: 0.5 g / 50 mL
QC Batch: 0813782

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	110	mg/kg dry wt.	1	10	2.9		12/01/08 18:44

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB61B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 10:11
Solids: 0.00
Laboratory ID: 0811332-41

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0813783

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	820	mg/kg dry wt.	1	10	2.9		12/01/08 18:57

LM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB47A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 10:17
Solids: 0.00
Laboratory ID: 0811332-42

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0813783

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	200	mg/kg dry wt.	1	10	2.9		12/01/08 19:01

Lim

00251

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB47B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 10:21
Solids: 0.00
Laboratory ID: 0811332-43

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5005 g / 50 mL
QC Batch: 0813783

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	160	mg/kg dry wt.	1	10	2.9		12/01/08 19:05

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB60A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 12:19
Solids: 0.00
Laboratory ID: 0811332-44

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0813783

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	120	mg/kg dry wt.	1	10	2.9		12/01/08 19:09

LM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB60B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 12:23
Solids: 0.00
Laboratory ID: 0811332-45

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0813783

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	190	mg/kg dry wt.	1	10	2.9		12/01/08 19:13

Lm

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB49A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 12:30
Solids: 0.00
Laboratory ID: 0811332-46

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0813783

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	180	mg/kg dry wt.	1	10	2.9		12/01/08 19:17

Lim

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB59A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:02
Solids: 0.00
Laboratory ID: 0811332-47

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.4998 g / 50 mL
QC Batch: 0813783

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	190	mg/kg dry wt.	1	10	2.9		12/01/08 19:29

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB59B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:23
Solids: 0.00
Laboratory ID: 0811332-48

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0813783

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	190	mg/kg dry wt.	1	10	2.9		12/01/08 19:34

Lm

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB50A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:31
Solids: 0.00
Laboratory ID: 0811332-49

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.4998 g / 50 mL
QC Batch: 0813783

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	69	mg/kg dry wt.	1	10	2.9		12/01/08 19:37

LM

00254

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB50B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:36
Solids: 0.00
Laboratory ID: 0811332-50

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5003 g / 50 mL
QC Batch: 0813783

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	75	mg/kg dry wt.	1	10	2.9		12/01/08 19:41

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB50C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:41
Solids: 0.00
Laboratory ID: 0811332-51

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.4999 g / 50 mL
QC Batch: 0813783

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7439-92-1	Lead, Total	110	mg/kg dry wt.	1	10	2.9		12/01/08 19:45	L,m

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB57A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:48
Solids: 0.00
Laboratory ID: 0811332-52

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5002 g / 50 mL
QC Batch: 0813783

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	95	mg/kg dry wt.	1	10	2.9		12/01/08 19:49

LM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB57B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:52
Solids: 0.00
Laboratory ID: 0811332-53

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0813783

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed	
7439-92-1	Lead, Total	120	mg/kg dry wt.	1	10	2.9		12/01/08 19:53	L1m

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB57C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 13:56
Solids: 0.00
Laboratory ID: 0811332-54

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5003 g / 50 mL
QC Batch: 0813783

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	110	mg/kg dry wt.	1	10	2.9		12/01/08 19:57

L,m

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB53A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 14:05
Solids: 0.00
Laboratory ID: 0811332-55

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5004 g / 50 mL
QC Batch: 0813783

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	91	mg/kg dry wt.	1	10	2.9		12/01/08 20:01

Lm

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB53B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 14:09
Solids: 0.00
Laboratory ID: 0811332-56

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5 g / 50 mL
QC Batch: 0813783

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	70	mg/kg dry wt.	1	10	2.9		12/01/08 20:05

LM

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB65A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 14:28
Solids: 0.00
Laboratory ID: 0811332-57

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0813783

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	260	mg/kg dry wt.	1	10	2.9		12/01/08 20:34

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB65B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 11/14/08 14:34
Solids: 0.00
Laboratory ID: 0811332-58

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 11/21/08 07:30
Initial/Final: 0.5003 g / 50 mL
QC Batch: 0813783

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	280	mg/kg dry wt.	1	10	2.9		12/01/08 20:37

Lm

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

EQBK-7

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water
Sampled: 11/14/08 15:25
Solids: 0.00
Laboratory ID: 0811332-59

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3010A Digestion
Prepared: 11/20/08 07:30
Initial/Final: 25 mL / 25 mL
QC Batch: 0813680

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	75	ug/L	1	75	25	U	11/25/08 11:40

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

EQBK-8

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water
Sampled: 11/14/08 15:30
Solids: 0.00
Laboratory ID: 0811332-60

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3010A Digestion
Prepared: 11/20/08 07:30
Initial/Final: 25 mL / 25 mL
QC Batch: 0813680

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	75	ug/L	1	75	25	U	11/25/08 11:44

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

EQBK-9

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water
Sampled: 11/14/08 15:35
Solids: 0.00
Laboratory ID: 0811332-61

SDG: 36440-62
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3010A Digestion
Prepared: 11/20/08 07:30
Initial/Final: 25 mL / 25 mL
QC Batch: 0813680

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	75	ug/L	1	75	25	U	11/25/08 11:56

DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: 36440-62
Project No.: 11656367

Project Name: Radford SWMU 13
Reviewer: Lee Anne Mareck
Date: January 14, 2009

1.0 Chain of Custody/Sample Condition/Raw Data		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?				X								
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?				X								
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?					X							
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 ^{O}C $\pm$ 2 ^{O}C)					X							
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.				X								

Note: Two coolers (1897 and 2173) were received at 6.6 °C and 7.7 °C, respectively.

2.0 Holding Time		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, CN: 14 days, other metals: 6 months) Action:L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).					X							

Note:

3.0 Instrument Calibration		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? (ICP& ICPMS: blank + one standard & a RL standard OR 3 standards and a blank with one standard at the RL; CVAA: blank + five standards with one standard at the RL). If not, qualify with "R".				X								
3.2	Are the correlation coefficients > 0.99? Action: J(+)/UJ(-).				X								
3.3	Once per calibration, did a high and low distilled standard recovery within 85-115%? If no, follow 3.6.												
3.4	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".				X								
3.5	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.				X								
3.6	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR ICP 90%-110%, FOR Hg 80-120%, FOR CN 85-115%.				X								
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury < 65% 65% - 79% > 120% Cyanide < 65% 65% - 84% > 115% Other Metals < 75% 75% - 89% > 110%												
3.7	For ICP & ICPMS, did the CRDL standard recover between 80-120%?						X						
	<50% 50%-79% >120% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K												

Note: _____

URS

4.0 Blanks

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?				X								
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".				X								
4.3	Are there reported MB or ICB/CCBs values > MDL?					X							
	Sample Results > MDL												
	< 5X Blank Contamination B												
4.4	Are there negative blank results with the absolute value > MDL?					X							
	Sample Results Non-detects > MDL												
	< 5X absolute Blank Contamination UL L												
4.5	Are there reported field blank > ± MDL?					X							
	Sample Results > MDL												
	< 5X Blank Contamination B												

Note: _____

5.0 ICP Interference Check Sample (ICS)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning of each ICP run?				X								
5.2	Are the ICS AB recoveries within 80% - 120%?				X								
5.3	Are the results for unspiked analytes (in ICS A) < ± RL?				X								
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?						X						
	If not...												
	Action: Not Spiked Analytes Spiked analytes (ICS AB analytes)												
	< -MDL > MDL < 50% 50% - 79% >120%												
	L(+)/UL(-) K(+) L(+)/R(-) L(+)/UL(-) K(+)												

Note: _____

6.0 Laboratory Control Sample (LCS)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.				X								
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)					X							

Action:	Solid		Aqueous		
	< LCL	> UCL	< 50%	50% - 79%	> 120%
	L(+)/UL(-)	K(+)	L(+)/R(-)	L(+)/UL(-)	K(+)

Note:

7.0 Laboratory Duplicates (MSD)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.				X								
	For aqueous 6010B and Hg - RPD< 25%, aqueous CN - RPD < 20%, aqueous 6020 - RPD < 20%, and for soil - use laboratory generated limits for MS/MSD.												
7.2	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ(-) for the analyte with results that fall outside criteria.					X							

Note: 13SB90B - MSD %R = 176

13SB66B - MS %R = 55

13SB35A - MS %R = 5/ MSD %R = 36

13SB42A - MSD %R = 15

13SB86B - MSD %R = 127

13SB53B - MS %R = 58/ MSD %R = 60

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.				X								
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125% for aqueous matrices or lab limits for soil matrices?												
	%R > 125% 30%< %R < 74% < 30%				X								
	Positive K L L												
	Non-detect None UL R												
8.3	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.						X						

Note: _____

9.0 Instrument Detection Limits (IDL)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?				X								

Note: _____

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?				X								
10.2	Was a five-fold dilution performed?				X								
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 5 X the RL for 6010 or > 20 X the RL for 6020 in the original sample? If no, J(+).				X								

Note: _____

11.0 Field Duplicate Samples

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?				X								
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.												
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report					X							

Note: 13SB33A and DUP-6 - RPD = 154%

13SB56B and DUP-14 - RPD = 49%

12.0 Result Verification/ Internal Standards/ Tune

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?				X								
12.2	Were all dilution reflected in the positive results and detection limits?						X						
12.3	Were the Internal Standard recoveries within 30-120%				X								
12.4	Were the tunes run at a minimum of four times with RSD < 5% for analytes in solution?												
12.5	Were the tune mass calibrations < 0.1 amu from the true value?												
12.6	Was the resolution check peak width < 0.9 amu at 10% peak height?												

Note:

13.0 Completeness Calculation

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)				X								
13.1.1	Number of samples: 167												
13.1.2	Number of target compounds in each analysis: 1												
13.1.3	Number of results rejected and not reported: 0												
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2)												
	% Completeness = 100												

Note:

Radford Army Ammunition Plant
SWMU 13
Duplicate Statistics

13SB26B and DUP-1

		Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
	Metals									
lead		mg/Kg	10.0	50	220	230.0	4%	10.0	40.0	Pass

13SB76B and DUP-2

		Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
	Metals									
lead		mg/Kg	10.0	50	170	190.0	11%	20.0	40.0	Pass

13SB74C and DUP-3

		Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
	Metals									
lead		mg/Kg	10.0	50	190	270.0	35%	80.0	40.0	Pass

13SB75B and DUP-4

		Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
	Metals									
lead		mg/Kg	10.0	50	210	200.0	5%	10.0	40.0	Pass

13SB89A and DUP-5

		Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
	Metals									
lead		mg/Kg	10.0	50	130	150.0	14%	20.0	40.0	Pass

Soil Control Limits

[sample] > 5 x RL, use 35%
[sample] < 5 x RL, use 4 x RL

URS
Measurement Systems

Radford Army Ammunition Plant
SWMU 13
Duplicate Statistics

13SB33A and DUP-6

		Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
	Metals									
lead		mg/Kg	10.0	50	1600	210.0	154%	1390.0	40.0	Fail

13SB36B and DUP-7

		Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
	Metals									
lead		mg/Kg	10.0	50	250	250.0	0%	0.0	40.0	Pass

13SB38B and DUP-8

		Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
	Metals									
lead		mg/Kg	10.0	50	460	370.0	22%	90.0	40.0	Pass

13SB39A and DUP-9

		Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
	Metals									
lead		mg/Kg	10.0	50	330	360.0	9%	30.0	40.0	Pass

13SB84A and DUP-10

		Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
	Metals									
lead		mg/Kg	10.0	50	210	210.0	0%	0.0	40.0	Pass

Soil Control Limits

[sample] > 5 x RL, use 35%
[sample] < 5 x RL, use 4 x RL

URS
Measurement Systems

Radford Army Ammunition Plant
SWMU 13
Duplicate Statistics

13SB62A and DUP-11

	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
Metals									
lead	mg/Kg	10.0	50	460	610.0	28%	150.0	40.0	Pass

13SB58A and DUP-12

	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
Metals									
lead	mg/Kg	10.0	50	120	110.0	9%	10.0	40.0	Pass

13SB56B and DUP-14

	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
Metals									
lead	mg/Kg	10.0	50	870	530.0	49%	340.0	40.0	Fail

Soil Control Limits

[sample] > 5 x RL, use 35%
[sample] < 5 x RL, use 4 x RL

SDG CASE NARRATIVE

URS Corporation
RFAAP SWMU 13 RFI/CMS, WO 008

SDG Executive Summary

This case narrative applies to samples received on November 14, 2008 through November 15, 2008. All samples were scheduled for analysis in accordance with parameters outlined on the field chain of custody record, the TriMatrix bid form, and/or oral and written correspondence between URS Corporation and TriMatrix Laboratories, Inc..

Each sample receipt event was assigned a unique TriMatrix work order number. Sample receipt documentation is included in section A of this data package.

Project Technical Issues/Problems

Project-related data qualification designations and reporting conventions are included in Attachment 1 - *Project Technical Narrative.*

QA/QC Data Qualifications/Narrations

Quality assurance issues and/or quality control data qualifications and narrations related to the analysis and reporting of this SDG are presented in Attachment 2 - *Statement of Data Qualifications.* The absence of a statement page for a particular analyte group (*e.g.* Percent Solids) implies that no qualifying statements were generated for that analyte.

Data Review and Approval

All data was peer-reviewed by a second analyst, and then by appropriate data management staff against laboratory quality control requirements and project specifications. It was then reviewed and approved by the group supervisor/manager prior to further review by the project chemist.

Data Deliverables

The data deliverables, both hardcopy and/or electronic (EDD), that comprise this data package are intended to comply with the documents referenced in the introductory section of this narrative. The EDD, if requested, will be issued separately from this hardcopy report. Hold time reports for each test procedure are presented following the CLP-like forms section of this report.

This report relates only to the sample(s) as received. Test results are in compliance with the requirements of the National Environmental Laboratory Accreditation Conference (NELAC). Estimates of analytical uncertainties for the test results contained within the report are available upon request.

Lisa M. Harvey, Project Chemist

12.10.2008
Date

SDG: 36440-62

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Individual sample results relate only to the sample tested.

SDG CASE NARRATIVE

Attachment 1
Project Technical Narrative

Sample Result Reporting Convention

Sample results are reported as RL "U" (e.g. 0.001 U) if the target analyte was not detected above the MDL.

If a sample for an organic analyte is reanalyzed and also reported, the second analysis includes the suffix "RE*n*" where *n* = the first, second, etc. reanalysis.

Data Qualifier Designation

If applicable, sample results are qualified with:

a "J" flag if the analyte was detected, but the concentration is greater than the MDL and less than the RL;

a "B" flag if the analyte was also detected at or above the RL in the associated method blank, and the sample concentration was less than five times the method blank result;

an "E" flag if the analyte exceeded the instrument calibration range;

an asterisk (*) if a report-generated statement of qualification applies; qualifying statements, if any, will be found in Attachment 2 to this narrative.

Batch and Analytical Batch Designation

A Quality Control (QC) Batch is a seven-digit number that associates all samples that have been prepared together (or analyzed together if there is no preparation). Quality Control batches are limited to no more than twenty samples, excluding batch QC (method blanks, control spikes, etc.). Some batches may contain multiple sets of method blanks (BLK) and laboratory control samples (BS), where a set of method quality control analyses were prepared in concert with each set of samples on a given day.

An Analytical Batch (or Sequence) is a seven-digit number that associates all samples analyzed as a set under one analytical run.

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SDG CASE NARRATIVE

Attachment 2
Statement of Data Qualifications

Total Metals by EPA 6000/7000 Series Methods

Qualification: The MS and/or MSD recovery was outside the control limit. The non-spiked sample concentration for the same analyte was less than 4 times the spiked amount; the non-spiked sample result is considered estimated.

Analysis: USEPA-6010B

Sample/Analyte:		
	0811332-56 13SB53B	Lead

Qualification: The MS or MSD recovery, but not both, was outside the control limit. The RPD is within the control limit. The unspiked sample result is considered estimated.

Analysis: USEPA-6010B

Sample/Analyte:		
	0811330-41 13SB66B	Lead

Qualification: The MS and/or MSD recovery was outside the control limit. The non-spiked sample concentration for the same analyte was greater than or equal to 4 times the spiked amount; the non-spiked sample result is not qualified.

Analysis: USEPA-6010B

Sample/Analyte:		
	0811329-41 13SB90B	Lead
	0811330-21 13SB35A	Lead
	0811332-01 13SB42A	Lead
	0811332-34 13SB86B	Lead

Qualification: Matrix QC results are not available due to sample dilution.

Analysis: USEPA-6010B

Sample/Analyte:		
	0811329-34 13SB80B	Lead
	0811330-10 13SB38B	Lead

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6010B

13SB90B

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-62

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.5003 g / 50 mL

Laboratory ID: 0813703-MSD1

QC Batch: 0813703

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Lead, Total	25.0	218	176 *	7	20	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6010B

13SB66B

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-62

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.4996 g / 50 mL

Laboratory ID: 0813704-MS1

QC Batch: 0813704

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Lead, Total	25.0	37.8	51.6	55 *	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

00334

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6010B

13SB35A

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-62

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.4995 g / 50 mL

Laboratory ID: 0813707-MS1

QC Batch: 0813707

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Lead, Total	25.0	227	228	5 *	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6010B

13SB35A

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-62

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.5005 g / 50 mL

Laboratory ID: 0813707-MSD1

QC Batch: 0813707

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Lead, Total	25.0	236	36 *	3	20	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

00037

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6010B

13SB42A

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-62

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.5 g / 50 mL

Laboratory ID: 0813781-MSD1

QC Batch: 0813781

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Lead, Total	25.0	440	155 *	4	20	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6010B

13SB86B

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-62

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.4998 g / 50 mL

Laboratory ID: 0813782-MSD2

QC Batch: 0813782

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Lead, Total	25.0	314	127 *	3	20	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

00345

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6010B

13SB53B

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-62

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.5005 g / 50 mL

Laboratory ID: 0813783-MS1

QC Batch: 0813783

Analyte	Spike Added	Sample Conc.	MS Conc.	MS % Rec. #	QC Limits Rec.	Units
Lead, Total	25.0	70.4	85.0	58 *	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

002344

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

USEPA-6010B

13SB53B

Laboratory: TriMatrix Laboratories, Inc.

Client: URS Corporation

Matrix: Soil

SDG: 36440-62

Project: RFAAP SWMU 13 RFI/CMS, WO 008

Preparation: 3050B Digestion

Initial/Final: 0.5005 g / 50 mL

Laboratory ID: 0813783-MSD1

QC Batch: 0813783

Analyte	Spike Added	MSD Conc.	MSD % Rec. #	% RPD #	QC Limits RPD	QC Limits Rec.	Units
Lead, Total	25.0	85.4	60 *	0.4	20	80 - 120	mg/kg dry wt.

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

000345

TriMatrix Laboratories, Inc.

5560 Corporate Exchange Court SE Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 126459

30440-62 pb

Page 1 of 4

For Lab Use Only
Cart: 6
VOA Rack/Tray: —
Receipt Log No.: 25-10
Project Chemist: CMH
Laboratory Project No.: 0811329

Client Name: URS Corp
Address: 5540 Falmouth St, #201
Richmond, VA 23230
Phone: 804 965 9000
Fax: 804 965 9764

Project Name: RFAHP - Siumi 13
Client Project No./P.O. No.: 11656367
Invoice No.: ☒ ~~Client~~ ☐ Other (comments)
Contact/Report To: Lee Ann Marek

Analyses Requested

A
P.O. 60103

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Container Type (corresponds to Container Packing List) 16 — Number of Containers Submitted	Total	Sample Comments
D	SO	01	1 135B77A		11/12/08	1332		✓	SO	1		
		02	2 135B77B			1335		✓		1		
		03	3 135B76A	1897		1350		✓		1		
		04	4 135B76B			1355		✓		1		
		05	5 135B76C			1405		✓		1		
		06	6 135B78A			1309		✓		1		
		07	7 135B78B			1311		✓		1		
		08	8 135B79A			1300		✓		1		
		09	9 135B79B	1897		1305		✓		1		
F	FD	10	10 DUP-2	↓	↓			✓	↓	1		

Sampled By (print): Kelly Hicks
Sampler's Signature: [signature]
Company: URS Corp

How Shipped? Hand Carrier FedEx
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
[signature]	11/13/08	1607						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						[signature]	11/14/08	0900

TriMatrixCOC -- COC WHITE COPY - REPORT YELLOW COPY - LABORATORY PINK COPY - FIELD

219

TriMatrix Laboratories, Inc.

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Phone (616) 975-4500 Fax (616) 942-7463
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Chain of Custody Record

COC No. 126482

36440-62 Pb

Page 2 of 4

For Lab Use Only
Cart 6
VOA Rack/Tray
Receipt Log No. 25-10
Project Chemist CMH
Laboratory Project No. 0811329

Client Name: URS Corp
Address: 7540 Falmouth St, #201
Richmond, VA 23230
Phone 804 965-9000
Fax 804 965-9764

Project Name: RFAAP Slurry B
Client Project No./P.O. No. 11605363.67
Invoice No. ☒ Client ☐ Other (comments)
Contact/Report To: Lee Ann Marek

Analyses Requested
A
Pb 6010B

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Container Type (corresponds to Container Packing List)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	16 Number of Containers Submitted	Total	Sample Comments
D	SO	11	1	135B27A		11/12/08	1230		✓	SO	1		
		12	2	135B82A	1897		0934		✓		1		
		13	3	135B82B			0941		✓		1		
		14	4	135B82C			0951		✓		1		
		15	5	135B75A			1000		✓		1		
		16	6	135B75B			1005		✓		1		
		17	7	135B25C			1015		✓		1		
		18	8	135B26A			1214		✓		1		
		19	9	135B26B			1228		✓		1		
F	FD	20	10	DUP-1			—		✓		1		

Sampled By (print): Kelly Hicks
Sampler's Signature: KH
Company: URS Corp

How Shipped? Hand Carrier FedEx
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	11/13/08	1605						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
							11/14/08	0900

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Chain of Custody Record

COC No. 126485

36440-62 Pb

Page 3 of 4

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Cart: 6
VOA Rack/Tray:
Receipt Log No.: 25-10
Project Chemist: MH
Laboratory Project No.: 0811329

Client Name: URS Corp
Address: 5540 Falmouth St #201
Richmond, VA 23230
Phone: 804 965 9000
Fax: 804 965 9764

Project Name: RFAAP SWMU 13
Client Project No./P.O. No.: 11656367
Invoice No.: ☒ Client ☐ Other (comments)
Contact/Report To: Lee Ann Manuel

Analyses Requested

Pb 6010B

Container Type (corresponds to Container Packing List)

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted (A)	Total	Sample Comments
D	SO	21	1	135B23A	1897	11/12/08	0912		✓	SO	1		
		22	2	135B23B			0918		✓		1		
		23	3	135B23C			0927		✓		1		
		24	4	135B24A			0912		✓		1		
		25	5	135B24B			0919		✓		1		
		26	6	135B24C			0925		✓		1		
		27	7	135B30A			1424		✓		1		
		28	8	135B31A			1428		✓		1		
		29	9	135B28A			1245		✓		1		
		30	10	135B33A		11/12/08	1608		✓		1		

Sampled By (print): Kelly Hicks
Sampler's Signature: KJH
Company: URS Corp

How Shipped? Hand Carrier FedEx
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	11/13/08	1607						
1. Received By	**Date**	**Time**	**2. Received By**	**Date**	**Time**	**3. Received For Lab By**	**Date**	**Time**
							11/14/08	0900

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Chain of Custody Record

COC No. 126463

32640-12 Pb

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Cart: 6
VOA Rack/Tray:
Receipt Log No.: 25-10
Project Chemist: MH
Laboratory Project No.: 0811329

Client Name: URS Corp
Address: 5540 Falmouth St #201
Richmond, VA 23230
Phone: 804 965 9000
Fax: 804 965 9764

Project Name: RFAAP SWMU 13
Client Project No./P.O. No.: 11656367
Invoice No.: ☑ Client ☐ Other (comments)
Contact/Report To: Lee Ann Marcel

Analyses Requested

Pb 6010B	TAL Metals	SVOCs Exp. Mthd	TCC
A	A	A	A

Container Type (corresponds to Container Packing List): 16

Number of Containers Submitted

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Pb 6010B	TAL Metals	SVOCs Exp. Mthd	TCC	Total	Sample Comment
D	SO	31	1	135B81A	1897	11/12/08	0944		✓	SO	1					
|	|	32	2	135B81B			0950		✓		1					
|	|	33	3	135B80A			1210		✓		1					
E	SO	34	4	135B80B ms/msd			1213		✓		1					
D	SO	35	5	135B83A			0930		✓		1					
|	|	36	6	135B83B			0933		✓		1					
X	X	X X X	7	135B13A			1000		✓			1	1	1		
	X	X X X	8	135B13C			1018		✓			1	1			
	X	X X X	9	135B21C			1226		✓			1	1			
X	X	X X X	10	135B14A			1600		✓			1	1			

Sampled By (print): Kelly Hicks
Sampler's Signature:
Company: URS Corp

How Shipped? Hand Carrier FedEx
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	11/13/08	1657						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
							11/14/08	0900

519

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COC No. 126483

36440-62 Pb

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Cart: 6
VOA Rack/Tray:
Receipt Log No.: 25-10
Project Chemist: CMH
Laboratory Project No.: 0611329

Client Name: URS Corp
Address: 5540 Falmouth St. Suite 201
Richmond VA 23230
Phone 804 965 9660
Fax 8049659764

Project Name: RFAAP - SWMU
Client Project No./P.O. No.: 11656367
Invoice No.: [X] Client [ ] Other (comments)
Contact/Report To: Lee Marrack

Analyses Requested

Pb 6010B; 5 VOC 8260C; Nitrate 8352; Explosives 8330B; TAL Met. 6010B/7470A

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Container Type (corresponds to Container Packing List)	Number of Containers Submitted	Total	Sample Comments
D	SO	37	1 135B74A	2173	11/12/08	1535		X	S	1	1	1	
		38	2 135B74B			1540		X		1	1	1	
		39	3 135B74C			1550		X		1	1	1	
		40	4 135B90A			1542		X		1	1	1	
		41	5 135B90B			1548		X		1	1	1	
		42	6 135B75A			1425		X		1	1	1	
		43	7 135B75B			1430		X		1	1	1	
		44	8 135B75C			1440		X		1	1	1	
		45	9 135B89A			1517		X		1	1	1	
		46	10 135B89B			1521		X		1	1	1	

Sampled By (print): Brett Fisher
Sampler's Signature:
Company: URS Corp

How Shipped? Hand Carrier FedEx
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	11/13/08	1607						
1. Received By	**Date**	**Time**	**2. Received By**	**Date**	**Time**	**3. Received For Lab By**	**Date**	**Time**
						Lee Romeyn	11/14/08	0900

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COC No. 126484

36440-1

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Cart: 6

VOA Rack/Tray:

Receipt Log No.: 25-10

Project Chemist: MH

Laboratory Project No.: 0811329

Client Name: LES Grp

Address:

Phone:

Fax:

Project Name: RFAAP-SWMU 13

Client Project No./P.O. No.:

Invoice No. ☐ Client ☐ Other (comments)

Contact/Report To

Analyses Requested

Pb 6010B | SVOC 8270C | Nitro 8330 | Explosives 8330 | TAL Metals 6010B 8260

⇦ PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Container Type (corresponds to Container Packing List)	Number of Containers Submitted										Total	Sample Comments
D	50	47	1	135B88A	2173	11/12/08	1508		X	S		1									DF	1	
		48	2	135B88B			1515		X			1										1	
		49	3	135B86A			1545		X			1										1	
		50	4	135B86B			1350		X			1										1	
		51	5	135B87A			1400		X			1										1	
		52	6	135B87B			1405		X			1										1	
		53	7	135B87C			1415		X			1										1	
		54	8	135B85A			1310		X			1										1	
		55	9	135B85B			1314		X			1										1	
		56	10	135B85C			1320		X			1										1	

Sampled By (print):

Sampler's Signature:

Company:

How Shipped? Hand Carrier

Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	11/13/08	1607						
1. Received By	**Date**	**Time**	**2. Received By**	**Date**	**Time**	**3. Received For Lab By**	**Date**	**Time**
							11/14/08	0900

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Chain of Custody Record

COC No. 126460

36440-602 Pb

Page 4 of 4

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Cart: 6
VOA Rack/Tray:
Receipt Log No.: 25-10
Project Chemist: CMH
Laboratory Project No.: 0811329

Client Name: URS
Address:
Phone:
Fax:

Project Name: RAAP
Client Project No./P.O. No.:
Invoice No. ☐ Client ☐ Other (comments)
Contact/Report To:

Analyses Requested

Pb 6010B

⇦ PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Container Type (corresponds to Container Packing List)	Number of Containers Submitted	Total	Sample Comments
F	FD	57	1	Dup-6	2173	11/12/08			X	S	1	1	1	
			2			11/12/08								
			3											
			4											
			5											
			6											
			7											
			8											
			9											
			10											

Sampled By (print):
Sampler's Signature:
Company:

How Shipped? Hand Carrier
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	11/13/08	1607						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
							11/14/08	0900

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COC No. 126474

36440-62

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Cart: 4
VOA Rack/Tray:
Receipt Log No.: 25-10
Project Chemist: CMH
Laboratory Project No.: 0811329

Client Name: URS Corp
Address: 5540 Falmouth St #201
Richmond, VA 23230
Phone: 804 965 9000
Fax: 804 965 9764

Project Name: RFHAP Sumu 13
Client Project No./P.O. No.: 11165631.07
Invoice No.: ~~Client~~ Other (comments)
Contact/Report To: Leedin, Marc L

Page 1 of

Analyses Requested

B	A	A	A	X	B				
TAL Metals	SVOCs	NG	Explosives	Extra	PO 6010B				

⇦ PRESERVATIV
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH
E NaOH pH>1
F ZnAc/NaOH pH
G MeOH
H Other (note bel

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Container Type (corresponds to Container Packing List)										Total	Sample Commer
											Number of Containers Submitted											
X	X	X	X	1 EQBK-1	2144	11/12/08	1700		✓	W	1	1	1	1	2							
GEB		58		2 EQBK-2 ✓	↓	↓	1715		✓	↓					1							
GEB		59		3 EQBK-3 ✓	↓	↓	1720		✓	↓					1							
				4																		
				5																		
				6																		
				7																		
				8																		
				9																		
				10																		

Sampled By (print): Kelly Hicks
Sampler's Signature:
Company: URS Corp

How Shipped? Hand Carrier
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	11/13/08	1607						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
							11/14/08	0900

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Chain of Custody Record

COC No. 126486

Page 3 of 1

36440-62 Pb

For Lab Use Only	
Cart	6
VOA Rack/Tray	—
Receipt Log No.	25-11
Project Chemist	CMH
Laboratory Project No.	0811329

Client Name	URS
Address	Richmond
Phone	
Fax	
Project Name	RRAAP SWMU 13
Client Project No./P.O. No.	
Invoice No.	☐ Client ☐ Other (comments)
Contact/Report To	

Analyses Requested

Container Type (corresponds to Container Packing List)

Number of Containers Submitted

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Pb 6010B	SVOC 8270C	Nitrate 8330	Explosives 8330	TAL Metals 6010B	TOC	Total	Sample Comments
D	SO	100	1	135B29A	2173	11/12/08	1335		X	S	1						1	
D	SO	101	2	135B32A			1450		X		1						1	
X	X	X	3	135B20A			1434		X			1	1	1	1		4	
X	X	X	4	135B20C			1449		X			1	1	1	1	1	5	
X	X	X	5	135B22A			1320		X			1	1	1	1		4	
X	X	X	6	135B22C			1325		X			1	1	1	1		4	
X	X	X	7	135B21A			1221		X			1	1	1	1		4	
F	FD	102	8	Dup-3			—		X		(1)	+	Lm	+			1	
F	FD	103	9	Dup-4			—		X		(1)	+	Lm	+			1	
F	FD	104	10	Dup-5			—		X		(1)	+	Lm	+			1	

Preservatives: A NONE pH~7; B HNO_3 pH<2; C H_2SO_4 pH<2; D 1+1 HCl pH<; E NaOH pH>12; F ZnAc/NaOH pH; G MeOH; H Other (note bel

Sampled By (print)	How Shipped? Hand Carrier	Comments	
Sampler's Signature	Tracking No.		
Company	1. Relinquished By / Date / Time: 11/13/08 1607	2. Relinquished By / Date / Time	3. Relinquished By / Date / Time
	1. Received By / Date / Time	2. Received By / Date / Time	3. Received For Lab By / Date / Time: 11/14/08 0900

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Chain of Custody Record

COC No. 126475

Page 1 of 2

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Cart: 4
VOA Rack/Tray: 2 LR
Receipt Log No.: 25-10 (11)
Project Chemist: GMH
Laboratory Project No.: 0811330

Client Name: URS Corp
Address: 5540 Falmouth St #201
Richmond, VA 23230
Phone: 804 965 9000
Fax: 804 965 9764

Project Name: RFATP Summit3 — 360441D-1 (02 pb)
Client Project No./P.O. No.: 11655367
Invoice No.: ☐ Client ☐ Other (comments)
Contact/Report To: LeeAnn Marek

Analyses Requested: Pb 6010B (A)

Container Type (corresponds to Container Packing List)

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted	Total	Sample Comments
D	SO	01	1	13 SB 73 A (13SB73A)	1257	11/13/08	1130	1130	✓	SO	1		
		02	2	13 SB 73 B (13SB73B)		11/13/08	1140	1142	✓	SO	1		
		03	3	13 SB 73 C		11/13/08	1150		✓	SO	1		
		04	4	13 SB 34 A		11/13/08	1200		✓	SO	1		
		05	5	13 SB 34 B		11/13/08	1204		✓	SO	1		
		06	6	13 SB 71 A		11/13/08	1215		✓	SO	1		
		07	7	13 SB 71 B		11/13/08	1219		✓	SO	1		
		08	8	13 SB 71 C		11/13/08	1223		✓	SO	1		
		09	9	13 SB 38 A		11/13/08	1420		✓	SO	1		
E	SO	10	10	13 SB 38 B MS/MSD		11/13/08	1426		✓	SO	1		

Sampled By (print): Kelly Hicks
Sampler's Signature: KJH

How Shipped? Hand Carrier FedEx
Tracking No.

Comments

Company: URS Corp

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
KJH	11/13/08	1614						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						[signature]	11/14/08	0900

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COC No. 126476

360440-10362 Pb

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Cart: 6
VOA Rack/Tray:
Receipt Log No.: 25-10(1)
Project Chemist: LMH
Laboratory Project No.: 0811330

Client Name: URS Corp
Address: 5540 Falmouth St. #201
Richmond, VA 23230
Phone: 804 965 9000
Fax: 804 965 9764

Project Name: RFHAP Summ 13
Client Project No./P.O. No.: 11650 3607
Invoice No.: ☒ Client ☐ Other (comments)
Contact/Report To: Kee Ann Marick

Analyses Requested

A	A	A	A	A					
Pb 6010B	SVOC 8270C	NG & 3320	EXPH 8330	TAL metals	TOC				

Container Type (corresponds to Container Packing List)

Number of Containers Submitted

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix										Total	Sample Comments
F	FD	11	1	DUP-8	1257	11/13/08	—		✓	SO	1									1	
D	SO	12	2	13SB38C	1257	11/13/08	1435		✓	SO	1									1	
|	|	13	3	13SB67A 13SB67A		11/13/08	1444		✓	SO	1									1	
|	|	14	4	13SB67B 13SB67B		11/13/08	1448		✓	SO	1									1	
|	|	15	5	13SB41A	1257	11/13/08	1502		✓	SO	1									1	
|	|	16	6	13SB41B	1257	11/13/08	1508		✓	SO	1									1	
X	X	Cancelled	7	13SB18A	1257	11/13/08	1521		✓	SO		1	1	1	1	1				3	
X	X	X	8	13SB18C 13SB18C	1257	11/13/08	1529		✓	SO		1	1	1	1					2	
			9																		
			10																		

Sampled By (print): Kelly Hicks
Sampler's Signature: [signature]
Company: URS Corp

How Shipped? Hand Carrier FedEx
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
[signature]	11/13/08	1614						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						[signature]	11/14/08	090

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Chain of Custody Record

COC No. 126470

36440-163 (162)

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For Lab Use Only	
Cart	6
VOA Rack/Tray	—
Receipt Log No.	25-10(11)
Project Chemist	LMH
Laboratory Project No.	0811330

Client Name	URS Corp
Address	5540 Falmouth St #201
	Richmond, VA 23230
Phone	804 965 9000
Fax	804 965 9764

Project Name	RFAAP Sump 13
Client Project No./P.O. No.	11056307
Invoice No.	☑ Client ☐ Other (comments)
Contact/Report To	Lee Ann Mancek

Analyses Requested

Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Container Type (corresponds to Container Packing List)	Number of Containers Submitted										Total	Sample Comments
										A	A	A										
										PD 6010B	TAL Metals	SVOCs, NB, Expl										
D	SO	18	1 135B72A	2145	11/13/08	1145		✓	SO	1												
		19	2 135B72B			1148		✓		1												
		20	3 135B72C			1150		✓		1												
		21	4 135B35A			1156		✓		1												
		22	5 135B35B			1205		✓		1												
		23	6 135B35C			1212		✓		1												
X	X	X	7 135B19A			1222		✓					1	1								
X	X	X	8 135B19C MS/MSD			1227		✓					1	1								
D	SO	24	9 135B39(6)A			1237		✓		1												
F	FD	25	10 DUP-7			—		✓		1												

Page ← PRESERVATIV
A NONE pH~
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH
E NaOH pH>1
F ZnAc/NaOH p
G MeOH
H Other (note be

Sampled By (print)	Kelly Hicks	How Shipped? Hand Carrier FedEx
Sampler's Signature		Tracking No.
Company	URS Corp	

Comments

	Relinquished By	Date	Time	Received By	Date	Time
1.		11/13/08	1606			
2.						
3.						

3. Received For Lab By — Date 11/14/08 Time 0902

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COC No. 126481

36440-103 (62)

For Lab Use Only		Client Name	Project Name
Cart	CO	URS Corp	RFATH Summit 13
VOA Rack/Tray	✓	Address	Client Project No./P.O. No.
Receipt Log No.	25-10(11)	5540 Falmouth St, #201	11605630.07
Project Chemist	CMH	Richmond VA 23230	Invoice No. ☒ Client ☐ Other (comments)
Laboratory Project No.	0811330	Phone 804 965 4000	Contact/Report To
		Fax 804 965 4764	Leeann Hauck

Analyses Requested

Pb 6010B

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Container Type (corresponds to Container Packing List)	Number of Containers Submitted	Total	Sample Comments
D	SO	26	1 HBSB39B (6)	2145	11/13/08	1242		✓	SO	A	1		
		27	2 HBSB39C (6)			1246		✓			1		
		28	3 HBSB70A			1250		✓			1		
		29	4 HBSB70B			1301		✓			1		
		30	5 HBSB37A			1315		✓			1		
		31	6 HBSB69A			1330		✓			1		
		32	7 HBSB68A			1402		✓			1		
		33	8 HBSB68B			1409		✓			1		
		34	9 HBSB39A			1430		✓			1		
F	FD	35	10 DUP-9	↓	↓	—		✓	↓		1		

Sampled By (print)	How Shipped? Hand Carrier FedEx	Comments
Kelly Hicks	Tracking No.	
Sampler's Signature		

Company	1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
URS Corp		11/13/08	1600						
	1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
								11/14/08	0900

575

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COC No. 126473

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36440-103 (Pb) (62)

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Cart: 2e
VOA Rack/Tray: —
Receipt Log No.: 25-10(11)
Project Chemist: LMH
Laboratory Project No.: 0811330

Client Name: URS Corp
Address: 5540 Falmouth St. #201
Richmond, VA 23230
Phone: 804 965 9000
Fax: 804 965 9764

Project Name: RFHAF SWMU 13
Client Project No./P.O. No.: 11056307
Invoice No.: ~~Client~~ Other (comments)
Contact/Report To: Lee Ann Mareck

Analyses Requested

Container Type (corresponds to Container Packing List): A, B
Pb 6010B
Pb 6010B

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted		Total	Sample Comments
D	SO	36	1	T35B39B	2145	11/13/08	1435		✓	SO	1			
|	|	37	2	T35B39C	|	|	1440		✓	|	1			
|	|	38	3	T35B40A	|	|	1450		✓	|	1			
|	|	39	4	T35B40B	|	|	1456		✓	|	1			
|	|	40	5	T35B66A	|	|	1510		✓	|	1			
E	SO	41	6	T35B66B MS/MSD	|	|	1516		✓	↓	1			
G	EB	42	7	EQBK-4	↓	↓	1558		✓	W		1		
			8											
			9											
			10											

Sampled By (print): Kelly Hicks
Sampler's Signature: K Hicks
Company: URS Corp

How Shipped? Hand Carrier FedEx
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
K Hicks	11/13/08	1606						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						Lisa Romeyn	11/14/08	0900

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COC No. 126472A

36440-62

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Cart 7
VOA Rack/Tray —
Receipt Log No. 273
Project Chemist MH
Laboratory Project No. 0811332

Client Name: URS Corp
Address: 5510 Falmouth St. #201
Richmond, VA 23230
Phone 804 9659000
Fax 804 9659764

Project Name: RFAAP SWMU 13
Client Project No./P.O. No. 11656367
Invoice No. ~~Client~~ ☐ Other (comments)
Contact/Report To: Lee Ann Marek

Analyses Requested

Container Type (corresponds to Container Packing List)

Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted	Total	Sample Comments
D	SO	01	1 ~~SB~~ 135B42A	1566	11/4/08	0840		✓	SO	1		
		02	2 135B42B			0845		✓		1		
		03	3 135B43A			0858		✓		1		
		04	4 135B43B			0901		✓		1		
		05	5 135B43C			0906		✓		1		
		06	6 135B63A			0915		✓		1		
		07	7 135B45A			0923		✓		1		
		08	8 135B45B			0930		✓		1		
		09	9 135B62A			0945		✓		1		
F	FD	10	10 DUP-11	↓	↓	—		✓	↓	1		

Preservatives
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Sampled By (print): Kelly Hicks
Sampler's Signature: [signature]
Company: URS Corp

How Shipped? Hand Carrier FedEx
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
[signature]	11/14/08	1504						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						[signature]	11/15/08	0850

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COC No. 126467

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36440-62

For Lab Use Only	Client Name	Project Name
Cart: 7	URS Corp	RFAAP SWMU 13
VOA Rack/Tray: —	Address: 5540 Falmouth St. #201	Client Project No./P.O. No.: 11623637
Receipt Log No.: 273	Richmond, VA 23230	Invoice No. ~~Client~~ / Other (comments)
Project Chemist	Phone: 804 965 9000	Contact/Report To: Lee Ann Marek
Laboratory Project No.: 0811332	Fax: 804 965 9764	

Analyses Requested

Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted	Total	Sample Comments
D	SO	11	1 T35B48A		11/4/08	0948		✓	SO	1		
|	|	12	2 T35B48B			0950		✓		1		
|	|	13	3 T35B48C			0956		✓		1		
X	X	X	4 T35B17A			1005		✓		1 1		
X	X	X	5 T35B17C MS/MSD			1015		✓		1 1		
D	SO	14	6 T35B48A			1216		✓		1		
|	|	15	7 T35B48B			1220		✓		1		
|	|	16	8 T35B48C			1225		✓		1		
|	|	17	9 T35B58A			1240		✓		1		
|	|	18	10 DUP-12		↓	—		✓	↓	1		

Container Type (corresponds to Container Packing List)

Analyses Requested: A A A — Pb 6010B; TAL Metals; SVOC, Expl, NG

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Sampled By (print): Kelly Hicks
Sampler's Signature: [signature]
Company: URS Corp

How Shipped? Hand Carrier FedEx
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						[signature]	11/5/08	0850

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COC No. 126461A

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Cart 7
VOA Rack/Tray —

Client Name: URS Corp	Project Name: RFAAP SWMU 13	
Address: 5540 Falmouth St. #201	Client Project No./P.O. No.: 11651367	
Receipt Log No.: 27-3	Invoice No.: ☑ Client ☐ Other (comments)	
Project Chemist: MH	Richmond, VA 23230	
Laboratory Project No.: 08I1332	Phone: 804 965 9000	Contact/Report To: Leeanne Marcek
	Fax: 804 965 9764	

Analyses Requested

Pb, Cr, Cd, B	TAL Metals	SVOCs, NO Expl	TCC
A	A	A	A

Container Type (corresponds to Container Packing List)

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted	Total	Sample Comments
D	SO	19	1 T3SB58B		11/14/08	1245		✓	SO	1		
|	|	20	2 T3SB51A			1250		✓		1		
|	|	21	3 T3SB51B			1255		✓		1		
X	X	X	4 T3SB16A			1300		✓		1 1		
X	X	X	5 T3SB16C			1308		✓		1 1 1		
D	SO	22	6 T3SB52A			1325		✓		1		
|	|	23	7 T3SB52B			1330		✓		1		
|	|	24	8 T3SB56A			1335		✓		1		
|	|	25	9 T3SB56B			1340		✓		1		
F	FD	26	10 DUP-14			—		✓		1		

Sampled By (print): Kelly Hicks
Sampler's Signature:
Company: URS Corp

How Shipped? Hand Carrier FedEx
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	11/14/08	1504						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
							11/15/08	0850

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Cart 7
VOA Rack/Tray

Client Name	UBS Corp
Address	5540 Falmouth St. #201
	Richmond, VA 23230
Phone	804 965 9000
Fax	804 965 9764
Project Name	RFHAP Sum 13
Client Project No./P.O. No.	116516367
Invoice No.	☒ Client ☐ Other (comments)
Contact/Report To	Lee Anne Marcel
Receipt Log No.	27-3
Project Chemist	MLH
Laboratory Project No.	0811332

Analyses Requested

PB 6010 B

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Container Type (corresponds to Container Packing List)	Number of Containers Submitted	Total	Sample Comments
D	SO	27	1	135B54A	1566	11/14/08	1350		✓	SO		1		
1	1	28	2	135B54B	↓	↓	1355		✓	↓		1		
E	SO	29	3	135B55A MS/MSD	↓	↓	1405		✓	↓		1		
			4											
			5											
			6											
			7											
			8											
			9											
			10											

Sampled By (print) Kelly Hicks
Sampler's Signature
Company UBS Corp

How Shipped? Hand Carrier FedEx
Tracking No.

Comments

	Relinquished By	Date	Time	Received By	Date	Time
1.		11/14/08	1504			
2.						
3.					11/15/08	0850

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Cart: 7
VOA Rack/Tray: —
Receipt Log No.: 27-3
Project Chemist:
Laboratory Project No.: 0811332

Client Name: URS
Address: 5540 Falmouth St Suite 201
Richmond, VA 23230
Phone: 804.965.9000
Fax: 804.965.9764

Project Name: RFAAP SWMU13
Client Project No./P.O. No.: 11656367
Invoice No.: ☒ Client ☐ Other (comments)
Contact/Report To: Lee Anne Mareck

Analyses Requested: PB 6010B

Container Type (corresponds to Container Packing List)

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted	Total	Sample Comments
D	SO	30	1 13SB84A		11/14/08	0850		✓	SO	1	1	
F	FD	31	2 DUP-10		11/14/08	0850		✓	SO	1	1	
D	SO	32	3 13SB84B		11/14/08	0855		✓	SO	1	1	
1	1	33	4 13SB86A		11/14/08	0910		✓	SO	1	1	
E	SO	34	5 13SB86B MS/MSD		11/14/08	0915		✓	SO	1	1	
D	SO	35	6 13SB64A		11/14/08	0932		✓	SO	1	1	
1	1	36	7 13SB64B		11/14/08	0936		✓	SO	1	1	
		37	8 13SB44A		11/14/08	0952		✓	SO	1	1	
		38	9 13SB44B		11/14/08	0959		✓	SO	1	1	
		39	10 13SB44C		11/14/08	1001		✓	SO	1	1	

Sampled By (print): Mark Fischer
Sampler's Signature:
Company: URS Corp

How Shipped? Hand Carrier FedEx
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
	11/14/08	1506						
1. Received By	**Date**	**Time**	**2. Received By**	**Date**	**Time**	**3. Received For Lab By**	**Date**	**Time**
							11/15/08	0850

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VOA Rack/Tray —

Receipt Log No. 27-3

Project Chemist MH

Laboratory Project No. 0811332

Client Name URS

Address 5540 Falmouth St. Suite 201
Richmond, VA 23230

Phone 804.965.9000
Fax 804.965.9764

Project Name RFAAPSWMU13
1165636?

Client Project No./P.O. No. 11656367

Invoice No. ☑ Client ☐ Other (comments)

Contact/Report To Lee Anne Mareck

Analyses Requested

A	A	A	A	A	A
PB 6010B	SVOC 8270C	NG 8332	EXP 6010	TAL Metals	TOC

Container Type (corresponds to Container Packing List)

⇦ PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted										Total	Sample Comments
D	SO	40	1	13SB61A		11/14/08	1008		✓	SO	1										1	
		41	2	13SB61B		11/14/08	1011		✓	SO	1										1	
		42	3	13SB47A		11/14/08	1017		✓	SO	1										1	
		43	4	13SB47B		11/14/08	1021		✓	SO	1										1	
		44	5	13SB60A		11/14/08	1219		✓	SO	1										1	
		45	6	13SB60B		11/14/08	1223		✓	SO	1										1	
		46	7	13SB49A		11/14/08	1230		✓	SO	1										1	
X		X X	8	13SB15A		11/14/08	1253		✓	SO	6	1	0	0	1	1					3	
X		X X	9	DUP-13		11/14/08	—		✓	SO		1			1	1					3	
D	SO	47	10	13SB59A		11/14/08	1302		✓	SO	1										1	

Sampled By (print) Kelly Hicks

Sampler's Signature KJH

Company URS Corp

How Shipped? Hand Carrier FedEx

Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
KJH	11/14/08	1506						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						Lisa Romeyn	11/15/08	0850

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Cart: 7
VOA Rack/Tray: —
Receipt Log No.: 27-3
Project Chemist: MH
Laboratory Project No.: 0811332

Client Name: URS
Address: 5540 Falmouth St-Suite 201
Richmond, VA 23230
Phone: 804965.9000
Fax: 804965.9764

Project Name: RFAAP Swmu 13
Client Project No./P.O. No.: 11656367
Invoice No.: ☑ Client ☐ Other (comments)
Contact/Report To: Lee Anne Mareck

Analyses Requested

A
Pb 6010B

Container Type (corresponds to Container Packing List)

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted	Total	Sample Comments
D	SO	48	1 135B59B		11/14/08	1323		✓	SO	1	1	
		49	2 135B50A		11/14/08	1331		✓	SO	1	1	
		50	3 135B50B		11/14/08	1336		✓	SO	1	1	
		51	4 135B50C		11/14/08	1341		✓	SO	1	1	
		52	5 135B57A		11/14/08	1348		✓	SO	1	1	
		53	6 135B57B		11/14/08	1352		✓	SO	1	1	
		54	7 135B57C		11/14/08	1356		✓	SO	1	1	
		55	8 135B53A		11/14/08	1405		✓	SO	1	1	
E	SO	56	9 135B53B MS/MSD		11/14/08	1409		✓	SO	1	1	
D	SO	57	10 13SB65A		11/14/08	1425		✓	SO	1	1	

Sampled By (print): Kelly Hicks
Sampler's Signature: KH KW
Company: URS Corp

How Shipped? Hand Carrier FedEx
Tracking No.

Comments

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
KH KW	11/14/08	1506						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						Lisa Romeyn	11/15/08	0850

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Cart: 7

VOA Rack/Tray:

Receipt Log No.: 27-3

Project Chemist: LMH

Laboratory Project No.: 0811332

3440-62

Client Name: URS

Address: 5540 Falmouth St Suite 201

Richmond, VA 23230

Phone: 804.965.9000

Fax: 804.965.9764

Project Name: RFAAP SWMU 13

Client Project No./P.O. No.: 11656367

Invoice No.: ☒ Client ☐ Other (comments)

Contact/Report To: Lee Anne Mareck

Analyses Requested

PB 6010B

Container Type (corresponds to Container Packing List)

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted	Total	Sample Comments
D	SW	58	135B65B		11/14/08	1434		√	SO	1	1	
			2									
			3									
			4									
			5									
			6									
			7									
			8									
			9									
			10									

Sampled By (print): Kelly Hicks

Sampler's Signature: KH NS

Company: URS Corp

How Shipped? Hand Carrier FedEx

Tracking No.:

Comments:

1. Relinquished By	Date	Time	2. Relinquished By	Date	Time	3. Relinquished By	Date	Time
KH NS	11/14/08	1506						
1. Received By	Date	Time	2. Received By	Date	Time	3. Received For Lab By	Date	Time
						[signature]	11/15/08	0850

TriMatrix Laboratories, Inc.

5560 Corporate Exchange Court SE Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 126466

Page 1 of 1

For Lab Use Only
Cart: 7
VOA Rack/Tray: —
Receipt Log No.: 27-34
Project Chemist: LMH
Laboratory Project No.: 0811332

Client Name: URS Corp
Address: 5540 Falmouth St. #201
Richmond, VA 23230
Phone: 804 965 9000
Fax: 804 965 9764

Project Name: RFAAP SWMU 13
Client Project No./P.O. No.: 11656307 (36140-62)
Invoice No.: ~~Client~~ Other (comments)
Contact/Report To: Lee Anne Marcks

Analyses Requested

Test Group	Matrix Code	Laboratory Sample Number	Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Container Type (corresponds to Container Packing List)	Total	Sample Comments
										B A A A B		
										TAL Metals / Explosives / SVOCs / NG / PCB 8082		
	X	X X	1 EQBK-56	1851	11/14/08	1520		✓	W	1 1 1 1		
G	EB	59	2 EQBK-57			1525		✓		1		
G	EB	100	3 EQBK-58			1530		✓		1		
G	EB	101	4 EQBK-59			1535		✓		1		
			5									
			6									
			7									
			8									
			9									
			10									

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Sampled By (print): Kelly Hicks
Sampler's Signature: KH
Company: URS Corp

How Shipped? Hand Carrier FedEx
Tracking No.

Comments

1. Relinquished By	Date	Time
	11/14/08	1630

1. Received By	Date	Time

2. Relinquished By	Date	Time

2. Received By	Date	Time

3. Relinquished By	Date	Time

3. Received For Lab By	Date	Time
	11/15/08	0850

TriMatrixCOC -- COC

WHITE COPY - REPORT YELLOW COPY - LABORATORY PINK COPY - FIELD

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: WES Corp | Project-Submittal No.: new / add to 0811329
Receipt Record Page/Line No.: 25-10 | Project Chemist: MH | Sample Nos.: 01 -- 104

Coolers Received

Recorded by (initials/date): LR 11/14/08

☑ Cooler ☐ Box ☐ Other ____ | Qty Received: 5

Thermometer Used: ☑ IR Gun (#202) ☐ Digital Thermometer (#54) ☐ Other (#____) | ☐ See Additional Cooler Information Form

Cooler No. 1897	Time 1220	Cooler No. 2173	Time 1256	Cooler No. 1257	Time 1320	Cooler No. 2144	Time 1328
Custody Seals: ☐ none ☑ present / intact ☐ present / not intact		Custody Seals: ☐ none ☑ present / intact ☐ present / not intact		Custody Seals: ☐ none ☑ present / intact ☐ present / not intact		Custody Seals: ☐ none ☑ present / intact ☐ present / not intact	
Coolant Location: (Dispersed) Top / Middle / Bottom		Coolant Location: (Dispersed) Top / Middle / Bottom		Coolant Location: (Dispersed) Top / Middle / Bottom		Coolant Location: (Dispersed) Top / Middle / Bottom	
Coolant/Temperature Taken Via: ☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers		Coolant / Temperature Taken Via: ☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers		Coolant / Temperature Taken Via: ☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers		Coolant / Temperature Taken Via: ☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers	
Alternate Temperature Taken Via: ☐ temperature blank (tb) ☐ 1 container		Alternate Temperature Taken Via: ☑ temperature blank (tb) ☐ 1 container		Alternate Temperature Taken Via: ☐ temperature blank (tb) ☐ 1 container		Alternate Temperature Taken Via: ☑ temperature blank (tb) ☐ 1 container	
Recorded °C / Correction Factor °C / Actual °C		Recorded °C / Correction Factor °C / Actual °C		Recorded °C / Correction Factor °C / Actual °C		Recorded °C / Correction Factor °C / Actual °C	
tb		tb 7.0 – 7.0		tb 4.0 – 4.0		tb 3.8 – 3.8	
tb location: representative / in ice		tb location: representative / in ice		tb location: representative / in ice		tb location: representative / in ice	
1 7.8 – 7.8		1 4.7 – 4.7		1 4.6 – 4.6		1 4.8 – 4.8	
2 8.4 – 8.4		2 8.9 – 8.9		2 4.8 – 4.8		2 5.4 – 5.4	
3 3.7 – 3.7		3 7.6 – 7.6		3 3.8 – 3.8		3 4.1 – 4.1	
Average °C: 6.6		Average °C: 7.7		Average °C: 4.4		Average °C: 4.8	
☑ Cooler ID on COC?		☑ Cooler ID on COC?		☑ Cooler ID on COC?		☑ Cooler ID on COC?	
☐ VOC trip blank received?		☐ VOC trip blank received?		☐ VOC trip blank received?		☐ VOC trip blank received?	

If any shaded areas checked, complete Sample Receiving Non-Conformance Form

Paperwork Received

☐ No COC received

N/A	Yes	No	
	☑	☐	Chain of Custody Record(s)?
	☐		If No, COC initiated by ____
	☑		Rec'd for Lab signed/date/time?
☐	☑		Shipping Document?
☑	☐		Other ____

COC ID Nos.

☑ TriMatrix

☐ Other (name or ID#) ____

Check COC for Accuracy

☐ No analysis requested

Yes	No	
☑	■	Sample ID matches COC?
☑	■	Sample date and time matches COC?
☑		Container type completed on COC?
☑	■	All container types indicated are received?

Sample Condition Summary

☐ Non-TriMatrix containers, see Notes

N/A	Yes	No	
	■	☑	Broken containers/lids?
	■	☑	Missing or incomplete labels?
	■	☑	Illegible information on labels?
	■	☑	Low volume received?
	■	☑	Inappropriate containers received?
☑	■	☐	VOC vials / TOX containers have headspace?
☐	■	☐	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
	☐	■	Average sample temperature ≤6° C?
☐	☑		Completed Sample Preservation Verification Form?
☐	☑		■ Samples preserved correctly?
☑	☐		If "No", added orange tag?
☑	☐		Received pre-preserved VOC soils? ☐ MeOH ☐ Na_2SO_4

Check for Short Hold-Time Prep/Analyses

☐ Bacteriological
☐ Air Bags
☐ EnCores / Methanol Pre-Preserved
☐ Formaldehyde/Aldehyde
☐ Green-tagged Containers
☐ Yellow/White-tagged 1L Ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
☑ NONE RECEIVED
☐ RECEIVED, COCs TO LAB(S)

Notes

☐ Trip blank received ☐ Trip blank not listed on COC
☐ No COC received, Proj. Chemist reviewed (init./date) ____
☐ No analysis requested, Proj. Chemist completed (init./date) ____

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
11/14/08 0900	11/14/08 1355	Yes (No)

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST
ADDITIONAL COOLER INFORMATION

Recorded by (initials/date)	Client	Project-Submittal No.
LR 11/14/08	URS Corp	0811329
	Receipt Log No. 25-10 / Sample Nos. 01-64	Project Chemist MH

Cooler No. 2145 — Time 1350

Custody Seals
- ☐ none
- ☑ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant/Temperature Taken Via:
- ☑ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

Recorded °C	Correction Factor °C	Actual °C
tb		
tb location: representative / in ice		
1 2.8	—	2.8
2 5.5	—	5.5
3 7.1		7.1
	Average °C	5.1

- ☑ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

Recorded °C	Correction Factor °C	Actual °C
tb		
tb location: representative / in ice		
1		
2		
3		
	Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

Recorded °C	Correction Factor °C	Actual °C
tb		
tb location: representative / in ice		
1		
2		
3		
	Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

Recorded °C	Correction Factor °C	Actual °C
tb		
tb location: representative / in ice		
1		
2		
3		
	Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant/Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

Recorded °C	Correction Factor °C	Actual °C
tb		
tb location: representative / in ice		
1		
2		
3		
	Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

Recorded °C	Correction Factor °C	Actual °C
tb		
tb location: representative / in ice		
1		
2		
3		
	Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

Recorded °C	Correction Factor °C	Actual °C
tb		
tb location: representative / in ice		
1		
2		
3		
	Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

Recorded °C	Correction Factor °C	Actual °C
tb		
tb location: representative / in ice		
1		
2		
3		
	Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Comments

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST
ADDITIONAL COOLER INFORMATION

Recorded by (initials/date)	Client	Project-Submittal No.
LL 11/14/08	URS Corp	081330
	Receipt Log No. 25-XXXX	Sample Nos. 1-42
		Project Chemist MH

Cooler No. 2145 — Time 1350

Custody Seals
- ☐ none
- ☑ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant/Temperature Taken Via:
- ☑ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

Recorded °C	Correction Factor °C	Actual °C
tb		
tb location: representative / in ice		
1 2.8	—	2.8
2 5.5	—	5.5
3 7.1	—	7.1
	Average °C	5.1

- ☑ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

Recorded °C	Correction Factor °C	Actual °C
tb		
tb location: representative / in ice		
1		
2		
3		
	Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

Recorded °C	Correction Factor °C	Actual °C
tb		
tb location: representative / in ice		
1		
2		
3		
	Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

Recorded °C	Correction Factor °C	Actual °C
tb		
tb location: representative / in ice		
1		
2		
3		
	Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant/Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

Recorded °C	Correction Factor °C	Actual °C
tb		
tb location: representative / in ice		
1		
2		
3		
	Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

Recorded °C	Correction Factor °C	Actual °C
tb		
tb location: representative / in ice		
1		
2		
3		
	Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

Recorded °C	Correction Factor °C	Actual °C
tb		
tb location: representative / in ice		
1		
2		
3		
	Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Cooler No. — Time

Custody Seals
- ☐ none
- ☐ present / intact
- ☐ present / not intact

Coolant Location:
Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via:
- ☐ loose ice / avg 2-3 containers
- ☐ bagged ice / avg 2-3 containers
- ☐ blue ice / avg 2-3 containers
- ☐ none / avg 2-3 containers

Alternate Temperature Taken Via:
- ☐ temperature blank (tb)
- ☐ 1 container

Recorded °C	Correction Factor °C	Actual °C
tb		
tb location: representative / in ice		
1		
2		
3		
	Average °C	

- ☐ Cooler ID on COC?
- ☐ VOC trip blank received?

Comments

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: URS Corp
Receipt Record Page/Line No.: 25-1011
Project-Submittal No.: new / add to 0811330
Project Chemist: NMA
Sample Nos.: 1-42

Coolers Received

Recorded by (initials/date): LR 11/4/08

- [x] Cooler
- [ ] Box
- [ ] Other

Qty Received: 5

Thermometer Used: [x] IR Gun (#202) [ ] Digital Thermometer (#54) [ ] Other (#____)

[ ] See Additional Cooler Information Form

Cooler No. 1897 — Time 1220

Custody Seals: [ ] none [x] present / intact [ ] present / not intact

Coolant Location: (Dispersed) / Top / Middle / Bottom

Coolant/Temperature Taken Via: [x] loose ice / avg 2-3 containers [ ] bagged ice / avg 2-3 containers [ ] blue ice / avg 2-3 containers [■] none / avg 2-3 containers

Alternate Temperature Taken Via: [ ] temperature blank (tb) [ ] 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
1	7.8	–	7.8
2	8.4	–	8.4
3	3.7	–	3.7

tb location: representative / in ice

Average °C: 6.6

[x] Cooler ID on COC? [ ] VOC trip blank received?

Cooler No. 2173 — Time 1256

Custody Seals: [ ] none [x] present / intact [ ] present / not intact

Coolant Location: (Dispersed) / Top / Middle / Bottom

Coolant / Temperature Taken Via: [x] loose ice / avg 2-3 containers [ ] bagged ice / avg 2-3 containers [ ] blue ice / avg 2-3 containers [■] none / avg 2-3 containers

Alternate Temperature Taken Via: [x] temperature blank (tb) [ ] 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	7.0	–	7.0
1	4.7	–	4.7
2	8.9	–	8.9
3	7.6	–	7.6

tb location: (representative) / in ice

Average °C: 7.7

[x] Cooler ID on COC? [ ] VOC trip blank received?

Cooler No. 1257 — Time 1320

Custody Seals: [ ] none [x] present / intact [ ] present / not intact

Coolant Location: (Dispersed) / Top / Middle / Bottom

Coolant / Temperature Taken Via: [x] loose ice / avg 2-3 containers [ ] bagged ice / avg 2-3 containers [ ] blue ice / avg 2-3 containers [■] none / avg 2-3 containers

Alternate Temperature Taken Via: [ ] temperature blank (tb) [ ] 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	4.0	–	4.0
1	4.4	–	4.4
2	4.8	–	4.8
3	3.8	–	3.8

tb location: (representative) in ice

Average °C: 4.4

[x] Cooler ID on COC? [ ] VOC trip blank received?

Cooler No. 2144 — Time 1328

Custody Seals: [ ] none [x] present / intact [ ] present / not intact

Coolant Location: (Dispersed) / Top / Middle / Bottom

Coolant / Temperature Taken Via: [x] loose ice / avg 2-3 containers [ ] bagged ice / avg 2-3 containers [ ] blue ice / avg 2-3 containers [■] none / avg 2-3 containers

Alternate Temperature Taken Via: [x] temperature blank (tb) [ ] 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	3.8	–	3.8
1	4.8	–	4.8
2	5.4	–	5.4
3	4.1	–	4.1

tb location: (representative) / in ice

Average °C: 4.8

[x] Cooler ID on COC? [ ] VOC trip blank received?

If any shaded areas checked, complete Sample Receiving Non-Conformance Form

Paperwork Received

[ ] No COC received

N/A	Yes	No	
	[x]	[ ]	Chain of Custody Record(s)?
	[ ]		If No, COC initiated by ____
	[x]		Rec'd for Lab signed/date/time?
[ ]	[x]		Shipping Document?
[x]	[ ]		Other ____

COC ID Nos.

[x] TriMatrix

[ ] Other (name or ID#)____

Check COC for Accuracy

[ ] No analysis requested

Yes	No	
[x]	[■]	Sample ID matches COC?
[x]	[■]	Sample date and time matches COC?
[x]		Container type completed on COC?
[x]	[■]	All container types indicated are received?

Sample Condition Summary

[ ] Non-TriMatrix containers, see Notes

N/A	Yes	No	
	[■]	[x]	Broken containers/lids?
	[■]	[x]	Missing or incomplete labels?
	[■]	[x]	Illegible information on labels?
	[■]	[x]	Low volume received?
	[■]	[x]	Inappropriate containers received?
[x]	[■]	[ ]	VOC vials / TOX containers have headspace?
[ ]	[■]	[ ]	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
	[ ]	[■]	Average sample temperature ≤6° C?
[ ]	[x]		Completed Sample Preservation Verification Form?
[ ]	[x]	[■]	Samples preserved correctly?
[x]	[ ]		If "No", added orange tag?
[x]	[ ]		Received pre-preserved VOC soils?

[ ] MeOH [ ] Na_2SO_4

Check for Short Hold-Time Prep/Analyses

- [ ] Bacteriological
- [ ] Air Bags
- [ ] EnCores / Methanol Pre-Preserved
- [ ] Formaldehyde/Aldehyde
- [ ] Green-tagged Containers
- [ ] Yellow/White-tagged 1L Ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
[x] NONE RECEIVED
[ ] RECEIVED, COCs TO LAB(S)

Notes

[ ] Trip blank received [ ] Trip blank not listed on COC
[ ] No COC received, Proj. Chemist reviewed (init./date) ____
[ ] No analysis requested, Proj. Chemist completed (init./date) ____

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	24 Hour Goal Met?
11/4/08 0900	11/4/08 1355	Yes (No)

316440-02

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: LRS | Project-Submittal No.: new / add to 0811332
Receipt Record Page/Line No.: 27-3 | Project Chemist: MH | Sample Nos.: 1-61

Coolers Received

Recorded by (initials/date): LA 11/15/08

☑ Cooler ☐ Box ☐ Other ____ | Qty Received: 3

Thermometer Used: ☑ IR Gun (#202) ☐ Digital Thermometer (#54) ☐ Other (#____) | ☐ See Additional Cooler Information Form

Cooler No.	Time	Custody Seals	Coolant Location	Coolant/Temperature Taken Via	Alternate Temperature Taken Via
1566	1027	☐ none ☑ present / intact ☐ present / not intact	(Dispersed) / Top / Middle / Bottom	☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers	☑ temperature blank (tb) ☐ 1 container
1422	1047	☐ none ☑ present / intact ☐ present / not intact	(Dispersed) / Top / Middle / Bottom	☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers	☑ temperature blank (tb) ☐ 1 container
1851	11:00	☐ none ☑ present / intact ☐ present / not intact	(Dispersed) / Top / Middle / Bottom	☑ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers	☑ temperature blank (tb) ☐ 1 container
		☐ none ☐ present / intact ☐ present / not intact	Dispersed / Top / Middle / Bottom	☐ loose ice / avg 2-3 containers ☐ bagged ice / avg 2-3 containers ☐ blue ice / avg 2-3 containers ■ none / avg 2-3 containers	☐ temperature blank (tb) ☐ 1 container

Cooler No.	Recorded °C	Correction Factor °C	Actual °C
1566	tb 3.8	—	3.8
	tb location: (representative) / in ice		
	1 5.8	—	3.8
	2 4.7	—	4.7
	3 4.8	—	4.8
		Average °C	5.1
	☑ Cooler ID on COC?		
	☐ VOC trip blank received?		
1422	tb 3.3	—	3.3
	tb location: (representative) / in ice		
	1 4.9	—	4.9
	2 2.4	—	2.4
	3 2.3	—	2.3
		Average °C	3.2
	☑ Cooler ID on COC?		
	☐ VOC trip blank received?		
1851	tb 2.4	—	2.4
	tb location: (representative) / in ice		
	1 2.4	—	2.4
	2 2.2	—	2.2
	3 2.2	—	2.3
		Average °C	2.3
	☑ Cooler ID on COC?		
	☐ VOC trip blank received?		
	Recorded °C	Correction Factor °C	Actual °C
	tb		
	tb location: representative / in ice		
	1		
	2		
	3		
		Average °C	
	☐ Cooler ID on COC?		
	☐ VOC trip blank received?		

If any shaded areas checked, complete Sample Receiving Non-Conformance Form

Paperwork Received

☐ No COC received

N/A	Yes	No	
	☑	☐	Chain of Custody Record(s)?
	☐		If No, COC initiated by ____
	☑		Rec'd for Lab signed/date/time?
☐	☑	☐	Shipping Document?
☑	☐	☐	Other ____

COC ID Nos.

☑ TriMatrix

☐ Other (name or ID#) ____

Check COC for Accuracy

☐ No analysis requested

Yes	No	
☑	■	Sample ID matches COC?
☑	■	Sample date and time matches COC?
☑		Container type completed on COC?
☑	■	All container types indicated are received?

Sample Condition Summary

☐ Non-TriMatrix containers, see Notes

N/A	Yes	No	
	■	☑	Broken containers/lids?
	■	☑	Missing or incomplete labels?
	■	☑	Illegible information on labels?
	■	☑	Low volume received?
	■	☑	Inappropriate containers received?
☑	■	☐	VOC vials / TOX containers have headspace?
☑	■	☐	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
	☑	■	Average sample temperature ≤6° C?
☐	☑		Completed Sample Preservation Verification Form?
☐	☑	■	Samples preserved correctly?
☑	☐		If "No", added orange tag?
☑	☐		Received pre-preserved VOC soils? ☐ MeOH ☐ Na_2SO_4

Check for Short Hold-Time Prep/Analyses

☐ Bacteriological
☐ Air Bags
☐ EnCores / Methanol Pre-Preserved
☐ Formaldehyde/Aldehyde
☐ Green-tagged Containers
☐ Yellow/White-tagged 1L Ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
☑ NONE RECEIVED
☐ RECEIVED, COCs TO LAB(S)

Notes

☐ Trip blank received ☐ Trip blank not listed on COC
☐ No COC received, Proj. Chemist reviewed (init./date) ____
☐ No analysis requested, Proj. Chemist completed (init./date) ____

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
11/15/08 0850	11/15/08 1108	Yes (No)

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				

DATA VALIDATION REPORT - Level III Review

SDG No.:_____36440-64_____ **Fraction:_____Lead_____**

Lab:_____TriMatrix_____ **Project Name:___Radford SWMU 13____**

Reviewer:___Lee Anne Mareck___ **Date:_____January 14, 2009_____**

This report presents the findings of a review of the referenced data. The report consists of this summary, a listing of the samples included in the review, copies of data reports with data qualifying flags applied (as required), the completed data validation checklist, supporting documentation, and an explanation of the data qualifying flags employed. The review performed is based on the Region III Modifications to the USEPA National Functional Guidelines for Inorganic Data Review as pertains to the specifics of the analytical method employed and provisions of the approved project-specific QAPP.

Major Anomalies: None.

Minor Anomalies: None.

Correctable Anomalies: None.

Comments: On the basis of this evaluation, the laboratory appears to have followed the specified method. All data are usable for their intended purpose based on the data reviewed.

Signed: Lee Anne Mareck

Radford SWMU 13
36440-64

Laboratory Sample Identification	Field Sample Identification	Date Sampled	Parameters Requested
0812387-01	13SB91A	12/17/2008	Lead
0812387-02	13SB91B	12/17/2008	Lead
0812387-03	13SB91C	12/17/2008	Lead
0812387-04	DUP-15	12/17/2008	Lead
0812387-05	13SB92A	12/17/2008	Lead
0812387-06	13SB92B	12/17/2008	Lead
0812387-07	13SB92C	12/17/2008	Lead
0812387-08	EQBK7	12/17/2008	Lead

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB91A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 12/17/08 16:30
Solids: 0.00
Laboratory ID: 0812387-01

SDG: 36440-64
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 12/26/08 08:30
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0814914

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	130	mg/kg dry wt.	1	10	2.9		12/30/08 10:02

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB91B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 12/17/08 16:35
Solids: 0.00
Laboratory ID: 0812387-02

SDG: 36440-64
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 12/26/08 08:30
Initial/Final: 0.4995 g / 50 mL
QC Batch: 0814914

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	160	mg/kg dry wt.	1	10	2.9		12/30/08 10:06

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB91C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 12/17/08 16:40
Solids: 0.00
Laboratory ID: 0812387-03

SDG: 36440-64
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 12/26/08 08:30
Initial/Final: 0.4998 g / 50 mL
QC Batch: 0814914

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	140	mg/kg dry wt.	1	10	2.9		12/30/08 10:10

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

DUP-15

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 12/17/08 00:00
Solids: 0.00
Laboratory ID: 0812387-04

SDG: 36440-64
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 12/26/08 08:30
Initial/Final: 0.5001 g / 50 mL
QC Batch: 0814914

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	130	mg/kg dry wt.	1	10	2.9		12/30/08 10:13

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB92A

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 12/17/08 16:50
Solids: 0.00
Laboratory ID: 0812387-05

SDG: 36440-64
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 12/26/08 08:30
Initial/Final: 0.4996 g / 50 mL
QC Batch: 0814914

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	82	mg/kg dry wt.	1	10	2.9		12/30/08 10:17

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB92B

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 12/17/08 16:55
Solids: 0.00
Laboratory ID: 0812387-06

SDG: 36440-64
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 12/26/08 08:30
Initial/Final: 0.5 g / 50 mL
QC Batch: 0814914

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	150	mg/kg dry wt.	1	10	2.9		12/30/08 10:41

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

13SB92C

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Soil
Sampled: 12/17/08 17:00
Solids: 0.00
Laboratory ID: 0812387-07

SDG: 36440-64
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3050B Digestion
Prepared: 12/26/08 08:30
Initial/Final: 0.4997 g / 50 mL
QC Batch: 0814914

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	200	mg/kg dry wt.	1	10	2.9		12/30/08 10:45

INORGANIC ANALYSIS DATA SHEET
USEPA-6010B

EQBK7

Laboratory: TriMatrix Laboratories, Inc.
Client: URS Corporation
Matrix: Water
Sampled: 12/17/08 17:30
Solids: 0.00
Laboratory ID: 0812387-08

SDG: 36440-64
Project: RFAAP SWMU 13 RFI/CMS, WO 008
Preparation: 3010A Digestion
Prepared: 12/22/08 08:00
Initial/Final: 25 mL / 25 mL
QC Batch: 0814785

CAS No.	Analyte	Conc.	Units	Dil. Factor	MRL	MDL	Q	Analyzed
7439-92-1	Lead, Total	75	ug/L	1	75	25	U	12/31/08 13:03

DATA VALIDATION WORKSHEET
INORGANIC - ICP, CVAA, AND CYANIDE
REGION III - NATIONAL FUNCTIONAL GUIDELINES

SDG No.: 36440-64
Project No.: 11656367

Project Name: Radford SWMU 13
Reviewer: Lee Anne Mareck
Date: January 14, 2009

1.0 Chain of Custody/Sample Condition/Raw Data		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples which were analyzed?				X								
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?				X								
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?					X							
1.4	Does sample preservation, collection and storage meet method requirement? (For metal: water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 $^{O}C \pm 2\ ^{O}C$)				X								
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.				X								

Note: _____

2.0 Holding Time		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, CN: 14 days, other metals: 6 months) Action:L(+)/UL(-). If the holding time is grossly exceeded (twice the holding time criteria), L(+)/R(-).					X							

Note: _____

3.0 Instrument Calibration		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? (ICP& ICPMS: blank + one standard & a RL standard OR 3 standards and a blank with one standard at the RL; CVAA: blank + five standards with one standard at the RL). If not, qualify with "R".				X								
3.2	Are the correlation coefficients > 0.99? Action: J(+)/UJ(-).				X								
3.3	Once per calibration, did a high and low distilled standard recovery within 85-115%? If no, follow 3.6.												
3.4	Was an initial calibration check standard (ICV) analyzed immediately after instrument system had been calibrated? Action: If no, all associated data are rejected "R".				X								
3.5	Was continuing calibration standard (CCS) analyzed at a minimum frequency of 10% (every 10 samples) during an analytical run and at the end of the analytical run? If not, document and flag based on professional judgement.				X								
3.6	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? FOR ICP 90%-110%, FOR Hg 80-120%, FOR CN 85-115%.				X								
	ICV and CCV: Action: L(+)/R(-) L(+)/UL(-) K(+) Mercury < 65% 65% - 79% > 120% Cyanide < 65% 65% - 84% > 115% Other Metals < 75% 75% - 89% > 110%												
3.7	For ICP & ICPMS, did the CRDL standard recover between 80-120%?						X						
	<50% 50%-79% >120% 2xCRDL>[sample]>IDL L(+)/R(-) L(+)/UL(-) K												

Note: _____

4.0 Blanks

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
4.1	Were method blank (MB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?				X								
4.2	Were calibration blanks (ICB and CCBs) analyzed immediately after each and every ICV and CCVs? Action: If no ICB was run, all associated data are rejected. If the frequency of the CCBs does not follow requirement, all associated data are qualified "J".				X								
4.3	Are there reported MB or ICB/CCBs values > MDL?					X							
	Sample Results > MDL												
	< 5X Blank Contamination B												
4.4	Are there negative blank results with the absolute value > MDL?					X							
	Sample Results Non-detects > MDL												
	< 5X absolute Blank Contamination UL L												
4.5	Are there reported field blank > ± MDL?					X							
	Sample Results > MDL												
	< 5X Blank Contamination B												

Note: _____

5.0 ICP Interference Check Sample (ICS)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
5.1	Was ICS analyzed at beginning of each ICP run?				X								
5.2	Are the ICS AB recoveries within 80% - 120%?				X								
5.3	Are the results for unspiked analytes (in ICS A) < ± RL?				X								
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?						X						
	If not...												
	Action: Not Spiked Analytes Spiked analytes (ICS AB analytes)												
	< -MDL > MDL < 50% 50% - 79% >120%												
	L(+)/UL(-) K(+) L(+)/R(-) L(+)/UL(-) K(+)												

Note: _____

6.0 Laboratory Control Sample (LCS)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
6.1	Was an LCS prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+) any sample not associated with LCS results.				X								
6.2	Is any LCS recovery outside the control limits? (Aqueous limits: 80% - 120% - except Ag and Sb; Solid limits: as per EPA-EMSL/LV)					X							
	Action: Solid: < LCL L(+)/UL(-); > UCL K(+). Aqueous: < 50% L(+)/R(-); 50% - 79% L(+)/UL(-); > 120% K(+)												

Note:

7.0 Laboratory Duplicates (MSD)

		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), using professional judgement, analytes not associated with duplicate results.				X								
	For aqueous 6010B and Hg - RPD< 25%, aqueous CN - RPD < 20%, aqueous 6020 - RPD < 20%, and for soil - use laboratory generated limits for MS/MSD.												
7.2	Are all analyte duplicate results within control limits? If no, qualify all associated field samples J(+)/UJ(-) for the analyte with results that fall outside criteria.				X								

Note:

8.0 Spike Sample Analysis -Pre-Digestion/Post-Digestion		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, batch, matrix and level)? If not, J(+) with professional judgement.				X								
8.2	For all analytes with sample concentration > 4 x spike concentration, are spike recoveries within the control limit of 75-125% for aqueous matrices or lab limits for soil matrices?												
	%R > 125% 30%< %R < 74% < 30%				X								
	Positive K L L												
	Non-detect None UL R												
8.3	Where pre-digestion matrix spike analytes were outside the acceptable recovery limits(except Ag), was a post-digestion spike performed? Note any failures in DV report, but no data qualifying action is required.						X						

Note: _____

9.0 Instrument Detection Limits (IDL)		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
9.1	Are all IDLs/RLs equal to or less than the reporting limits specified?				X								

Note: _____

10.0 ICP/AA Serial Dilutions (Not for Mercury Analysis)		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
10.1	Were serial dilutions performed?				X								
10.2	Was a five-fold dilution performed?				X								
10.3	Did the serial dilution results agree within 10% for ICP analyte concentration > 5 X the RL for 6010 or > 20 X the RL for 6020 in the original sample? If no, J(+).				X								

Note: _____

11.0 Field Duplicate Samples		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
11.1	Were any field duplicates submitted for metal analysis?				X								
	For sample results > 5 x RL, a control limit of 25% RPD for water and 35% RPD for soil will be used. For sample results < 5 x RL, a control limit of 2 x RL for water and 4 X RL for soil will be used.												
11.2	Are all analyte duplicate results within control limits? Generally, no action is taken on percent difference of field duplicate results. Results that fall outside criteria recommended above should be noted during data validation and discussed in the DV report				X								

Note: _____

12.0 Result Verification/ Internal Standards/ Tune		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?				X								
12.2	Were all dilution reflected in the positive results and detection limits?						X						
12.3	Were the Internal Standard recoveries within 30-120%				X								
12.4	Were the tunes run at a minimum of four times with RSD < 5% for analytes in solution?												
12.5	Were the tune mass calibrations < 0.1 amu from the true value?												
12.6	Was the resolution check peak width < 0.9 amu at 10% peak height?												

Note: _____

13.0 Completeness Calculation		6020			6010B			CVAA-Hg			Cyanide		
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit 90%)				X								
13.1.1	Number of samples: 8												
13.1.2	Number of target compounds in each analysis: 1												
13.1.3	Number of results rejected and not reported: 0												
	% Completeness = (13.1.1 x 13.1.2 - 13.1.3) x 100/(13.1.1 x 13.1.2)												
	% Completeness = 100%												

Note: _____

Radford Army Ammunition Plant
SWMU 13
Duplicate Statistics
13SB91C and DUP-15

	Units	RL	5xRL	Sample Conc	Duplicate Conc	%RPD	Delta	4xRL	Pass/ Fail
Metals									
lead	mg/Kg	10.0	50	140	130.0	7%	10.0	40.0	Pass

Soil Control Limits

[sample] > 5 x RL, use 35%
[sample] < 5 x RL, use 4 x RL

URS
Measurement Systems

SDG CASE NARRATIVE

URS Corporation
RFAAP SWMU 13 RFI/CMS, WO 008

SDG Executive Summary

This case narrative applies to samples received on December 19, 2008. All samples were scheduled for analysis in accordance with parameters outlined on the field chain of custody record, the TriMatrix bid form, and/or oral and written correspondence between URS Corporation and TriMatrix Laboratories, Inc..

Each sample receipt event was assigned a unique TriMatrix work order number. Sample receipt documentation is included in section A of this data package.

Project Technical Issues/Problems

Project-related data qualification designations and reporting conventions are included in Attachment 1 - *Project Technical Narrative.*

QA/QC Data Qualifications/Narrations

Quality assurance issues and/or quality control data qualifications and narrations related to the analysis and reporting of this SDG are presented in Attachment 2 - *Statement of Data Qualifications.* The absence of a statement page for a particular analyte group (*e.g.* Percent Solids) implies that no qualifying statements were generated for that analyte.

Data Review and Approval

All data was peer-reviewed by a second analyst, and then by appropriate data management staff against laboratory quality control requirements and project specifications. It was then reviewed and approved by the group supervisor/manager prior to further review by the project chemist.

Data Deliverables

The data deliverables, both hardcopy and/or electronic (EDD), that comprise this data package are intended to comply with the documents referenced in the introductory section of this narrative. The EDD, if requested, will be issued separately from this hardcopy report. Hold time reports for each test procedure are presented following the CLP-like forms section of this report.

This report relates only to the sample(s) as received. Test results are in compliance with the requirements of the National Environmental Laboratory Accreditation Conference (NELAC). Estimates of analytical uncertainties for the test results contained within the report are available upon request.

Lisa M. Harvey, Project Chemist

01-09-2009
Date

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Individual sample results relate only to the sample tested.
5560 Corporate Exchange Court SE • Grand Rapids, MI 49512 • (616) 975-4500 • Fax (616) 942-7465

SDG CASE NARRATIVE

Sample Receipt and Login -- Work Order: 0812387

TriMatrix Laboratories received the cooler(s) for this work order on December 19, 2008, at 10:00am. Receiving documents include field chain-of-custody (COC) record(s), sample receipt form(s), and FedEx shipping document(s). The condition of the custody seals, the type and location of the coolant, and the temperatures recorded for each cooler are presented on the TriMatrix *Sample Receiving / Log-In Checklist* provided in section A of this package. The receipt temperature of the samples was determined by using an infrared thermometer to record the temperature of three random samples of varying container types and the accompanying temperature blank, if present.

Samples were scheduled for the analyses listed on the corresponding COC form. Field IDs and assigned laboratory identifiers are presented in the table below.

Field Sample Name	Laboratory Sample ID	Matrix	Date Sampled
13SB91A	0812387-01	Soil	12/17/2008
13SB91B	0812387-02	Soil	12/17/2008
13SB91C	0812387-03	Soil	12/17/2008
DUP-15	0812387-04	Soil	12/17/2008
13SB92A	0812387-05	Soil	12/17/2008
13SB92B	0812387-06	Soil	12/17/2008
13SB92C	0812387-07	Soil	12/17/2008
EQBK7	0812387-08	Water	12/17/2008

No administrative issues were encountered during the receipt and analysis of this work order.

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SDG CASE NARRATIVE

Attachment 1
Project Technical Narrative

Sample Result Reporting Convention

Sample results are reported as RL 'U' (e.g., 0.001 U) if the target analyte was not detected above the MDL. If a sample for an organic parameter is reanalyzed and also reported, the second analysis includes the suffix 'REn' where n = the first, second, etc. reanalysis. If a sample is reanalyzed for confirmation purposes, is confirmed and also reported, the second analysis includes the suffix 'RE1'. If the confirmation was not performed simultaneously, the second set of sample results is reported on a second Form 1 since that confirmation analysis did not occur at the same time and/or date.

Method Detection Limits, Target Analytes, and Reporting Limits

All method detection limits (MDL) for analytes in this report are compliant with the DoD QSM specification that each reporting limit (RL) employed is to be at least three times the MDL. In addition, no RL is less than the equivalent concentration of the lowest instrument calibration standard.

Quality Control Limits

Quality control limits specified in the DoD QSM were employed. For cases in which the analyte is not listed in the QSM, internal laboratory control limits were used.

Data Qualifier Designation

If applicable, a sample result is qualified with:

- a "U" flag if the analyte was not detected at a concentration greater than the MDL,
- a "B", "J", and/or an "E" flag as defined in the Variance section,
- a LIMS-generated statement of qualification. Qualifying statements, if any, will be found in Attachment 2 to this narrative.

QC Batch and Analytical Batch Designation

A Quality Control (QC) Batch is a seven digit number that associates all samples that have been prepared together (or analyzed together if there is no preparation). Quality Control batches are limited to no more than twenty samples, excluding batch QC (method blanks, control spikes, etc.). Some batches may contain multiple sets of method blanks (BLK) and laboratory control samples (BS), where a set of method quality control analyses were prepared in concert with each set of samples on a given day.

An Analytical Batch (or Sequence) is a seven digit number that associates all samples analyzed as a set under one analytical sequence.

Variances

Data Qualifier Flags

Data qualifier flags other than those listed in the DoD QSM were employed or the definition of an existing flag was modified.

J – Estimated: the analyte was detected at a concentration greater than the limit of detection (i.e., MDL) but less than the reporting limit (i.e., MRL).

B – Blank contamination: The analyte was detected above one-half the reporting limit in an associated method blank. The same analyte in the sample was detected at less than five times the method blank concentration. (If a common laboratory contaminant is present in the method blank at a concentration greater than one-half the reporting limit but less than or equal to that reporting limit, any associated sample results are flagged but corrective action is not necessarily taken. A text qualifier is also associated with such a result.)

E – Exceeds calibration range: The analyte response exceeded the calibrated range of the instrument. (With the exception of metals for which only the final non-qualified result is reported, both the initial E-qualified result and final non-qualified result from reanalysis-at-dilution are reported.)

Text Qualifier

A LIMS-generated text qualifier is substituted for many instances in which the DoD QSM "Q" flag would otherwise apply. The text qualifiers are listed in a summary format by parameter with applicable samples identified.

Methods 6010B and 6020A

The acceptance criterion of < 2 x RL is substituted for < 2 x MDL for interference check solution ICS-A.

Project Correspondence

Any additional correspondence with the Client, and potentially any third parties also involved in the project, regarding sample receipt and/or analysis follows.

SDG CASE NARRATIVE

Attachment 2
Statement of Data Qualifications

All analyses have been validated and comply with our Quality Control Program.
No qualifications are required.

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TriMatrix Laboratories, Inc.

5560 Corporate Exchange Court SE Grand Rapids, MI 49512
Phone (616) 975-4500 Fax (616) 942-7463
www.trimatrixlabs.com

Chain of Custody Record

COC No. 126464

Page ____ of ____

36440-64

For Lab Use Only		Client Name	Project Name
Cart	4	URS Corp.	RFMAP Semi 13 RF1
VOA Rack/Tray	—	Address	Client Project No./P.O. No.
Receipt Log No.	31.6	5510 Falmouth St. Suite 21	11656367
Project Chemist	CMH	Richmond, VA 23230	Invoice No. ☐ Client ☐ Other (comments)
Laboratory Project No.	06123871	Phone / Fax	Contact/Report To: Tina Devine

Analyses Requested

Container Type (corresponds to Container Packing List)

Number of Containers Submitted

PRESERVATIVES
A NONE pH~7
B HNO_3 pH<2
C H_2SO_4 pH<2
D 1+1 HCl pH<2
E NaOH pH>12
F ZnAc/NaOH pH>9
G MeOH
H Other (note below)

Test Group	Matrix Code	Laboratory Sample Number		Sample ID	Cooler ID	Sample Date	Sample Time	COMP	GRAB	Matrix	Number of Containers Submitted	Total	Sample Comments
D	SO	01	1	135SB91A		12/7/08	1630		X	S	1		
1		02	2	135SB91B			1635		X	S	1		
1		03	3	135SB91C			1640		X	S	1		
F	SO FB	04	4	DUP-15			—		X	S	1		
E	SO	05	5	135SB92A MS/MSD			1650		X	S	1		
D	SO	06	6	135SB92B			1655		X	S	1		
D	1	07	7	135SB92C			1700		X	S	1		
G	EB WG	08	8	EQBK7			1730		X	W	1		HNO3 preservative
			9										
			10										

Sampled By (print)	How Shipped? Hand Carrier FedEx	Comments
MARK FUTRELL		
Sampler's Signature	Tracking No.	
Company URS Corp	1. Relinquished By / Date / Time: 12/19/08 1200	2. Relinquished By / Date / Time
	1. Received By / Date / Time	2. Received By / Date / Time

3. Relinquished By / Date / Time

3. Received For Lab By: Wm Cole 12-19-08 1000

TriMatrixCOC -- COC

WHITE COPY - REPORT YELLOW COPY - LABORATORY PINK COPY - FIELD

TriMatrix Laboratories, Inc.

SAMPLE RECEIVING / LOG-IN CHECKLIST

Client: URS | Project-Submittal No.: (new) / add to 0812387
Receipt Record Page/Line No.: 31.6 | Project Chemist: MA | Sample Nos.: 01-08

Coolers Received

Recorded by (initials/date): WC 12.19.08

- [x] Cooler
- [ ] Box
- [ ] Other

Qty Received: 1

Thermometer Used: [x] IR Gun (#202) [ ] Digital Thermometer (#54) [ ] Other (#_____)

[ ] See Additional Cooler Information Form

Cooler No. — / Time 1109

Custody Seals: [ ] none [x] present / intact [ ] present / not intact

Coolant Location: (Dispersed) / Top / Middle / Bottom

Coolant / Temperature Taken Via: [x] loose ice / avg 2-3 containers [ ] bagged ice / avg 2-3 containers [ ] blue ice / avg 2-3 containers [■] none / avg 2-3 containers

Alternate Temperature Taken Via: [x] temperature blank (tb) [ ] 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb	3.2	-	3.2
tb location: representative / in ice			
1	3.5	—	3.5
2	3.8	—	3.8
3	3.10	—	3.10
Average °C			3.6

[ ] Cooler ID on COC? [ ] VOC trip blank received?

Cooler No. — / Time —

Custody Seals: [ ] none [ ] present / intact [ ] present / not intact

Coolant Location: Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via: [ ] loose ice / avg 2-3 containers [ ] bagged ice / avg 2-3 containers [ ] blue ice / avg 2-3 containers [■] none / avg 2-3 containers

Alternate Temperature Taken Via: [ ] temperature blank (tb) [ ] 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
Average °C			

[ ] Cooler ID on COC? [ ] VOC trip blank received?

Cooler No. — / Time —

Custody Seals: [ ] none [ ] present / intact [ ] present / not intact

Coolant Location: Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via: [ ] loose ice / avg 2-3 containers [ ] bagged ice / avg 2-3 containers [ ] blue ice / avg 2-3 containers [■] none / avg 2-3 containers

Alternate Temperature Taken Via: [ ] temperature blank (tb) [ ] 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
Average °C			

[ ] Cooler ID on COC? [ ] VOC trip blank received?

Cooler No. — / Time —

Custody Seals: [ ] none [ ] present / intact [ ] present / not intact

Coolant Location: Dispersed / Top / Middle / Bottom

Coolant / Temperature Taken Via: [ ] loose ice / avg 2-3 containers [ ] bagged ice / avg 2-3 containers [ ] blue ice / avg 2-3 containers [■] none / avg 2-3 containers

Alternate Temperature Taken Via: [ ] temperature blank (tb) [ ] 1 container

	Recorded °C	Correction Factor °C	Actual °C
tb			
tb location: representative / in ice			
1			
2			
3			
Average °C			

[ ] Cooler ID on COC? [ ] VOC trip blank received?

If any shaded areas checked, complete Sample Receiving Non-Conformance Form.

Paperwork Received

[ ] No COC received

N/A	Yes	No	
	[x]	[ ]	**Chain of Custody Record(s)?**
	[ ]		If No, COC initiated by _____
	[x]		Rec'd for Lab signed/date/time?
[ ]	[x]		Shipping Document?
[x]	[ ]		Other _____

COC ID Nos.

[x] TriMatrix 12041604

[ ] Other (name or ID#)_____

Check COC for Accuracy

[ ] No analysis requested

Yes	No	
[x]	[ ]	Sample ID matches COC?
[x]	[ ]	Sample date and time matches COC?
[x]	[ ]	Container type completed on COC?
[x]	[ ]	All container types indicated are received?

Sample Condition Summary

[ ] Non-TriMatrix containers, see Notes

N/A	Yes	No	
		[x]	Broken containers/lids?
		[x]	Missing or incomplete labels?
		[x]	Illegible information on labels?
		[x]	Low volume received?
		[x]	Inappropriate containers received?
[x]		[ ]	VOC vials / TOX containers have headspace?
[ ]		[ ]	Extra sample locations / containers not listed on COC?

Check Sample Preservation

N/A	Yes	No	
	[x]	[■]	Average sample temperature ≤6° C?
[ ]	[x]		Completed Sample Preservation Verification Form?
[ ]	[x]	[■]	Samples preserved correctly?
[x]		[ ]	If "No", added orange tag?
[x]		[ ]	Received pre-preserved VOC soils?

[ ] MeOH [ ] Na_2SO_4

Check for Short Hold-Time Prep/Analyses

- [ ] Bacteriological
- [ ] Air Bags
- [ ] EnCores / Methanol Pre-Preserved
- [ ] Formaldehyde/Aldehyde
- [ ] Green-tagged Containers
- [ ] Yellow/White-tagged 1L Ambers (SV Prep-Lab)

AFTER HOURS ONLY:
COPIES OF COC TO LAB AREA(S)
[x] NONE RECEIVED
[ ] RECEIVED, COCs TO LAB(S)

Notes

[ ] Trip blank received [ ] Trip blank not listed on COC
[ ] No COC received, Proj. Chemist reviewed (init./date) _____
[ ] No analysis requested, Proj. Chemist completed (init./date) _____

Cooler Received (Date/Time)	Paperwork Delivered (Date/Time)	≤1 Hour Goal Met?
12.19.08 1000	12.19.08 1113	Yes / (No)

Data Qualifying Codes

Two types of data qualifying codes or flags are applied in the course of the data review. The data validation flags indicate data that are not usable for decision-making, more than normally biased and/or variable, or not representative of field conditions. These codes and their definitions are presented below in the hierarchy stipulated in the USEPA Region III Modifications to the National Functional Guidelines for Data Review (September 1994).

Data Validation Flags

Flag	Interpretation
R	Unreliable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.
U	Not detected. The associated number indicates the approximate sample concentration is necessary to be detected.
B	Not detected substantially above the level reported in laboratory or field blanks.
N	Tentative Identification. Consider present. Special methods may be needed to confirm its presence or absence in future sampling efforts.
J	Analyte present. Reported value may not be accurate or precise.
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.
UJ	Not detected, quantitation limit may be inaccurate or imprecise.
UL	Not detected, quantitation limit is probably higher.
NT	Not tested, no analytical result provided.

The other type of code used by URS is a "Reason Code". The reason code indicates the type of quality control failure that led to the application of the data validation flag.

Reason Codes

GC/MS Organics		GC and HPLC Organics		Inorganics and Conventionals	
Code	Interpretation	Code	Interpretation	Code	Interpretation
a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence
b	Bubble found in vial >6mm	b	Instrument performance failure	c	Calibration failure
c	Calibration failure; poor or unstable response	c	Calibration failure; poor or unstable response	d	MS/MSD imprecision
d	MS/MSD imprecision	d	MS/MSD imprecision	e	LCSD imprecision
e	LCSD imprecision	e	LCSD imprecision	f	Field duplicate imprecision
f	Field duplicate imprecision	f	Field duplicate imprecision	g	Laboratory duplicate imprecision
g	Tuning failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	h	Holding time violation
h	Holding time violation	h	Holding time violation	k	Cooler receipt temperature exceeds limits
i	Internal standard failure	i	Internal standard failure	l	LCS recovery failure
k	Cooler receipt temperature exceeds limits	k	Cooler receipt temperature exceeds limits	m	MS/MSD recovery failure
l	LCS recovery failure	l	LCS recovery failure	n	ICS failure
m	MS/MSD recovery failure	m	MS/MSD recovery failure	o	Calibration blank contamination
p	Poor chromatography	p	Poor chromatography	p	Preparation blank contamination
q	Concentration exceeded the linear range of the instrument	q	Concentration exceeded the linear range	q	Concentration exceeded the linear range
r	Linearity failure in initial calibration	r	Linearity failure in initial calibration	r	Linearity failure in calibration or MSA
s	Surrogate failure	s	Surrogate failure	s	Serial dilution failure
t	TIC	u	No confirmation column	v	Post-digestion spike failure
w	Identification criteria failure	w	Retention time failure	w	CRDL Standard Failure
x	Field blank contamination	x	Field blank contamination	x	Field blank contamination
y	Trip blank contamination	z	Method blank contamination	z	Laboratory storage blank contamination
z	Method blank contamination				