UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
PERMIT
FOR CORRECTIVE ACTION AND WASTE MINIMIZATION;
PURSUANT TO THE RESOURCE CONSERVATION AND RECOVERY ACT
AS AMENDED BY THE HAZARDOUS AND SOLID WASTE
AMENDMENTS OF 1984

Permittee:	Alliant Ammunition and Powder Company LLC and the United States Department of the Army
Permit Number:	VA1210020730
Facility:	Radford Army Ammunition Plant Radford, Virginia

This permit is issued by the United States Environmental Protection Agency (EPA) under the authority of the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976 (RCRA) and the Hazardous and Solid Waste Amendments of 1984 (HSWA), 42 U.S.C. § 6901 et seq., and EPA regulations at 40 C.F.R. Parts 260-271 and Part 124, to Alliant Ammunition and Powder Company LLC as the operator, and to the United States Department of the Army, as the owner (together known as the Permittee) to meet the requirements of HSWA at the Permittee's facility, the Radford Army Ammunition Plant (Radford AAP), in Radford, Virginia at latitude 37° 11' 45" North and longitude 80° 30' 30" West (the Facility).

The complete RCRA permit for purposes of Section 3005(c) of RCRA, 42 U.S.C. § 6925(c), consists of two portions: this permit, issued by EPA, which addresses the provisions of HSWA, and the permit issued by the Virginia Department of Environmental Quality (VDEQ) on September 14, 1994, which addresses the provisions of the Code of Virginia Regulations, Chapter 14, Article 4, Title 10.1, for which the Commonwealth of Virginia (Commonwealth) has received authorization under Section 3006(b) of RCRA, 42 U.S.C. § 6926(b), to carry out such program in lieu of the federal hazardous waste management program under RCRA. As of the date of issuance of this permit, the Commonwealth has not received authorization to administer the provisions of HSWA. This permit, which addresses provisions of HSWA, will be enforced by EPA. The VDEQ permit will be enforced by VDEQ, but EPA may also exercise its enforcement discretion if and when appropriate.

The Permittee must comply with all terms and conditions of this permit. This permit consists of the conditions contained herein (Parts I and II and Attachments A through G) and the applicable regulations contained in 40 C.F.R. Parts 124, 260 through 264, 268 and 270 as specified in the permit or which are, by statute, self-implementing. (40 C.F.R. § 270.32(c))

This permit is based on information provided to EPA by the Permittee and VDEQ. Section 3005(c)(3) of RCRA provides EPA the authority to review and amend the permit at any time. Any inaccuracies found in the information submitted by the Permittee may be grounds for

the termination, modification or revocation and reissuance of this permit (see 40 C.F.R. §§ 270.41, 270.42 and 270.43). The Permittee must inform EPA of any deviation from or changes in the submitted information which would affect the Permittee's ability to comply with the applicable statutes, regulations or permit conditions.

This permit is effective on October 31, 2000, and shall remain in effect until October 31, 2010, unless revoked and reissued, modified or terminated in accordance with 40 C.F.R. §§ 270.41, 270.42, 270.43 or continued in accordance with 40 C.F.R. § 270.51(a).

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PART I - STANDARD CONDITIONS

A. DEFINITIONS

For the purposes of this permit, terms used herein shall have the same meaning as those set forth in 40 C.F.R. Parts 260 through 264, 268 and 270, unless this permit specifically states otherwise. Where terms are not otherwise defined, the meaning associated with such terms shall be as defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the terms. The following definitions also apply to this permit.

1. Area of Concern - pursuant to the authority granted by Section 3005(c)(3) of RCRA, 40 C.F.R. § 270.32(b)(2), an area of concern is hereby defined for purposes of this permit to mean an area at the facility or an off-site area, which is not at this time known to be a solid waste management unit, where hazardous waste and/or hazardous constituents are present or are suspected to be present as a result of a release from the facility.

2. Days - except as otherwise provided herein, calendar days. If any requirement under the terms of this permit would fall on a Saturday, Sunday or federal holiday, then the requirement shall be due on the following business day.

3. Deadlines - shall mean the Near Term Milestones specifically established for the current fiscal year under the Installation Action Plan.

4. Facility - for the purpose of implementing corrective action under 40 C.F.R. § 264.101, all contiguous property under the control of the owner or operator seeking a permit under Subtitle C of RCRA. (40 C.F.R. § 260.10)

5. Fiscal year - shall mean the time period used by the United States Government for budget management and commences on October 1 and ends September 30th of the immediate following calendar year.

6. Hazardous Constituent - any constituent identified in Appendix VIII of 40 C.F.R. Part 261.

7. Installation Action Plan - shall mean a planning document, prepared specifically under permit condition II.G, that contains a timetable, plan, or schedule which indicates the time and sequence of events. The Installation Action Plan will be used as a management tool in planning, reviewing and setting priorities for all response activities at the Facility. Deadlines and Target Dates developed under the terms of this permit are listed in the Installation Action Plan.

8. Milestones - shall mean the dates established by the Parties in the Installation Action Plan for the initiation or completion of Primary Actions and the submission of Deliverable Documents and Project End Dates. Milestones shall include Near Term Milestones, Out

Year Milestones, Primary Actions, and Project End Dates.

9. Near Term Milestones - shall mean the Milestones within the current fiscal year (FY), the next fiscal year or "budget year" (FY+1), and the year for which the budget is being developed or "planning year" (FY+2).

10. Out Year Milestones - shall mean the Milestones within those years occurring after the planning year until the completion of the cleanup or phase of the cleanup (FY+3 through Project End Date).

11. Parties - shall mean EPA and the Permittee.

12. Permittee - shall mean Alliant Ammunition and Powder Company LLC as the operator and the United States Department of the Army as the owner.

13. Primary Actions - as used in this permit shall mean those specified major, discrete actions that the Parties identify as such in the Installation Action Plan. The Parties should identify all major, discrete actions for which there is sufficient information to be confident that the date for taking such action is implementable.

14. Project End Dates - shall mean the dates established by the Parties in the Installation Action Plan for the completion of major portions of the cleanup or completion of the cleanup of the Facility. The Parties recognize that, in many cases, a higher degree of flexibility is appropriate with Project End Dates due to uncertainties associated with establishing such dates.

15. Regional Administrator - Regional Administrator of the United States Environmental Protection Agency, Region III, his designee or authorized representative.

16. Relative Risk Process - shall mean a methodology used to evaluate the relative risk posed by a site in relation to other sites when applicable. The Relative Risk Process is used at active Army installations for the Army's Environmental Restoration Program prioritization pursuant to DOD directions. The Relative Risk Process Guidance (1997) groups sites into high, medium, and low categories contingent upon site information. The Relative Risk Process helps to determine the general sequence in which Army sites will be addressed and assists in establishing funding priority.

17. Release - any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment.

18. Site - as used in this Permit shall mean the Facility and any contamination beyond the Facility boundary within the meaning of section 3004(v) of RCRA.

19. Solid Waste Management Unit - any discernible unit at which solid wastes have been placed

at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released.

20. Target Dates - shall mean dates established for the completion and transmission of a preliminary/conceptual Corrective Measures Design document, a thirty (30) percent design report and a ninety (90) percent or prefinal Corrective Measures Design. Target Dates are not subject to dispute resolution and they are not Milestones.

B. STANDARD DUTIES AND REQUIREMENTS

1. Duty to Comply

a. The Permittee shall comply with all conditions of this permit, except to the extent and for the duration such noncompliance is authorized by an emergency permit issued under 40 C.F.R. § 270.61 or the analogous provisions of the Commonwealth's authorized hazardous waste management regulations. Any other permit noncompliance constitutes a violation of RCRA and is grounds for enforcement action; permit termination, revocation and reissuance, or modification, or for denial of a permit renewal application. (40 C.F.R. § 270.30(a))

b. It shall not be a defense for the Permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. (40 C.F.R. § 270.30(c))

2. Duty to Mitigate

In the event of noncompliance with this permit, the Permittee shall take all reasonable steps to minimize releases to the environment and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment. (40 C.F.R. § 270.30(d))

3. Duty to Properly Operate and Maintain

The Permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit. (40 C.F.R. § 270.30(e))

4. Duty to Monitor and Record Results

Pursuant to 40 C.F.R. § 270.30(j), the Permittee shall comply with the following requirements:

a. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. All sampling and analyses shall be of adequate quality, scientifically valid, of known precision and accuracy, and of acceptable completeness, representativeness and comparability. Laboratory analysis of each sample must be performed using an appropriate method for testing the parameter(s) of interest taking into account the sample matrix. The test methods found in the EPA publication, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846), 3rd Edition, as updated, shall be used for: The Toxicity Characteristic analytes (40 C.F.R. § 261.24); the Free Liquids Test (Method 9095) used to determine if free liquid is a component of a waste as a specific requirement for bulk and containerized wastes (40 C.F.R. § 264.314(c)); and the chemical analysis of wastes for hazardous waste incineration permits (40 C.F.R. § 270.62(b)(2)(i)(C)).

b. The Permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports and records required by this permit, the certification required by 40 C.F.R. § 264.73(b)(9) and records of all data used to complete the application for this permit for a period of at least three (3) years from the date of the sample, measurement, report, certification or application. These periods may be extended by request of the Regional Administrator at any time and are automatically extended during the course of any unresolved enforcement action regarding this facility. (40 C.F.R. § 264.74) The Permittee shall maintain records from all groundwater monitoring wells and associated groundwater surface elevations for the active life of the Facility, and, for disposal facilities, for the post-closure care period as well. (40 C.F.R. § 270.30(j))

c. Records of monitoring information shall specify:

(1) The date, exact place, and time of sampling or measurements;

(2) The individual(s) who performed the sampling or measurements;

(3) The date(s) analyses were performed;

(4) The individual(s) who performed the analyses;

(5) The analytical techniques or methods used; and

(6) The results of such analyses.

5. Duty to Provide Information

The Permittee shall furnish, within a reasonable specified time, any relevant information which the Regional Administrator may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The Permittee shall also furnish to the Regional Administrator upon request, copies of records required to be kept by this permit. (40 C.F.R. §§ 270.30(h) and 264.74(a))

6. Duty to Allow Inspection and Entry

Pursuant to 40 C.F.R. § 270.30(i), the Permittee shall allow the Regional Administrator, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

a. Enter at reasonable times upon the Permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

d. Sample or monitor, at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by RCRA, any substances or parameters at any location.

7. Project Coordinators

a. EPA hereby designates Robert G. Thomson as the EPA Project Coordinator. Within ten (10) calendar days of the effective date of this permit, the Permittee shall notify EPA, in writing, of the Project Coordinator it has selected. Each Project Coordinator shall be responsible for overseeing the implementation of the permit. The EPA Project Coordinator will be EPA's primary designated representative for the Facility. To the maximum extent possible, all communications between the Army, Alliant and EPA, and all documents, reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this permit, shall be directed through the Project Coordinators.

b. Each Party agrees to provide at least seven (7) calendar days written notice to the other Party prior to changing Project Coordinators.

c. The absence of the EPA Project Coordinator at the Facility shall not be cause for the delay or stoppage of work.

8. Duty to Submit Certified Documents

a. At least 6 copies of draft documents and 3 copies of all final plans, reports, notifications or other documents which are required by this permit to be submitted to the Regional Administrator or EPA, shall be sent Certified Mail, Return Receipt Requested, overnight mail, or hand-carried to:

Federal Facilities Branch (3HS13)
EPA Region III
1650 Arch Street
Philadelphia, Pennsylvania 19103
215-814-3357

Each report, notification or other submission shall reference the Permittee's name, permit number and Facility address. In addition, one copy of such submission shall be sent to both:

Commonwealth of Virginia
Department of Environmental Quality
Waste Division
P.O. Box 10009
Richmond, Virginia 23240
(804)698-4155

and

Commonwealth of Virginia
Department of Environmental Quality
West Central Regional Office
Executive Office Park, Suite D
5338 Peters Creek Road
Roanoke, Virginia 24019

b. All reports or other information submitted to the Regional Administrator or EPA shall be signed and certified as required by 40 C.F.R. §§ 270.11 and 270.30(k).

9. Duty to Maintain Documents at the Facility

Pursuant to 40 C.F.R. § 264.73, the Permittee shall maintain at the Facility (or other location approved by the Regional Administrator) during the term of this permit, including any reissued permit, all documents and raw data, such as laboratory reports, drilling logs, and other supporting information generated from investigations required by this permit including amendments, revisions and modifications to these documents.

10. Duty to Minimize Waste

The Permittee shall certify no less often than annually that the Permittee has a program in place to reduce the volume and toxicity of hazardous waste that the Permittee generates to the degree determined by the Permittee to be economically practicable; and the proposed method of treatment, storage or disposal is the practicable method currently available to the Permittee which minimizes the present and future threat to human health and the environment. The Permittee shall maintain each such certification of waste minimization at the Facility until closure of such Facility. (40 C.F.R. § 264.73(b)(9))

11. Duty to Comply with the Land Disposal Restrictions

All activities of the Permittee which involve the land disposal of hazardous waste are subject to the provisions of RCRA Section 3004(b)-(m), 42 U.S.C. § 6924(b)-(m), and applicable regulations thereunder at 40 C.F.R. Part 268.

12. Reporting Requirements

a. Failure to Submit Relevant and/or Accurate Information

Whenever the Permittee becomes aware that it failed to submit any relevant facts in the permit application, or submitted incorrect information in a permit application or in any report to the Regional Administrator, the Permittee shall notify the Regional Administrator of such failure within seven (7) days of becoming aware of such deficiency or inaccuracy. The Permittee shall submit the correct or additional information to the Regional Administrator within fourteen (14) days of becoming aware of the deficiency or inaccuracy. (40 C.F.R. § 270.30(l)(11)) Failure to submit the information required in this permit or misrepresentation of any submitted information is grounds for termination of this permit. (40 C.F.R. § 270.43)

b. Noncompliance with Schedules for Interim and Final Requirements

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than fourteen (14) days following each schedule date. (40 C.F.R. § 270.30(l)(5))

c. Other Noncompliance

The Permittee shall report all other instances of noncompliance not otherwise required to be reported above, at the time monitoring reports are submitted. The reports shall contain the information listed in 40 C.F.R. § 270.30(l)(10).

13. Duty to Comply with RCRA Organic Air Emission Standards

The Permittee shall comply with all requirements specified in 40 C.F.R. Part 264, Subparts AA and BB, as applicable, including all reporting, air monitoring and maintenance requirements.

C. DISPUTE RESOLUTION

Except as otherwise provided in this permit, in the event the Permittee disagrees, in whole or in part, with EPA disapproval of any submission required by this permit, the Permittee shall notify EPA in writing of its objections, and the basis therefor, within twenty-one (21) days of receipt of EPA's disapproval.

Such notice shall set forth the specific matters in dispute, the basis for the Permittee's belief that its position is consistent with the permit requirements, and any supporting documentation.

EPA and the Permittee shall have an additional twenty-one (21) days from EPA receipt of the notification to meet or confer to resolve any dispute. In the event agreement is reached, the Permittee shall submit the revised submission and implement the same in accordance with such agreement.

In the event EPA and the Permittee are not able to reach agreement within this twenty-one (21)-day period, the Permittee shall have the opportunity to submit written comments regarding EPA's disapproval, and receive a written decision from the EPA Regional Administrator or his delegatee (e.g., the Division Director or the Office Director) regarding the Permittee's objection. EPA will notify the Permittee in writing of its decision and the Permittee shall comply with the terms and conditions of EPA's decision. The Permittee does not waive its right to assert any and all available defenses in a proceeding to enforce this permit, nor does it waive any statutory or regulatory rights it may have, if any, to affirmatively challenge EPA's decision in the dispute.

D. EFFECT OF PERMIT

1. This permit authorizes only the management of hazardous waste expressly described in this permit and does not authorize any other management of hazardous waste.

2. Issuance of this permit does not convey property rights of any sort or any exclusive privilege, nor does it authorize any injury to persons or property, or invasion of other private rights, or any infringement of Commonwealth or local laws or regulations. (40 C.F.R. §§ 270.30(g) and 270.4(b) and (c)) Compliance with the full permit during its term constitutes compliance with Subtitle C of RCRA, except for those requirements not included in the permit which become effective by statute or which are promulgated under 40 C.F.R. Part 268. (40 C.F.R. § 270.4(a)) However, compliance with the terms of this permit does not constitute a defense to any action brought under Section 7003 of RCRA, 42 U.S.C. § 6973, Section 106(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. § 9606(a) (commonly known as Superfund), or any other law governing protection of public health or welfare or the environment.

3. Nothing contained herein shall in any way be deemed to waive the Permittee's obligation to comply with 40 C.F.R. Part 270, Subpart C, and applicable regulations set forth at 40 C.F.R. Part 124.

E. PERMIT MODIFICATION, REVOCATION AND REISSUANCE

1. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request for a permit modification, revocation and reissuance, or termination or the notification of planned changes or anticipated noncompliance on the part of the Permittee does not stay any permit condition. (40 C.F.R. § 270.30(f)) Review of any application for a permit renewal shall consider improvements in the state of control and measurement technology, as well as changes in applicable regulations and laws. (RCRA Section 3005(c)(3), 42 U.S.C. § 6925(c)(3))

2. The Regional Administrator will modify the permit in accordance with 40 C.F.R. § 270.41 and Section 3005(c) of RCRA in the event that investigations required in this permit, or any other information available to the Regional Administrator, identify solid waste management units that require corrective measures. This paragraph does not limit the Regional Administrator's authority to otherwise modify this permit in accordance with 40 C.F.R. Part 270, Subpart D.

3. This permit may be modified if the Regional Administrator determines good cause exists for modification, such as an act of God, strike, flood, materials shortage or other events over which the Permittee has little or no control and for which there is no reasonably available remedy. (40 C.F.R. § 270.41)

F. PERMIT EXPIRATION AND CONTINUANCE

1. Pursuant to 40 C.F.R. § 270.50, this permit shall be effective for a fixed term not to exceed ten years. Pursuant to 40 C.F.R. § 270.51, this permit and all conditions herein will remain in effect beyond the permit's expiration date if the Permittee has submitted a timely and complete application for a new permit (see 40 C.F.R. §§ 270.10 and 270.14 - 270.29) and, through no fault of the Permittee, the Director has not issued a new permit under 40 C.F.R. § 124.15 on or before the expiration date of this permit. In addition, each permit for a land disposal facility shall be reviewed by the Regional Administrator five years after the date of permit issuance or reissuance and shall be modified as necessary, as provided in 40 C.F.R. § 270.41. (40 C.F.R. § 270.50(d))

2. If the Permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the Permittee must submit a complete application for a new permit at least 180 days before this permit expires, unless permission for a later date has been granted by the Regional Administrator. (40 C.F.R. §§ 270.10(h) and 270.30(b))

3. The corrective action obligations contained in this permit shall continue regardless of

whether the Permittee continues to operate or ceases operation and closes the Facility. The Permittee is obligated to complete Facility-wide corrective action under the conditions of a RCRA permit regardless of the operational status of the Facility. The Permittee must submit an application for a new permit at least 180 days before this permit expires pursuant to 40 C.F.R. § 270.10(h), unless the permit has been modified to terminate the corrective action schedule of compliance and the Permittee has been released from the requirements for financial assurance for corrective action.

G. TRANSFER OF PERMIT

1. This permit is not transferable to any person, except after notice to the Regional Administrator. (40 C.F.R. § 270.30(l)(3)) A permit may be transferred by the Permittee to a new owner or operator only if the permit has been modified or revoked and reissued under 40 C.F.R. § 270.40(b) or 270.42(b)(2) to identify the new permittee and incorporate such other requirements as may be necessary under the appropriate Act. (40 C.F.R. § 270.40)

2. Before transferring ownership or operation of the Facility during its operating life, the Permittee transferring its interest in the Facility shall notify the new owner or operator in writing of the requirements of 40 C.F.R. Parts 264 and 270. (40 C.F.R. § 264.12(c))

H. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby. (40 C.F.R. § 124.16(a)(2))

PART II - SPECIFIC FACILITY CONDITIONS

A. STATEMENT OF PURPOSE

The mutual objectives of EPA and the Permittee are: (1) the establishment of a procedural framework and schedule for developing, implementing and monitoring appropriate response actions at or from (or both) the Facility; (2) the performance by the Permittee of a RCRA Facility Investigation ("RFI") to determine fully the nature and extent of any release of hazardous wastes, solid wastes and/or hazardous constituents at or from the Facility; (3) the performance by the Permittee of a Corrective Measures Study ("CMS") to identify and evaluate alternatives for corrective action necessary to prevent or mitigate migration or releases of hazardous wastes, solid wastes and/or hazardous constituents at and/or from the Facility; and (4) the performance by the Permittee of the Corrective Measures as selected by EPA.

B. RCRA-CERCLA INTEGRATION

EPA and the Permittee intend to integrate the Army's Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) response obligations and RCRA corrective action obligations which relate to the release(s) of hazardous substances, solid wastes, hazardous constituents, hazardous wastes, pollutants or contaminants at the Facility. Therefore, the Parties intend that activities covered by this permit will achieve compliance with CERCLA, 42 U.S.C. Section 9601 et seq.; satisfy the corrective action requirements of RCRA Section 3004(u) and (v), 42 U.S.C. Section 6924(u) and (v); and meet or exceed all applicable or relevant and appropriate Federal and Commonwealth laws and regulations, to the extent required by CERCLA Section 121, 42 U.S.C. Section 9621, and other applicable laws.

Based upon the foregoing, the EPA and the Army intend that any corrective measures action selected, implemented and completed in accordance with the requirements of this permit, or any modification of this permit, will be protective of human health and the environment such that remediation of releases covered by this permit shall obviate the need for further corrective action under RCRA (i.e., no further corrective action shall be required) as well as further response actions under CERCLA.

C. CORRECTIVE ACTION FOR CONTINUING RELEASES; PROTECTION OF HUMAN HEALTH AND THE ENVIRONMENT

Section 3004(u) of RCRA, 42 U.S.C. § 6924(u), and regulations codified at 40 C.F.R. § 264.101, provide that all permits issued after November 8, 1984 must require corrective action as necessary to protect human health and the environment for all releases of hazardous waste or hazardous constituents from any solid waste management unit (SWMU), regardless of when waste was placed in the unit.

Under Section 3004(v) of RCRA, 42 U.S.C. § 6924(v), EPA may require that corrective action at a

permitted facility be taken beyond the facility boundary where necessary to protect human health and the environment, unless the owner or operator of the facility concerned demonstrates to the satisfaction of EPA that, despite the owner or operator's best efforts, the owner or operator was unable to obtain the necessary permission to undertake such action.

Section 3005(c)(3) of RCRA, 42 U.S.C. § 6925(c)(3), and 40 C.F.R. § 270.32(b) provide that each permit shall contain such terms and conditions as the Administrator determines necessary to protect human health and the environment.

This permit requires the Permittee to conduct a RCRA Facility Investigation (RFI). The RFI will determine the nature and extent of releases of hazardous waste and hazardous constituents from regulated units, solid waste management units, and any other Area of Concern at the Facility and to gather all data necessary for EPA to determine whether a Corrective Measures Study is required. The RFI includes the collection of Site specific data to evaluate any human health and or ecological impacts of contamination from the Facility. If, on the basis of the RFI and any other relevant information, the Regional Administrator determines that a Corrective Measures Study (CMS) is necessary, the Permittee will be required to conduct a Corrective Measures Study for those releases from SWMUs or Areas of Concern (AOCs) which threaten human health or the environment.

The Permittee may have completed some of the tasks required by this permit and may have some of the information and data required by this permit. This previous work may be used to meet the requirements of this permit, upon submission to and approval by the Regional Administrator in accordance with permit conditions I.C (Dispute Resolution) and II.E (Consultation).

The Permittee shall prepare Facility-specific work plans and reports relating to Interim Measures, RCRA Facility Investigation, Corrective Measures Study and any Risk Screening or Risk Assessment in accordance with the relevant attachments. The Permittee shall establish specific and appropriate elements of such scopes and reports to EPA's satisfaction under permit conditions I.C (Dispute Resolution) and II.E (Consultation).

The Permittee may, at any stage of the RFI, if applicable, submit to the Regional Administrator, in writing, a proposal to perform corrective measures for the remediation of any release of hazardous waste or hazardous constituents at or from a SWMU and/or AOC. Any such proposal shall include a schedule for performance of such corrective measures. For any releases to soil, ground-water, sediment and surface water, the Permittee must demonstrate in such proposal, to the Regional Administrator's satisfaction, that the subsurface conditions and contaminant plume relating to such release have been adequately characterized and that the proposed corrective measures will adequately remove, contain, or treat the released hazardous waste or hazardous constituents as necessary to protect human health and the environment. The nature and extent of releases to other media shall likewise be adequately characterized. The Regional Administrator shall review such proposal and notify the Permittee of his approval or disapproval of such proposal. If the Regional Administrator approves such a proposal, the Permittee shall be allowed to dispense with certain stages of the investigation, as described in the Regional Administrator's

approval of the proposal . No term or condition of this permit, except as otherwise provided for by this permit, shall be affected by such proposal until such time as this permit has been modified to include such proposal. The Regional Administrator or Permittee may seek modification of this permit pursuant to 40 C.F.R. § 270.41 or § 270.42 and § 124.5 to include such proposal.

The following Attachments are included as part of this permit:

Attachment A:	List of SWMUs and AOCs
Attachment B:	Hazardous Constituent Sampling List and Risk Based Concentration Screening
Attachment C:	RCRA Facility Investigation and Reporting Scope of Work
Attachment D:	Corrective Measures Study Scope of Work
Attachment E:	Interim Measures Scope of Work
Attachment F:	List of Previously Submitted Deliverable Documents
Attachment G:	Installation Action Plan for Radford Army Ammunition Plant

D. WORK TO BE PERFORMED

1. The Parties recognize that background information exists and must be reviewed prior to developing the work plans required by this permit. The Army need not halt currently ongoing work but may be obligated to modify or supplement work previously done to meet the requirements of this permit. It is the intent of the Parties to this permit that work done and data generated prior to the effective date of this permit be retained and utilized as elements of the RFI to the maximum extent feasible.

2. The Permittee shall develop, implement and report upon the Site-Screening Areas (SSAs) as defined herein, and listed in Attachment A to this permit, in order to satisfy its obligations under RCRA/CERCLA integration. The Site Screening Process (SSP), outlined in permit condition II.D.5-7 of this permit, is intended to provide a simplified investigative method whereby identified areas of concern can be evaluated to determine whether RFIs are required for these areas. Additional SSP investigations may be initiated at areas later identified by the Parties. The SSP investigation(s) shall be conducted in accordance with an EPA-approved SSP Work Plan.

3. SSP Reports(s) shall be subject to the review and comment procedures described in permit condition II.E (Consultation). The SSP investigation(s) shall be conducted in accordance with the requirements set forth in permit condition II.D.5-7, the Deadlines or Milestones established therein and set forth in permit condition II.G (Deadlines and Contents of

Installation Action Plan).

4. For those SWMUs or AOCs which the Permittee determines to represent a negligible or minimal impact and are strong candidates for no action, or remediation limited to periodic monitoring, the Permittee shall include a schedule in the Installation Action Plan for FY 2000-2001 for submittal of a Site Screening Process Work Plan, including a schedule for any limited sampling that may be recommended to support the Site Screening Process. This schedule will be finalized in accordance with permit condition II.H of this permit. The submittal, review, and approval of the Site Screening Process Work Plan, as well as the performance of the Site Screening shall follow the procedures outlined in permit condition II.D and II.E. If, based upon the review of the Site Screening Process Report, the EPA determines that further action is not required at identified SWMUs, AOCs, or SSAs the Permittee shall prepare, with EPA assistance, a brief decision document reflecting that agreement. The decision document must be signed by all the Project Coordinators.

Site Screening Areas

5. Determination of Site Screening Areas Within seven (7) calender days after a Party to this permit determines that an area on the Site which has not previously been identified as an area which may pose a threat, or potential threat, to public health, welfare, or the environment, may pose such a threat, or potential threat, such Party shall notify in writing the other Party of such determination. Notification of the other Party under paragraphs II.D.5-7 shall at a minimum include the location of such area on the Site and the reason(s) the Party believes such an area poses a threat, or potential threat, to public health, welfare, or the environment.

6. Any area at the Site which is established as an SSA pursuant to the procedures described in paragraphs II.D.5-7 after the effective date of this permit shall be added to the list of SSAs found in Attachment A as an additional SSA to be investigated and possibly remediated pursuant to the requirements of this permit. For any SSAs established pursuant to paragraphs II.D.5-7 after the effective date of this permit, the Army shall, in the next draft Amended Installation Action Plan, propose Deadlines or Milestones for the submittal of an SSP Work Plan(s). This Deadline(s) or Milestone(s) shall be approved in accordance with permit condition II.G and adopted in the Installation Action Plan.

7. Attachment A contains a list of thirty-one (31) identified Site Screening Areas (SSAs) which may pose a threat, or potential threat to human health and the environment. The Permittee shall submit to the EPA and the VDEQ SSP Work Plan(s) which shall outline the activities necessary to determine if there have been releases of hazardous substances, solid wastes, pollutants, contaminants, hazardous wastes, or hazardous constituents to the environment from the SSAs. The scope of the SSPs shall be determined by the Parties. The SSP Work Plan(s) shall include a proposed Deadline or Milestone for the submittal of an SSP Report(s). The schedule and Deadlines or Milestones included in the final SSP Work Plan will be incorporated into the Installation Action Plan in accordance with permit condition

II.G (Deadlines and Contents of Installation Action Plan).

a. In planning SSPs, the Permittee shall consider current CERCLA and RCRA guidance to determine if there have been releases of hazardous substances, pollutants, contaminants, hazardous wastes or hazardous constituents to the environment from the SSAs. Upon conclusion of an SSP, the Permittee shall submit to the EPA and the VDEQ a draft SSP Report which shall provide the basis for a determination that either: (1) a RFI be performed on the area addressed by the SSP or, (2) the area does not pose a threat, or potential threat to public health, welfare, or the environment and therefore the area should be removed from further study under this permit.

b. For those SSAs which EPA agrees do not warrant an RFI, the Permittee shall prepare and submit to EPA and VDEQ for review, a brief decision document reflecting that agreement. This agreement must be signed by all the Project Coordinators.

c. Where EPA determines that an RFI is required, the Permittee shall, within the next draft Amended Installation Action Plan, propose to EPA a Deadline or Milestone for the submission of the RFI Work Plan for each Area of Concern or SWMU. The schedule and Deadlines or Milestones included in the final RFI Work Plan(s) will be incorporated into the next update of the Installation Action Plan and will be the enforceable schedule for the submittal of the draft RFI.

RFI and CMS

8. The Permittee shall develop, implement and report upon a RFI for all SWMUs in Attachment A and any AOCs listed in Attachment A that are not screened out via the site screening process. The Permittee will continue to coordinate the cleanup of units listed in Attachment A (SWMUs 10, 13, 26, 27, 28, 29, 32, 52, and 53; HWMUs 4, 5, 7, 16, 39 and the Hazardous Waste Incinerator) with VDEQ and EPA. RFIs shall be conducted in accordance with the requirements and schedules set forth in the approved RFI Work Plan and Installation Action Plan. RFIs shall meet the purposes set forth in permit condition II.A (Statement of Purpose). A Baseline Risk Assessment shall be a component of the RFIs. Final Site clean-up level criteria will only be determined following completion of the Baseline Risk Assessment.

9. The Permittee shall, in accordance with permit condition II.C and II.D, develop, implement and report upon a CMS for areas subject to an RFI. The CMS shall be conducted in accordance with the requirements and schedules set forth in the approved Installation Action Plan. The CMS shall meet the purposes set forth in permit condition II.A (Statement of Purpose). The Permittee shall follow the steps outlined in permit condition II.D.22-34 below.

Procedures for Interim Measures

10. If at any time during the pendency of this permit the Permittee obtains or discovers information concerning a release of any hazardous waste, solid waste or hazardous constituent at or from the Facility into the environment in addition to or different from that information submitted by the Permittee pursuant to permit condition I.C (Dispute Resolution) or II.E (Consultation), or in the Administrative Record, the Permittee shall:

    a. Orally notify EPA within 48 hours of the source, nature, extent, location and amount of such release, the endangerment posed by such release and the actions taken and/or to be taken to address such release;

    b. Unless otherwise directed by EPA, immediately take such actions as are necessary and appropriate to address such release, which are consistent with and integrated into any long-term remediation at the Facility;

    c. Confirm the notification to EPA in writing within three (3) calendar days of providing oral notification; and

    d. Report the actions taken and their results to EPA in writing within ten (10) calendar days of completion of said actions.

11. If the Regional Administrator determines, on the basis of information submitted by the Permittee pursuant to permit condition I.C (Dispute Resolution) or II.E (Consultation) or any other information obtained by the Permittee by conducting the RFI process, that corrective action is necessary to protect human health or the environment from a release of hazardous waste or constituents from a SWMU/AOC, the Permittee may be required to implement Interim Measures, as outlined in permit conditions II.D.10-20.

    a. According to the EPA-approved schedule, the Permittee shall submit to EPA and VDEQ an Interim Measure CMS Work Plan and an Interim Measure CMS. Following EPA approval of the CMS and the selection of the IM, the Permittee shall submit to EPA and VDEQ an Interim Measures Design and an Interim Measures Action Work Plan. These plans must be approved by the Regional Administrator in accordance with permit conditions I.C (Dispute Resolution) and II.E (Consultation).

    b. According to the EPA-approved schedule, the Permittee shall submit to EPA and VDEQ for EPA approval the Interim Measures Construction Completion Report, the Interim Measures Action Report, and necessary IM Long-Term Monitoring Plans and IM Operation and Maintenance Plan required for each identified SWMU and AOC.

    c. Nothing in this Permit shall preclude the Permittee from performing Interim Measures at any time either to reduce or eliminate the risk to human health or the environment, or to prevent or reduce the spread of contamination. Such measures (*e.g.*, source

removal, capping, groundwater pump and treat) may be taken at any time during the term of this permit.

d. Nothing in this Permit shall limit EPA's authority to undertake or require any person to undertake response action or corrective action under any law including, but not limited to, Sections 104 or 106 of CERCLA, 42 U.S.C. §§ 9604 or 9606, and Section 7003 of RCRA, 42 U.S.C. § 6973. Nothing in this permit shall relieve the Permittee of any obligation it may have under any law, including, but not limited to, Section 103 of CERCLA, to report releases of hazardous waste, hazardous constituents or hazardous substances to, at, or from the Facility.

12. The Permittee shall implement those Interim Measures (IM) the Regional Administrator has deemed necessary, in accordance with permit condition Part II.D, to prevent, minimize, or eliminate risks to human health and the environment caused by the release of hazardous substances, pollutants, or contaminants. An Interim Measure is identified, proposed, and implemented prior to the performance of the final corrective action.

13. When the Regional Administrator determines that an Interim Measure is necessary for an area(s) within the Facility, EPA will notify, in writing, the Permittee, of the determination. The determination notification to the Permittee under this permit will include the location of such area(s) on the Facility and the reason(s) the IM is required.

14. After the EPA determination that an Interim Measure is required under this Permit, the Army shall, in the next draft Amended Installation Action Plan, submit to EPA and the VDEQ proposed Deadlines for the submission of Work Plan(s) for the performance of a CMS for the identified area(s). The Deadlines will be finalized in accordance with permit condition II.G (Deadlines and Contents of the Installation Action Plan). Each CMS Work Plan shall contain a proposed Deadline for the submittal of the CMS. The schedule and Deadlines included in the approved, final CMS Work Plan will immediately be incorporated in the Installation Action Plan. The CMS shall include an evaluation of proposed IM alternatives. The Permittee shall develop, implement, and report upon each CMS in accordance with the requirements set forth in the final CMS Work Plan. The Permittee will submit the CMS for the IM to EPA for review and approval.

15. Based upon the information contained in the EPA-approved CMS, the Permittee shall prepare a brief document proposing the selection of the Interim Measure(s) to control or abate the release, and which are expected to be a necessary component of the final remedy. The Permittee will submit the outline document to EPA for review and approval.

16. Following EPA approval of the proposed Interim Measure, the Army shall modify the Installation Action Plan to include a Deadline for the submission of a preliminary/conceptual Interim Measures 30% design document; a 90% prefinal Interim Measures design; a final Interim Measures Design; and an Interim Measures Work Plan. The Permittee shall develop clear and comprehensive design plans and specifications which include, but are not limited

to the following:

a. Discussion of the design strategy and design basis, including:

(1) Compliance with all applicable or relevant environmental and human health standards.

(2) Minimization of environmental and human health impacts.

(3) Establishment of Interim Measures clean-up goals.

b. Discussion of the technical factors of importance including:

(1) Use of currently accepted environmental control measures and technology.

(2) The constructability of the design.

(3) Use of currently acceptable construction practices and techniques.

c. Description of assumptions made and detailed justification of these assumptions.

d. Discussion of the possible sources of error and references to possible operations and maintenance problems.

e. Detailed drawings of the proposed design, sealed and signed by a registered P.E.

f. Tables listing equipment and specifications.

g. Appendices, including:

(1) Results of laboratory or field tests.

(2) Sample calculations

17. The Interim Measures (IM) Work Plan(s) shall at a minimum contain a schedule for the completion of the IM Action, a Health and Safety Plan, a Sampling and Analysis Plan, a Quality Assurance Project Plan, IM Action Specifications, Erosion Control and Sedimentation Plan, Decontamination Plan, a Long-Term Monitoring Plan (if necessary) and an Operation and Maintenance Plan. The schedule for the performance of the IM action contained in the final IM Work Plan(s) will be immediately incorporated into the Installation Action Plan.

18. After the final IM design and IM Action Work Plan is approved, pursuant to permit condition II.E (Consultation), the Permittee shall begin performance of the IM action in

accordance with the final IM design and IM Work Plan. The IM action(s) shall be completed in accordance with the approved IM design and IM Work Plan.

19. The Permittee shall submit to EPA and VDEQ an IM Action Report in accordance with the schedule in the Installation Action Plan following the completion of the Interim Measures Action for each SWMU or AOC. The IM Action Report shall document the cleanup activities that took place at the SWMU or AOC, and report on any post-IM action confirmation sampling that may have been performed. For any required Long-Term Response Action (LTRA), an IM Construction Completion Report shall be prepared when the physical construction of the system is complete and the unit is operating as designed. Such IM Construction Completion Report shall be amended and finalized when the LTRA performance standards specified in the IM design and IM Work Plan are achieved.

20. The IM Action Report shall outline in detail, and provide an explanation for, any activities that were not conducted in accordance with the final IM Design and/or IM Action Work Plan(s). In addition, in accordance with the schedule provided in the Installation Action Plan, after the completion of the IM Action for each SWMU or AOC, the Permittee shall submit a Long-Term Monitoring Plan and an Operation and Maintenance Plan (if necessary) to EPA and VDEQ for review. Draft Long-Term Monitoring Plan(s) and draft Operation and Maintenance Plan(s) shall be submitted prior to finalization of the IM Action Report for each SWMU or AOC. Long-Term Monitoring Plan(s) and Operation and Maintenance Plan(s) finalized under this permit shall contain schedules for completion of the work described therein. These schedules shall be incorporated in the Installation Action Plan and become enforceable pursuant to the terms of this permit.

21. Following EPA's approval of the IM Action Report for each SWMU or AOC, and the subsequent EPA approval of necessary IM Long-Term Monitoring Plans and IM Operation and Maintenance Plan, the SWMU or AOC should be evaluated under the Site Screening section, (Permit Condition II.D.5-7) of this permit to determine if additional work is needed at the SWMU or AOC.

Statement of Basis and Corrective Measures Implementation

22. Permit conditions II.D.23-26 shall apply to selection of final corrective measures actions.

23. Within sixty (60) days after finalization of the CMS, the Permittee will submit a draft Statement of Basis. EPA will issue the Statement of Basis, which includes EPA's tentative selection of the corrective measures to be implemented. The EPA Statement of Basis will be published for forty-five (45) days of public review and comment.

24. EPA and the Permittee shall hold a public information meeting during the public comment period to discuss the preferred alternative for each corrective measures action. Copies of all written and oral public comments received will be provided to the Parties. Public review and comment shall be conducted in accordance with Part 124 of RCRA, and applicable EPA

guidance.

25. Following the close of the public comment period, including any extensions, the Permittee shall submit a draft Final Decision/Response to Comments (FDRC). The FDRC will include a Responsiveness Summary, in accordance with applicable EPA Guidance. EPA will issue the Final Decision/Response to Comments (FDRC) subsequent to the EPA final review.

26. Prior to the implementation of the selected corrective measure, as contained in the FDRC, the Regional Administrator will modify the permit according to procedures in permit condition I.E (Permit Modification, Revocation and Reissuance).

Corrective Measures Design and Corrective Measures Action

27. The Installation Action Plan shall include a Target Date for submission of: (i) a preliminary/conceptual Corrective Measures Design document; (ii) a thirty (30) percent design report; (iii) a ninety (90) percent or prefinal Corrective Measures Design; and, (iv) a Deadline for the final Corrective Measures Design. The Corrective Measures Design shall provide the appropriate plans and specifications describing the intended corrective measures construction and shall include provisions necessary to ensure that the corrective measures action will achieve the performance standards identified in the FDRC.

28. The Corrective Measures (CM) Work Plan(s) shall at a minimum contain a schedule for the completion of the CM Action, a Health and Safety Plan, a Sampling and Analysis Plan, a Quality Assurance Project Plan, CM Action Specifications, Erosion Control and Sedimentation Plan, Decontamination Plan, CM Action Contingency Plan, a Long Term Monitoring Plan if necessary and an Operation and Maintenance Plan, if necessary. The schedule contained in the final CM Work Plan(s) will be immediately incorporated in the Installation Action Plan.

29. After the final design document is approved, pursuant to permit condition II.E (Consultation), the Permittee shall begin performance of the Corrective Measures Action (CMA) in accordance with the EPA-approved CM Design and the CM Work Plan. The CMA shall be completed in accordance with the EPA-approved final CM Design and CM Work Plan and all applicable EPA and VDEQ guidance.

Finalization of Corrective Measures Actions

30. The Permittee shall submit to EPA and VDEQ a CM Action Report in accordance with the schedule in the Installation Action Plan following the completion of the Corrective Measures Action for each SWMU or AOC. The CM Action Report shall document the cleanup activities that took place at the SWMU or AOC, and that performance standards specified in the FDRC have been met. For each Long-Term Response Action (LTRA), an Interim CM Action Report shall be prepared when the physical construction of the system is complete and the unit is operating as designed. Such Interim CM Action Report shall be

amended and finalized when the LTRA performance standards specified in the FDRC are achieved.

31. In accordance with the schedule provided in the Installation Action Plan, after the completion of the CM Action for each SWMU or AOC, the Permittee shall submit a Long-Term Monitoring Plan and an Operation and Maintenance Plan (if necessary) to EPA and VDEQ for review. Draft Long-Term Monitoring Plan(s) and draft Operation and Maintenance Plan(s) shall be submitted prior to finalization of the CM Action Report for each SWMU or AOC. Long-Term Monitoring Plan(s) and Operation and Maintenance Plan(s) finalized under this permit shall contain schedules for completion of the work described therein. These schedules shall be incorporated in the Installation Action Plan and become enforceable pursuant to the terms of this permit.

Construction Completion/ SWMU or AOC Completion/ Corrective Measures Completion

32. The Permittee agrees that it shall submit to EPA and VDEQ a Preliminary Close Out Report (PCOR) in accordance with the schedule in the Installation Action Plan following the completion of physical construction of the CM action for the last SWMU or AOC requiring Corrective Action at the Site. The PCOR shall demonstrate and document that physical construction at all identified SWMUs and AOCs at the Site has been completed. The PCOR must contain a schedule for the completion of any remaining Corrective Measures Actions to adequately address all SWMUs and AOCs at the Site and other procedural requirements necessary to issue a Final Close Out Report (FCOR). The PCOR shall focus on construction at the Site, including the releases at the Site, Site conditions, construction activities, CM actions, completion of construction, and a detailed schedule of steps remaining for Site completion. The Parties recognize that in some cases, depending on the nature of the CM action at the last SWMU or AOC, a PCOR may not be necessary and that the FCOR may meet the requirements for Site completion.

33. When the Permittee determines that CM Actions at all identified SWMUs and AOCs have been completed, it shall submit a FCOR to EPA and VDEQ for review. The FCOR shall document compliance with statutory requirements and provide a consolidated record of all Corrective Measures Actions activities for all identified SWMUs and AOCs at the Site. The FCOR documents Site corrective action completion. In order for a Site to be eligible for Site completion, the following criteria must be met:

    a. Performance standards specified in all FDRC(s) have been met, and all cleanup actions and other measures identified in the FDRC(s) have been successfully implemented.

    b. The constructed remedies are operational and performing according to engineering specifications.

    c. The Site is protective of human health and the environment.

d. The only remaining activities, if any, at the Site are operation and maintenance activities (which may include long-term monitoring).

34. The FCOR shall cover the entire Site, including all identified SWMUs and AOCs. As outlined in permit condition II.D.30-31, the CM Action Report for each SWMU and AOC, including the final SWMU or AOC, is required to document that work was performed according to design specifications. A CM Action Report, however, cannot document Site corrective action completion. Only the FCOR satisfies Site completion requirements. The FCOR shall include a discussion regarding any operation and maintenance requirements and/or land use restrictions required at the Site.

E. CONSULTATION

Review and Comment Process for Draft and Final Documents

1. Applicability:

a. The provisions of this section establish the procedures that shall be used by the Parties to provide each other with appropriate notice, review, comment, and response to comments regarding RFI/CMS and CM Design/CM Action documents, specified herein. The Permittee will be responsible for issuing documents to EPA and the VDEQ. As of the effective date of this permit, all draft and final reports for any deliverable document identified herein shall be prepared, distributed and subject to dispute in accordance with permit condition II.E.2-6.

b. The designation of a document as "draft" or "final" is solely for purposes of consultation with EPA and the VDEQ in accordance with this Section. Such designation does not affect the obligation of the Permittee to issue documents, which may be referred to herein as "final," to the public for review and comment as appropriate and as required by law.

2. General Process for SSP, RFI/CMS and CM Design/Action Documents:

a. Deliverable Documents include those documents that are major, discrete portions of the SSP, RFI/CMS or CM Design/Action activities. Deliverable Documents are initially issued by the Permittee in draft subject to review by EPA and the VDEQ and approval by EPA. Following receipt of comments on a particular draft Deliverable Document, the Permittee will respond to the comments received and issue a draft revised Deliverable Document, for EPA review and approval, which is subject to dispute resolution.

b. The thirty (30) percent design report and the ninety (90) percent or prefinal Corrective Measures Design are discrete portions of Deliverable Documents and are typically input or feeder documents. The thirty (30) percent design report and the ninety (90)

percent or prefinal Corrective Measures Design are issued by the Permittee in draft subject to review by EPA and the VDEQ and approval by EPA. Although the Permittee will respond to comments received, the thirty (30) percent design report and the ninety (90) percent or prefinal Corrective Measures Design may be finalized in the context of the corresponding draft final Deliverable Documents. The thirty (30) percent design report and the ninety (90) percent or prefinal Corrective Measures Design may be disputed at the time the corresponding draft final Deliverable Document is issued.

3. Deliverable Documents:

a. Prior to the effective date of this permit, the Permittee has completed and submitted the following draft Deliverable Documents to EPA and the VDEQ for review and EPA approval. These documents are listed in Attachment F of this Permit.

b. All Deliverable Documents shall be prepared in accordance with applicable EPA guidance. The Permittee shall complete and transmit drafts of the following Deliverable Documents to EPA and the VDEQ for review and EPA for approval in accordance with the provisions of this Section:

(1) Site Screening Process Work Plans

(2) Site Screening Process Reports

(3) Interim Measures Corrective Measure Study Work Plan (IM CMS WP)

(4) Interim Measures CMS Report

(5) Interim Measures CM Design

(6) Interim Measures CM Action Work Plan

(7) Interim Measures CM Construction Completion Report

(8) Interim Measures CM Long-Term Monitoring Plan

(9) Interim Measures CM Operation & Maintenance Plan

(10) RFI/CMS Work Plans (including Baseline Risk Assessment for human health and the environment) and CMS Work Plans

(11) RFI Reports (including baseline Risk Assessments for human health and the environment)

(12) CMS Reports

(13) Treatability Studies

(14) CM Designs

(15) CM Action Work Plans

- Schedules for Corrective Measures Action
- CM Action Sampling Plan
- CM Action Construction Quality/Assurance Project Plan
- CM Action Environmental Monitoring Plan
- CM Action Health and Safety Plan
- CM Action Decontamination Plan
- CM Action Contingency Plan

(16) Long-Term Monitoring Plans

(17) CM Construction Completion Reports

(18) CM Action Reports

(19) Operation and Maintenance Plans

(20) Preliminary Close Out Report (PCOR)

(21) Final Close Out Report (FCOR)

(22) Installation Action Plan

(23) Community Relations Plan

c. Only the revised draft Deliverable Documents identified above shall be subject to dispute resolution in accordance with permit condition I.C (Dispute Resolution). The Permittee shall complete and transmit draft Deliverable Documents in accordance with the schedule and Deadlines established in permit condition II.G (Deadlines and Contents of Installation Action Plan).

4. Review and Comment on Draft Documents:

a. The Permittee shall complete and transmit each draft Deliverable Document to EPA and the VDEQ on or before the corresponding Deadline established pursuant to Permit Condition II.G (Deadlines and Contents of Installation Action Plan) for the issuance of the document.

b. Review of any document by EPA and the VDEQ may concern all aspects of the document (including completeness) and should include, but not be limited to, technical evaluation of any aspect of the document, and consistency with RCRA. The Permittee shall respond to EPA and/or VDEQ comments and, if appropriate, make changes to the draft document.

c. In the event documents not scheduled in the current Installation Action Plan are determined by mutual agreement of the Project Coordinators to be necessary, review periods, Deadlines, and Target Dates shall be established and shall be incorporated into the amended Installation Action Plan.

d. The Permittee shall make itself readily available to EPA and the VDEQ during the review of Deliverable Documents for purposes of responding to questions and comments on draft documents.

e. Following the review and comment for a draft document, the Permittee shall give full consideration to all written comments on the draft document submitted. Within sixty (60) days of the receipt of EPA comments on a draft Deliverable Document, the Permittee shall transmit to EPA and the VDEQ a revised draft Deliverable Document, which shall include the Permittee's response to all written comments received.

f. The Permittee may request the 60-day period for either responding to comments on a draft document or for issuing the revised draft Deliverable Document for an additional twenty (20) days by providing timely notice to EPA and the VDEQ. In appropriate circumstances, this time period may be further extended in accordance with permit condition II.F (Extensions).

5. Finalization of Documents:

a. The revised draft Deliverable Document shall serve as the final Deliverable Document if EPA approves of the revised draft document. If EPA's comments are not satisfactorily addressed in the revised draft Deliverable Document, EPA will disapprove the revised draft Deliverable Document, and the revised draft Deliverable Document cannot be finalized without EPA approval. If the revised draft Deliverable Document is disapproved by EPA, the Permittee may invoke dispute resolution regarding the disapproval. If dispute resolution is invoked regarding EPA's disapproval of a revised draft Deliverable Document, and the Permittee's position is upheld, the revised draft Deliverable Document may become the final Deliverable Document.

b. If the Permittee's position on a revised draft Deliverable Document is not sustained in the dispute resolution process provided in permit condition I.C, the Permittee shall prepare, within not more than sixty (60) days, a revision of the revised draft Deliverable Document which conforms to the results of dispute resolution. In

appropriate circumstances, the time period for this revision period may be extended in accordance with permit condition II.F (Extension).

6. Subsequent Modification of Final Document:

Following finalization of any Deliverable Document pursuant to permit condition II.E.5 above, any Party to this permit may seek to modify the document, including seeking additional field work, pilot studies, computer modeling or other supporting technical work, only as provided in Subsections a. and b. below.

a. A Party may seek to modify a document after finalization if it determines, based on new information (i.e., information that became available, or conditions that became known, after the document was finalized) that the requested modification is necessary. A Party may seek such a modification by submitting a concise written request to the Project Coordinator of the other Party. The request shall specify the nature of the requested modification and how the request is based on new information.

b. Nothing in this Subsection shall alter EPA's or the VDEQ's ability to request the performance of additional work which was not contemplated by this permit. The Permittee's obligation to perform such work can be established by either a modification of a report or document or by amendment to this permit.

F. EXTENSIONS

1. A timetable, Deadline or schedule shall be extended upon receipt of a timely request for extension and when good cause exists for the requested extension as described in permit condition II.F.2, below. Any request for extension by the Permittee shall be submitted in writing and shall specify:

a. The timetable, Deadline or schedule that is sought to be extended;

b. The length of the extension sought;

c. The good cause(s) for the extension; and

d. Any related timetable and Deadline or schedule that would be affected if the extension were granted.

2. Good cause exists for an extension when sought in regard to:

a. A delay caused by the good faith invocation of dispute resolution or the initiation of judicial action;

b. A delay caused, or which is likely to be caused, by the grant of an extension in regard

to another timetable and Deadline or schedule; and

c. Any other event or series of events mutually agreed to by the Parties as constituting good cause.

3. Absent agreement of the Parties with respect to the existence of good cause, Permittee may seek and obtain a determination through the dispute resolution process that good cause exists.

4. Within twenty-one (21) days of receipt of a request for an extension of a timetable and Deadline or a schedule, the EPA shall advise the Permittee in writing of its position on the request. If EPA does not concur in the requested extension, it shall include in its statement of nonconcurrence an explanation of the basis for its position.

5. If there is consensus among the Parties that the requested extension is warranted, the Permittee shall extend the affected timetable and Deadline or schedule accordingly. If there is no consensus among the Parties as to whether all or part of the requested extension is warranted, the timetable and Deadline or schedule shall not be extended except in accordance with a determination resulting from the dispute resolution process.

6. Within seven (7) days of receipt of a statement of nonconcurrence with the requested extension, the Permittee may invoke dispute resolution.

7. A written, timely and good faith request by the Permittee for an extension shall toll any application for enforcement of the affected timetable and Deadline or schedule until a decision is reached on whether the requested extension will be approved. If dispute resolution is invoked and the requested extension is denied enforcement may be initiated by EPA.

G. DEADLINES AND CONTENTS OF THE INSTALLATION ACTION PLAN

1. This permit establishes a process for creating the Installation Action Plan (IAP). The Radford AAP shall submit an IAP within 45 days of the effective date of this permit, which will be attached to this permit as Attachment G. The IAP and each annual Amendment to the IAP shall be Deliverable Documents. Milestones established in the IAP or established in a final Amendment to the IAP remain unchanged unless otherwise agreed to by the Parties or unless directed to be changed pursuant to the agreed dispute resolution process set out in permit condition I.C. In addition, if an activity is fully funded in the current FY, Milestones associated with the performance of work and submittal of Deliverable Documents associated with such activity (even if they extend beyond the current FY) shall be enforceable.

2. The IAP includes proposed actions for both CERCLA and RCRA actions. The IAP will incorporate all Milestones contained in approved Work Plans.

3. Milestones in the IAP reflect the priorities agreed to by the Parties through a process of "Risk Plus Other Factors" Priority Setting. Site activities have been prioritized by weighing and balancing a variety of factors including, but not limited to: (i) the DoD Relative Risk Process rankings for the Site; (ii) current, planned, or potential uses of the Facility; (iii) ecological impacts; (iv) impacts on human health; (v) intrinsic and future value of affected resources; (vi) cost effectiveness of the proposed activities; (vii) environmental justice considerations; (viii) regulatory requirements; and, (ix) actual and anticipated funding levels. While Milestones should not be driven by budget targets, such targets should be considered when setting Milestones. Furthermore, in setting and modifying Milestones, the Parties agree to make good faith efforts to accommodate Federal fiscal constraints, which include budget targets established by the Army Material Command.

4. The IAP and its annual Amendments include:

   a. A description of actions necessary to mitigate any immediate threat to human health or the environment;

   b. A listing of all currently identified Defense Site Environmental Restoration Tracking System (DSERTS) Sites. These include Solid Waste Management Units (SWMUs), Areas of Concern (AOCs), Site Screening Areas (SSAs), RFI/CMS investigations, Interim Corrective Measure Actions, Supplemental Response Actions, and final Corrective Measure Actions covered or identified pursuant to this permit;

   c. Activities and schedules for CERCLA and RCRA actions covered by the IAP, including at a minimum:

      - Identification of any Interim Measures or final Corrective Measures Actions;
      - All Deadlines;
      - All Near Term Milestones;
      - All Out Year Milestones;
      - All Target Dates;
      - Schedule for initiation of Corrective Measures Designs, Interim Measures Corrective Measure Designs and Actions, and any initiation of other planned CERCLA and RCRA action(s) covered by this permit; and,
      - All Project End Dates.

5. The Radford AAP shall submit an Amendment to the IAP on an annual basis as provided in permit condition II.H (Budget Development and Amendment of Installation Action Plan).

All Amendments to the IAP shall conform to all of the requirements set forth in this Section.

6. The Milestones established in accordance with this Section and permit condition II.H (Budget Development and Amendment of Installation Action Plan) remain the same unless otherwise agreed by the Parties, or unless changed in accordance with the dispute resolution procedures set out in permit condition I.C. The Parties recognize that possible bases for requests for changes or extensions of the Milestones include but are not limited to—(i) the identification of significant new site conditions at this installation; (ii) reprioritization of activities under this permit caused by changing priorities or new site conditions elsewhere in the Department of Defense; (iii) reprioritization of activities under this permit caused by budget adjustments (e.g., rescissions, inflation adjustments, and reduced Congressional appropriations); (iv) a delay caused by a Party's failure to meet any requirement of this permit; (v) a delay caused by the good faith invocation of dispute resolution or the initiation of judicial action; (vi) a delay caused, or which is likely to be caused, by the grant of an extension in regard to another timetable and Deadline or schedule; and (vii) any other event or series of events mutually agreed to by the Parties as constituting good cause.

H. BUDGET DEVELOPMENT AND AMENDMENT OF INSTALLATION ACTION PLAN

1. The Department of Defense, as a Federal agency, is subject to fiscal controls, hereinafter referred to as the Five Year Defense Plan (FYDP). The planning, programming, and budgeting process, hereinafter referred to as the POM process, is used to review total requirements for DoD programs and make appropriate adjustments within the FYDP for each program while adhering to the overall FYDP control. The Parties recognize that the POM process is a multi-year process. The Parties also agree that each Party should be involved in the full cycle of POM activities as specified in this permit. Further, the Parties agree that each Party should consider the factors listed in permit condition II.G.3, including Federal fiscal constraints as well as each of the other factors, in their priority-setting decisions. Initial efforts to close any gap between cleanup needs and funding availability shall be focused on the identification and implementation of cost savings.

Facility-Specific Budget Building

2. Radford AAP's chain of command is as follows: Radford AAP reports to Operations Support Command (OSC) which reports to Army Material Command (AMC) which reports to Headquarters, Department of the Army (HQDA), which reports to the Department of Defense (DoD). In order to promote effective involvement by the Parties in the POM building process within the chain of command, the Parties will meet at the Project Coordinator level for the purpose of (1) reviewing the FYDP controls; (2) developing a list of requirements/work to be performed at the Site for inclusion in the Department of the Army POM process; and, (3) participating in development of the Department of the Army submission to the President's proposed budget, based on POM decisions for the year currently under consideration. For Environmental Restoration, Army (ER,A) eligible Sites, the POM building process is accomplished through the Cost to Complete (CTC). For non-

ER,A Sites the budget building process occurs on a different time schedule and through different mechanisms. Given that this is the case, unless the Parties agree to a different time frame, the Radford AAP agrees to notify EPA within ten (10) days of receipt, at the Project Coordinator level, that budget controls have been received. Unless the Parties agree to a different time frame or agree that a meeting is not necessary, the Parties will meet, at the Project Coordinator level, within five (5) days of receiving such notification to discuss the budget controls. However, this consultation must occur at least ten (10) days prior to the Radford AAP's initial budget (CTC) submission to OSC. It is understood by both Parties that notification of budget constraints for ER,A and non-ER,A Sites may not occur simultaneously.

3. In the event that the Project Coordinators cannot agree on funding levels required to perform all work outlined in the IAP, the Parties agree to make reasonable efforts to informally resolve these disagreements, either at the immediate or secondary supervisor level; this would also include discussions, as necessary, with Operations Support Command and EPA's Hazardous Site Cleanup Division leadership. If agreement cannot be reached informally within a reasonable period of time, the Operations Support Command shall resolve the disagreement, if possible with the concurrence of EPA, and notify EPA. If EPA does not concur in the resolution, the Operations Support Command will forward through Army Material Command to HQDA its budget request with the views of EPA and also inform HQDA of the possibility of future enforcement action should the money requested not be sufficient to perform the work subject to disagreement.

Radford Army Ammunition Plant Budget for Clean Up Activities

4. The Radford Army Ammunition Plant shall forward to EPA documentation of the budget requests for the Site, as submitted by the Radford AAP to OSC, and by AMC to HQDA, within 14 days after the submittal of such documentation to the HQDA by AMC.

Amended IAP

5. The initial IAP is due to HQDA on March 1. No later than November 15 of each year after the initial adoption of the IAP, the Army shall submit to EPA a draft Amendment to the IAP. When formulating the draft Amendment to the IAP, the Army shall consider funding circumstances (including OMB targets/guidance) and "risk plus other factors" outlined in permit condition II.G.3 to evaluate whether the previously agreed upon Milestones should change. Prior to proposing changes to Milestones in its annual Amendment to the IAP, the Permittee will first offer to meet with EPA to discuss the proposed changes. The Parties will attempt to agree on Milestones before the Permittee submits the annual Amendment by November 15, but failure to agree on such proposed changes does not modify the November 15 date, unless agreed by both the Parties. Any proposed extensions or other changes to Milestones must be explained in a cover letter to the draft Amendment to the IAP. The draft Amendment to the IAP should reflect any agreements made by the Parties during the POM process outlined in this Section. Resolution of any disagreement over adjustment of

Milestones pursuant to this subsection shall be resolved pursuant to permit conditions II.H.6-7.

6. The Parties shall meet as necessary to discuss the draft Amendment to the IAP. The Parties shall use the consultation process contained in permit condition II.E (Consultation).

7. The Permittee shall finalize the draft revised Amendment as a final Amendment to the IAP consistent with EPA's approval. In the absence of EPA approval, the Permittee shall finalize the draft revised Amendment in accordance with the final decision of the dispute resolution process. The draft revised Amendment to the IAP shall not become final until 21 days after the Radford AAP receives official notification of Congress' authorization and appropriation of funds if funding is sufficient to complete work in the draft final IAP or, in the event of a funding shortfall, following the procedures in permit condition II.H.8 However, upon approval of the draft revised Amendment or conclusion of the dispute resolution process, the Parties shall implement the IAP while awaiting official notification of Congress' authorization and appropriation.

Resolving Appropriations Shortfalls

8. After authorization and appropriation of funds by Congress and within 21 days after the Radford AAP has received official notification of its allocation based on the current year's Environmental Restoration, Army (ER,A) Account, the Radford AAP shall determine if planned work (as outlined in the draft revised Amendment to the IAP can be accomplished with the allocated funds. (1) If the allocated funds are sufficient to complete all planned work for that fiscal year and there are no changes required to the draft revised Amendment to the IAP, the Permittee shall immediately forward a letter to EPA indicating that the draft revised Amendment to the IAP has become the final Amendment to the IAP. (2) If the Permittee determines within the 21-day period specified above that the allocated funds are not sufficient to accomplish the planned work for the Site (an appropriations shortfall), the Permittee shall immediately notify EPA. The Project Coordinators shall meet within thirty (30) days to determine if planned work (as outlined in the draft revised Amendment to the IAP can be accomplished through: 1) rescoping or rescheduling activities in a manner that does not cause previously agreed upon Near Term Milestones and Out Year Milestones to be missed; or 2) developing and implementing new cost-saving measures. If, during this thirty (30) day discussion period, the Parties determine that rescoping or implementing cost-saving measures are not sufficient to offset the appropriations shortfall such that Near Term Milestones, Out Year Milestones, and Project End Dates should be modified, the Parties shall discuss these changes and develop modified Milestones. Such modifications shall be based on the "Risk Plus Other Factors" prioritization process discussed in permit condition II.G.3, and shall be specifically identified by the Permittee. The Permittee shall submit a new draft revised Amendment to the IAP to EPA within 30 days of the end of the 30 day discussion period. In preparing the draft revised Amendment to the IAP, the Permittee shall give full consideration to EPA input during the 30-day discussion period. If the EPA approves the modifications made to the draft revised Amendment to the IAP, EPA shall

notify the Permittee and the draft revised Amendment shall become the final Amendment. If the EPA disapproves with the modifications made to the draft revised amendment to the IAP the Permittee may seek and obtain a determination through the dispute resolution process established in permit condition I.C (Dispute Resolution).

Public Participation

9. In addition to any other provision for public participation contained in this permit, the development of the IAP, including its annual Amendments, shall include participation by members of the public interested in this action. In accordance with current DoD policies, the Radford Army Ammunition Plant will ensure that the opportunity for such public participation is timely.

   a. For Radford Army Ammunition Plant the "members of the public interested in this action" are represented by the Restoration Advisory Board.

   b. The Radford Army Ammunition Plant shall provide timely notification under permit condition II.H.8, regarding allocation of ER,A, to the members of the public interested in this action.

   c. The Radford Army Ammunition Plant shall provide opportunity for discussion under permit conditions II.H.2-8 to the members of the public interested in this action.

   d. The Radford Army Ammunition Plant shall ensure that public participation provided for in permit condition II.H.9 complies with Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.

I. FUNDING

1. It is the expectation of the Parties to this permit that all obligations of the Radford Army Ammunition Plant arising under this permit will be fully funded. The Army agrees to seek sufficient funding through the budgetary process to fulfill obligations under this permit.

2. The Radford Army Ammunition Plant shall submit to DoD, through the Cost to Complete, the specific cost estimates and budgetary proposals associated with the implementation of this permit.

3. Any requirement for the payment or obligation of funds by the Radford Army Ammunition Plant established by the terms of this permit shall be subject to the availability of appropriated funds, and no provision herein shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, 31 U.S.C. Section 1341. In cases where payment or obligation of funds would constitute a violation of the Anti-Deficiency Act, the dates established requiring the payment or obligation of such funds shall be

appropriately adjusted.

4. If appropriated funds are not available to fulfill the Permittee's obligations under this permit, EPA reserves the right to initiate an action against any other person, or to take any response action, which would be appropriate absent this permit.

J. EMERGENCY RESPONSE; RELEASE REPORTING

1. Emergencies

If, at any time during the term of this permit, the Permittee discovers that a release of hazardous waste or hazardous constituents at or from the Facility is presenting or may present an imminent and substantial endangerment to human health or the environment, and such release is not subject to Contingency Plan and Emergency Procedures as defined in the portion of the RCRA permit issued by VDEQ, the Permittee shall:

a. Notify EPA as soon as practicable of the source, nature, extent, location and amount of such release, the endangerment posed by such release and the actions taken and/or to be taken, to the extent known, to address such release. Such notification shall be confirmed in writing within three (3) days of discovery of such release; and

b. Unless otherwise directed by EPA, immediately take such actions as are necessary and appropriate to address such release.

2. Releases

If, at any time during the term of this permit, the Permittee discovers a release of hazardous waste or hazardous constituents at or from the Facility which:

a. Is not being addressed by corrective measures at the time of such discovery;

b. Is not being addressed pursuant to permit conditions II.D.12 or II.J; or

c. Is not subject to the Contingency Plan and Emergency Procedures as set forth in the portion of the RCRA permit issued by VDEQ, the Permittee shall notify EPA, in writing, of the nature, source, extent, location and approximate amount of such release within seven (7) days of discovery of such release.

3. Based on the information submitted in permit condition II.J.2, the Regional Administrator may require the SWMU/AOC to be included in an ongoing RCRA Facility Investigation or may require Interim Measures (see permit condition II.D.12).

4. Nothing in this permit shall limit EPA's authority to undertake or require any person to undertake response action or corrective action under any law, including but not limited to,

Sections 104 or 106 of CERCLA, 42 U.S.C. §§ 9604 or 9606, and Section 7003 of RCRA, 42 U.S.C. § 6973. Nothing in this permit shall relieve the Permittee of any obligation it may have under any law, including, but not limited to, Section 103 of CERCLA, to report releases of hazardous waste, hazardous constituents or hazardous substances to, at or from the Facility.

K. GUIDANCE DOCUMENTS

In addition to guidance documents specified elsewhere in this permit or Attachments, the following documents shall be referred to, as appropriate:

(Note: This list is not intended to be an all-inclusive list of EPA guidance documents, but rather a list of the more commonly used guidance documents. This list does not preclude the use of any other EPA guidance document.)

1. U.S. EPA, May 1978 (Rev. May 1986), NEIC Policies and Procedures, Office of Enforcement and Compliance Monitoring, National Enforcement Investigations Center. EPA-330/9-78-001-R, Denver, Colorado, 80225;

2. U.S. EPA, March 1987, Data Quality Objectives for Remedial Response Activities, Volume 1: Development Process, Volume 2: Example Scenario, Office of Emergency and Remedial Response and Office of Waste Programs Enforcement. EPA 540/6-87/003a, OSWER Directive No. 9335.0-7B;

3. U.S. EPA, April 1989, Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells. EPA/600/4-89/034;

4. U.S. EPA, October 1986, RCRA Facility Assessment Guidance, Office of Solid Waste, OSWER Directive No. 9502.00-5;

5. U.S. EPA, May 1989, Interim Final RCRA Facility Investigation (RFI) Guidance, Volumes I - IV, Office of Solid Waste, OSWER Directive No. 9502.006D;

6. U.S. EPA, June 1988, Interim Final RCRA Corrective Interim Measures Guidance, Office of Solid Waste, EPA/530-SW-88-029, OSWER Directive No. 9902.4;

7. U.S. EPA, August 1991, Handbook - Stabilization Technologies for RCRA Corrective Actions, Center for Environmental Research Information, EPA/625/4-91/029;

8. U.S. EPA, November 1992, RCRA Ground-Water Monitoring; Draft Technical Guidance, Office of Solid Waste, EPA/530-R-93-001;

9. U.S. EPA, May 1994, RCRA Corrective Action Plan; Office of Solid Waste, EPA 520-R-94-004, OSWER Directive No. 9902.3-2A;

10. Cohen, Robert M. and Mercer, James W. DNAPL Site Evaluation, (funded by U.S. EPA), 1993;

11. U.S. EPA, May 1995, Land Use in the CERCLA Remedy Selection Process; Office of Solid Waste, OSWER Directive No. 9355.7-04; and

12. Any future Agency guidance provided by EPA to the Facility regarding Corrective Measure Studies, Design or Implementation.

L. SOLID WASTE MANAGEMENT UNIT (SWMU) ASSESSMENT

1. The Permittee shall notify the Regional Administrator in writing of any newly-identified SWMU at the Facility, no later than thirty (30) days after the date of discovery. The notification shall include, but not be limited to, the following known information:

   a. A description of the SWMU's type, function, dates of operation, location (including a map), design criteria, dimensions, materials of construction, capacity, ancillary systems (e.g., piping), release controls, alterations made to the unit, engineering drawings, and all closure and post-closure information available, particularly whether wastes were left in place;

   b. A description of the composition and quantities of solid wastes processed by the units with emphasis on hazardous wastes and hazardous constituents; and

   c. A description of any release (or suspected release) of hazardous waste or hazardous constituents originating from the unit. Include information on the date of release, type of hazardous waste or hazardous constituents, quantity released, nature of the release, extent of release migration, and cause of release (e.g., overflow, broken pipe, tank leak, etc.). Also provide any available data which would quantify the nature and extent of environmental contamination, including the results of soil and/or groundwater sampling and analysis efforts. Likewise, submit any existing monitoring information that indicates releases of hazardous waste or hazardous constituents have not occurred or are not occurring. The Permittee may refer to information regarding releases previously submitted to EPA under permit condition II.J (Emergency Response; Release Reporting) and II.D.10 (Interim Measures).

   d. For a discussion of the need for and feasibility of implementing interim measures immediately, see permit condition II.D.10 (Interim Measures).

2. Upon receipt of the notification of any newly-identified SWMU, the Regional Administrator will determine the need for corrective action at such SWMU. If corrective action is necessary to protect human health or the environment, the Regional Administrator will determine whether a RCRA Facility Investigation will be performed and the need for and

scope of any Interim Measures or Site Screening.

3. Within sixty (60) days after receipt of the Regional Administrator's determination that a RCRA Facility Investigation is necessary, the Permittee shall submit a RCRA Facility Investigation Work Plan that meets the requirements of permit conditions II.D.1-8. The Regional Administrator's determination shall either specify the media and/or parameters to be investigated or shall require the Permittee to propose and justify the selection of media and/or parameters.

4. Within the time specified in the approved RCRA Facility Investigation Plan, the Permittee shall submit the RCRA Facility Investigation Report.

5. In lieu of a separate RCRA Facility Investigation, the Permittee may propose either to incorporate any newly-identified SWMU into an ongoing RCRA Facility Investigation or to submit a proposal for the performance of corrective measures at such newly-identified SWMU in accordance with the provisions of permit condition II.C. Any such proposal shall be submitted to the Regional Administrator along with notification of the discovery of the SWMUs.

M. RECORDKEEPING

Solid waste management units:

Upon completion of closure of any SWMU, the Permittee shall maintain in the Facility operating record, documentation of the closure measures taken.

N. ACCESS FOR CORRECTIVE ACTION OVERSIGHT

EPA and its authorized representatives shall have access to the Facility at all reasonable times for the purpose of monitoring compliance with the provisions of this permit. The Permittee shall use its best efforts to obtain access to property beyond the boundaries of the Facility at which corrective action is required by this permit (see Section 3004(v) of RCRA, 42 U.S.C. § 6924(v)); (1) for itself and any contractor of the Permittee for the purpose of taking corrective action required by this permit, and (2) for EPA and its authorized representatives for the purposes described in this paragraph.

9/26/2000
Date Signed

Maria Parisi Vickers, Associate Director
Office of RCRA Programs
Waste & Chemicals Management Division
EPA Region III

LIST OF UNITS

ATTACHMENT A

Radford Army Ammunition Plant
Radford, Virginia

1. List of Solid Waste Management Units (SWMUs)

SWMU-6	Acid Wastewater Lagoon
SWMU-8	$CaSO_4$ Treatment/Disposal Area
SWMU-9	$CaSO_4$ Treatment/Disposal Area
SWMU-17	Air Curtain Destructor and Open Burning Ground
SWMU-31	Coal Ash Settling Lagoons
SWMU-35	$CaSO_4$ Treatment/Disposal Area
SWMU-36	$CaSO_4$ Drying Bed
SWMU-37	$CaSO_4$ Treatment/Disposal Area
SWMU-38	$CaSO_4$ Treatment/Disposal Area
SWMU-39	Wastewater Ponds from Propellant Incinerator
SWMU-40	Landfill Nitro Area
SWMU-41	Red Water Ash Burial Ground
SWMU-43	Sanitary Landfill #2
SWMU-45	Landfill #3
SWMU-46	Propellant Burial
SWMU-48	Oily Water Burial Area
SWMU-49	Red Water Ash Burial #2
SWMU-50	$CaSO_4$ Treatment/Disposal Area
SWMU-51	TNT Waste Neutralization Pits
SWMU-54	Propellant Burning Ash Disposal Area
SWMU-57	Pond by Building 4931/4932
SWMU-58	Rubble Pile
SWMU-59	Bottom Ash Pile
SWMU-61	Mobile Waste Oil Tanks
SWMU-68	Chromic Acid Treatment Tanks
SWMU-69	Pond by Chrome Acid Treatment Plant Tanks
SWMU-71	Flash Burn Parts Area
SWMU-74	Inert Landfill #3
SWMU-75	Waste Oil Underground Storage Tank (Inert Gas Plant)
SWMU-76	Waste Oil Underground Storage Tanks

2. Areas of Concern (AOCs)

AOC-F	Former Drum Storage Area
AOC-O	Underground Fuel Oil Spill
AOC-P	Battery Storage Area
AOC-Q	$CaSO_4$ Treatment/Disposal Area
AOC-Bldg.4343	Former Cadmium Plating Facility
AOC-FLFA	Former Lead Furnace Area

Site Screening Areas (SSAs)

SSA-2	TNT Wastewater Equalization Basin
SSA-3	TNT Wastewater Treatment Unit
SSA-11	Nitroglycerin 1 Pretreatment Plant
SSA-12	Nitroglycerin 2 Pretreatment Plant
SSA-18	Sulfuric Acid Recovery Plant – Waste Acid Treatment
SSA-19	The A-B Line Acidic Wastewater Treatment Plant
SSA-20	C Line Acidic Wastewater Treatment Plant
SSA-21	Continuous Automated Single-Base Line Wastewater Treatment Plant
SSA-22	Wastewater Holding Lagoons
SSA-23	Wastewater Holding Lagoons
SSA-24	Wastewater Holding Lagoons
SSA-25	Wastewater Holding Lagoons
SSA-30	Asbestos Disposal Trench No.1
SSA-33	Treatment Plant for Solids from Water Treatment
SSA-34	Treatment Plant for Solids from Water Treatment
SSA-55	Sewage Treatment Plant (Northeast Section)
SSA-56	Sewage Treatment Plant (Northwest Section)
SSA-60	Rubble Pile East of Administration Building
SSA-63	C-Line Boiling Tub House Settling Pits
SSA-64	Nitrocellulose C-Line Collection Sump
SSA-65	Nitrocellulose A-B Line Acidic Water Settling Pits
SSA-66	Nitrocellulose A-B Line Neutral Water Settling Pits
SSA-67	Main Acid Sewer Sumps
SSA-70	Heavy Equipment Maintenance Shop Tractor Steam Cleaning Area
SSA-72	Oleum Plant Acidic Wastewater Sump
SSA-73	Main Lab Waste Container Storage Area
SSA-77	Garbage Incinerator
SSA-78	Rubble Pile Southwest of Unit 51
SSA-79	Asbestos Disposal Trench No. 2
SSA-80	Drainage Ditch for C-Line Wastewater Treatment and Plant Runoff
SSA-81	Red Water Treatment Plant

Miscellaneous Units

MU-1 Sewer Systems
- -acid
- -industrial

MU-2 Drainage Ditches (including tributaries of Stroubles Creek)
- -near SWMU No. 4
- -at the TNT/DNT Plant Area
- -near abandoned buildings at Increment Area No. 3

-selected drainage ditches from Main Mfg. Area to New River

MU-3 Abandoned Buildings at Increment Area No. 3
-red conductive paint and shallow soil

MU-4 TNT/DNT Plant Area - Site of May 1974 explosion

MU-5 Nitroglycerin Facility - Site of 1993 explosion

MU-6 Oleum Plant Area

MU-7 Buildings and/or demolition debris with red conductive flooring material. For example, Building 9358-4.

MU-8 Discarded munitions along the New River from testing at the Ballistics range.

MU-9 Automated single base area (abandoned)

The following SWMUs/AOCs are regulated by Virginia Department of Environmental Quality (VDEQ) under its Hazardous Waste Regulations or Solid Waste Regulations. Cleanup of these SWMUs/AOCs, (if necessary) will be coordinated by both EPA and VDEQ.

SWMU-10	Bio-plant Basin
SWMU-13	Waste Propellant Burning Ground
SWMU-26	Fly Ash Landfill #1
SWMU-27	$CaSO_4$ Treatment/Disposal Area
SWMU-28	Closed Sanitary Landfill
SWMU-29	Fly Ash Landfill #2
SWMU-32	Inert Landfill #1
SWMU-52	Closed Sanitary Landfill
SWMU-53	Activated Carbon Disposal Area
HWMU-4	Surface Impoundment #4
HWMU-5	Surface Impoundment #5
HWMU-7	Surface Impoundment #7
HWMU-16	Hazardous Waste Landfill
HWMU-39	Incinerator Spray Pond adjacent to SWMU-39 Hazardous Waste Incinerator

HAZARDOUS CONSTITUENT SAMPLING LIST
and
RISK BASED CONCENTRATION SCREENING - ATTACHMENT B

1. The Permittee shall analyze media for hazardous constituents listed in 40 C.F.R. Part 261, Appendix VIII. Based on site-specific considerations (e.g., the contaminated media, sampling and analysis of waste from the unit, or facility-specific information), the Permittee may propose to EPA for approval a reduced list of constituents for analyses. Likewise, the above list shall not preclude the Permittee from analyzing constituents, chemical parameters or physical parameters not otherwise specified.

2. The Permittee shall either screen analytical data against Risk-Based Screening Levels (RBSLs) or, in lieu of screening, carry forward a SWMU/AOC, constituent, media and/or exposure pathway through the RFI. By use of a risk-based concentration screen, the corrective action process (including any risk assessment) can be made more efficient by focusing on media, significant units, dominant contaminants and routes of exposure at the earliest feasible stage. The levels specified below represent **screening levels** which are intended to guide the Permittee in recommending further action (e.g., conducting a RFI/CMS). These values are not intended to be remedial cleanup levels.

   A. The RBSLs will be developed from the following sources as appropriate:

      i. U.S. EPA Region III Technical Guidance Manual, Risk Assessment,"Selecting Exposure Routes and Contaminants of Concern by Risk-Based Screening," U.S. EPA/903/r-93-001, January 1993.

      ii. U.S. EPA Region III Risk-Based Concentration (RBC) Table (most recent update)

      iii. Current Federal Primary Drinking Water Standards

      iv. Soil Screening Guidance, U.S. EPA/540/R-95/128, May 1996.

      v. Ambient Water Quality Criteria (AWQC).

vi. Other guidance documents as appropriate and approved by EPA.

B. For a given medium containing a constituent with more than one risk-based concentration (i.e., one based on carcinogenic risk, one based on noncarcinogenic effects), the lower concentration shall be used. RBSLs for noncarcinogenic constituents will be based on a hazard quotient of 0.1. RBSLs for carcinogenic constituents will be based on a risk level of 1×10^{-6}.

C. If health-based criteria are not available for a constituent detected at the site, EPA may require that provisional RBSLs be proposed based conservatively on toxicity data reported in literature and/or health-based criteria for similar constituents. As additional toxicological data of adequate quality becomes available, the Permittee may incorporate such data into the RBSLs, subject to EPA approval.

3. The Permittee may use existing data (i.e. data collected prior to the effective date of the permit) or data collected during the RFI to characterize the nature and extent of contamination for a SWMU/AOC, constituent, media and/or exposure pathway. Data collected prior to EPA approval of a Quality Assurance Project Plan must have documentation supporting its quality. For either existing data or data collected during the RFI, the detection limits for the analytical methods used must meet the various screening criteria outlined below. Standard SW-846 method detection limits will not meet the various screening criteria outlined below for all constituents. For those constituents, the Permittee may choose to carry them forward through the RFI at one-half the detection limit, or use a more sensitive method which can meet the screening criteria.

4. The requirement to implement Corrective Measures at the Facility is not contingent upon exceedances of these screening levels. That is, if EPA determines that a constituent(s) present in a concentration below screening levels may pose a threat to human health or the environment, given site-specific exposure conditions, and there is reason to believe that the constituent(s) has been released from the facility, EPA may require a Corrective Measures. Likewise, EPA may deem no further action is necessary despite exceedances of these screening levels, with appropriate rationale.

5. The Permittee shall screen each pathway described below. A SWMU/AOC, constituent, and/or medium with sufficient quantity and quality of data, that does not exceed screening concentrations for any of the pathways may generally be eliminated from further investigation. A SWMU/AOC, constituent or medium for which analytical data exceeds screening levels for a given pathway shall require further investigation or evaluation under the RFI. Based upon all the available information (e.g. number of samples, nature of contamination, location of SWMU/AOC), the Permittee shall recommend a course of action.

   A. Soil screening concentrations shall be developed for each of the following exposure pathways; direct contact, inhalation, migration to groundwater, and ecological receptors.

      i. For direct contact, RBSLs shall be developed so that contaminants remaining in soil would be safe for incidental ingestion assuming residential exposure. If the Permittee has submitted documentation supporting industrial (or other non-residential) future land use scenarios (see Condition 6 of this Attachment), the Permittee may also develop RBSLs for soils in accordance with the scenario under EPA consideration. The Permittee may conduct the industrial screening prior to the residential screening so that, if contaminant concentrations at the unit exceed the industrial RBSLs, further investigation or evaluation is required, and the residential screening is not required. If a unit does not exceed the industrial RBSLs, then the residential screening must be conducted, so that soils at the site can be classified for direct contact exposure as follows:

         a. Below Residential - A SWMU/AOC or constituent for which analytical data is below residential RBSLs can generally be eliminated from further investigation for the direct contact pathway.

         b. Above Industrial - A SWMU/AOC or constituent for which analytical data is above industrial RBSLs shall be carried forward for additional investigation or evaluation under the RFI or CMS.

c. Between Residential and Industrial - For a SWMU/AOC or constituent for which analytical data is below industrial and above residential RBSLs, the Permittee shall recommend whether further investigation or evaluation is warranted under the RFI or CMS for the direct contact pathway, based upon all available information (e.g., data quality, number of samples, nature of contamination, location of the SWMU/AOC, location and nature of actual/potential pathways and receptors, and potential for exposure).

ii. For inhalation, RBSLs shall be developed so that contaminants remaining in soil would be safe for inhalation of volatilized constituents or of soil-bound contaminants suspended in the air.

iii. For migration to groundwater, RBSLs shall be developed so that contaminants remaining in soil would not; (1) increase contamination in groundwater to concentrations that exceed RBSLs (see Condition 5.B. below); and (2) increase contamination in surface water to concentrations that exceed RBSLs (see Condition 5.C. below).

iv. For ecological receptors, if ecological exposure has occurred or is potentially occurring, the permittee shall quantitatively screen analytical data against the appropriate ecological screening criteria below. If it is not known if ecological exposure has occurred or is potentially occurring, the Permittee must collect sufficient biotic survey data to make such a determination.

a. Toxicological Benchmarks for Wildlife: 1996 Revision. Sample, B.E., D.M. Opresko, and G.W. Suter II, Oak Ridge National Laboratory, Oak Ridge, TN, 1996.

b. Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Terrestrial Plants: 1997 Revision. Efroymson, R.A., M.E. Will, G.W. Suter II, and A.C. Wooten, Oak Ridge National Laboratory, Oak Ridge, TN, 1997.

c. Toxicological Benchmarks for Potential Contaminants of Concern for Effects on Soil and Litter Invertebrates and Heterotrophic Processes. Will, M.E. and G.W. Suter II, Oak Ridge National Laboratory, Oak Ridge, TN, 1995.

B. Groundwater screening shall be conducted both for potential human health exposure and for protection of surface water considering the nature of the groundwater/surface water interaction.

i. For the protection of human health, groundwater samples shall be screened based on the current or potential use of the aquifer as follows:

a. If the aquifer is a current or potential source of drinking water, or is hydraulically connected to an aquifer which could be a drinking water supply, then the Permittee shall screen groundwater against the lower of the Maximum Contaminant Levels (MCLs) established under the Safe Drinking Water Act, Region III RBCs or similarly derived RBSLs.

b. If the aquifer is not a current or potential future source of drinking water, as designated by EPA or through an EPA-endorsed CSGWPP[1], and the aquifer is not hydraulically connected to an aquifer which could be a drinking water supply, then RBSLs appropriate for the groundwater use that could apply (e.g., agricultural) shall be developed for EPA approval by the Permittee.

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[1] In interpreting whether the aquifer is a current or potential source of drinking water, EPA will generally use the approach outlined in the Ground-Water Protection Strategy (August 1984) and/or a site specific decision making rationale included in an EPA endorsed Comprehensive State Ground Water Protection Program (CSGWPP). Currently there are no states in Region III with an EPA endorsed CSGWPP, consequently the RCRA Program must rely on the Federal classification. It is Region III RCRA Program experience that most RCRA facilities in Region III will probably be either a current or potential drinking water supply and will not meet the requirements to be classified as a non-potable (i.e., Class III) aquifer.

ii. For the protection of surface water, groundwater which discharges to surface water shall also be screened against the surface water criteria listed below in Condition 5.C.

C. Surface water screening shall be conducted both for human health exposure and for protection of aquatic life. Surface water screening for human health will be based on the surface water body use, as designated by the applicable state. For drainage systems (e.g. storm water channels), the designation shall be based on the designation of the surface water body which ultimately receives the discharge. Screening for the protection of aquatic life shall also include screening of sediment.

i. For the protection of human health, surface water samples will be screened based on the state designation as follows:

a. If the state surface water designation includes use as drinking water, the Permittee shall use the available human health Ambient Water Quality Criteria (AWQC) for ingestion of water and organisms. Where AWQC are not available, the Permittee shall screen against the lower of MCLs, Region III RBCs or similarly derived RBSLs.

b. If the state surface water designation does not include use as drinking water, the Permittee shall use the available human health AWQC for ingestion of organisms. Where AWQC are not available, the Permittee may develop similarly derived RBSLs.

ii. For protection of aquatic life, surface water and sediment shall be screened as follows:

a. Surface water samples shall be screened against Chronic AWQC for the protection of aquatic organisms, or, if not available, the screening values in *Toxicological Benchmarks for Screening of Potential Contaminants of Concern for Effects on Aquatic Biota on Oak Ridge Reservation: 1996 Revision* (Suter, G.W. II and C.L. Tsao, Oak Ridge National

Laboratory, Oak Ridge, TN, 1996).

b. Sediment samples shall be screened against the screening values in Toxicological Benchmarks for Screening Contaminants of Potential Concern for Effects on Sediment-Associated Biota: 1997 Revision (Jones, D.S., G.W. Suter II, and R.N. Hull, Oak Ridge National Laboratory, Oak Ridge, TN, 1997).

6. If the Permittee believes that a future industrial land use scenario is applicable to the Facility, the Permittee must submit the land use information specified in the OSWER Directive No. 9355.7-04 "Land Use in the CERCLA Remedy Selection Process." EPA will make a final land use determination after review of the Permittee's submittal and consultation with state and local land use planning authorities, elected officials, and the public. This determination will be independent of the screening procedures specified above.

1. RCRA Facility Investigation (RFI) Plan requirements:

a. General Description of Current Conditions Section

The Permittee shall provide background information pertinent to the facility, contamination, and interim measures as set forth below. The data gathered during any previous investigations or inspections and other relevant data shall be included.

(1) Facility Background

The Permittee shall summarize the regional location, pertinent boundary features, general facility physiography, hydrogeology, and historical use of the facility for the treatment, storage, or disposal of solid and hazardous waste. The Permittee shall include in this section the following:

Map(s) depicting the following:

(a) General geographic location;

(i) Property lines, with the owners of all adjacent property clearly indicated;

(ii) The location of all known past solid or hazardous waste treatment, storage, or disposal areas and the site of all known spills, fires or other accidental or intentional release locations, including the approximate locations of any groundwater contamination plumes presently identified;

(iii) All known past and presently operating product and hazardous or solid waste underground tanks or piping; and

(iv) The location of all production and groundwater monitoring wells, whether or not they are associated with the particular SWMU under investigation. These wells shall be clearly labeled. Ground, top of casing and screened-interval elevations shall also be provided.

(v) Topography (with a contour interval of 10 feet and a scale of 1 inch = 100 feet), waterways, all wetlands, floodplains, water features, drainage patterns;

(vi) All tanks, buildings, utilities, paved areas, easements, right-of-way, and other features; and

(vii) Surrounding land uses (residential, commercial, agricultural, recreational);

All maps shall be consistent with the requirements set forth in 40 C.F.R. § 270.14(b)(19) and be of sufficient detail and accuracy to locate and report all current and future work performed at the site;

(b) A history and description of ownership and operation, solid and hazardous waste generation, and treatment, storage, and disposal activities at the facility;

(c) Approximate dates or periods of past product and waste spills, identification of the materials spilled, the amount spilled, the location of the spills, and a description of the response actions conducted (local, State, or Federal response units or private parties), including any inspection reports or technical reports generated as a result of the response; and

(d) A summary of past permits requested and/or received, any enforcement actions and their subsequent responses.

(2) Nature and Extent of Contamination

The Permittee shall submit information in this section, describing the existing nature and extent of contamination.

(a) The Permittee shall summarize all possible source areas of contamination. This, at a minimum, should include all regulated units, solid waste management units, spill areas, and other suspected source areas of contamination. For each area, the Respondent shall identify the following:

(i) Location of unit/area (which shall be depicted on a facility map);

(ii) Quantities of solid and hazardous wastes;

(iii) Hazardous waste or hazardous constituents, to the extent known; and

(iv) Identification of areas where additional information is necessary.

(b) The permittee shall prepare an assessment and description of the existing degree and extent of contamination. This should include:

(i) Available monitoring data and qualitative information on locations and levels of contamination at the facility;

(ii) All potential migration pathways including information on geology, pedology, hydrogeology, physiography, hydrology, water quality, meteorology, and air quality; and

(iii) The potential impact(s) on human health and the environment, including demography, ground water and surface water use, and land use.

(3) Implementation of Interim Measures

The Permittee shall provide information documenting interim measures which were or are being undertaken at the facility. This shall include:

(a) Objectives of the interim measures: how the measure is mitigating a potential threat to human health and the environment and/or is consistent with and integrated into any long term solution at the facility;

(b) Design, construction, operation, and maintenance requirements;

(c) Schedules for design, construction, and monitoring; and

(d) Schedule for progress reports.

b. Potential Corrective Measure Technologies Section

Based on existing information, the Permittee shall identify:

(1) The potential corrective measure technologies that may be used at the Facility or beyond the boundaries of the Facility to respond to releases of hazardous waste or hazardous constituents at or from the Facility; and

(2) Any field, laboratory, bench-scale or pilot-scale data that needs to be collected in the RFI to facilitate the evaluation and selection of the final corrective measure(s), if any, for releases at or from the Facility (e.g., compatibility of waste and construction materials, information to evaluate effectiveness, treatability of wastes, etc.).

c. Project Management Plan Section

The Permittee shall submit a Project Management Plan which shall include a discussion of the technical strategy, schedules, budget, and personnel that will be used for the

study. The plan shall also include a description of the qualifications of personnel performing or directing the RFI, including contractor personnel, and document the overall management approach to the RFI.

d. Community Relations Plan Section

(1) The Permittee shall prepare a fact sheet describing the scope and objectives of the RFI. This fact sheet shall be mailed by the Permittee to all persons on the Facility mailing list compiled under 40 C.F.R. § 124.10(c)(1)(ix) and to the appropriate units of State and local governments at least ten (10) business days prior to start of the field activities.

(2) An executive summary of the RCRA Facility Investigation (RFI) Report shall be included with the RFI Report (permit condition II.C.5). Within ten (10) business days of receipt of the Regional Administrator's approval of the RFI Report, the summary report shall be mailed to all individuals on the facility mailing list compiled under 40 C.F.R. § 124.10(c)(1)(ix).

(3) Notification of groundwater contamination. If at any time the Permittee discovers that hazardous constituents, which may have been released from a SWMU or AOC at the Facility, in groundwater have migrated beyond the Facility boundary in concentrations that exceed the levels specified in Attachment B, the Permittee shall, within fifteen (15) calendar days of such discovery, provide written notice to the Regional Administrator *and* any person who owns or resides on the land which overlies the contaminated groundwater.

(4) Notification of air contamination. If at any time the Permittee discovers that hazardous constituents, which may have been released from a SWMU or AOC at the Facility, in air have migrated or are migrating to areas beyond the facility boundary in concentrations that exceed health-based levels[1], and that residences or other places at which continuous, long-term exposure to such constituents

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[1] The health-based levels for such hazardous waste or hazardous constituents as derived in a manner consistent with EPA guidelines set forth in 51 Federal Register 33992, 34006, 34014, 34028. The health-based level for carcinogens represents a concentration associated with an excess upper bound lifetime risk of 1×10^{-6} due to continuous constant lifetime exposure, and for systemic toxicants represents a concentration to which the human population, exposed to on a daily basis, is not likely to suffer an appreciable risk of deleterious effect during a lifetime. Any list prepared by EPA according to these procedures may be used. As these lists may be revised at any time based on new information, contact EPA for guidance.

might occur are located within such areas, the Permittee shall, within fifteen (15) calendar days of such discovery:

(a) Provide written notification to the Regional Administrator; and

(b) Provide notice to all individuals who have or may have been subject to such exposure.

e. Schedule

The Permittee shall provide a schedule for performance of the RFI tasks and the submission of an RFI Report, within the RFI Plan.

2. RCRA Facility Investigations

a. Environmental Setting Investigation

The Permittee shall collect information to supplement and verify existing information on the environmental setting at the Facility. The Permittee shall characterize the following:

(1) Geology and Hydrogeology

The Permittee shall conduct a program to evaluate the hydrogeologic conditions at the Facility. The program shall provide:

(a) A description of the regional and site-specific geologic units underlying the Facility, including:

(i) Stratigraphy: strike and dip, and identification of stratigraphic contacts;

(ii) Structural features: folding, fracturing, channeling, faulting, jointing; and

(iii) Soil: classification, description of appearance, and consistency;

(b) A description of regional and site-specific hydrogeologic characteristics, including:

(i) Regional and Facility specific groundwater flow patterns;

(ii) A characterization of seasonal variations in the groundwater flow regime, including any perched groundwater zones;

(iii) Identification and characterization of areas of recharge and discharge;

(iv) An analysis of any topographic or geomorphic features that might influence the groundwater flow system; and

(v) A description of the stratigraphic units including:

a) Hydraulic conductivity;

b) An interpretation of hydraulic interconnections between saturated zones, including any perched zones; and

c) Attenuation capacity and mechanisms of the soils (e.g., ion exchange capacity, organic carbon content, mineral content, redox potential, etc.);

(c) Using a topographic map as a base, and at least two approximately perpendicular geologic cross-sections for each SWMU/AOC and the surrounding area, provide a description of the extent (depth, thickness, lateral extent) of each geologic unit including:

(i) Generalized soil (based on testing, grain size, water content, Atterburg limits, etc.) and rock profiles;

(ii) Encountered features such as faults, fractures, voids, stratum changes, lenses, pinch out zones, etc.;

(iii) Location and type of sampling including blow counts, percent recovery, etc.;

(iv) Location and type of in-situ testing performed (pressuremeter, packer permeability testing, slug tests, pump tests, etc.); and

(v) Groundwater elevation and/or potentiometric elevation;

(d) A description of the Facility site flow system including:

(i) Water-level contour and/or potentiometric maps;

(ii) The vertical and horizontal components of flow;

(iii) Any temporal changes in water levels or hydraulic gradients, for example, due to tidal or seasonal influences;

(iv) Active and inactive local water supply and production wells with an approximate schedule of pumping; and

(v) Manmade hydraulic structures (pipelines, french drains, ditches, unlined ponds, septic tanks, NPDES outfalls, retention ponds, etc.).

(2) Soils

The Permittee shall conduct a program to evaluate the soil conditions at the Facility. The program shall provide the following information:

(a) Where remediation by removal of soils is the only corrective measures option, provide map(s) and perpendicular cross sections showing:

(i) The extent of contamination;

(ii) Depth to groundwater; and

(iii) The consistency and distribution of soils using the Unified Soil Classification System (USCS) (ASTM D 2487);

(b) Where remediation by removal is the likely option but it is necessary to determine the extent of migration (for example, to assess the mobility of wastes from an unlined surface impoundment or landfill) provide the following in addition to the requirements immediately above:

(i) Depth to bedrock and the characteristics of the bedrock including lithologic variations, discontinuities such as faults, fissures, joints, fractures, sinkholes, etc.;

(ii) A detailed soil survey conducted according to USDA Soil Conservation Service (SCS) procedures including:

a) USDA Textural Soil Classification and soil profiles showing stratifications or zones which may affect or direct the subsurface flow;

b) Hydraulic conductivity and the SCS hydrologic group classification, A, B, C or D;

c) Relative permeability (only if the waste may have changed the soil's hydraulic

conductivity, such as concentrated organics);

d) Storage capacity;

e) Shrink-swell potential (where extreme dry weather could lead to the formation of cracks);

f) Potential for contaminant transport via erosion, using the Universal Soil Loss Equation;

g) Soil sorptive capacity;

h) Cation exchange capacity;

i) Soil organic content; and

j) Soil pH;

(iii) The following contaminant characteristics must be included (where properties have been estimated, include the basis for such estimations):

a) Physical state;

b) Viscosity;

c) pH;

d) pKa;

e) Density;

f) Water solubility;

g) Henry's Law Constant;

h) K_{ow};

i) Biodegradability; and

j) Rates of hydrolysis, photolysis and oxidation;

(c) When in-situ soil treatment will likely be the remediation, the following additional information must be provided:

(i) Bulk density;

(ii) Porosity;

(iii) Grain size distribution;

(iv) Mineral content;

(v) Soil moisture profile;

(vi) Unsaturated hydraulic conductivity;

(vii) Effect of stratification on unsaturated flow;

(viii) Infiltration and evapotranspiration.

(3) Surface Water and Sediment

The Permittee shall conduct a program to characterize the surface water bodies in the vicinity of the Facility. Such characterization shall include, but not be limited to:

(a) Description of the temporal and permanent surface water bodies including:

(i) For lakes: location, elevation, surface area, inflow, outflow, depth, temperature stratification, and volume;

(ii) For impoundments: location, elevation, surface area, depth, volume, freeboard, and purpose of impoundment;

(iii) For streams, ditches, and channels: location, elevation, flow, velocity, depth, width, tidal and seasonal fluctuations, and flooding tendencies (i.e., 100-year event);

(iv) Drainage patterns; and

(v) Evaporation rate;

(b) Description of the chemistry of the natural surface water and sediments. This includes determining the pH, total dissolved solids, total suspended solids, biochemical oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients (ammonia, nitrate/nitrite nitrogen, phosphate), chemical oxygen demand, total organic carbon, specific contaminant concentrations, etc.;

(c) Description of sediment characteristics including:

(i) Deposition area;

(ii) Thickness profile; and

(iii) Physical and chemical parameters (e.g.,

grain size, density, organic carbon content, ion exchange capacity, pH, etc.).

(4) Air

If the Regional Administrator requires an RFI for air releases from a SWMU/AOC, the Permittee shall provide information characterizing the climate in the vicinity of the Facility. Such information shall include, but not be limited to:

(a) A description of the following parameters: Annual and monthly rainfall averages; monthly temperature averages and extremes; wind speed and direction; relative humidity/dew point; atmospheric pressure; evaporation data; development of inversions; and climate extremes that have been known to occur in the vicinity of the Facility, including frequency of occurrence.

(b) A description of topographic and manmade features which affect air flow and emission patterns, including: ridges, hills, or mountain areas; canyons or valleys; surface water bodies (e.g., rivers, lakes, bays, etc.); wind breaks and forests; and buildings..

b. Source Characterization Investigation

The Permittee shall collect analytical data to completely characterize the wastes and the areas where wastes have been placed, including: type; quantity; physical form; disposition (containment or nature of deposits); and Facility characteristics affecting release (e.g., Facility security, and engineered barriers). This shall include quantification of the following specific characteristics at each source area:

(1) Unit/Disposal Area Characteristics:

(a) Location of unit/disposal area;

(b) Type of unit/disposal area;

(c) Design features;

(d) Operating practices (past and present);

(e) Period of operation;

(f) Age of unit/disposal area;

(g) General physical conditions; and

(h) Method used to close the unit/disposal area.

(2) Waste Characteristics:

(a) Type of waste placed in the unit, including but not limited to: Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing, or reducing agent); quantity; and chemical composition.

(b) Physical and chemical characteristics, including but not limited to: Physical form (solid, liquid, gas); physical description (e.g., powder, oily sludge); temperature; pH; general chemical class (e.g., acid, base, solvent); molecular weight; density; boiling point; viscosity; solubility in water; cohesiveness of the waste; and vapor pressure.

(c) Migration and dispersal characteristics of the waste, including but not limited to: biodegradability, bioconcentration, biotransformation; photodegradation rates; hydrolysis rates; sorption; and chemical transformations.

The Permittee shall document the procedures used in making the above characterizations.

c. Contamination Characterization Investigation

The Permittee shall collect analytical data on groundwater, soils, surface water, sediment, and subsurface gas contamination in the vicinity of the Facility. This data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminant plumes. Data shall include time and location of sampling, media sampled, concentrations found, conditions during sampling, and the identity of the individuals performing the sampling and analysis. The data must include the analyses of hazardous constituents as specified in Attachment B, at a minimum, unless otherwise approved by EPA prior to sampling. The Permittee shall address the following types of contamination at the Facility:

(1) Groundwater Contamination

The Permittee shall conduct a groundwater investigation to characterize any plumes of contamination at the Facility. This investigation shall provide, at a minimum, the following information:

(a) A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the Facility;

(b) The horizontal and vertical direction of contamination movement;

(c) The velocity of contaminant movement;

(d) The horizontal and vertical concentration profiles of hazardous constituents in the plume(s);

(e) An evaluation of factors influencing the plume movement; and

(f) An extrapolation of future contaminant movement.

(g) Each RFI Plan shall include the locations, design and installation procedures for any additional groundwater monitoring wells required to complete the monitoring well network at each area as necessary to meet the RFI objectives. These wells may be used in conjunction with existing wells in the area. All information required of the new wells shall also be required of the existing wells. The monitoring well network shall meet the following requirements:

(i) The upgradient wells must be capable of yielding samples that are representative of background water quality in the uppermost aquifer and are not affected by any solid waste management unit. The number and location of the wells must be sufficient to characterize the spatial variability of background water;

(ii) The downgradient wells must be capable of immediately detecting any statistically significant amounts of hazardous waste or hazardous constituents that migrate from each solid waste management unit into the groundwater; and

(iii) The monitoring system shall be designed to operate for a period of long-term duration.

When developing this information, the Permittee shall refer to the "Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Well," EPA/600/4-89/034, 1989 to determine methods and materials that are acceptable to EPA.

(h) Each RFI Plan shall provide a description of the groundwater monitoring wells including the following information:

(i) A description and map of well locations, including a survey of each well's surface reference point and the elevation of the top of its casing;

(ii) Size and depth of each well;

(iii) Description of well intake design,

including screen slot size and length, filter pack materials and method of filter pack emplacement;

(iv) Type of well casing and screen materials. The choice of well materials shall consider the parameters to be monitored and the nature of the leachate that could potentially migrate from the facility. The well materials shall: (1) minimize the potential of absorption of constituents from the samples; and (2) maintain their integrity for the life of the system.

(v) Description of methods used to seal the well from the surface and prevent downward migration of contaminants through the well annulus; and

(vi) Description of the methods and procedures used to develop the well.

(i) The Permittee shall select a sampling regime and conduct sampling and analysis activities capable of yielding representative samples. The sampling program shall include, at a minimum, the following elements:

(i) The list of analytes as specified in Attachment B of this permit (or as modified with prior EPA approval); or,

(ii) If the groundwater investigation is phased (i.e., conducted based on the results of a soil investigation): A list of parameters capable of detecting releases of hazardous waste or hazardous constituents into groundwater. The parameters shall be representative of hazardous constituents at least as mobile as the most mobile hazardous constituent that may be present after considering:

a) The types, quantities, and concentrations of hazardous constituents in wastes managed at the SWMU/AOC. Incidental constituents which may be released into the unit area from process areas shall be included in this list of analyses;

b) The mobility, stability, and persistence of hazardous waste constituents or their reaction products in the unsaturated zone beneath the waste management area;

c) The detection ability of the indicator parameters, waste constituents of reactive products in groundwater;

d) The concentration of and the natural variation (known or suspected) of the proposed monitoring parameters in background media; and

e) The list must include the basis for selecting each proposed indicator parameter, including any analysis or calculations performed. The basis for selection shall, where possible, include chemical analysis of the unit's waste and/or leachate as appropriate. The list shall also include parameters to characterize the site-specific chemistry of groundwater at the site including, but not limited to, the major anions and cations that make up the bulk of dissolved solids in water (i.e., Cl^{-}, Fe^{+3}, Mn^{+2}, Na^{+}, $(SO_4)^{-2}$, Ca^{+2}, Mg^{+2}, K^{+}, NO^{-3}, PO^{-3}, silicate, and ammonium).

The Permittee shall document, in the RFI Report submitted pursuant to condition 3 of this Attachment, the procedures used to characterize contaminant plume(s), for example, geophysics, modeling, pump tests, slug tests, nested piezometers, etc.

(2) Soil Contamination

The Permittee shall conduct an investigation to characterize the contamination of the soil and rock units above the water table in the vicinity of the contaminant release. The soil contamination investigation shall include:

(a) A description of the vertical and horizontal extent of contamination;

(b) A description of contaminant and soil chemical properties within the contaminant source area and plume. This includes contaminant solubility, speciation, adsorption, leachability, cation exchange capacity, biodegradability, hydrolysis, photolysis, oxidation, and other factors that might affect contaminant migration and transformation;

(c) Specific contaminant concentrations according to the analyte list (or as modified with prior EPA approval) in Attachment B;

(d) The velocity and direction of contaminant movement; and

(e) An extrapolation of future contaminant movement.

The Permittee shall document, in the RFI Report submitted pursuant to condition 3 of this Attachment, the procedures used in making the above characterizations and determinations of future contaminant movement.

(3) Surface Water and Sediment Contamination

The Permittee shall conduct a surface water investigation to characterize contamination in surface water bodies resulting from contaminant releases at the Facility.

The investigation shall generate, at a minimum, the following information:

(a) A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the Facility, and the extent of contamination in underlying sediments;

(b) The horizontal and vertical direction of contaminant movement;

(c) The contaminant velocity;

(d) An evaluation of the physical, biological, and chemical factors influencing contaminant movement;

(e) An extrapolation of future contaminant movement; and

(f) A description of the chemistry of the contaminated surface waters and sediments. This includes determining the pH, total dissolved solids, specific contaminant concentrations, etc.

The Permittee shall document, in the RFI Report submitted pursuant to condition 3 of this Attachment, the procedures used in making the above characterizations.

(4) Subsurface Gas Contamination

The Permittee shall conduct an investigation to characterize subsurface gases emitted from buried hazardous waste or hazardous constituents. This investigation shall generate, at a minimum the following information:

(a) A description of the horizontal and vertical extent of subsurface gases migration;

(b) The chemical composition of the gases being emitted;

(c) The rate, amount, and density of the gases being emitted; and

(d) Horizontal and vertical concentration profiles of the subsurface gases emitted.

The Permittee shall document, in the RFI Report submitted pursuant to condition 3 of this Attachment, the procedures used in making the above characterizations.

(5) Air Contamination

The Permittee shall conduct an investigation to characterize the particulate and gaseous contaminants released into the atmosphere. This investigation shall generate, at a minimum, the following information:

(a) A description of the horizontal and vertical direction and velocity of contaminant movement;

(b) The rate and amount of the release; and

(c) The chemical and physical composition of the contaminants(s) released, including horizontal and vertical concentration profiles.

The Permittee shall document, in the RFI Report submitted pursuant to condition 3 of this Attachment, the procedures used in making the above characterizations.

d. Potential Receptors Investigation

The Permittee shall collect data describing the human populations and environmental systems that may be exposed to releases of hazardous waste or hazardous constituents from the Facility. Chemical analysis of biological samples may be required. Data on observable effects in ecosystems may also be required. The following characteristics shall be identified:

(1) Local uses and possible future uses of groundwater:

(a) Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial); and

(b) Location of groundwater users, including wells and discharge areas;

(2) Local uses and possible future uses of surface waters draining the Facility:

(a) Domestic and municipal (e.g., potable and lawn/garden watering);

(b) Recreational (e.g., swimming, fishing);

(c) Agricultural;

(d) Industrial; and

(e) Environmental (e.g., fish and wildlife propagation);

(3) Human use of or access to the Facility and adjacent lands, including, but not limited to:

(a) Recreation;

(b) Hunting;

(c) Residential;

(d) Commercial;

(e) Zoning; and

(f) Relationship between population locations and prevailing wind direction;

(4) A description of the biota in surface water bodies or wetlands on, adjacent to, or affected by the Facility. An evaluation of the pollutant impacts on the ecosystems/populations potentially exposed to contamination. This evaluation may be accomplished through the use of toxicity test (acute and chronic) population surveys, and literature reviews.

(5) A description of the ecology overlying and adjacent to the Facility must include:

(a) the location and size of each identified habitat e.g. stream reaches, roads, wetlands of forested area, within the physical boundaries defined for the assessment and

(b) a listing and physical assessment of the ecosystems and population potentially exposed to contamination.

(6) A demographic profile of the people who use or have access to the Facility and adjacent land, including, but not limited to: age, sex, and sensitive subgroups; and

(7) A description of any endangered or threatened species near the Facility.

e. Laboratory and Bench Scale Studies

If specifically required by the Regional Administrator at any time during the RFI, the Permittee shall conduct laboratory and/or bench scale studies to determine the applicability of corrective measure technology or technologies to facility conditions. The Permittee shall analyze the technologies, based on literature review, vendor contracts, and past experience to determine the testing requirements.

The Permittee shall develop a testing plan identifying the type(s) and goal(s) of the study(ies), the level of effort needed, and the procedures to be used for data management and interpretation.

Upon completion of the testing, the Permittee shall evaluate the testing results to assess the technology or technologies with respect to the site-specific questions identified in the test plan. The Permittee shall prepare a report summarizing the testing program and its results, both positive and negative.

f. Risk Assessment

The baseline risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these releases (under the assumption of no action).

The baseline risk assessment contributes to the site characterization and subsequent development, evaluation, and selection of appropriate response alternatives. There are four steps in the risk assessment process:

(1) Determine contaminants of concern: Data collection and evaluation involves the gathering and analyzing the site data relevant to the human health evaluation and identifying the substances present at the site that are the focus of the risk assessment process.

(2) Exposure assessment: Using the procedure outline in Section d for determining potential receptors, estimate the magnitude of actual and/or potential human exposures, the frequency and duration of these exposures, and the pathways by which humans are potentially exposed. In the exposure assessment, reasonable maximum estimates of exposure are developed for both current and future land-use assumptions.

(3) Toxicity assessment: This component of the risk assessment considers the types of adverse health effects associated with chemical exposures and the relationship between the magnitude of exposure and adverse effects.

(4) Risk Characterization: This summarizes and combines outputs of the exposure and toxicity assessments to characterize baseline risk, both in quantitative expressions and qualitative statements.

3. RCRA Facility Investigation Report

The RCRA Facility Investigation Report shall include an

analysis and summary of all Facility investigations and the results of such investigations.

a. Data Analysis

The Permittee shall analyze all Facility investigation data outlined in permit condition II.C, RCRA Facility Investigation, and prepare a report on the type and extent of contamination at the Facility, including sources and migration pathways. The report shall describe the extent of contamination (qualitative and quantitative) in relation to screening levels specified in Attachment B and background levels indicative of the area.

b. Media Cleanup Standards

The Permittee shall identify the following cleanup standards:

(1) Groundwater Cleanup Standards

The Permittee shall provide information to support selection/development of Groundwater Cleanup Standards for all of the hazardous constituents found in the groundwater during the RCRA Facility Investigation.

(a) The Groundwater Cleanup Standards shall consist of:

(i) The Maximum Contaminant Level (MCL) for any constituents with an EPA promulgated Maximum Contaminant Level (MCL), if the background level of the constituent is below the value of the EPA approved MCL; or

(ii) The background level of that constituent in the groundwater; or

(iii) A standard established according to the criteria for Other Media Cleanup Standards.

(2) Other Media Cleanup Standards

The Permittee shall identify concentration levels in the affected media which protect human health and the environment.

Unless a lower concentration level is deemed necessary to protect environmental receptors, cleanup standards shall be established as follows:

(a) For any known or suspected carcinogens classified by EPA's weight of evidence classification as an A, B1 or B2 carcinogen, cleanup standards shall be established at concentration levels which represent an excess upperbound lifetime risk to an individual of 1×10^{-6}, or

(b) For systemic toxicants, cleanup standards shall represent concentration levels to which the human population (including sensitive subgroups) could be exposed on a daily basis without appreciable risk of deleterious effect during a lifetime.

c. The Permittee shall recommend which SWMUs, or groups of SWMUs/AOCs, require a Corrective Measures Study. The Permittee shall also identify those corrective action alternative(s) the Permittee intends to investigate further. The Permittee may either investigate several alternatives or focus on a limited number of alternatives.

CORRECTIVE MEASURES STUDY - ATTACHMENT D

The purpose of a Corrective Measures Study (CMS) is to develop and evaluate remedial alternative(s) and to recommend the remedy(ies) to be taken (refer to Permit Condition II.D). The Permittee may elect either to screen a number of potential remedies prior to evaluating a smaller number of potential remedies or delete the screening step and proceed with evaluation of the expected remedy(ies), including any specified by EPA.

The Corrective Measures Study shall consist of:

1. Screening of Potential Remedies:

   Should the Permittee elect to screen a number of potential remedies, any potential remedy specified in EPA's approval of the RFI Report shall also be screened. The Permittee shall document the reasons for eliminating any technology.

   a. The characteristics which shall be used to screen inapplicable remedies or technologies include, but are not limited to:

      (1) Site and Media Characteristics

      Site and media data shall be reviewed to identify conditions that may limit or promote the use of certain technologies. The use of technologies which are clearly precluded by site or media characteristics shall be eliminated from further consideration;

      (2) Waste Characteristics

      Potential remedies clearly limited by the waste characteristics should be eliminated from consideration; and

      (3) Technology Limitations

      During the screening process, the level of technological development, performance record, and inherent construction, operation, and maintenance problems should be identified for each technology considered. Technologies that are unreliable, perform poorly, or are not fully demonstrated may be eliminated in the screening process.

   b. The Permittee shall select remedy(ies) based on the above screening, together with any remedy(ies) specified by EPA, for further evaluation. Should an EPA-specified potential remedy(ies) prove infeasible based on the above screening, the Permittee may request that the alternative(s) be

dropped from further investigation. However, until approved, the request shall not stay the conditions of this permit.

2. Evaluation of Potential Remedies

The Permittee shall evaluate the selected potential remedy(ies), including any specified by EPA.

The evaluation shall include a description of each potential remedy which shall include, but is not limited to: preliminary process flow sheets; preliminary sizing and type of construction for buildings and structures; and rough quantities of utilities required. Each potential remedy shall be evaluated with respect to the following criteria:

a. Technical

(1) Evaluation of the performance, reliability, ease of implementation, and potential impacts of the remedy, including safety impacts, cross media impacts, and control of exposure to any residual contamination;

(2) Assessment of the effectiveness of potential remedies in achieving adequate control of source and cleanup of the hazardous waste (including hazardous constituents) released from solid waste management units;

(3) Assessment of the time required to begin and complete the remedy;

(4) Estimation of the costs of remedy implementation; and

(5) Assessment of institutional requirements, such as state or local permit requirements, or other environmental or public health requirements which may substantially affect implementation of the remedy(ies).

b. Environmental: An evaluation of the facility conditions and pathways of contamination actually addressed by each potential remedy. The evaluation shall include the short-term and long-term beneficial and adverse effects, any adverse effects on environmentally sensitive areas, and an analysis of measures to mitigate such adverse effects.

c. Human health: The potential remedy(ies) shall be evaluated with respect to mitigation of short- and long-term potential exposure to any residual contamination and protection of human health, both during and after implementation.

d. Institutional: The Permittee shall evaluate the effects of federal, State, and local environmental and public health standards, regulations, guidance, advisories, ordinances, or community relations, including the requirements for construction and operating permits on the design, operation, and timing of the remedy(ies).

3. Cost Estimate

The Permittee shall develop a cost estimate for the remedy(ies) and for each phase or segment of the remedy(ies) including:

a. Capital costs consisting of direct (construction) and indirect (non-construction and overhead) costs; and

b. Post-construction costs, including operation and maintenance) necessary to ensure continued effectiveness of the alternative(s).

4. Interim Reporting

The Permittee shall submit bi-monthly progress reports containing:

a. A description and estimate of the percentage of the CMS completed;

b. Summaries of all findings;

c. Summaries of all contacts with representatives of the local community, public interest groups, or State government during the reporting period;

d. Summaries of all problems or potential problems encountered during the reporting period;

e. Actions being taken to rectify problems;

f. Changes in personnel during the reporting period; and

g. Projected work for the next reporting period.

5. Final Report

According to the approved schedule, the Permittee shall submit to EPA for approval and to VDEQ a Corrective Measures Study Report. The report shall include:

a. An updated description of conditions at the Facility and the nature and extent of the contamination as documented by the RCRA Facility Investigation Report. The Permittee shall update the information with respect to any response

activities or interim measures which have or are being implemented at the Facility;

b. Recommended objectives for corrective action for each SWMU, AOC, or group of SWMU/AOCs. These objectives shall be based on public health and environmental criteria, information gathered during the RCRA Facility Investigation, EPA guidance, and the requirements of any applicable federal statutes or regulations;

c. The Permittee shall justify and recommend a remedy(ies) using technical, human health, and environmental criteria. These recommendations shall include summary tables which allow the alternative(s) to be understood easily. Trade-offs among health risks, environmental effects, and other pertinent factors among the alternatives evaluated shall be highlighted. Information on all evaluated potential remedy(ies) shall be presented; and

d. The Report shall, at a minimum, include:

(1) A description of the facility, site topographic map(s) and preliminary layouts;

(2) For the selected remedy(ies) include:

(a) Performance expectations, i.e., the selected remedy is expected to achieve the Media Cleanup Standards in the approved RCRA Facility Investigation Report;

(b) Preliminary design criteria and rationale;

(c) General operation and maintenance requirements;

(d) Long-term monitoring requirements;

(e) Design and Implementation Precautions:

(i) Special technical problems;

(ii) Additional engineering data required;

(iii) Permits and regulatory requirements;

(iv) Access, easements, right-of-way;

(v) Health and safety requirements; and

(vi) Community relations activities; and

(f) Cost Estimates and Schedules:

(i) Capital cost estimate;

(ii) Operation and maintenance cost estimate; and

(iii) Project schedule (design, construction, operation); including estimated operating time required to achieve the performance expectation.

e. Upon review of the Corrective Measures Study Report, the Regional Administrator may require the Permittee to evaluate further, and report upon, one or more additional remedies, or develop particular elements of one or more proposed remedies. Such further requirements will, if necessary, be incorporated into this permit via 40 C.F.R. §§ 270.41 or 270.42.

INTERIM MEASURES - ATTACHMENT E

Purpose

The purpose of Interim Measures are to implement corrective actions during the term of this Permit to control, abate or remove any known on-site or off-site contamination, and/or prevent the migration of contamination on, or beyond, the Facility boundary and to the extent practicable, said interim measures are to be consistent with, and integrated into any long-term remediation at the Facility.

Scope

I. Interim Measures Workplan

The Permittee shall prepare an Interim Measures Workplan that includes the development of several plans which shall be prepared concurrently. Upon EPA approval, the Permittee shall implement the Workplan according to the schedules contained therein.

A. Interim Measures Project Management Plan

The Interim Measures Project Management Plan ("IMPMP") shall document the overall management approach to the Interim Measures. The IMPMP shall include, but not be limited to:

1. Background information including a discussion of historical facility operations, the current conditions at the facility, including any interim measures which have, or are being implemented at the facility, pertinent geology, and the known nature and extent of contamination.

2. A discussion of Interim Measures objectives, the technical approach to meet those objectives, and an explanation of how the interim measures will control, abate or eliminate releases and, to the extent possible, be consistent and integrated with any long-term solution at the facility.

3. A description of the qualifications of personnel directing or performing the Interim Measures, including contractor and subcontractor personnel.

4. A project schedule identifying dates for the anticipated completion of the project and the submission of all documents referenced in this Attachment, including, but not limited to an Interim Measures Design Program containing Design Plans and Specifications, an Operations and Maintenance Plan, a Sampling and Analysis Plan (if necessary), progress reporting, and an Interim Measures Implementation Report.

B. Community Relations Plan

The Permittee shall prepare a fact sheet describing the scope and objectives of the Interim Measures to be performed under the Interim Measures Workplan as approved by EPA. The Permittee shall mail this fact sheet to all persons on the Facility mailing list compiled under 40 C.F.R. § 124.10(c)(1)(ix) and to the appropriate units of State and local governments at least ten (10) business days prior to the start of field activities.

C. Health and Safety Plan

The Permittee shall submit a Health and Safety Plan in accordance with Attachment F* to this Permit. If EPA deems it appropriate, Permittee may reference or amend a previous Health and Safety Plan submitted pursuant to this Permit.

II. Interim Measures Design Program

A. Design Documentation and Specifications. The Permittee shall submit to EPA design documentation and specifications which include, but are not limited to:

1. The design strategy and the design basis, including measures of compliance with all applicable or relevant environmental and public health standards;

2. The technical factors of importance, including but not limited to materials, equipment and specifications;

3. The assumptions made and detailed justification of these assumptions;

4. The possible sources of error, references to possible operation and maintenance problems and anticipated remedies; and

5. Detailed drawings including: facility layout, utility locations, engineering controls which aid in the safe operation of the IM, sample calculations, derivations of equations essential to understanding the report and results of laboratory or field tests.

B. Operation and Maintenance Plan

Permittee shall prepare an Operation and Maintenance Plan to cover both implementation and long-term maintenance of the Interim Measure(s). The plan shall be composed of:

1. Description of the equipment and its normal operation and maintenance (O&M), including a schedule showing frequency of each O&M task;

* (See RFAAP Master Workplan, Draft Final, April 1998)

2. Description of routine monitoring and laboratory testing, the required QA/QC, and a schedule of monitoring frequency and equipment replacement.

3. Records and reporting mechanisms required, including daily operating logs, laboratory records, mechanism for reporting equipment breakdown, failure and emergencies related to the implementation of the interim measure, personnel and maintenance records and monthly/annual reports to Federal/state agencies.

C. Sampling and Analysis Plan

If any sampling and analysis is required to implement the interim measures, Permittee must include in the Interim Measure Workplan a Data Collection Quality Assurance Plan and a Data Management Plan. These two plans shall be submitted in accordance with the requirements of Attachment F.* If EPA has previously approved a Sampling and Analysis Plan pursuant to a RFI or previous IM, and EPA deems it appropriate, Permittee may reference or amend the relevant portions of the approved Plan. The Sampling and Analysis Plan shall describe the methods and frequency for collecting and analyzing samples for monitoring the effectiveness and efficiency of the ongoing Interim Measures. At a minimum it shall describe the number of samples collected, including QA/QC samples, the location of the samples collected, the method of collection, frequency of sampling activities, decontamination procedures, and a constituent analysis list.

III. Reports

A. Interim Measures Workplan

Permittee shall submit an Interim Measures Workplan as described in this Attachment.

B. Progress

Permittee shall submit to EPA IM Progress Reports in accordance with an approved schedule described in the IMPMP of Section I.A. of this Attachment. The progress reports shall contain:

1. A description and estimate of the percentage of the interim measures completed;

2. Summaries of all findings;

3. Summaries of all changes made in the interim measures during the reporting period;

4. Summaries of all contacts with representative of the local

* (See RFAAP Master Workplan, Draft Final, April 1998)

community, public interest groups, or state government during the reporting period;

5. Summaries of all problems or potential problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in personnel during the reporting period;

8. Projected work for the next reporting period; and

9. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

C. Interim Measures Implementation Report

At the "completion" of the construction of the project, Permittee shall finalize the Interim Measures Workplan, and submit for EPA's approval a Draft Interim Measures Implementation Report ("IMIR") in accordance with the schedule described in Section I.A.4 of this Attachment. The IMIR shall document that the project is consistent with the design specifications and that the interim measures are performing adequately. The IMIR shall include, but not be limited to:

1. Synopsis of the interim measures and certification of the design and construction;

2. Explanation of any modifications to the plans and why these were necessary for the project;

3. Listing of the criteria, established before the interim measures were initiated, for judging the functioning of the interim measures and also for explaining any modification to these criteria;

4. Results of facility monitoring, indicating that the interim measures will meet or exceed the performance criteria; and

5. Summary of the operation and maintenance (including monitoring) to be undertaken at the facility.

In addition to the above information, the IMIR shall include the inspection summary reports, inspection data sheets, problem identification and corrective reporting data sheets, design engineers' acceptance reports, deviations from design and material specifications (with justifying documentation), and as-built drawings.

6. The Permittee shall respond to any comments received from EPA on the draft IMIR submission.

ATTACHMENT F

Previously Submitted Deliverable Documents

Verification Investigation Report, Dames and Moore, October 29, 1992 Draft Final. (The following sections of the 1992 VI were revised by: Draft Section 7.0 SWMUs 10 and 35, Dames and Moore, September 8, 1994; Draft Section 9.0 SWMUs 27,29 and 53, Dames and Moore, August 19, 1994; Draft Section 11.0 SWMU 39, Dames and Moore August 31, 1994; Draft Section 24.0 SWMU 71, Dames and Moore, August 19, 1994.)

RCRA Facility Investigation Report, Dames and Moore, October 29, 1992, Draft Final.

Draft Section 8.0, SWMU O, Dames and Moore, September 16, 1994 of the 1992 RFI report.

SWMU 69 Closure Report, Dames & Moore, Draft. August 1994.

RCRA Facility Investigation for Solid Waste Management Units 17, 31,48, 54, Parsons Engineering and Science, Inc., Final. May 1996

New River and Tributaries Study, Radford Army Ammunition Plant, Parsons Engineering Science, Inc. December 1997

Site Management Plan, ICF Kaiser Engineers, Inc., May 1997 and May 1998.

RFAAP Master Workplan, Draft Final, April 1998.

SWMU 68 Closure Report, Draft Final. April, 1998.

Ecological Risk Assessment Approach, Main Manufacturing Area and New River Unit, October 1998.

Closure Documentation for Solid Waste Management Unit 10, Biological Treatment Plant Equalization Basin, Radford Army Ammunition Plant, Radford, VA, Final. December 8, 1998.

Closure Report for the Eastern Lagoon of SWMU 8. Final December 1998.

Supplemental RFI for SWMU 54, Draft, December 1998.

RCRA Facility Investigation Report for SWMUs 31, 39,48,49,& 58, Draft, IF Kaiser, January 1999.

Workplan Addenda for SWMU 54 Interim Stabilization Measure, ATK, Draft Final January

1999.

Workplan Addendum 8: RI/FS for the Northern and Western Burning Grounds (at the NRU) and RFI for Building 4343, ICF Kaiser, June 1999.

Draft Screening Ecological Risk Assessment Report , The IT Group, September 1999.

Addendum 009: RFI Activities at Solid Waste Management Units 31, 48, and 49 and Horseshoe Area Groundwater Study, The IT Group, November 1999.

Draft Statistical Inorganic Background Report, The IT Group, April 1999.