



**US Army Corps  
of Engineers  
HUNTSVILLE DIVISION**

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**Defense Environmental Restoration Program  
for  
Formerly Used Defense Sites**

**Ordnance and Explosive Waste  
Chemical Warfare Materials**

**ARCHIVES SEARCH REPORT**

**NEW RIVER ORDNANCE PLANT**

**Radford, Virginia**

**Site No. C03VA0047**

**SEPTEMBER 1993**

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**Prepared by  
US ARMY CORPS OF ENGINEERS  
ST. LOUIS DISTRICT**

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**ORDNANCE AND EXPLOSIVE WASTE  
CHEMICAL WARFARE MATERIALS  
ARCHIVES SEARCH REPORT  
FOR  
NEW RIVER ORDNANCE PLANT  
RADFORD, VIRGINIA**

DERP-FUDS SITE NO. C03VA0047

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## **1.0 Introduction**

### **1.1 Authority**

In 1980, Congress enacted the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) 42 USC 9601 et seq. Ordnance and explosive wastes are included in the CERCLA definition of pollutants and contaminants that require a remedial response.

In 1983, the Environmental Restoration Defense Account (ERDA) was established by Public Law 98-212. This Congressionally-directed fund was to be used for environmental restoration at Department of Defense (DOD) active installations and formerly used properties. The DOD designated the Army as the sole manager for environmental restoration at closed installations and formerly used properties. The Secretary of the Army assigned this mission to the Corps of Engineers (USACE) in 1984.

The 1986 Superfund Amendments and Reauthorization Act (SARA) amended certain aspects of CERCLA, some of which directly related to OEW contamination. Chapter 160 of the SARA established the Defense Environmental Restoration Program (DERP). One of the goals specified for the DERP is "correction of environmental damage (such as detection and disposal of unexploded ordnance) which creates an imminent and substantial endangerment to the public health or welfare or to the environment.

The DERP requires that a CERCLA response action be undertaken whenever such "imminent and substantial endangerment" is found at:

- A. A facility or site that is owned by, leased to, or otherwise possessed by the United States and under the jurisdiction of the Secretary of Defense.
- B. A facility or site that was under the jurisdiction of the Secretary of Defense and owned by, leased to, or otherwise possessed by the United States at the time of actions leading to contamination.
- C. A vessel owned or operated by the Department of Defense.

The National Contingency Plan (NCP) was established by the Clean Water Act of 1972. The NCP has been revised and broadened several times since then. Its purpose is to provide the organizational structure and procedures for remedial actions to be taken in response to the presence of hazardous substances, pollutants, and contaminants at a site. Section 105 of the 1980 CERCLA states that the NCP shall apply to all response actions taken as a result of CERCLA requirements.

The March 1990 National Oil and Hazardous Substances Pollution Contingency Plan given in 40 CFR part 300 is the latest version of the NCP. Paragraph 300.120 states that "DOD will be the removal response authority with respect to incidents involving DOD military weapons and munitions under the jurisdiction, custody, and control of DOD."

On April 5, 1990, U.S. Army Engineer Division, Huntsville (USAEDH) was designated as the USACE Mandatory Center of Expertise (MCX) and Design Center for Ordnance and Explosive Waste (OEW). As the MCX and Design Center for OEW, USAEDH is responsible for the design and successful implementation of all Department of the Army OEW remediations required by CERCLA. USAEDH will also design and implement OEW remediation programs for other branches of the Department of Defense when requested. In cooperation with the Huntsville Division, the U.S. Army Corps of Engineers St. Louis District has been assigned the task of preparing Archives Search Reports for those Formerly Used Defense Sites (FUDS) suspected of chemical warfare materials (CWM) contamination.

## 1.2 Subject

The New River Ordnance Plant is located in Pulaski County, near Radford, Virginia. The plant has served as bag loading facility and storage facility for the Radford Army Ammunition Plant.

## 1.3 Purpose

This Archives Search Report (ASR) compiles information obtained through historical research at various archives and records holding facilities, interviews with persons associated with the site or its operations, and personal visits to the site. All efforts were directed towards determining possible use or disposal of chemical warfare materials on the site. Particular emphasis was placed on establishing the type (agent), munitions or container, quantities and area of disposal. Information obtained during this process was used in developing recommendations for further actions at the site.

## 1.4 Scope

The areas addressed in this ASR are the area of the bag loading facilities, administration area, warehouse area, officers quarters, and an area that contained rail sidings. The New River Ordnance Plant originally consisted of 3,838.60 acres fee plus easement and license areas. A total of 2,813.447 acres fee of this original site are still operated as part of the Radford Army Ammunition Plant. The balance of the site is addressed in this ASR and is designated as DERP-FUDS Site No. C03VA0047.

## **2.0 Previous Site Investigations**

Under the Defense Environmental Restoration Program (DERP), the Norfolk District prepared a Findings and Determination of Eligibility (FDE), dated 13 May 1986, for the New River Ordnance Plant. It indicates that the New River Ordnance Plant site originally consisted of 3,838.60 acres fee plus easement and license areas. A total of 2,813.447 acres fee of this original site are still operated as part of the Radford Army Ammunition Plant. The balance of the site comprises the DERP-FUDS and was addressed in the FDE. The report determined that the site had been formerly used by the DOD, however, it determined that an environmental restoration project was not an appropriate undertaking within the purview of DERP because the only current owner who requested such assistance had made beneficial use of the DOD buildings. No remedial actions were proposed under the Defense Environmental Program established under Public Law 98-473, Continuous Appropriation, 1985 [Conference Report (HR 98-1159)].

### **3.0 Site and Site Area Description**

#### **3.1 Location**

The New River Ordnance Plant site is located in Pulaski County, Virginia. The New River Ordnance Plant site originally consisted of 3,838.60 acres fee, plus easement and license areas. A total of 2,813.447 acres fee of this original site are still operated as part of the Radford Army Ammunition Plant. The balance of the site was addressed in the FDE. The location of is not available in Section, Township and Range format. However, the site can be located approximately at Latitude 37 Degrees, 5 minutes and 00 seconds North; and Longitude 80 Degrees, 40 minutes and 00 seconds West.

#### **3.2 Past Uses**

The area surrounding the former New River Ordnance Plant has a varied historical background. During the American Revolution, a plant was constructed, a few miles from the New River site, for the purpose of supplying American soldiers with black powder. Later, in 1820, a building was constructed along the New River for the manufacture of shot. However, prior to Government ownership, the land was dominated, for the most part, by farms, many of which existed in days prior to the American Revolution.

In response to World War I, the United States assembled an extensive munitions manufacturing network throughout the country. However, few survived the disarmament policies and the "return to normalcy" of the 1920's. As the United States prepared for World War II, the need for increased munitions production again became a priority. An Act of Congress granting authority for the construction of plants for the production of munitions, materials, equipment, and supplies with the goal of strengthening the Armed Forces of the United States was the basis for opening the New River Ordnance Plant. For this particular facility, the Government acquired approximately 3,844.325 acres to include right-of-way for water, electric, and sewer lines. The Government operated the plant under contract with the Hercules Powder Co. of Wilmington, Delaware. The mission of this facility was the loading of propellant and igniter charges and the manufacture of the bags used for such charges (Hercules Powder Company 1942).

New River Ordnance Plant operated as detailed in the Government contract until September 19, 1943, at which time the contract was canceled and the New River plant was transferred to the jurisdiction of Radford Arsenal. In October 1943, plant operations included rolled powder operations, which consisted of increment packaging. As the war progressed, the mission expanded at the New River site. Additional operations included facilities for flash-reducer loading lines, black-powder drying facilities, and an additional bag-loading line. However, bag-loading remained the primary function of the plant. As World War II drew to a close, production requirements lessened and on August 29, 1945, the New River Ordnance Plant was classified as a surplus plant by the Ordnance Department. However, in April 1946, the magazine areas were withdrawn from surplus status and classified in a stand-by condition. In May 1946, the New River unit was designated as a sub-post of Radford

Arsenal (Hercules Powder Company 1946). In February 1950, the New River plant was officially designated as the New River Unit of Radford Arsenal and operated in that capacity.

During the post-war period, the War Assets Administration began disposal of portions of the former New River Ordnance Plant, starting as early as 1947-48 and continuing through 1978.

### 3.3 Current Uses

The site currently serves a variety of purposes. A large portion of the site was acquired by Burlington Industries which used the warehouse area for their textile operations. They have since closed down their operation and portions of their site have been sold to the Town of Dublin. Most of the warehouses are still in use. The former officers' quarters now serve as private residences. Portions of the site are used by Pulaski County for a maintenance facility, and by the Commonwealth of Virginia for a highway maintenance facility. The Pulaski County School Board uses a portion of the site as does the County Park. Flow Laboratories owns a large acreage, most of which is undeveloped, however, they have constructed several new buildings. The Pulaski Furniture Company also owns an undeveloped tract of land. The U.S. Army Reserve has a facility and some undeveloped land at the site. The majority of the site remains undeveloped with many of the former buildings still standing and in a state of total disrepair. This is particularly true of the former hospital area and the area of the bag loading facilities. Some of these buildings were used for a period of time, however, most are now vacant and dilapidated.

### 3.4 Demographics of the Area

#### 3.4.1 Center of Activity

New River Ordnance Plant, now part of the Radford Army Ammunition Plant, is located approximately four miles north of the City of Radford, Virginia. The ordnance plant employs approximately 2,000 people and is a major source of income for the area. Other centers of activity in the area are: Radford University, located within the city limits, as well as Dedman Center Sports Complex, Radford Community Hospital, New River Valley Mall, and University Mall.

#### 3.4.2 Population Density

According to current figures, the population density of Radford, VA, is 1992.5 persons per square mile.

#### 3.4.3 Types of Businesses

The two predominant businesses in Radford are the University and the hospital. The hospital employs approximately 500 people.



#### 3.4.4 Types of Industry

Radford has quite a few industries. Radford Industrial Center houses New River Industries and Inland Motors. Each of these firms employs approximately 500 people. The arsenal itself is considered a source of industry for Radford, employing approximately 500 people.

#### 3.4.5 Types of Housing

The housing profile of Radford, VA, is 53% single family homes, 8% 2 to 4 family flats, 33% 5 to 10 unit apartments or condominiums and 4% trailers and mobile homes. The median dollar value for specified owner-occupied homes in Radford is \$64,500.

#### 3.4.6 New Development in the Area

The only significant new development in the area is a shopping mall centered between Radford, Christianburg, and Blacksburg, about 4 to 6 miles northeast of Radford.

#### 3.4.7 Cross-section of the Population

56% of the population of Radford is female, the remaining 44% is male. The largest age group is the 18 to 20 year old group comprising 28% of the population, followed by the 21 to 24 year group with 20%, and the 25 to 44 year group with 19%. The median age for Radford is 22 years. 92% of the population is white, 6% is black, 2% is Asian or Pacific Islander and 1.1% is of hispanic origin.

## **4.0 Physical Characteristics of the Site**

### **4.1 Geology/Physiography**

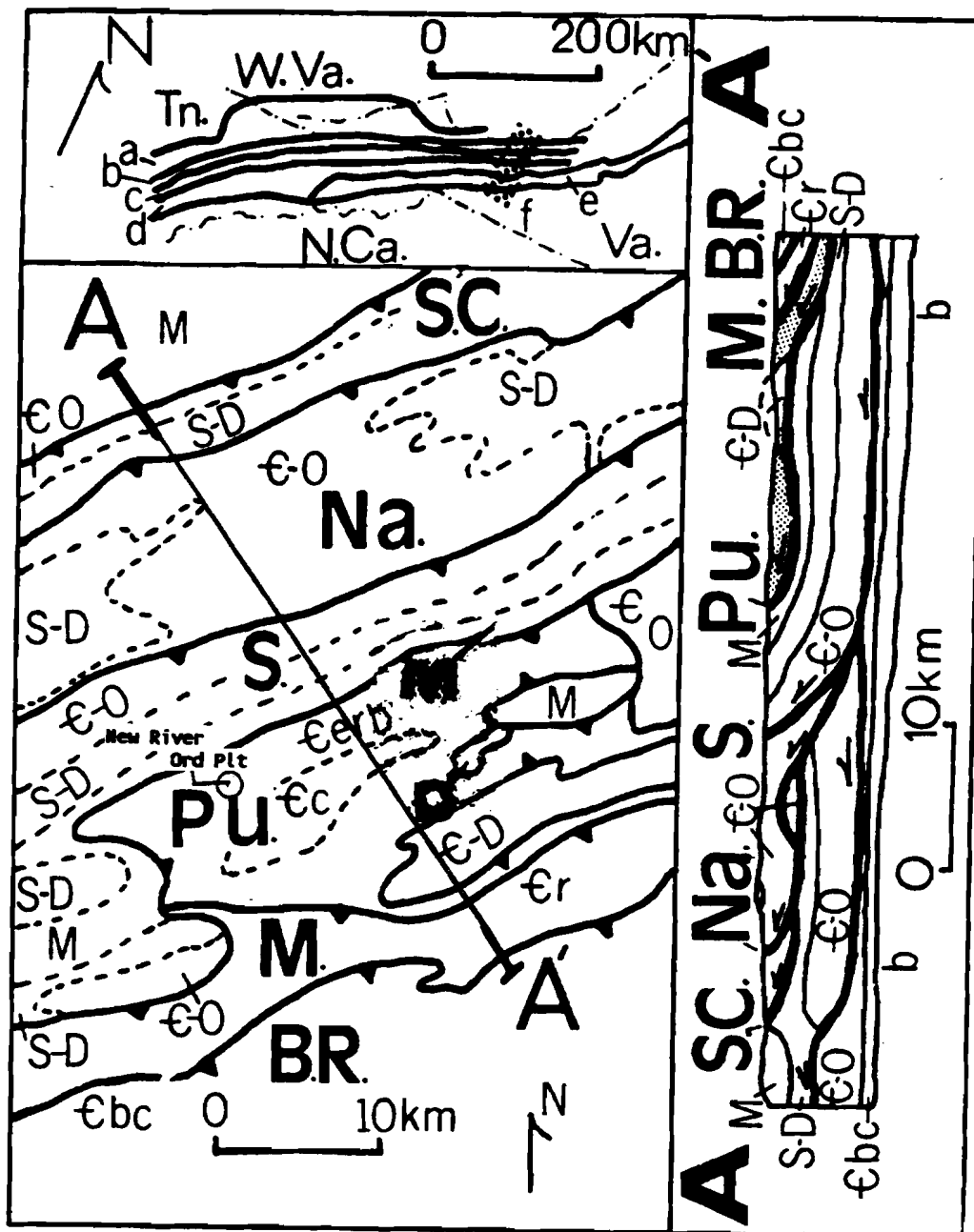
New River Ordnance Plant, Virginia, is located within the middle section of the Ridge and Valley province (Thornbury, 1965.).

The rocks which underlie site are Middle Cambrian limestones, dolomites and shales of the Elbrook formation. The thickness of the Elbrook formation in this area is approximately 1500 feet. The uppermost portion of the Elbrook is characterized by interbedded sandy, commonly cross-bedded, fine-grained dolomite containing thin lenses of fine- to medium-grained sandstone. This is followed by cyclic sequences of medium-gray, finely laminated, fine-grained dolomite with crossbedding, bioturbated fine-grained dolomite with burrowed areas filled with slightly coarser-grained dolomite. The percentage of limestone diminishes with depth. The basal unit is 25-50 feet of fine-grained finely laminated, light greenish-gray, phyllitic, dolomitic mudstone, and interbedded dolomite (Bartholomew and Lowery, 1979). This formation is thought to be part of the Pulaski overthrust sheet. Most of the rock units trend northeast-southwest. Southeastward dipping thrust faults and asymmetric folds overturned to the northwest are common (Dietrich, 1990).

The Pulaski thrust is one of several major southeast-dipping Alleghanian thrusts of the Southern and Central Appalachians. It has been traced along its strike for approximately 310 miles. Estimates of the displacement of the thrust range from 9.3 to 31.3 miles. Figure 4-1 shows the complex relationship of the overthrust sheets. The Pulaski sheet consists of two distinctively different lithotectonic units. Rocks of the Middle Cambrian Elbrook formation have been thrust over the younger rocks of Mississippian age (Schultz, 1986).

### **4.2 Soils**

The New River Ordnance Plant is underlain by gently to strongly sloping soils which developed from weathered products of shale interbedded with thin layers of limestone. These soils have a surface layer of dark, yellowish-brown sandy clayey silt approximately 8 inches thick. The subsoil to 60 inches, has an upper part of strong brown silty clay, a middle part of strong brown clay, and a lower part of silty sandy clay. These have been altered in places for urban use. In some places half of the original soil has been removed and the fill material can go as deep as 36 inches. In the undisturbed parts, the permeability is slow, while it varies in the fill areas. The soil is strongly acidic and can corrode uncoated steel. In this area, sheet and rill erosion is moderate to high (Cauley, et al., 1985). A detailed description of the site soils is presented in Table 4-1. Although the site soils may not exhibit the exact profile, they should possess similar engineering characteristics.



**Figure 4-1:** Regional geologic maps and cross section. (1), State and tectonic index map showing the major thrust sheets of the Southern Appalachian Valley and Ridge Province: a, Cumberland; b, Clinchport-St. Clair; c, Narros-Copper Creek; d, Saltville; e, Pulaski-Max Meadows; f, Blue Ridge. Regional geologic map shows major southeast dipping thrust faults and distribution of Paleozoic rocks near the study area. Bold letters: S.C., Saint Clair thrust sheet; Na., Narrows thrust sheet; S., Saltville thrust sheet; Pu., Pulaski thrust sheet; M., Max Meadows thrust sheet; B.R., Blue Ridge thrust sheet. Stratigraphic units are: M, Mississippian; S-D, Silurian through Devonian; C-O, Cambrian through Ordovician; Cc, Cambrian Conococheague Formation; Cerb, Cambrian Elkbroom and Rome formations and Max Meadows breccia; Cr, Cambrian Rome Formation; Cbc, Cambrian basal clastics. (3), Structure section along A-A'. Symbols same as geologic map except for b, basement rocks. (Modified from Schultz, 1986).

TABLE 4-1						
NEAR-SURFACE SOIL PROFILE						
DEPTH (IN)	SOIL DESCRIPTION	PERCENTAGE PASSING SIEVE NUMBER			LIQUID LIMIT	PLAS- TICITY INDEX
		#4	#40	#200		
0-8	Sandy, clayey silts (SM-SC)	80-100	50-100	30-90	25-40	5-15
8-60	Clay; silty sandy clays (CL, CH)	80-100	70-100	50-95	50-95	30-60
SOURCE: SOIL SURVEY OF PULASKI COUNTY, VIRGINIA						

### 4.3 Hydrology

#### 4.3.1 Surface Water

New River Ordnance Plant is located in Radford, near the city of Dublin, to the northeast of Pulaski, in Pulaski County, Virginia. The surface water from the site flows into the New River. New River at Radford has a drainage area equal to 2748.9 square miles. The Huntington District flood information for New River at Radford are:

<u>Annual Percent Chance of Exceedance</u>	<u>Elevation (NGVD)</u>
10	1732.3
5	1736.1
2	1741.5
1	1746.1
0.5	1750.7
0.2	1757.2

To determine the frequency in terms of the average recurrence interval, take the reciprocal of the annual percent chance; i.e., the reciprocal of the 2% annual chance (1/0.02) is a 50-year average recurrence interval flood. Because of the major highways around the site, it appears that any flooding from storms over the New River headwaters would come from the east.

#### 4.3.2 Ground Water

Numerous springs are due to the crushed and broken Elbrook formation which provides ample porosity. Depth to high water table is greater than 6.0 feet (Cauley, et al., 1985).

### 4.4 Weather

The New River Ordnance Plant is located in Pulaski County, Virginia. Pulaski County is in southwest Virginia about 70 miles west-southwest of Roanoke. January is usually the month

of minimum precipitation (2.42 inches) on the average, based on Pulaski data. July is usually the month of maximum precipitation (4.08 inches) on the average. The total annual precipitation is 37 inches. Of this, 20 inches, or 55 percent, usually falls in April through September, which includes the growing season for most crops. In 2 years out of 10, the rainfall in April through September is less than 17 inches. The heaviest 1-day rainfall during the period of record was 3.75 inches at Pulaski on May 29, 1973. Thunderstorms occur on about 40 days each year, and most occur in summer. The average seasonal snowfall is about 8 inches. The greatest snow depth at any one time during the period of record was 11 inches. On the average of 15 days, at least 1 inch of snow is on the ground. The number of such days greatly varies from year to year.

In the winter the average temperature is 32 degrees F, and the average daily minimum temperature is 24 degrees. The lowest temperature on record, which occurred at Pulaski on January 16, 1972, is -12 degrees. In summer the average temperature is 70 degrees, and the average daily maximum temperature is 82 degrees. The highest recorded temperature, which occurred at Pulaski on June 30, 1968, is 96 degrees. The average relative humidity in midafternoon is about 60 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines 60 percent of the time in possible summer and about 50 percent in winter.

The prevailing wind is from the southeast. Average wind speed is highest, 10 miles per hour, in winter.

#### 4.5 Ecology

The information provided below has been compiled from the U. S. Fish and Wildlife Service, Virginia Division of Natural Heritage, and the Commonwealth of Virginia Department of Agriculture and Consumer Services.

Two Federally-listed endangered species occur in Pulaski County. They include: Virginia fringed mountain snail (*Polygyriscus virginicus*), and smooth coneflower (*Echinacea laevigata*). Several candidate species include: Hellbender (*Cryptobranchus alleganiensis*), Atlantic heelsplitter (*Lasmigona subviridis*), regal fritillary (*Speyeria idalia*), piratebush (*Buckleya distichophylla*), and canby's mountain-lover (*Paxistima canbyi*).

The state lists the Virginia fringed mountain snail and piratebush as endangered species in Pulaski County. Candidate species include: Regal fritillary, fee's lipfern (*Cheilanthes feei*), smooth coneflower, tall gay-feather (*Liatris aspera*), plains muhly (*Muhlenbergia cuspidata*), and canby's mountain-lover.

Currently, no additional information on the occurrence of other candidate or endangered species or natural communities is available. This does not mean that other state or federally-listed species may not be present within the areas of interest. An on-site inspection by appropriate state and federal personnel may be necessary to verify the presence, absence or location of listed species, or natural communities.

## **5.0 Real Estate**

### **5.1 Present Ownership**

The Findings and Determination of Eligibility (FDE), cited in Paragraph 2.0, indicates that the FUDS site associated with the New River Ordnance Plant was disposed of as follows:

"Approximately 380 acres fee were sold to Burlington Industries by War Assets Administration in 1947 and 1948, 176 acres fee were sold to Stanley C. Frank by deed dated 22 April 1963, 184.32 acres fee were sold to Pulaski County Development Authority by deed dated 17 May 1963, 28 acres fee were sold to Commonwealth of Virginia by deed dated 26 July 1963, and 57.50 acres fee were conveyed to Pulaski County School Board by deed dated 22 May 1963. On 31 July 1961, 96.69 acres fee were reassigned to U.S. Army Reserve Outdoor Training Site at Radford and are still Government owned. By deed dated 19 May 1976, 13.80 acres fee were conveyed to the Town of Dublin. By deed dated 19 August 1976, 32.4 acres fee were conveyed to R. Kyle Hash; 4.093 acres to Henry Harvey, Jr. by deed dated 11 August 1976; 40.43 acres fee to George A. McConnell by deed dated 3 October 1977; and 11.92 acres to Samuel T. Elias by deed dated 8 March 1978. The remaining 2,813.447 acres fee are owned by the U.S. Government and is an active installation known as Radford Army Ammunition Plant (New River)."

The parcel owned by Flow Laboratories again changed owners due to the purchase of the Flow Laboratories subsidiary by ICN Pharmaceutical in November 1989.

### **5.2 Confirmed DOD Ownership**

Based on data contained in the FDE:

"In the 1940's, 3,838.60 acres fee, 22.72 acres easement, and 5 licenses (no area) were acquired from numerous landowners by purchase and condemnation. Radford Arsenal (New River Unit) was originally designated as New River Ordnance Plant. It was constructed in 1941 on 3,838.6 acres of Government owned land as a class II, temporary type installation. In 1946, the plant was designated as a subpost, and in 1960 became an integral part of Radford Arsenal."

### **5.3 Historically Significant Past Ownership**

There is nothing in the records to indicate that there were any historically significant past ownerships with respect to possible OEW or CWM contamination.

## **6.0 OEW/CWM Site Analysis**

### **6.1 Historical Summary of OEW/CWM Materials Activities**

Due to the nature of the products produced at New River Ordnance Plant and the working relationship with the Radford Army Ammunition Plant (AAP), the potential for OEW/CWM is present. However, the mission of the New River Ordnance Plant was the loading of propellant and igniter charges and the manufacture of the bags for such charges. While examination of historical records does indicate the storage of explosives within the land now designated as New River Unit of Radford AAP, this does not discount the possibility that at some time OEW/CWM was present at this DERP-FUDS site.

### **6.2 Records Review**

#### **6.2.1 Archive searches**

The locations listed below were searched for records relating to OEW/CWM activities at New River Ordnance Plant, Radford, Virginia.

Notes on records reviewed follow each entry. At the National Archives and Records Centers, we examined the following record groups as they were present and as initial inquiry led us to believe they might contain useful information. As at other repositories, we used finding aids, archivists, and records managers to locate portions of the records relevant to our research.

- RG 70 -Records of the Bureau of Mines
- RG 77 -Records of the Office of the Chief of Engineers
- RG 92 -Records of the Office of the Quartermaster General
- RG 135 -Records of Installations and Security Files
- RG 156 -Records of the Chief of Ordnance
- RG 159 -Records of the Office of the Inspector General
- RG 175 -Records of the Chemical Warfare Service
- RG 270 -Records of the War Assets Administration
- RG 338 -Records of United States Army Commands

National Archives, Washington D.C. We copied one entry in the military reference file.

National Archives/Washington National Records Center, Suitland, MD. Records were examined in RG 70; RG 77; RG 92; RG 156; RG 159; RG 175; RG 338. We copied general historical information relating to the inception of the New River Ordnance Plant. We copied correspondence relating to production schedules as well as operational documentation.

National Archives/Mid Atlantic Region, Philadelphia, PA. Records were examined in RG 270. We copied an appraisal report and valuation analysis on New River Ordnance Plant.

We also copied material relating to the potential sale of the New River Ordnance Plant property.

Philadelphia Federal Record Center/Philadelphia, PA. We examined records in RG 77 and RG 135. We copied maps and information relating to proposed engineering projects.

National Personnel Record Center/St. Louis, MO. We found no information concerning New River Ordnance Plant.

Historical Division, Chemical and Biological Defense Agency Aberdeen Proving Ground, MD. We copied information on Radford Ordnance Plant which referenced the New River Unit.

#### 6.2.2 Interpretation of aerial photographs

Photo analysis and land use interpretation was performed at the site with the use of aerial photography from 1949, 1963, and 1972. The approximate negative scale of the photography is as follows:

1949 & 1972	1" = 2000'
1963	1" = 2200'

The 1949 photography reveals the plant in operation. Planimetry within the area of concern include road networks, inert warehouses, the bag loading area, and plant support facilities including the water plant, sludge drying area, equalization tank, etc. Outside the area of concern is a large complex of igloos for high explosive and smokeless powder. The inert warehouse complex is located in the western portion of the area of concern. The bag loading facility is located in the southern portion of the site and the facilities support is located in the center of the site. A railroad line runs across the northern portion of the area. Several areas within the site appear to be disturbed and possibly under construction.

The 1963 photography reveals that the inert warehouse facility has expanded with an additional building complex to the southeast. The bag loading area and support facility area appear to be unchanged between the 1949 and 1963 photography. No other significant expansion of the area of concern is noted.

The 1972 photography shows significant change in the area of concern. A liquid storage tank has been constructed immediately east of the inert warehouse facility. Expansion of the support facility area is noted. The bag loading area appears unchanged. Significant urban development is noted to the immediate north of the area of concern.

#### 6.2.3 Map analysis

The New River Ordnance Plant site was analyzed by referencing the 7.5 minute quadrangle map from 1965. The map was photorevised in 1984. The map shows basic topography and



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planimetry of the area. Planimetry of the area includes streams, lakes, radio facilities, trails, etc. The area is sparsely to moderately populated. The map indicates the location of the ammunition plant and the location and position of the gunpowder loading facilities which are the areas of interest in this project.

A 1943 General Layout of New River Ordnance Plant was obtained. The map shows general boundaries, and planimetry of the base during the time period. The planimetry includes roads, road names, and buildings. The map also indicates specific real estate information regarding the base. The map has a legend indicating the various buildings and areas on the base. The map indicates the location of the inert warehouses, bag loading area, facility support (water plant, sludge drying area, equalization tank, etc.), and the igloo area for storage of high explosives and smokeless powder. The map was last revised on 11/2/87.

### 6.3 Interviews

#### 6.3.1 General

Interviews were conducted by telephone both prior to and after the site inspection.

#### 6.3.2 Mr. Steve Devore

On 20 August 1993, Robert Wich called Mr. Steve Devore, Chief, Civilian Operations, Radford AAP, 703-639-8645. Arrangements were made to meet with him and Joann Jenkins, an industrial technician and the site historian, 703-639-7480, on 2 September to obtain information on the New River Ordnance Plant site. He stated that he has been at RAAP about four years and that Ms. Jenkins had been there for quite a long time. He said that he was not aware of any OEW or CWM being found at the New River site, but stated that some OEW is occasionally found on the Radford Range. The Radford Range is not part of the FUDS portion of the Radford AAP. He requested that we send a letter regarding our visit to the Security Officer, Mr. Carl Chase. He also provided information on the Norfolk District's Area Office at the Radford AAP, and suggested that contacting Mr. Jodi Blackburn.

#### 6.3.3 Mr. Jodi Blackburn

On 20 August, Robert Wich called Mr. Jodi Blackburn, 703-639-7656, and talked to the Assistant Area Engineer, Mr. Guy Rhodes. He said that he had been at the site about 10 years and had never heard of anything related to OEW or CWM being associated with the New River facility of the Radford AAP. He said that Mr. Blackburn had been there only a couple of years and would have even less knowledge of the area.

#### 6.3.4 Mr. Peter Huber

On 20 August 1993, Robert Wich called Mr. Peter Huber, Assistant County Administrator, Pulaski County, 703-980-7705. He indicated that the area acquired in the 1960s was

probably the housing facilities of the New River Ordnance Plant and that this was now a residential area with many of the old quarters still in use. He was not aware of any OEW or CWM concerns on any of the FUDS portion of the site. His understanding of what the area was used for was consistent with our information in the INPR. He also furnished a list of possible contacts for Burlington Industries and ICM Pharmaceuticals, owners of major portions of the site.

On 30 August 1993, Bob again called Mr. Peter Huber, who had indicated in the previous conversation that he would probably have additional information. He said that the property currently owned by the County was being used for a vehicle maintenance facility and dog pound, and the school board used part of the site. He said that he had no recollections of anything related to OEW or CWM being encountered at the site. He said that over the years they had installed and removed underground storage tanks (UST) on several occasions and not encountered anything. He said that we were welcome to visit the site and should contact Mr. Doug Mayberry who is located at the County's facilities and is very familiar with the site since he has been there for some time.

On 15 September 1993, Dan Bradley also called Mr. Huber. He stated that no incidents involving CWM/OEW had been noted. He stated that Flow Laboratories is attempting to sell some of their approximately 140 acres. He suggested contacting Tom Turner for more information regarding property ownership by Flow Laboratories.

#### 6.3.5 Ms. Joann Jenkins

On 30 August 1993, Robert Wich called Ms. Joann Jenkins, Radford AAP, 703-639-7480. Arrangements have been made to meet with her and Mr. Steve Devore, Chief, Civilian Operations, on 2 September 1993 for the site inspection of the subject site. Ms. Jenkins is the unofficial historian with respect to the Radford AAP, including the New River site. She said that she would have maps and drawings available for the meeting and she also furnished information on current owners of the FUDS portion of the New River Ordnance Plant. She said that in her 19 years with the Radford AAP that she had never heard of anything associated with OEW or CWM being at the New River Ordnance Plant site.

#### 6.3.6 Mr. Bill Ward

On 30 August 1993, Robert Wich called Mr. Bill Ward, 703-674-4653, with Burlington Industries and the plant manager at the Dublin, VA, plant site. He referred Bob to Mr. James Wright, 919-379-2289, their environmental engineer, in Greensboro, NC. Bob then called Mr. Wright and explained the purpose of the call and site inspection. Mr. Wright was located at the site for about three years in the early 1980s and has been involved with the site the past several in his current capacity. Burlington Industries has closed the plant at the site and is trying to sell the property. He said that he checked their files of the site and found several environmental assessments of the site; none of them had any mention of CWM or OEW contamination. He said that they were in the process of cleaning up some hydrocarbons that resulted from their use of the site and that some of the contamination,

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namely from kerosene, was not theirs but would be cleaned up at the same time. He said that they had also removed some underground storage tanks (UST) in the past that were probably from DOD use of the site. He requested a letter requesting permission to visit the site. Bob sent the letter the same day via FAX.

#### 6.3.7 SFC Jim Cook

On 30 August 1993, Robert Wich called the U.S. Army Reserve Center located on part of the New River Ordnance Plant site and talked to SFC Jim Cook, 703-674-5881. He said that the Army had been using part of the site for the past three years or so for exercises several times a year. They had not encountered anything manmade and that "the only noxious thing that they had encountered was a skunk". He said that there were some 55-gallon drums located on the Flow Industries property behind the Reserve Center site and that these had been reported. He said that we should meet with Mr. John Lowman or SFC Darlene Kuntz when we came for the site inspection.

#### 6.3.8 Mr. Doug Mayberry

On 30 August 1993, Robert Wich called Mr. Doug Mayberry, 703-674-8667, Director of Fleet Maintenance and Operations, Pulaski County. He said that the site Pulaski County uses is about 20-25 acres, part of which is fenced and the balance has been used over the years as a borrow area to obtain clay for landfill covers. He said that he has been at the site for about 15 years and that they have never encountered anything related to DOD use of the site in all of the grading and excavation they have performed. He said that he had never heard of anything like OEW or CWM being associated with the site and that they have not encountered contamination of any kind on their site. He also said that part of the site was occupied by the school board. Arrangements were made to meet with him on 2 September 1993 for the site inspection.

#### 6.3.9 Ms. Jill Barr

On 6 August 1993, Dan Bradley called Ms. Jill Barr, 703-731-3623, Director, City Economic Development, Radford, VA. Ms. Barr stated that to her knowledge, there was no evidence of CWM at New River Ordnance Plant, past or present. She suggested contacting Nicole Kinser at Radford Arsenal.

#### 6.3.10 Ms. Nicole Kinser

On 16 August, Dan Bradley contacted Ms. Nicole Kinser, 703-639-7631, Public Affairs Officer, Radford AAP. Ms. Kinser stated that she was unaware of the New River plant ever being involved with CWM. There have been no reports of any occurrences involving CWM and that to her knowledge neither Radford Arsenal or New River ever dealt in CWM. She suggested contacting Mr. Kirtley of Hercules Powder Co. who operated the Government Owned Contractor Operated (GOCO) facility at New River.

#### 6.3.11 Mr. Kirtley

On 16 August, Dan Bradley also called Mr. Kirtley, 302-594-6918, Public Affairs Officer for Hercules Powder Company, located in Wilmington, Delaware. Mr. Kirtley stated that he has been employed with Hercules Powder for a number of years and that Hercules Powder was the operator of the New River installation. He stated that to his knowledge Hercules Powder was never involved in CWM and that no CWM activity took place at the New River Ordnance Plant. He spoke with the Vice President of the General Counsel for Hercules Powder who confirmed his conclusions. He stated that the New River plant was used for bag powder and powder storage. He continued by stating that existing facilities are still utilized at New River for powder storage operating under a contract through Radford AAP.

#### 6.3.12 Mrs. Sophia Pearson

On 18 August 1993, Dan Bradley called Mrs. Sophia Pearson, 703-731-3621, Librarian at the Radford Public Library. She researched a number of sources including past editions of newspapers and local history reference books and materials and found nothing relating to CWM and the ordnance plant at New River. She suggested contacting Radford University, 703-831-5696, for additional information.

#### 6.3.13 Mr. Maynard DeHart

On 14 September 1993, Dan Bradley called Mr. Maynard DeHart, 703-552-2876. Mr. DeHart was employed at Radford AAP as a Maintenance Engineer for 42.5 years. He has been retired for 5.5 years. He stated that he is quite familiar with the operational aspects of Radford AAP and the history of that installation and the New River unit. He stated that to his knowledge, no CWM or OEW has been noted. He amplified that it has been his experience that neither unit has been involved with CWM. He offered his assistance should future conditions warrant such action.

#### 6.3.14 Mr. Tom Turner

On 15 September Dan Bradley called Mr. Tom Turner, 704-541-1393. Mr. Turner is employed by the Hart Corporation, which is the real estate agency marketing the sale of property of the former Flow Laboratories. He stated that the property in question consisted of 141 acres but he was not familiar with the original transactions under which Flow Labs acquired the property. He suggested contacting Ms. M'Liss Kane.

#### 6.3.15 Ms. M'Liss Kane

On 15 September, Dan Bradley also contacted Ms. M'Liss Kane, 714-545-0100. Ms. Kane is employed by ICN Pharmaceutical and stated that Company had acquired the subsidiary of Flow Laboratories and hence the property in question. She confirmed that the property was 141 acres but could furnish no further information. She suggested contacting Tom McCabe.

#### 6.3.16 Mr. Tom McCabe

On 15 September, Dan Bradley called Mr. Tom McCabe, 703-506-5005, who is employed by GRC International which was instrumental in the sale of the Flow Labs subsidiary to ICN Pharmaceutical. He stated that Flow Labs had a lease with option to purchase agreement with Stanley Frank. He could not provide exact dates and acreage and suggested contacting Mr. Frank.

#### 6.3.17 Mrs. Jean Comer

On 15 September, Dan Bradley then called Mrs. Jean Comer, 703-980-7750, Commissioner of Revenue, Real Estate Office, Pulaski County, VA. Mrs. Comer stated that her office did have a copy of the deed of sale between Stanley C. Frank and Flow Labs. She stated that by purchase deed dated 16 March 1988, 140.14 acres was transferred.

### 6.4 Site Inspection

#### 6.4.1 General

The site inspection was performed on 2 September 1993 by the following St. Louis District personnel:

Robert F. Wich  
Frederick T. Miller  
Daniel L. Bradley

Project Manager  
Historian/Archivist and Site Safety Officer  
Historian

#### 6.4.2 Detailed Site Inspection

We departed the motel in Blacksburg, VA, and proceeded to the Radford AAP. Fred Miller gave the safety briefing enroute to the site and safety aspects related to the site were discussed.

At the Radford AAP, we met with Mr. Steve Devore, Chief, Civilian Operations, and Ms. Joann Jenkins, an Industrial Specialist who was quite knowledgeable concerning the facility. Mr. Devore has only been at the installation a short time and had limited historical knowledge of the site. He departed after introductions. Ms. Jenkins has been at Radford about 19 years and works in the real estate office. The plant has always been a GOCO facility, even dating back to World War II. The plant, including the New River Ordnance Plant, have been operated by the Hercules Powder Company since their construction.

Ms. Jenkins provided a drawing titled General Layout of New River Ordnance Plant. This drawing, dated March 1943 and revised through 2 November 1987, clearly delineated the property that had been disposed of and the names of the parties that acquired the sites. Generally, the FUDS portion of the New River site is at the western end of the site. The vast majority of the site is still active and is a part of Radford AAP. The two sites are about

12 miles apart via road. The FUDS area consists of the former bag loading area for explosive powder (propellant for munitions), a warehouse area, officers quarters, administration area, a rail siding area, and some undeveloped tracts that served as buffers between the plant and the adjacent private property. The plan provided by Ms. Jenkins proved to be very useful during our site inspection.

Ms. Jenkins stated that she had no knowledge of anything related to CWM ever having been associated with either Radford AAP or the facilities located at the New River Ordnance Plant. Likewise, she was not aware of anything related to OEW or CWM having been encountered in the development of the property that had been disposed of. She indicated that Maynard De Hart, a former employee who had been associated with the site during World War II and worked there until his recent retirement, may be able to furnish additional information. She also provided his phone number, 703-552-2876, and said that he would probably be glad to talk to us about the site.

We departed Radford AAP and proceeded toward the New River site. We discussed the fact that throughout the archive searches, phone interviews, and personal contacts, no information had been developed indicating that the New River Ordnance Plant site or the Radford had ever been associated in any way with any type of Chemical Warfare Materials. We discussed this lack of a connection between CWM and the site and could not answer the basic question of why this site was included on the list for preparation of an ASR. In fact, neither installation had ever been known to have ordnance present since both were involved in the manufacturing of various types of powder, propellants, and igniters.

Our first stop on the site inspection was the Newbern Plant of Burlington Industries. From information available prior to the site inspection, we were aware that Burlington Industries (BI) had acquired major portions of the FUDS, utilized the site for their textile operations for many years, subsequently closed the plant and disposed of portions of the site, and still had a presence on the site. We met with Mr. Bill Ward, the plant manager. Mr. Ward has worked at the site since 1960 with only a couple of minor interruptions in his time there. He too had no information as to CWM ever having been at either the Radford or New River sites.

Mr. Ward was extremely helpful in both explaining the history of the site and providing a tour of most of the FUDS portion of New River site. Burlington Industries had acquired essentially all of the hospital area, officers quarters, warehouse area, and the sewage and water treatment facilities. The property originally acquired by BI was bounded on the west by Newbern Road, shown on the General Layout as Old VA Route 100, and on the south by Wilderness Drive, shown on the drawing as Old Rock Road. Mr. Ward said that in all of the years he had been at the site, nothing related to OEW or CWM had ever been encountered. He indicated that BI had sold portions of the site to the Town of Dublin and that other companies were using parts of the warehouse area. He said that BI was trying to sell the balance of the property they owned at this location.

We drove through the former warehouse area which had been served by rail lines. Most of the former DOD buildings in this area are still intact and in use. Some have been demolished or altered. There are a variety of owner/users of these facilities. We drove by the wooded area south of the warehouses, an area that has never been developed during either DOD use or subsequent ownerships. The southern end of this area contained the hospital complex. These buildings are, for the most part, still standing but have not been used. The officers' quarters on the south end of the site are now single family homes and the area looks much like it did when it was part of the New River Ordnance Plant.

We proceeded to the area of the bag loading facilities. This 176-acre parcel contained three bag loading facilities each consisting of several buildings, some with embankments or blast shields providing protection on three sides. Virtually all of the buildings are still standing and, according to Mr. Ward, most of the site is owned by Flow Laboratories. Several new buildings have been constructed by Flow Laboratories. All of the former buildings appear to have been abandoned, however, most of the buildings were padlocked. One of the buildings was not locked and contained a variety of equipment and crates. Several of the buildings were recently used by Riggs Corporation, a manufacturer of cedar products, which moved out several months ago. Except for the area of the relatively new buildings, this entire area is heavily overgrown with all of the buildings are in a dilapidated condition.

We then drove to the northeastern part of BI's property which originally contained the water and sewage treatment facilities. The water treatment facilities had been used by BI for their plant until it closed. We left this area and returned to Newbern Road and proceeded north to the intersection with Bagging Plant Road, shown on the General Layout as Dublin Cut-Off Road. This road generally served as the northern boundary of the New River Ordnance Plant site. It was not developed and served as a buffer between the plant and the adjoining private property. The area was originally acquired by the Pulaski Development Authority and is now owned by a variety of concerns and public entities. We returned to this area later.

We then returned to the BI plant and thanked Mr. Ward for both his assistance and the information relative to the site. We felt truly fortunate to have met with Mr. Ward because of his seemingly endless knowledge concerning the site.

We then met Mr. Doug Mayberry, Director of Fleet Maintenance and Operations at the Pulaski County property. This property is on the south side of Bagging Plant Road and includes a vehicle maintenance facility, dog pound, and vehicle storage area. It was part of the tract originally transferred to the Pulaski County Redevelopment Authority. Mr. Mayberry has been at this facility for 15 years and said that nothing even remotely related to OEW or CWM had ever been found in any of the work that had been done on the site. He said that parts of the property originally acquired by the Pulaski County Development Authority were currently being used as a park and by the Pulaski County School Board and that several industrial firms now owned parts of the original Pulaski County property. Immediately west of the County property is a tract owned by the Commonwealth of Virginia and used by the Highway Department as a maintenance facility. The remaining parcel originally owned by Pulaski County is west of Newbern Road and is now owned by the

Pulaski Furniture Company. This firm also owns the property immediately south of the tract. This tract originally served as a rail yard for the New River Ordnance Plant and, according to Mr. Mayberry, has remained undeveloped. There is no road access to this tract. We then left the Maintenance Facility and drove through the various areas that had originally been acquired by Pulaski County.

The final stop on the site inspection was the U.S. Army Reserve Center, located on approximately 96 acres of the former New River Ordnance Plant along Wilderness Drive. We met Mr. John Lowman, Facility Manager and Unit Administrator. He has been at this site since 1978 during which time he served on active duty with the military, in an Army Reserve status, and eventually as a federal employee. This installation includes a small office building and a paved parking area. The vast majority of this site is undeveloped and is used as pasture land. Mr. Lowman explained that the area could be used as a training area in the future. This tract, on the southern edge of the New River Ordnance Plant site, was used only as a buffer area between the bag loading facilities and the adjacent private property. Mr. Lowman stated that nothing related to OEW or CWM had ever been found.

This concluded our site inspection of the FUDS portion of the former New River Ordnance Plant site. At no time during the inspection did we note first hand anything suggesting CWM or OEW contamination of the site. We also were not able to obtain any information from the records reviewed indicating that CWM had ever been associated with New River Ordnance Plant.

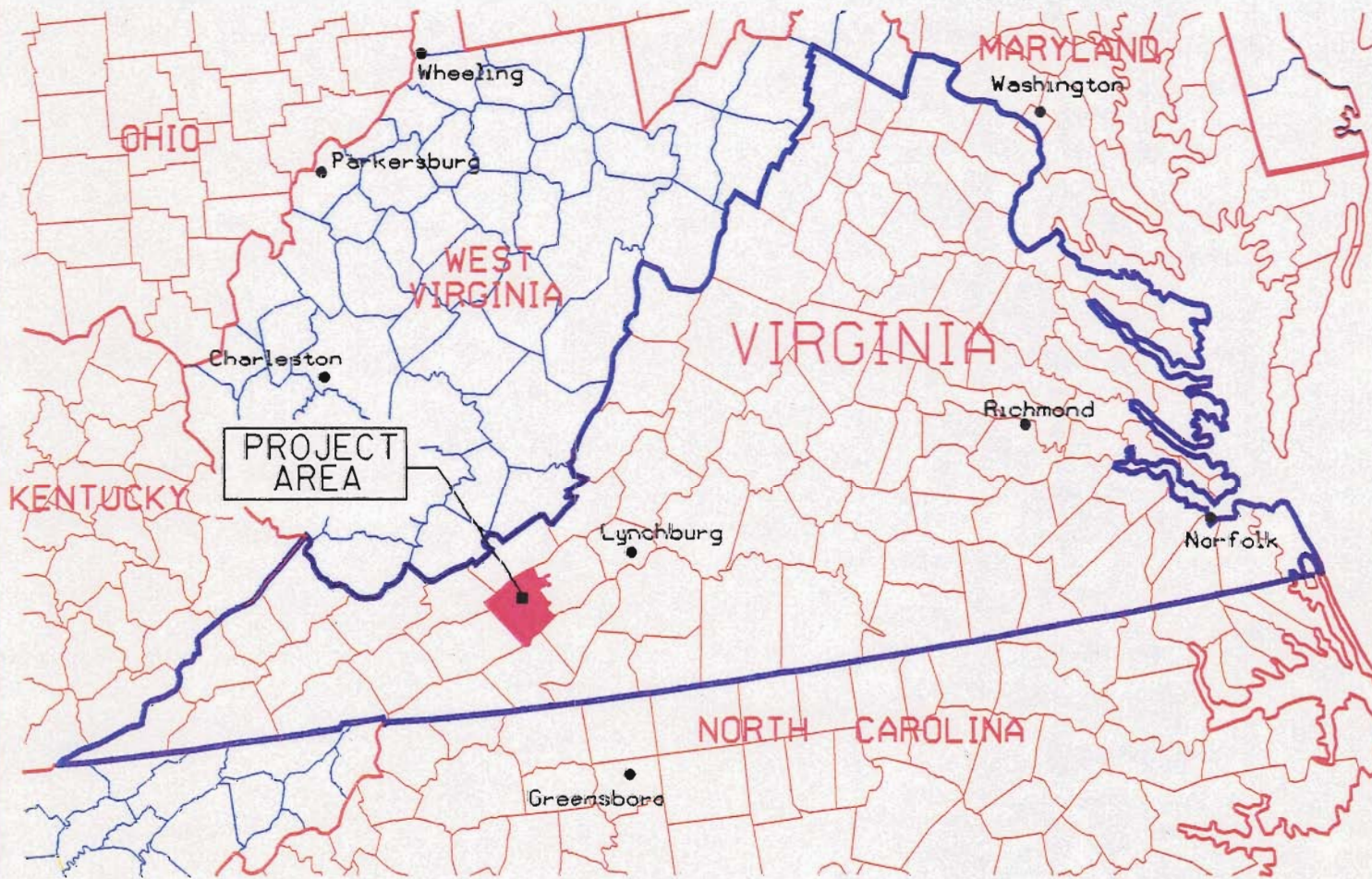


## **7.0 Evaluation of Ordnance Contamination**

Based on the extensive archive searches performed, the interviews with the owners of this DERP-FUDS site, and the results of the site investigation, there are no indications as to any CWM or OEW contamination of the DERP-FUDS site which was previously part of the New River Ordnance Plant. There is nothing that indicates that Chemical Warfare Materials were ever associated with this DERP-FUDS site. Likewise, there is nothing in the records that would indicate any CWM/OEW contamination of this DERP-FUDS site from any of the operations conducted at this site. This DERP-FUDS site served as a bag loading facility for the Radford Army Ammunition Plant and the former DOD areas that were disposed of include the bag loading facility area as well as the warehouse, hospital, officers' quarters, and administrative areas.

## **8.0 Conclusions and Recommendations**

Despite the extensive archive searches and other activities undertaken for this report, there is no way to guarantee that chemical warfare material contamination (CWM) does not exist at the DERP-FUDS site associated with the New River Ordnance Plant. This area has been associated with the bagging and storage of powder, however, there is no evidence to support that there is any resultant contamination from these activities. Based on the absence of OEW/CWM at this DERP-FUDS location, a Risk Assessment Code (RAC) of 5 has been assigned. No additional actions are recommended based on this Archives Search Report.

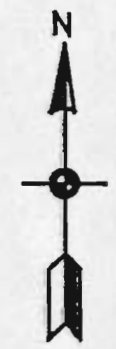
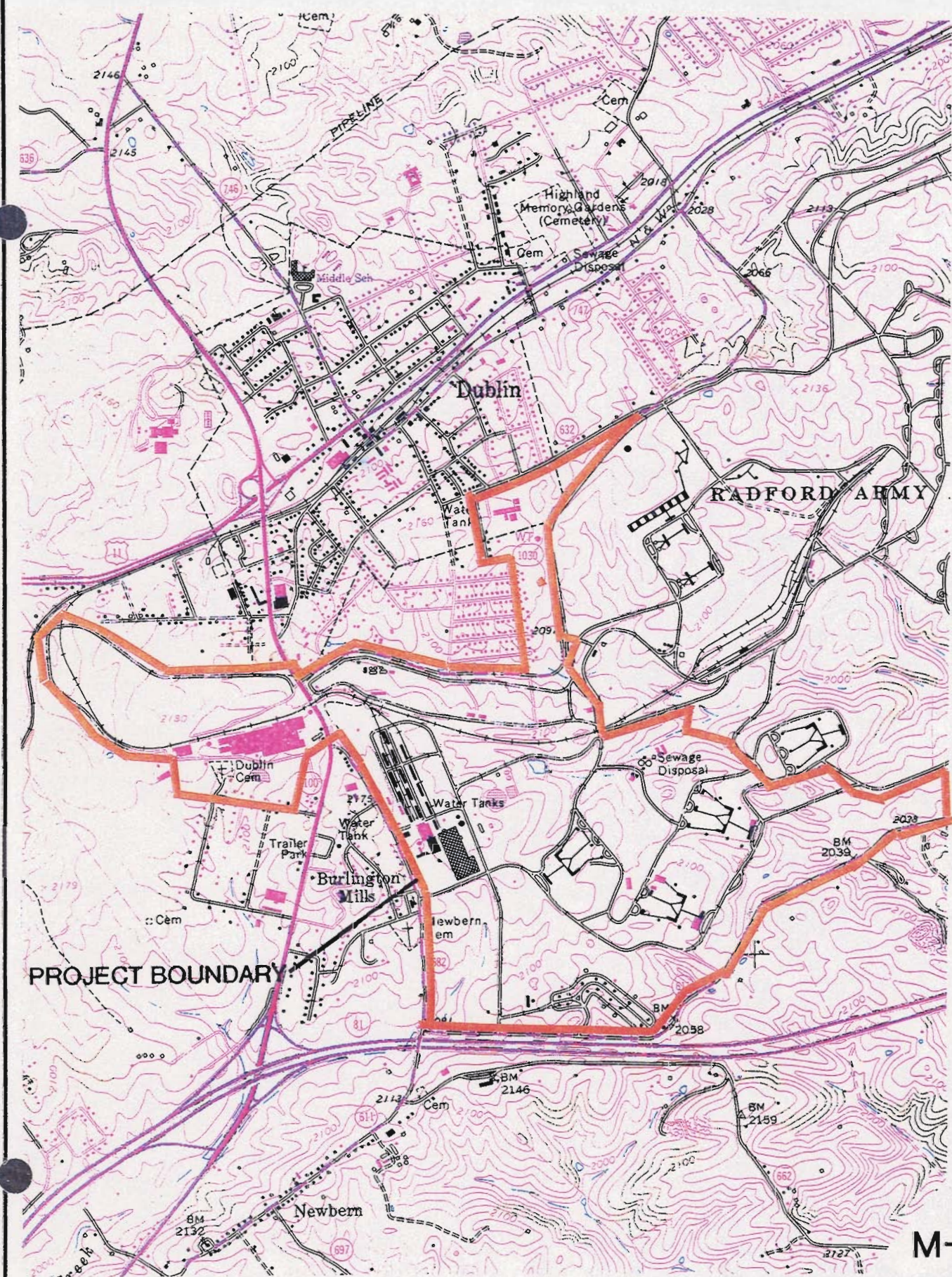


M-1

PROJECT LOCATION  
NEW RIVER ORDNANCE PLAN  
RADFORD , VIRGINIA

DATE:                      DATE OF MAP 195



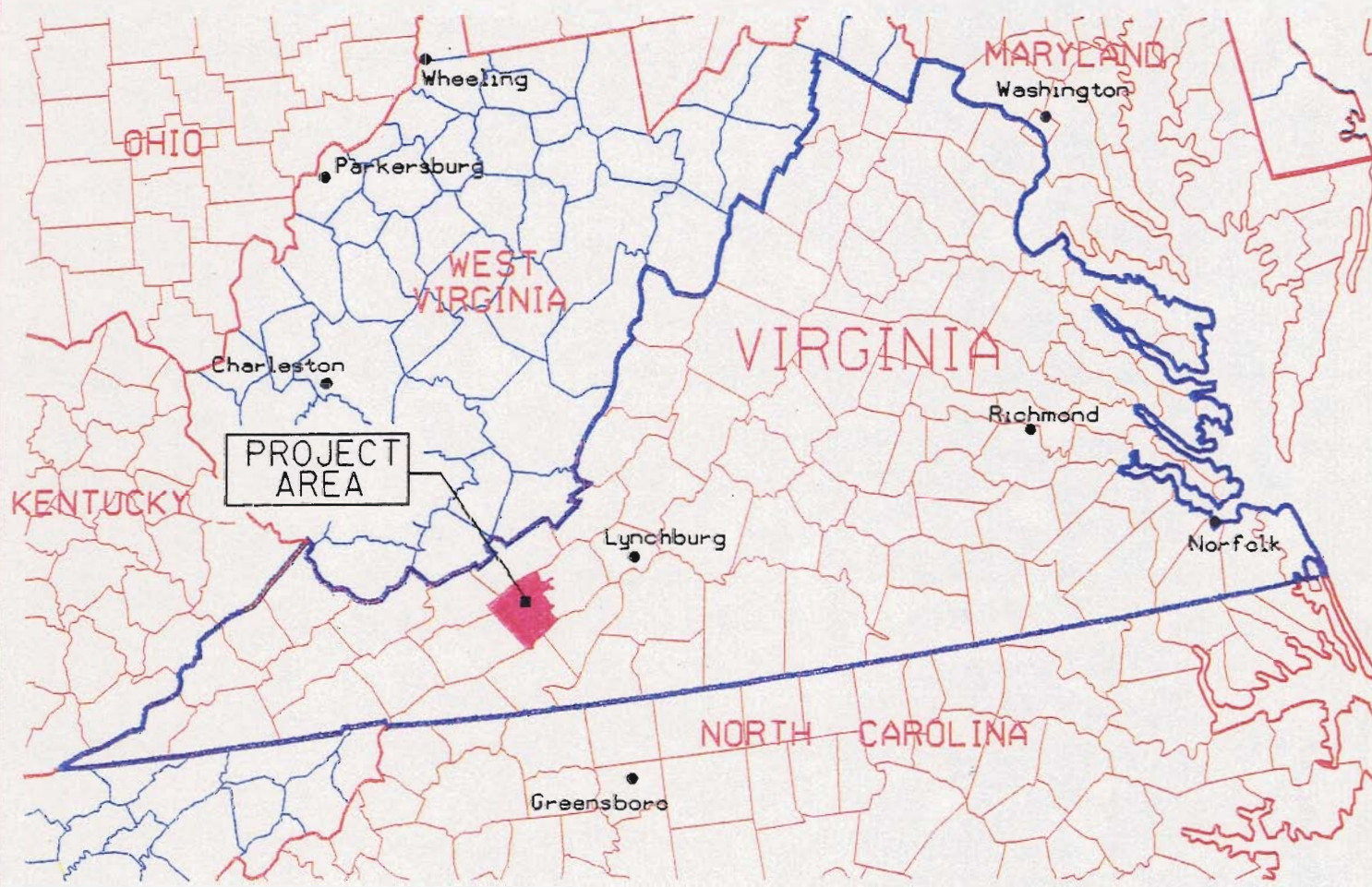


M-2

VICINITY MAP NEW RIVER ORDNANCE PLANT RADFORD, VA		
PROJ. DATE:		
PREPARED BY: J. BLONDELL		NOT TO SCALE



## **MAPS/DRAWINGS**

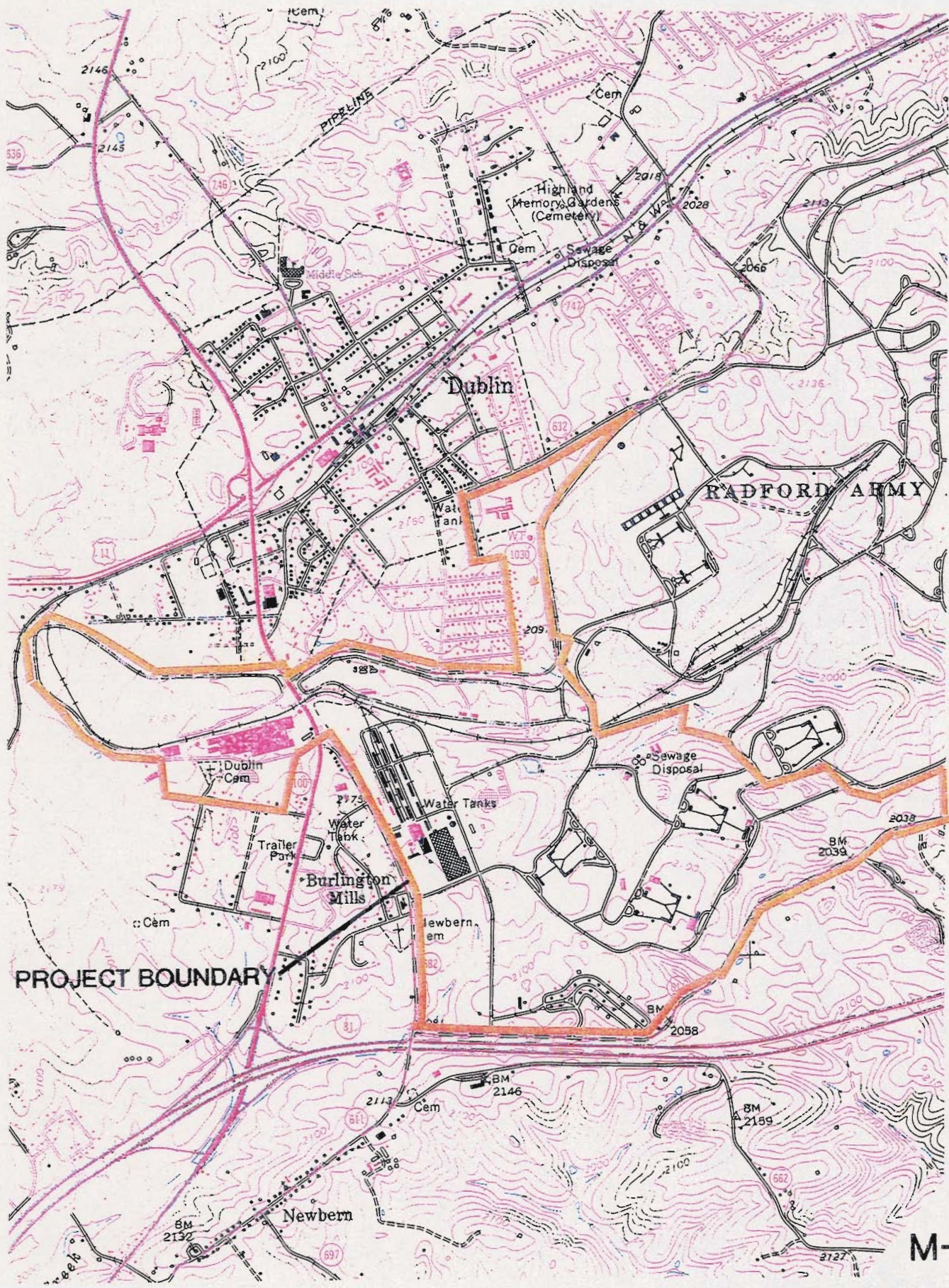


M-1

PROJECT LOCATION  
NEW RIVER ORDNANCE PLAN  
RADFORD, VIRGINIA

DATE: DATE OF MAP 19





M-2

VICINITY MAP NEW RIVER ORDNANCE PLANT RADFORD, VA	
PROJ. DATE:	
PREPARED BY: J. BLONDELL	NOT TO SCALE

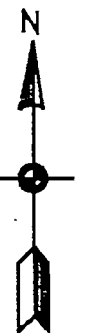




M-3

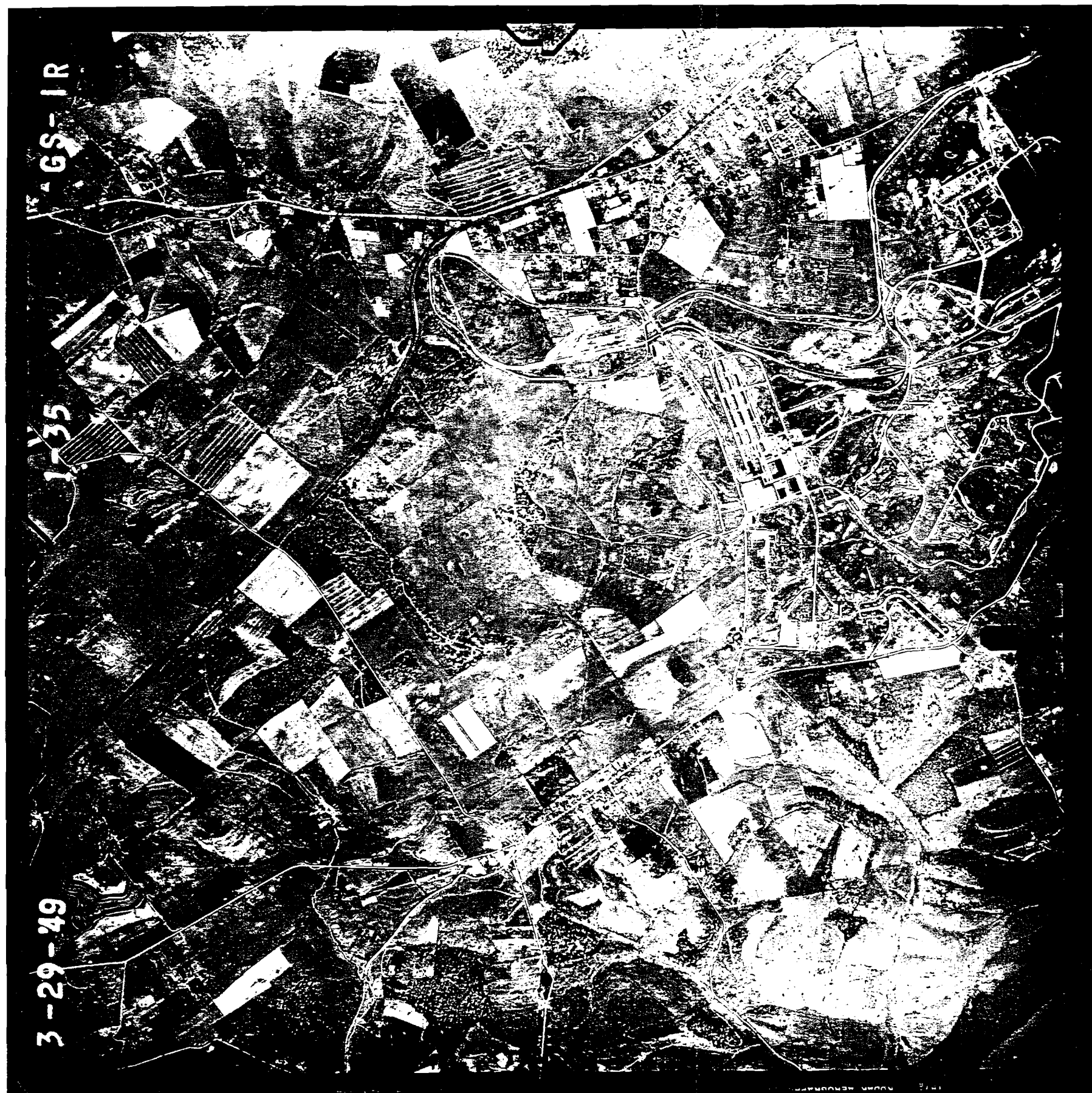
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M-4

AERIAL PHOTO 1949 NEW RIVER ORDNANCE PLANT RADFORD, VA		
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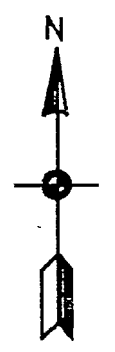
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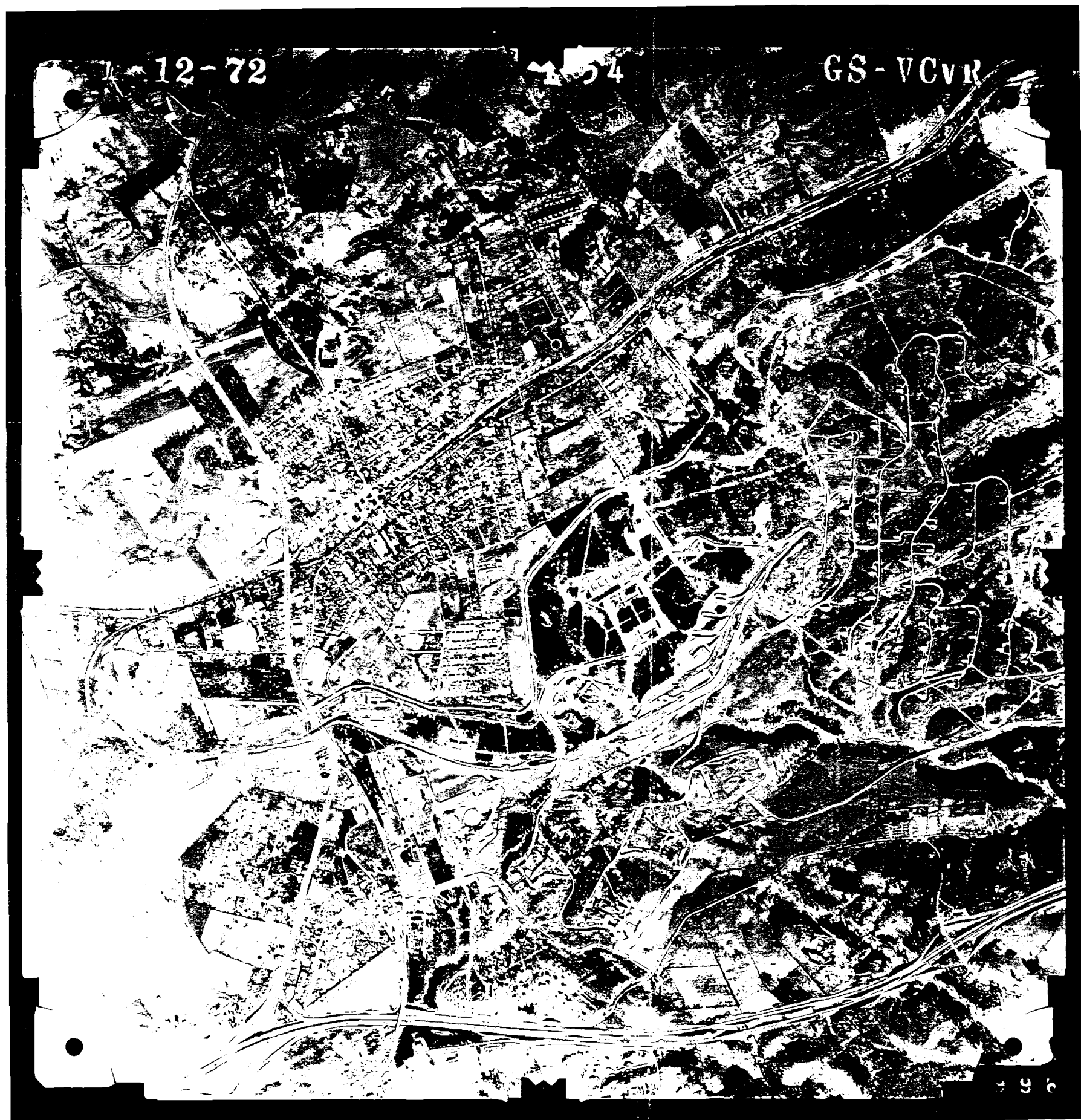
M-5

AERIAL PHOTO 1949 NEW RIVER ORDNANCE PLANT RADFORD, VA		
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M-6	
AERIAL PHOTO 1963	
NEW RIVER ORDNANCE PLANT	
RADFORD, VA	
PROJ. DATE:	DATE OF PHOTO:
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M-7

AERIAL PHOTO 1972  
NEW RIVER ORDNANCE PLANT  
RADFORD, VA

PROJ. DATE:	DATE OF PHOTO:
	NOT TO SCALE

# APPENDIX A

## REFERENCES

Ordinance and Explosive Waste  
Chemical Warfare Materials  
Archives Search Report  
for  
New River Ordnance Plant  
Radford, Virginia  
Site Number - C03VA0047

APPENDIX A

REFERENCES

Hercules Powder Company

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Hercules Powder Company

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## **APPENDIX B**

### **ACRONYMS**



Ordnance and Explosive Waste  
 Chemical Warfare Materials  
 Archives Search Report  
 for  
 New River Ordnance Plant  
 Radford, Virginia  
 Site Number - C03VA0047

APPENDIX B

ACRONYMS

AAP	Army Ammunition Plant
ASR	Archives Search Report
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CEHND	Corps of Engineers, Huntsville Division
CSM	Chemical Surety Material
CWM	Chemical Warfare Material
DERA	Defense Environmental Restoration Account
DERP	Defense Environmental Restoration Program
DLA	Defense Logistics Agency
DOD	Department of Defense
EOD	Explosives Ordnance Disposal
EPA	Environmental Protection Agency
ERDA	Environmental Restoration Defense Account
FDE	Findings and Determination of Eligibility
FUDS	Formerly Used Defense Sites
FWS	U. S. Fish and Wildlife
GSA	General Services Administration
HTW	Hazardous and Toxic Waste
INPR	Inventory Project Report
IRP	Installation Restoration Program
MCP	Mandatory Center of Expertise
NCP	National Contingency Plan
OEW	Ordnance and Explosive Waste
SARA	Superfund Amendments and Reauthorization Act
USACE	U.S. Army Corps of Engineers
USADACS	U.S. Army Defense Ammunition Center and School
USAED	U.S. Army Engineer District
USAEDH	U.S. Army Engineer Division, Huntsville, AL
USATHMA	U.S. Army, Corps of Engineers, Toxic and Hazardous Materials Agency
UST	Underground Storage Tank
UXO	Unexploded Ordnance

**APPENDIX C**  
**REPORTS/STUDIES/LETTERS/MEMORANDUMS**

Ordnance and Explosive Waste  
Chemical Warfare Materials  
Archives Search Report  
for  
New River Ordnance Plant  
Radford, Virginia  
Site Number - C03VA0047

APPENDIX C

REPORTS/STUDIES/LETTERS/MEMORANDUMS

Site Specific Safety and Health Plan (SSHP), New River Ordnance Plant, Radford, Virginia, 29 August 1993	C-1
Memorandum, CELMS-PM-M, 8 September 1993, subject: Trip Report, Site Inspection, New River Ordnance Plant, Radford, Virginia, Site No. C03VA0047	C-2

29 August 1993

SITE-SPECIFIC SAFETY AND HEALTH PLAN (SSHP)  
New River Ordnance Plant, Radford, Virginia

1. PURPOSE. This plan prescribes the safety and health requirements for team activities and operations conducted to determine the presence of ordnance and explosive waste (OEW) from conventional munitions and/or chemical warfare material (CWM) at the specified site.

2. APPLICABILITY. This plan applies to HQUSACE team personnel and assigned elements under the authority of HQUSACE.

3. REFERENCES. The provisions of this plan implement safety and health standards and requirements contained in 29 CFR 1910.120, 30 CFR 56, Executive Order 12196, DODI 6055.1, AR 385-10, AR 385-40, and EM 385-1-1.

4. STATEMENT OF SAFETY AND HEALTH POLICY.

a. No person shall be required or instructed to work in surroundings or under conditions which are unsafe or dangerous to his or her health.

b. Each team member has the responsibility to immediately halt the team's operations and activities upon encountering an unsafe situation or seeing an unsafe act.

c. Each team member is responsible for reading the SSHP before a site visit, complying with applicable safety requirements, wearing prescribed safety equipment, knowing the symptoms of chemical/biological agents, and preventing avoidable accidents.

5. TRAINING. Prior to site visits each team member shall have received the necessary training (OSHA, First Aid, CPR, Explosives Recognition, Chemical Warfare Weapons), to include refresher training on a scheduled basis, as required by the references listed in paragraph 3.

6. REPORTING REQUIREMENTS. Safety violations will be immediately reported to the designated team safety officer. The team safety officer shall report the findings of fact regarding the safety violation(s) through designated channels, as prescribed by the references listed in paragraph 3.

7. SITE SPECIFICS. Site description, possible hazards, recon procedures, emergency telephone numbers (medical, police, fire, and other contacts), personnel protective equipment, weather precautions, responsible personnel, site control and communications are provided in Enclosure 1. Enclosure 2 are map(s) of the site. Symptoms of chemical agents are provided in Enclosure 3. Prior to entering the site itself, a briefing by the team safety officer shall be provided to all team members. See Enclosure 4.

*Frederick T. Miller*

FREDERICK T. MILLER  
Safety Officer  
Alpha East Team

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SITE SPECIFICS  
(Enclosure 1)  
for  
New River Ordnance Plant

1. Site History/Description. In 1941, the New River Ordnance Plant was constructed on 3,838.60 acres fee of Government owned land as a class II, temporary type installation. This included 22.72 acres easement, and 5 licenses (no area). The acreage was acquired through purchase from landowners and by condemnation. The New River Plant was operated during World War II by the Hercules Powder Company for loading powder into bagged charges, production of flash reducers for the 155MM gun, and storage of powder. In 1946, the plant was designated as a subpost, and in 1950 became an integral part of Radford Arsenal. On 31 January 1950, the New River Ordnance Plant was discontinued as a subpost and redesignated part of Radford Arsenal, a class II industrial installation under the jurisdiction of the Chief of Ordnance. Prior to that, during 1947 and 1948, the War Assets Administration disposed of approximately 380 acres to Burlington Industries. Except for magazine storage, the subpost, New River Ordnance Plant, later part of Radford Arsenal, was in a caretaker status from 1947 to 1960. On 31 July 1961, 96.69 acres fee were reassigned to the U.S. Army Reserve Outdoor Training Site at Radford and is still government owned. In the disposal process, 176 acres fee were sold to Stanley C. Frank by deed, dated 22 April 1963; 184.3 acres fee were sold to Pulaski County Development Authority by deed, dated 17 May 1963; 57.50 acres fee were conveyed to Pulaski County School Board by deed, dated 22 May 1963; 28 acres fee were sold to the Commonwealth of Virginia by deed, dated 26 July 1963; 13.80 acres fee were conveyed to the Town of Dublin by deed, dated 19 May 1976; 4.093 acres to Henry Harvey, Jr., by deed, dated 11 August 1976; 32.4 acres fee were conveyed to R. Kyle Hash by deed, dated 19 August 1976; 40.43 acres fee to George A. McConnell by deed, dated 3 October 1977; and 11.92 acres to Samuel T. Elias by deed, dated 8 March 1978. All buildings were abandoned by the Government at the time of disposal, and all buildings have either been removed, are being used, and are not desired to be removed by the current owners.

2. Possible Hazards.

a. CWM. This site was specified on a list that the Huntsville Division provided from their own archive search. As such, the possibility of encountering CWM cannot be totally discounted.

b. OEW. The New River Ordnance Plant was a wartime explosive plant designed for the loading of propellant and igniter charges and the manufacture of bags thereof. The New River Plant was just 12 miles from the Radford Ordnance Works, the plant that manufactured most of the powder that was afterwards bagged at New River. The original plan for the New River Ordnance Plant called for four propellant-charge bag-loading lines (Buildings 401-472), two igniter-charge bag-loading lines (Buildings 502 and 524), a bag manufacturing building (Building 205). In addition, there were to be storage magazines for a 30 days' supply of incoming material and

a 60 days' supply of finished products. This requirement translated into 87 smokeless-powder magazines (Buildings 1107, and 1113-2113), two black powder magazines (Buildings 1109, 1111), and 59 high explosives magazines (Buildings 4603-1 through 4603-59). Duties at the New River Plant included loading, storing, and shipping explosives to the armed forces in the prosecution of the war. The loading of propellant and igniter charges, as well as the manufacture of bags, were for the 155mm gun, M1, 8" gun, and the 10" gun, M1888 & 1895. After WWII, the New River Plant was placed in a standby condition, with large amounts of explosives stored in igloos at the station. In addition, the New River Plant was used for storage of the overflow of nitrocellulose powder from the Radford Ordnance Works.

c. HTW. No hazardous or toxic materials are known to be present. However, due to the history of the plant, contamination from explosive powder cannot be totally discounted. Historical documentation reflects that certain areas of the installation had been contaminated by explosives and other toxic elements. Though not specific, the historical documentation states that, under no conditions, should any part of a contaminated area (including land, buildings or equipment) be disposed of unless decontamination be cleared through the Decontamination Section, Rehabilitation Branch, Property Management Division, Office of Real Property Disposal, Washington, D.C. Documents also state that the plant had a laboratory which had the necessary chemical supplies and equipment for chemists to make various tests.

d. Old Structures. Because of the historical nature of the site, a few remaining old structures still exist, which may present falling hazards or debris.

e. Natural Hazards. Hurricane Emily is not expected to pose a significant threat during our site visit. However, larger amounts of rain and higher velocity of winds are anticipated. The Safety Office will continually monitor the weather forecasts to note any significant changes. As with any site dependent on its geographic location and season of the year, do not conduct an on-site inspection during any natural hazard, such as an electrical, sand, dust, snow or heavy rain storm. All persons will retire to a place of safety.

1) Dangers from wildlife and vegetation are expected to be a possible hazard for this site. If you inspect an undeveloped area, exercise caution in avoiding abusive vegetation (thorn bushes, poison ivy and oak, etc.) and rodents (mice, rats, etc.) and larger animals (foxes, deer, etc.). Also, near the marshlands and wetland areas there is the possibility of hazards from reptilians or scaled creatures (snakes, lizards, etc.).

2) Exercise caution in walking the area to avoid slips, trips, and falls. Loose soil may pose a hazard while traversing the site. NO RUNNING WHILE ON SITE!

3) Exercise caution near water hazards at this site. Avoid steep or slippery banks along side creeks and streams.

f. Other Hazards.

1) Exercise caution to avoid man-made pits, holes, and water collection areas.

2) Be aware of power lines in the area.

3) If unexploded explosive ordnance (UXO) is detected, note the presence of antennas, communication and radar devices on the site. Some types of ordnance are particularly susceptible to electromagnetic radiation (EMR) radio frequency (RF) transmitters. If necessary, consult with the Huntsville Safety Division. If not available, request guidance from explosive ordnance disposal (EOD) personnel. See paragraph 5b for telephone numbers.

4) Practice defensive driving while on the site. Maintain safe speed limits. Always use your seat belt.

g. If known, specific hazards at specific locations are annotated on the site map in Enclosure 2. Otherwise, the hazards listed above in paragraph 2 will be brought to the attention of team members before approaching the specific hazard at the site.

3. OEW/CWM Reconnaissance Procedures.

a. General. Do not conduct on-site inspections between sunset and dawn.

b. Due to the nature of hazards that may be encountered, TEAM PERSONNEL WILL NOT EAT, DRINK, OR SMOKE WHILE ON SITE! After returning from a site inspection (especially before eating), team personnel will wash their hands and any other parts of their bodies as necessary.

c. Movement. Before walking in a particular direction, scan your approach with your eyes. Do not stray from travelled paths or enter areas with dense vegetation. REMEMBER -- STAY ALERT, STAY ALIVE!

d. Sighting. Upon sighting a suspicious object, note its size, shape, any markings, and specific location. DO NOT TOUCH ANYTHING!

e. Actions. Alert all team members. Withdraw to a safe distance.

1) For non-fragmenting explosive materials, evacuation distance should be a minimum of 1250 feet.

2) For fragmenting explosive materials, evacuation distance should be a minimum of 2500 feet. For bombs and projectiles with caliber 5-inch or greater, use a minimum evacuation distance of 4000 feet.

3) The safety officer will mark the area with survey tape. If the suspicious object is considered to be an immediate threat, designated team members will remain in the area at a safe distance to warn civilians until the EOD unit arrives.

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4) Notes regarding the suspicious object will be compiled by the project manager on the team for the archival search report.

f. Notification. If the suspicious object is considered to be an immediate threat, the safety officer will contact and advise the Huntsville Safety Division and the local police. If the Huntsville Safety Division cannot be contacted, the responsible EOD unit will be notified by the safety officer.

4. Emergency Telephone Numbers.

a. Medical. 911

b. Fire. 911

c. Local Police. 911 or (703) 639-2151.

5. Other Important Phone Numbers for Site Visit.

a. Radford Police Department, (703) 731-3624; Montgomery County Police, (703) 382-2951; and the Pulaski County Sheriff, (703) 980-7800 (all non-emergency numbers).

b. 147 Ordnance Detachment (EOD), Ft. Lee, VA, (804) 734-5555, DSN 687-5555; 57th Ordnance Detachment (EOD), Ft. Belvoir, VA, (703) 664-4168, DSN 354-4168.

6. Phone Numbers for Army Corps of Engineers. Huntsville Safety Division, (205) 955-4968; St. Louis District Corps of Engineers, PM-M (Mike Dace), (314) 331-8036, and PD-AC (314) 331-8790 (Don Groh).

7. Location of Nearest Telephone to Site (to be entered at a later date, if possible).

8. Name, Location, and Telephone Number of Nearest Hospital. Radford Community Hospital, 700 Randolph St., Radford, (703) 731-2000 (non-emergency).

9. Directions from the Site to Radford Community Hospital: Take Route 11 to Radford, Turn left on Randolph St., Hospital on left hand side.

10. First Aid. In the need arises, each team member should be prepared to administer immediate first aid, including CPR, until medical personnel arrive.

11. Personnel Protective Equipment.

a. Personal Equipment on Site. Check the following equipment: Engineer Hard Hat, Engineer Red Cap, Uvex Industrial Protective Eyewear, White Leather Gloves, Flashlight, Safety Boots, Oasis Canteen, Earplugs (disposable), Notebook/Pen, and a Copy of this SSHP. Use equipment as required. Note that some of this equipment is stored in the team's storage container (paragraph 10b below).



1) Avoid wearing outer or undergarments made of wool, silk, or synthetic textiles, such as rayon and nylon. These materials can generate sufficient static charge to ignite fuels or initiate explosives. If possible, wear flame-retardant clothing.

2) Do not carry fire or spark-producing devices on-site. DO NOT SMOKE WHILE ON-SITE!

b. Team Equipment on Site. Check the following equipment: Rubbermaid Action Pack Storage Container (Model #1171), Master Locks (2) with Keys, Site-Specific Safety and Health Plan (SSHP), First Aid Kit, Uvex Industrial Protective Eyewear (3), American Red Cross Standard First Aid Instructions Booklet, EM 385-1-1 (Oct 92) U.S. Army Corps of Engineers Safety and Health Requirements Manual, White Leather Gloves (3), Silva Precision Compass, Oasis Canteens (3), Contractor-Morgan Marathon Slicker Rainwear (3), Sport Pouch, Packet of M9 Paper (Chemical Agent Detection), Packet of M8 Paper (Chemical Agent Detection), Orange Survey Tape, Flashlights (3) w/batteries, 35 mm camera, w/50 or 100-300 mm zoom lens, 35 mm film (24 exp., 200 or 400 ASA), Swift Precision Binoculars (CELMS-LM #65294), Leatherman Pocket Survival Tool, Earplugs (disposable), Rand McNally Road Atlas and State Maps for Sites, FM 9-16 (Explosive Ordnance Recognition), and the All-Purpose Portable Cart (Model #400). Note that the Team's 35mm camera, with 50 or 100-300 mm zoom lens and 35mm film (24 exp., 200 or 400 ASA) is stored separately or hand carried.

c. The listing of personal and team equipment on site may be modified by the Site Safety Officer in consultation with team members.

## 12. Weather Precautions.

a. Cold Weather. Cold weather is highly unlikely for this site during this time of the year.

b. Heat. Precautionary steps, if necessary, need to be taken for sunburn, heat exhaustion, and heat stroke. Follow measures found in the American Red Cross Standard First Aid Instructions Booklet.

c. Severe Weather. The safety officer will monitor local newscasts for any type of severe weather and take the necessary safety precautions. The most common severe weather hazard to be encountered for this site is lightning from a thunderstorm. Take the following precautions:

- 1) Stay inside and away from windows.
- 2) Stay away from electrical appliances and telephones.
- 3) If outside, stay away from metal objects (fences, etc.)
- 4) Lightning generally strikes the highest object in an area. If you are outside, make sure you are not the tallest point. For this reason also, do not stand under a lone tree.

5) Stay out of the water.

6) If outdoors, immediately look for shelter.

7) Remember, lightning can jump more than you might anticipate ahead of a thunderstorm. DON'T TAKE UNNECESSARY RISKS!

### 13. Team Personnel and Responsibilities.

a. Safety Officer (Fred Miller). The safety officer has overall authority and responsibility for the conduct of activities and operations while on site. Any personnel observed violating safety precautions may be directed to depart the site by the safety officer.

b. Project Manager (Bob Wich). Prior to actually entering the site, the project manager and the safety officer will coordinate the time schedule, routes to be taken and the specific locations on the site to be surveyed. If the safety officer becomes incapacitated, the project manager will temporarily assume the position of safety officer.

c. Other Team Member(s) (Dan Bradley). Any other team member(s) will assist the safety officer and project manager as necessary, such as photographing pertinent portions of the site.

d. On-Site Personnel will be kept to a minimum.

### 14. Site Control and Communications.

a. Site Control. While on site, team members will stay together as a group and remain within eyesight and vocal contact with each other. If separated and no contact with team personnel stay put or return to team vehicle, if location is known. Use vehicle horn with four short beeps to signal your presence.

b. Site Communications. If possible, an alternate means of audible communication (example, whistle) should be made available to warn team members of safety hazards while on site. The following standard sounds will be used in case of failure of verbal communications:

One Long Blast-----Stop Movement

Two Long Blasts-----Sighting of Suspicious Object

Three Long Blasts-----Emergency

c. Hand Signals. If audible communications are not possible, the following standard hand signals will be used:

Hand gripping throat-----Out of air; Can't breathe.

Quick movement of fist up and down-----Leave area Immediately.

Hands on top of head-----Need assistance.

Thumbs up-----OK, I am all right, I understand.

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Thumbs down-----No, negative.

Circular motion of hand in air and point-----Assemble at area pointed.

15. Changes to SSHP. As the situation dictates and without risking the safety of team personnel, the safety officer may modify aspects of the plan in coordination with team personnel.

SSHP SAFETY BRIEFING CHECKLIST  
(Enclosure 4)

Site Name: New River Ordnance Plant, VA Date/Time: 25 Sep 93 / 0745 Hours  
(Check each subject, when briefed)

General

Purpose of Site Visit ✓ Statements of Safety and Health ✓  
Training Received ✓ Administrative Reporting Requirements ✓

Specifics

Site History/Description ✓  
Possible Hazards: OEW/CWM Hazards ✓  
Toxic Wastes ✓  
Natural Hazards ✓  
Other Hazards ✓

OEW/CWM Reconnaissance Procedures: General ✓  
Movement ✓  
Sighting ✓  
Actions ✓  
Notification ✓

Emergency Telephone Numbers: Medical ✓  
Fire ✓  
Police ✓  
Other Contacts ✓

Location of Nearest Telephone to Site ✓  
Location and Telephone Number of Nearest Hospital ✓  
First Aid ✓

Personnel Protective Equipment: Personal Equipment ✓  
Team Equipment ✓

Weather Precautions: Cold Weather ✓  
Heat ✓  
Severe Weather ✓

Team Personnel and Responsibilities: Safety Officer ✓  
Project Manager ✓  
Other Team Members ✓

Site Control and Communications: Site Control ✓  
Site Communications ✓  
Alternate Audible ✓  
Hand Signals ✓

Changes/Additional Comments \_\_\_\_\_

ACKNOWLEDGEMENT OF BRIEFING BY TEAM PERSONNEL

Full Name & Organization

Signature

Robert Wich, CELMS-PM-M  
Daniel Bradley, CELMS-PD-AC

[Signature]  
0-0 2015  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Safety briefing presented by: Frederick T. Miller, CELMS-PD-AC  
Safety Officer, Alpha East Team

[Signature]  
(signature)  
01-9

8 September 1993

## MEMORANDUM FOR FILE

SUBJECT: Trip Report, Site Inspection, New River Ordnance Plant, Radford, Virginia, Site No. C03VA0047

1. The subject site inspection was performed on 2 September 1993 by the following St. Louis District personnel:

Robert F. Wich	Project Manager
Frederick T. Miller	Historian/Archivist and Site Safety Officer
Daniel L. Bradley	Historian

2. We departed the motel in Blacksburg, VA, and proceeded to the Radford Army Ammunition Plant (RAAP). Fred Miller gave the safety briefing enroute to the site and safety aspects related to the site were discussed.

3. At the Radford Army Ammunition Plant we met with Mr. Steve Devore, Chief, Civilian Operations, and Ms. Joann Jenkins, an Industrial Specialist who was quite knowledgeable concerning the facility. Mr. Devore has only been at the installation a short time and had limited historical knowledge of the site. He departed after introductions. Ms. Jenkins has been at Radford about 19 years and works in the real estate office. The plant has always been a Government Owned Contractor Operated (GOCO) facility, even dating back to World War II. The plant, including the New River Ordnance Plant, have been operated by the Hercules Powder Company since their construction.

4. Ms. Jenkins provided a drawing titled General Layout of New River Ordnance Plant. This drawing, dated March 1943 and revised through 2 November 1987, clearly delineated the property that had been disposed of and the names of the parties that acquired the sites. Generally, the FUDS portion of the New River site is at the western end of the site. The vast majority of the site is still active and is a part of RAAP. The two sites are about 12 miles apart via road. The FUDS area consists of the former bag loading area for explosive powder (propellant for munitions), a warehouse area, officers quarters, administration area, a rail siding area, and some undeveloped tracts that served as buffers between the plant and the adjacent private property. The plan provided by Ms. Jenkins proved to be very useful during our site inspection.

5. Ms. Jenkins stated that she had no knowledge of anything related to CWM ever having been associated with either RAAP or the facilities located at the New River Ordnance Plant. Likewise, she was not aware of anything related to OEW or CWM having been encountered in the development of the property that had been disposed of. She indicated that Maynard De Hart, a former employee who had been associated with the site during World War II and

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SUBJECT: Trip Report, Site Inspection, New River Ordnance Plant, Radford, Virginia, Site No. C03VA0047

worked there until his recent retirement, may be able to furnish additional information. She also provided his phone number, 703-552-2876, and said that he would probably be glad to talk to us about the site.

6. We departed RAAP and proceeded toward the New River site. We discussed the fact that throughout the archive searches, phone interviews, and personal contacts, no information had been developed indicating that the New River Ordnance Plant site or the Radford had ever been associated in any way with any type of Chemical Warfare Materials. We discussed this lack of a connection between CWM and the site and could not answer the basic question of why this site was included on the list for preparation of an ASR. In fact, neither installation had ever been known to have ordnance present since both were involved in the manufacturing of various types of powder, propellants, and igniters.

7. Our first stop on the site inspection was the Newbern Plant of Burlington Industries. From information available prior to the site inspection, we were aware that Burlington Industries (BI) had acquired major portions of the FUDS, utilized the site for their textile operations for many years, subsequently closed the plant and disposed of portions of the site, and still had a presence on the site. We met with Mr. Bill Ward, the plant manager. Mr. Ward has worked at the site since 1960 with only a couple of minor interruptions in his time there. He too had no information as to CWM ever having been at either the Radford or New River sites.

8. Mr. Ward was extremely helpful in both explaining the history of the site and providing a tour of most of the FUDS portion of New River site. Burlington Industries had acquired essentially all of the hospital area, officers quarters, warehouse area, and the sewage and water treatment facilities. The property originally acquired by BI was bounded on the west by Newbern Road, shown on the General Layout as Old VA Route 100, and on the south by Wilderness Drive, shown on the drawing as Old Rock Road. Mr. Ward said that in all of the years he had been at the site, nothing related to OEW or CWM had ever been encountered. He indicated that BI had sold portions of the site to the Town of Dublin and that other companies were using parts of the warehouse area. He said that BI was trying to sell the balance of the property they owned at this location.

9. We drove through the former warehouse area which had been served by rail lines. Most of the former DOD buildings in this area are still intact and in use. Some have been demolished or altered. There are a variety of owner/users of these facilities. We drove by the wooded area south of the warehouses, an area that

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SUBJECT: Trip Report, Site Inspection, New River Ordnance Plant, Radford, Virginia, Site No. C03VA0047

has never been developed during either DOD use or subsequent ownerships. The southern end of this area contained the hospital complex. These buildings are, for the most part, still standing but have not been used. The officers' quarters on the south end of the site are now single family homes and the area looks much like it did when it was part of the New River Ordnance Plant.

10. We proceeded to the area of the bag loading facilities. This 176-acre parcel contained three bag loading facilities each consisting of several buildings, some with embankments or blast shields providing protection on three sides. Virtually all of the buildings are still standing and, according to Mr. Ward, most of the site is owned by Flow Laboratories. Several new buildings have been constructed by Flow Laboratories. All of the former buildings appear to have been abandoned, however, most of the buildings were padlocked. One of the buildings was not locked and contained a variety of equipment and crates. Several of the buildings were recently used by Riggs Corporation, a manufacturer of cedar products, which moved out several months ago. Except for the area of the relatively new buildings, this entire area is heavily overgrown with all of the buildings are in a dilapidated condition.

11. We then drove to the northeastern part of BI's property which originally contained the water and sewage treatment facilities. The water treatment facilities had been used by BI for their plant until it closed. We left this area and returned to Newbern Road and proceeded north to the intersection with Bagging Plant Road, shown on the General Layout as Dublin Cut-Off Road. This road generally served as the northern boundary of the New River Ordnance Plant site. It was not developed and served as a buffer between the plant and the adjoining private property. The area was originally acquired by the Pulaski Development Authority and is now owned by a variety of concerns and public entities. We returned to this area later.

12. We then returned to the BI plant and thanked Mr. Ward for both his assistance and the information relative to the site. We felt truly fortunate to have met with Mr. Ward because of his seemingly endless knowledge concerning the site.

13. We then met Mr. Doug Mayberry, Director of Fleet Maintenance and Operations at the Pulaski County property. This property is on the south side of Bagging Plant Road and includes a vehicle maintenance facility, dog pound, and vehicle storage area. It was part of the tract originally transferred to the Pulaski County Redevelopment Authority. Mr. Mayberry has been at this facility for 15 years and said that nothing even remotely related to OEW or CWM had ever been found in any of the work that had been done on

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SUBJECT: Trip Report, Site Inspection, New River Ordnance Plant,  
Radford, Virginia, Site No. C03VA0047

the site. He said that parts of the property originally acquired by the Pulaski County Development Authority were currently being used as a park and by the Pulaski County School Board and that several industrial firms now owned parts of the original Pulaski County property. Immediately west of the County property is a tract owned by the Commonwealth of Virginia and used by the Highway Department as a maintenance facility. The remaining parcel originally owned by Pulaski County is west of Newbern Road and is now owned by the Pulaski Furniture Company. This firm also owns the property immediately south of the tract. This tract originally served as a rail yard for the New River Ordnance Plant and, according to Mr. Mayberry, has remained undeveloped. There is no road access to this tract. We then left the Maintenance Facility and drove through the various areas that had originally been acquired by Pulaski County.

14. The final stop on the site inspection was the U.S. Army Reserve Center, located on approximately 96 acres of the former New River Ordnance Plant along Wilderness Drive. We met Mr. John Lowman, Facility Manager and Unit Administrator. He has been at this site since 1978 during which time he served on active duty with the military, in an Army Reserve status, and eventually as a federal employee. This installation includes a small office building and a paved parking area. The vast majority of this site is undeveloped and is used as pasture land. Mr. Lowman explained that the area could be used as a training area in the future. This tract, on the southern edge of the New River Ordnance Plant site, was used only as a buffer area between the bag loading facilities and the adjacent private property. Mr. Lowman stated that nothing related to OEW or CWM had ever been found.

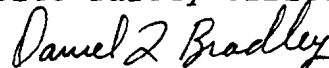
15. This concluded our site inspection of the FUDS portion of the former New River Ordnance Plant site. At no time during the inspection did we note first hand anything suggesting CWM or OEW contamination of the site. We also were not able to obtain any information from the records reviewed indicating that CWM had ever been associated with New River Ordnance Plant.



ROBERT F. WICH, P.E.  
Project Manager



FREDERICK T. MILLER  
Historian/Archivist and  
Site Safety Officer



DANIEL L. BRADLEY  
Historian

CF:

CELMS-PM-M (Dace)  
CELMS-PD-A (Groh)



**APPENDIX D****NOT USED**

**APPENDIX E**

**NOT USED**

**APPENDIX F**

**NOT USED**

**APPENDIX G**  
**PRESENT SITE PHOTOGRAPHS**



**Photo 1: Looking North at warehouse area  
Burlington Industries**



**Photo 2: "Staff Village" Former housing units  
Burlington Industries**





**Photo 3: Former Hospital area Burlington Ind.**



**Photo 4: Water Filtration and Sewage Disposal area  
Burlington Industries**





**Photo 5:** Looking Northeast at General view of  
Burlington Industries



**Photo 6:** Bldg A 464 Former Bag Loading Facility  
Flow Laboratories



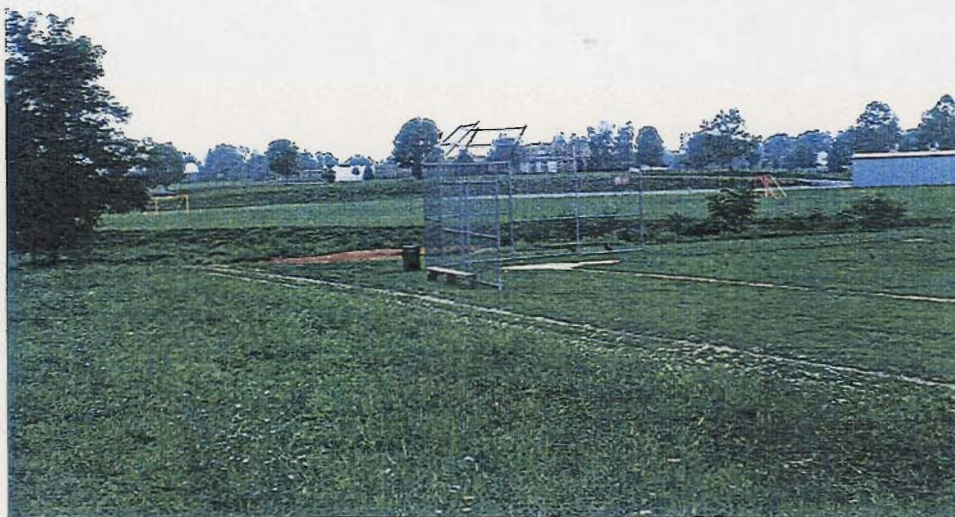


**Photo 7:** Bldg 472 Former Bag Loading Facility  
Flow Laboratories



**Photo 8:** Pulaski County Maintenance Facility  
Pulaski County, VA





**Photo 9:** Area utilized for County park  
Pulaski County Development Authority



**Photo 10:** Looking West at Undeveloped area  
Pulaski Furniture Company



**Photo 11: US Army Reserve Center  
Radford, VA**

**APPENDIX H**  
**HISTORICAL MAPS/DRAWINGS**

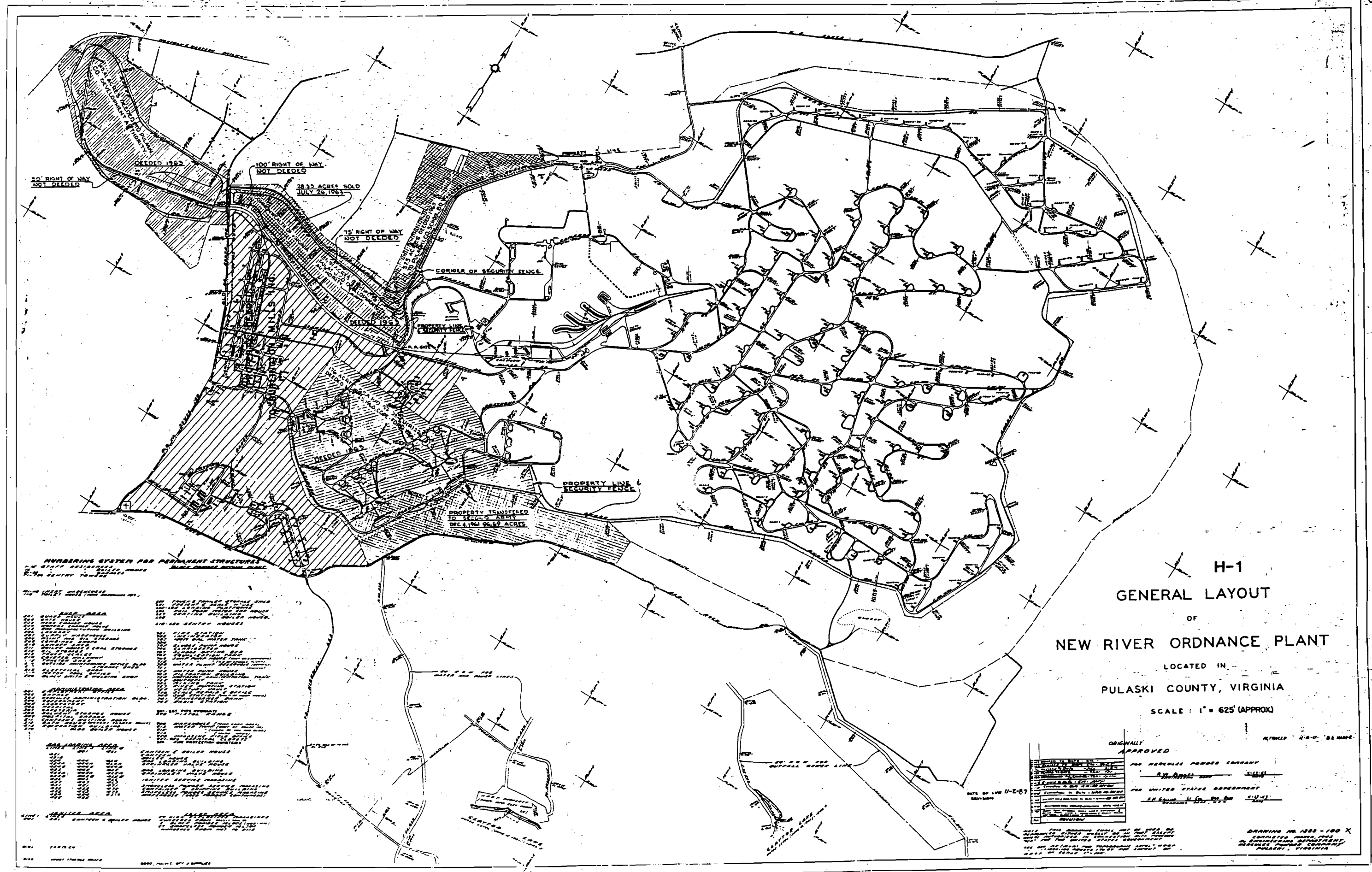
Ordnance and Explosive Waste  
Chemical Warfare Materials  
Archives Search Report  
for  
New River Ordnance Plant  
Radford, Virginia  
Site Number - C03VA0047

APPENDIX H

HISTORICAL MAPS/DRAWINGS

Drawing No.	Title
H-1	General Layout - New River Ordnance Plant March, 1943





**APPENDIX I**  
**RAC WORKSHEET**

# RISK ASSESSMENT PROCEDURES FOR ORDNANCE AND EXPLOSIVE WASTE (OEW) SITES

Site Name <u>NEW RIVER ORDNANCE PLANT</u>	Rater's Name <u>ROBERT F. WICH</u>
Site Location <u>RADFORD, VA</u>	Phone No. <u>314 331 8784</u>
DERP Project # <u>CO3VA0047</u>	Organization <u>CEHMS-PM-M</u>
Date Completed <u>13 SEP 93</u>	RAC Score <u>5</u>

## OEW RISK ASSESSMENT:

This risk assessment procedure was developed in accordance with MIL-STD 882B and AR 385-10. The RAC score will be used by CEHND to prioritize the remedial action at this site. The OEW risk assessment should be based upon best available information resulting from records searches, reports of Explosive Ordnance Disposal (EOD) detachment actions, and field observations, interviews, and measurements. This information is used to assess the risk involved based upon the potential OEW hazards identified at the site. The risk assessment is composed of two factors, **hazard severity** and **hazard probability**. Personnel involved in visits to potential OEW sites should view the CEHND videotape entitled "A Life Threatening Encounter: OEW."

Part I. Hazard Severity. Hazard severity categories are defined to provide a qualitative measure of the worst credible mishap resulting from personnel exposure to various types and quantities of unexploded ordnance items.

## TYPE OF ORDNANCE (Circle all values that apply)

### A. Conventional Ordnance and Ammunition

	VALUE
Medium/Large Caliber (20 mm and larger)	10
Bombs, Explosive	10
Grenades, Hand and Rifle, Explosive	10
Landmines, Explosive	10
Rockets, Guided Missiles, Explosive	10
Detonators, Blasting Caps, Fuzes, Boosters, Bursters	6
Bombs, Practice (w/spotting charges)	6
Grenades, Practice (w/spotting charges)	4
Landmines, Practice (w/spotting charges)	4
Small Arms (.22 cal - .50 cal)	1
Conventional Ordnance and Ammunition (Select the largest single value)	<u>0</u>

What evidence do you have regarding conventional OEW? NONE

## B. Pyrotechnics (For munitions not described above.)

VALUE

Munition (Container) Containing  
White Phosphorus or other  
Pyrophoric Material (i.e.,  
Spontaneously Flammable) 10

Munition Containing A Flame  
or Incendiary Material (i.e.,  
Napalm, Triethylaluminum Metal  
Incendiaries) 6

Flares, Signals, Simulators 4

Pyrotechnics (Select the largest single value) 0

What evidence do you have regarding pyrotechnics? NONE

## C. Bulk High Explosives (Not an integral part of conventional ordnance; uncontainerized.)

VALUE

Primary or Initiating Explosives 10  
(Lead Styphnate, Lead Azide,  
Nitroglycerin, Mercury Azide,  
Mercury Fulminate, Tetracene, etc.)

Demolition Charges 10

Secondary Explosives 8  
(PETN, Compositions A, B, C,  
Tetryl, TNT, RDX, HMX, HBX,  
Black Powder, etc.)

Military Dynamite 6

Less Sensitive Explosives 3  
(Ammonium Nitrate, Explosive D, etc.)

High Explosives (Select the largest single value) 0

What evidence do you have regarding bulk explosives? NONE

## D. Bulk Propellants (Not an integral part of rockets, guided missiles, or other conventional ordnance; uncontainerized)

VALUE

Solid or Liquid Propellants 6

Propellants 0

What evidence do you have regarding bulk propellants? NONE

E. Radiological/Chemical Agent/Weapons

	VALUE
Toxic Chemical Agents (Choking, Nerve, Blood, Blister)	25
War Gas Identification Sets	20
Radiological	15
Riot Control and Miscellaneous (Vomiting, Tear, incendiary and smoke)	5
Radiological/Chemical Agent (Select the largest single value)	<u>0</u>
What evidence do you have of chemical/radiological OEW?	<u>NONE</u>

=====

Total Hazard Severity Value 0  
 (Sum of Largest Values for A through E--Maximum of 61).  
 Apply this value to Table 1 to determine Hazard Severity Category.

TABLE 1

HAZARD SEVERITY\*

Description	Category	Value
CATASTROPHIC	I	≥21
CRITICAL	II	≥10 <21
MARGINAL	III	≥5 <10
NEGLIGIBLE	IV	≥1 <5
**NONE		<u>0</u>

\* Apply Hazard Severity Category to Table 3.

\*\*If Hazard Severity Value is 0, you do not need to complete Part II. Proceed to Part III and use a RAC Score of 5 to determine your appropriate action.

Part II. Hazard Probability. The probability that a hazard has been or will be created due to the presence and other rated factors of unexploded ordnance or explosive materials on a formerly used DOD site.

AREA, EXTENT, ACCESSIBILITY OF OEW HAZARD  
(Circle all values that apply)

A. Locations of OEW Hazards

	VALUE
On the surface	5
Within Tanks, Pipes, Vessels or Other confined locations.	4
Inside walls, ceilings, or other parts of Buildings or Structures.	3
Subsurface	2
Location (Select the single largest value)	_____
What evidence do you have regarding location of OEW?	_____

B. Distance to nearest inhabited locations or structures likely to be at risk from OEW hazard (roads, parks, playgrounds, and buildings).

	VALUE
Less than 1250 feet	5
1250 feet to 0.5 miles	4
0.5 miles to 1.0 mile	3
1.0 mile to 2.0 miles	2
Over 2 miles	1
Distance (Select the single largest value)	_____
What are the nearest inhabited structures?	_____



C. Numbers of buildings within a 2 mile radius measured from the OEW hazard area, not the installation boundary.

	VALUE
26 and over	5
16 to 25	4
11 to 15	3
6 to 10	2
1 to 5	1
0	0
Number of Buildings (Select the single largest value)	_____
Narrative	_____
	_____

D. Types of Buildings (within a 2 mile radius)

	VALUE
Educational, Child Care, Residential, Hospitals, Hotels, Commercial, Shopping Centers	5
Industrial, Warehouse, etc.	4
Agricultural, Forestry, etc.	3
Detention, Correctional	2
No Buildings	0
Types of Buildings (Select the largest single value)	_____
Describe types of buildings in the area.	_____
	_____

E. Accessibility to site refers to access by humans to ordnance and explosive wastes. Use the following guidance:

BARRIER	VALUE
No barrier or security system	5
Barrier is incomplete (e.g., in disrepair or does not completely surround the site). Barrier is intended to deny egress from the site, as for a barbed wire fence for grazing.	4
A barrier, (any kind of fence in good repair) but no separate means to control entry. Barrier is intended to deny access to the site.	3
Security guard, but no barrier	2
Isolated site	1
A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel) which continuously monitors and controls entry onto the facility; or An artificial or natural barrier (e.g., a fence combined with a cliff), which completely surrounds the facility; and a means to control entry, at all times, through the gates or other entrances to the facility (e.g., an attendant, television monitors, locked entrances, or controlled roadway access to the facility).	0
Accessibility (Select the single largest value)	_____
Describe the site accessibility.	_____

F. Site Dynamics - This deals with site conditions that are subject to change in the future, but may be stable at the present. Examples would be excessive soil erosion by beaches or streams, increasing land development that could reduce distances from the site to inhabited areas or otherwise increase accessibility.

	VALUE
Expected	5
None Anticipated	0
Site Dynamics (Select largest value)	_____
Describe the site dynamics.	_____

=====

Total Hazard Probability Value  
 (Sum of Largest Values for A through F--Maximum of 30)

Apply this value to Hazard Probability Table 2 to determine  
 Hazard Probability Level.

TABLE 2

HAZARD PROBABILITY		
Description	Level	Value
FREQUENT	A	≥27
PROBABLE	B	≥21 <27
OCCASIONAL	C	≥15 <21
REMOTE	D	≥ 8 <15
IMPROBABLE	E	<8

\* Apply Hazard Probability Level to Table 3.

Part III. Risk Assessment. The risk assessment value for this site is determined using the following Table 3. Enter with the results of the hazard probability and hazard severity values.

TABLE 3

Probability Level		FREQUENT A	PROBABLE B	OCCASIONAL C	REMOTE D	IMPROBABLE E
Severity Category:						
CATASTROPHIC	I	1	1	2	3	4
CRITICAL	II	1	2	3	4	5
MARGINAL	III	2	3	4	4	5
NEGLIGIBLE	IV	3	4	4	5	5

RISK ASSESSMENT CODE (RAC)

- RAC 1    Imminent Hazard - Expedite INPR - Immediately call CEHND-ED-SY--commercial 205-955-4968 or DSN 645-4968.
- RAC 2    High priority on completion of INPR - Recommend further action by CEHND.
- RAC 3    Complete INPR - Recommend further action by CEHND.
- RAC 4    Complete INPR - Recommend further action by CEHND.
- RAC 5    Recommend no further action. Submit NOFA and RAC to CEHND.

=====  
Part IV. Narrative. Summarize the documented evidence that supports this risk assessment. If no documented evidence was available, explain all the assumptions that you made.

The DERP-FUDS tracts associated with the New River Ordnance Plant were formerly used as a bag loading and storage facility for powder and as the administrative, hospital, warehouse, officers' quarters, and rail yard areas associated with the plant. Chemical Warfare Materials (CWM) have never been associated with the site and there is no evidence to suggest that either CWM or OEW were ever present at or disposed of on the tracts that comprise the DERP-FUDS.

**APPENDIX J**  
**REPORT DISTRIBUTION LIST**

Ordnance and Explosive Waste  
Chemical Warfare Materials  
Archives Search Report  
for  
New River Ordnance Plant  
Radford, Virginia  
Site Number - C03VA0047

APPENDIX J

REPORT DISTRIBUTION LIST

<u>Addressee</u>	<u>No. Copies</u>
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**APPENDIX K**  
**ARCHIVE ADDRESSES**

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APPENDIX K

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