COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
Street address: 629 East Main Street, Richmond, Virginia 23219
Mailing address: P.O. Box 1105, Richmond, Virginia 23218
www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

(804) 698-4000
1-800-592-5482

April 1, 2016

VIA ELECTRONIC MAIL
Mr. Jay Stewart
Environmental Manager
Radford Army Ammunition Plant
4050 Pepper's Ferry Road
Radford, Virginia 24141

Re: Approval of Reissuance of Hazardous Waste Management Corrective Action Permit
Radford Army Ammunition Plant, Radford, VA
EPA ID No.VA1210020730

Dear Mr. Stewart,

Enclosed is the Final Hazardous Waste Management Corrective Action Permit for the Radford Army Ammunition Plant facility, Radford, Virginia. The Final Permit issuance has been approved and is scheduled to become effective on May 1, 2016.

This final permit decision is in accordance with the Virginia Hazardous Waste Management Regulations (VHWMR), 9 VAC 20-60, 9 VAC-20-60-124, which incorporates 40 CFR Part 124 by reference, and in accordance with 40 CFR § 124.13, Obligation to Raise Issues and Provide Information During the Public Comment Period, which specifies:

> *All persons, including applicants, who believe any condition of a draft permit is inappropriate or that the Director's tentative decision to deny an application, terminate a permit, or prepare a draft permit is inappropriate, shall raise all reasonably ascertainable issues and submit all reasonably available arguments and factual grounds supporting their position, including all supporting material, by the close of public comment period (including any public hearing) under §124.10). Any supporting materials which are submitted shall be incorporated in full and may not be incorporated by reference, unless they are already part of the administrative record in the same proceeding, or consist of Commonwealth or federal statutes and regulations, documents of general applicability, or other generally available reference materials. Commenters shall make all supporting material, not already included in the administrative record, available to the Commonwealth as directed by the Director.*

The DEQ published a Public Notice of a 66-day comment period addressing the draft Permit in the Roanoke Times: General Edition and the Southwest Times on December 22, 2015. The corresponding radio announcement was broadcast on December 22, 2015, on Radio Stations WVRU 89.9 FM and WBRW, 105.3 FM in Radford, Virginia. A public meeting to disseminate information and exchange ideas relevant to the draft permit was held on January 27, 2016. A public hearing to accept oral comments regarding the draft permit was held on February 10, 2016. The 66 day comment period ended on February 26, 2016.

The hazardous waste Permit fee of $56,180 was deposited with the DEQ's Department of Finance account on January 26, 2015.

The DEQ received no comments expressing the opinion that the permit should be denied. Therefore, in accordance with 40 CFR § 124.15, the Director of the DEQ has made a final permit decision to issue the corrective action permit. The final permit is attached as Enclosure 1.

This final permit decision is based upon the supporting rationale provided in the enclosed "Comment Response Summary," dated March 24, 2016, for the Radford Army Ammunition Plant, Radford, Virginia facility, which is attached as Enclosure 2, which is in accordance with 40 CFR § 124.17. The "Comment Response Summary," specifies which provisions of the draft permit, if any, have been changed in the final permit decision, and the reasons for the change. In addition, this document describes and responds to all significant comments on the draft permit or the permit application raised during the public comment period.

In addition, please note that this final permit decision shall become effective 30 days after the service of notice of this decision unless a review or an appeal is requested on the permit under the VHWMR, 9 VAC 20-60-124. Appeals under the VHWMR do not incorporate the appeals process under 40 CFR § 124.19. Appeals under the VHWMR will be in accordance with the Administrative Process Act, Chapter 40, § 2.2-4000 et seq., of Title 2.2 of the Code of Virginia. All federal regulatory references to the appeals process or the EPA Environmental Appeals Board, such as in 40 CFR § 124.5, shall be construed to mean the administrative processes and appeals processes as specified by Virginia's Administrative Process Act.

As provided by Rule 2A:2 of the Supreme Court of Virginia, an appeal may be initiated by filing a notice of appeal within 30 days from the date of service of this decision to:

David K. Paylor, Director
Department of Environmental Quality
629 East Main Street
P.O. Box 1105
Richmond, VA 23218

In the event that this decision is served to you by mail, the date of service will be calculated as three days after the postmark date. Please refer to Part 2A of the Rules of the Supreme Court of Virginia, which describes the required content of the Notice of Appeal, including specifications of the Circuit Court to which the appeal is taken, and additional requirements concerning appeals from decisions of administrative agencies.

The DEQ appreciates the courtesy and professionalism shown during the permitting process. If you have any further questions regarding , please contact Mr. Ashby Scott, of my staff by phone at (804) 698-4467 or by email at Ashby.Scott@deq.virginia.gov.

Sincerely,

Leslie A. Romanchik
Hazardous Waste Program Manager
Office of Financial Responsibility and Waste Programs

Attachments:

Enclosure 1 – Final Corrective Action Permit for Radford Army Ammunition Plant, Radford Virginia Facility

Enclosure 2 – Comment Response Summary

cc: Andrea Barbieri, EPA, Region III (3LC50)
Luis Pizarro, EPA Region III (3LC20)
Erich Weissbart, EPA Region III (3LC20)
Aziz Farahmand, DEQ, BRRO
Leslie A. Romanchik, Russ McAvoy, Kurt Kochan, Brett DEQ, CO
Central Hazardous Waste Files

Hazardous Waste Management Permit
For
Corrective Action

Radford Army Ammunition Plant
Radford, Virginia

EPA ID No. VA1210020730

April 1, 2016

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

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(804) 698-4000
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Hazardous Waste Management Permit for Corrective Action

Permittees: **BAE Systems Ordnance Systems Inc. and**
United States Department of the Army
4050 Peppers Ferry Road
Radford, Virginia

EPA I.D. No.: **VA1210020730**

Pursuant to Chapter 14, Section 10.1-1426 Code of Virginia (1950), as amended and regulations promulgated thereunder by the Department of Environmental Quality ("DEQ"), a Permit is issued to BAE Systems Ordnance Systems Inc. as the operator and to United States Department of the Army as the owner (hereinafter referred to as the Permittees or RFAAP), to conduct Corrective Action ("CA"), as necessary to protect human health and the environment, for all releases of hazardous waste or hazardous constituents from any solid waste management unit ("SWMU") or Area of Concern ("AOC"). The facility being permitted is located in Radford, VA with an address of 4050 Peppers Ferry Road, Radford, VA 24143 at latitude 37° 11' 45.0" north and longitude 80° 30' 30.0" west.

The Permittees shall comply with all terms and conditions set forth in this Permit including Permit Attachments. If the Permit and the Permit Attachments conflict, then the wording of the Permit shall prevail. The Permittees shall also comply with all applicable regulations contained in the Virginia Hazardous Waste Management Regulations ("VHWMR") as codified in Title 9 of the Virginia Administrative Code, Agency 20, Chapter 60 (9 VAC 20-60) and regulations implementing the Resource Conservation and Recovery Act ("RCRA") set forth in 40 CFR Parts 124, 260, 261, 262, 264, 265, 268, and 270, as adopted by reference in the VHWMR. (For convenience, wherever the RCRA regulations are adopted by reference are cited in this Permit and the Permit Attachments, the regulatory citations will be only those from 40 CFR).

The Commonwealth of Virginia has received authorization for its hazardous waste program under Section 3006(b) of the RCRA, 42 U.S.C. § 6926(b), to administer and enforce the RCRA under the VHWMR in lieu of the federal hazardous waste management program. Applicable regulations are those under the VHWMR under (9 VAC 20-60) and the RCRA which are in effect on the date of final administrative action on this Permit and as well as any self implementing statutory provisions and related regulations which are automatically applicable to the Permittees' hazardous waste management activities, notwithstanding the conditions of this Permit.

This Permit is based on the administrative record and the assumption that the information submitted by the Permittees and contained in the administrative record is complete and accurate. The Permittees' failure in the application or during the Permit issuance process to fully disclose all relevant facts, or the Permittees' misrepresentation of any relevant facts at any time, shall be grounds for the modification or termination of this Permit pursuant to 40 CFR § 124.5, § 270.41, and § 270.43, and shall also be grounds for initiation of an enforcement action. The Permittees shall inform the Department of any deviations from permit conditions or changes from information provided in the application. In particular, the Permittees shall inform the Department of any proposed changes that might affect the ability of the Permittees to comply with applicable regulations and/or permit conditions, or which alter any of the conditions of the Permit in any way.

This Permit is effective as of May 1, 2016 and shall remain in effect until May 1, 2026 unless revoked and reissued in accordance with 40 CFR § 124.5 and § 270.41, or terminated in accordance with 40 CFR § 270.43, or continued in accordance with VHWMR 9 VAC 20-60-270.B.5.

April 1, 2016

Date Signed

Leslie A. Romanchik
Hazardous Waste Program Manager
Office of Financial Responsibility and Waste Programs

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LIST OF ATTACHMENT

DEFINITIONS

For the purposes of this Permit, the following definitions shall apply:

a. The term "**Permit**" shall mean the Permit issued by the Virginia Department of Environmental Quality, pursuant to Chapter 14, Article 4, Title 10.1, Code of Virginia (1950), as amended, and the Virginia Hazardous Waste Management Regulations (VHWMR) as codified in Title 9 of the *Virginia Administrative Code*, Agency 20, Chapter 60 (9 VAC 20-60).

b. The term "**Director**" shall mean the Director of the Virginia Department of Environmental Quality or his designated representative.

c. The term "**Department**" shall mean the Virginia Department of Environmental Quality (VDEQ), (with the address as specified in Permit Condition I.I.4).

d. The terms "**facility**" or "**site**" shall mean all contiguous land, and structures, other appurtenances, and improvements on the land, used for treating, storing, or disposing of hazardous waste. For the purpose of implementing corrective action under 40 CFR § 264.101, "facility" means all contiguous property under the control of the owner or operator under a permit under Subtitle C of RCRA. The Radford Army Ammunition Plant (RFAAP) facility in Radford, Virginia, is identified in the physical description of the property (including structures, appurtenances, and improvements). The facility map is provided as Attachment A of this Permit.

e. The term "**corrective action unit" (CAU)** is a contiguous area of land on or in which hazardous waste is placed. Examples of corrective action units consist of Solid Waste Management Units (SWMUs), Areas of Concern (AOCs), Site Screening Areas (SSAs) and Miscellaneous Units (MUs). A container alone does not constitute a unit; the unit includes containers and the land or pad upon which they are placed.

e. The term "**hazardous waste management unit"** is a contiguous area of land on or in which hazardous waste is placed. Examples of hazardous waste management units include burial areas, burning areas, burning grounds, neutralization pits, disposal trenches, a wastewater sump, landfill cells, small arms and mortar ranges.

f. The term "**release**" shall mean any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment of any hazardous waste or hazardous constituents.

g. The term **"Area of Concern"** shall mean an area at the facility or an off-site area, which is not at this time known to be a solid waste management unit, where hazardous waste and/or hazardous constituents are present or are suspected to be present as a result of a release from the facility.

h. The term **"Hazardous Constituent"** shall mean a constituent that is listed in 40 CFR Part 261, Appendix VIII.

i. The term **"Permittees"** refers to both the U.S. Army (owner) and BAE Systems Ordnance Systems Inc. (Operator).

j. The term **"EPA"** shall mean United States Environmental Protection Agency.

k. The term **"Solid Waste Management Unit"** shall mean any discernable unit at the facility from which hazardous constituents might migrate, irrespective of whether the units were intended for the management of solid and/or hazardous wastes. Such units include any area at a facility which solid wastes have been routinely and systematically released.

l. The term **"Days"** shall mean calendar days except as otherwise provided herein.

m. All definitions contained in 40 CFR Sections 124.2, 260.10, 270.2, 264.141, 264.1031, 264.1051, 264.1081, and 9 VAC 20-60 are hereby incorporated, in their entirety, by reference into this Permit. Any of the definitions used above, (a) through (f), shall supersede any definition of the same term given in 40 CFR Sections 124.2, 260.10, 270.2, 264.141, 264.1031, 264.1051, 264.1081, and 9 VAC 20-60. Where terms are not defined in the regulations or the Permit, the meaning associated with such terms shall be defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.

n. Throughout the Permit, all references to 40 C.F.R. Parts 261-266, 268, 270, 273, 279, are as adopted by reference in the *Virginia Hazardous Waste Management Regulations*, 9 VAC 20-60

ABBREVIATIONS AND ACRONYMS

For the purposes of this Permit, the following abbreviations and acronyms shall apply:

AOC	Area of Concern
ARSAR	Army Small Arms Range
BAE	BAE Systems, Ordnance Systems Inc.
CA	Corrective Action
CAU	Corrective Action Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMS	Corrective Measures Study
COPCs	Constituents of Potential Concern
ECs	Engineering Controls
EPA	United States Environmental Protections Agency
FDRTC	Final Decision and Response to Comments
HHRA	Human Health Risk Assessment
HW	Hazardous Waste
ICs	Institutional Controls
IMs	Interim Measures
IRP	Installation Restoration Program
LTR	Long-Term Monitoring
MCLs	Maximum Contaminant Levels
MEC	Munitions and Explosives of Concern
MMA	Main Manufacturing Unit
MMRP	Military Munitions Response Program
MNA	Monitored Natural Attenuation
NFA	No Further Action
NRU	New River Unit
OBG	Open Burning Ground
O&M	Operation and Maintenance
PAHs	Poly-aromatic Hydrocarbons
PCBs	Polychlorinated Biphenyls
RCRA	Resource Conservation and Recovery Act
RFAAP	Radford Army Ammunition Plant
RFI	RCRA Facility Investigation
RSLs	Risk Screening Levels
SB	Statement of Basis
SSA	Site Screening Area
SVOC	Semivolatile Organic Compound
SWMU	Solid Waste Management Unit
TNT	Trinitrotoluene
VDEQ	Virginia Department of Environmental Quality
VELAP	Virginia Environmental Laboratory Accreditation Program
VHWMR	Virginia Hazardous Waste Management Regulations

MODULE I – STANDARD CONDITIONS

I.A. EFFECT OF PERMIT

I.A.1. This Permit, issued by the Director pursuant to 40 CFR § 270.1(c)(4), authorizes only the management of hazardous waste under corrective action (CA) expressly described in this Permit and in accordance with the conditions of this Permit and with the applicable provisions of the VHWMR under 9 VAC 20-60. Any management of hazardous waste by the Permittees which is not authorized by this Permit or 9 VAC 20-60, and for which a permit is required under Chapter 14, Article 4, Title 10.1, Code of Virginia (1950), as amended, is prohibited. (40 CFR §§ 270.30(g) and 270.4(b) and (c)) Compliance with this Permit generally constitutes compliance, for the purposes of enforcement, with Chapter 14, Article 4, Title 10.1-1426, Code of Virginia (1950), as amended. This Permit does not convey any property rights of any sort, or any exclusive privilege. Possession of a permit does not authorize any injury to persons or property or invasion of other private rights, or any infringement of Commonwealth of Virginia or local laws or regulations. Compliance with the terms of this Permit may not constitute a defense to any action brought under Chapter 14, Article 8, Code of Virginia (1950), as amended, or any other Commonwealth law governing protection of the public health or the environment.

I.A.2. The Permittees is obligated to complete facility-wide CA under the conditions of a RCRA Permit regardless of the operational status of the facility. The Permittees must submit an application for a new Permit at least 180-days before this Permit expires pursuant to 40 CFR § 270.10(h), unless the Permit has been modified to terminate the CA schedule of compliance.

I.B. PERMIT ACTIONS

I.B.1. This Permit may be modified, revoked and reissued, or terminated for cause as specified in 40 CFR §§ 124.5, 270.30(f), 270.41, 270.42, and 270.43. The filing of a request by the Permittees for a permit modification, revocation and reissuance, or termination, or the notification of planned changes or anticipated noncompliance does not stay the applicability or enforceability of any permit condition (40 CFR § 270.30(f)).

I.B.2. Permit modifications at the request of the Permittees shall be done as specified by 40 CFR § 270.42.

I.B.3. This Permit may be renewed as specified in 9 VAC 20-60-270.10 and 40 CFR § 270.109(h), and permit condition I.D.2. Review of any application for a permit renewal shall consider improvements in the state of control and measurement technology, as well as changes in applicable regulations.

I.C. SEVERABILITY

I.C.1. The provisions of this Permit are severable, and if any provision of this Permit or the application of any provision of this Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this Permit shall not be affected thereby. Invalidation of any Commonwealth or federal statutory or regulatory provision which forms the basis for any condition of this Permit does not affect the validity of any other Commonwealth or Federal statutory or regulatory basis for said condition. (40 CFR § 124.16(a)(2)).

I.C.2. In the event that a condition of this Permit is stayed for any reason, the Permittees shall continue to comply with the related applicable and relevant interim status standards in 40 CFR § 270.10(e) until final resolution of the stayed condition unless the Director determines compliance with the related applicable and relevant interim status standards would be technologically incompatible with compliance with other conditions of this Permit which have not been stayed.

I.D. DUTIES AND REQUIREMENTS

I.D.1. Duty to Comply

The Permittees shall comply with all conditions of this Permit, except to the extent and for the duration such noncompliance is authorized by an emergency permit under 40 CFR § 270.61. Any other noncompliance with the Permit constitutes a violation of Title 10.1 Code of Virginia (1950), as amended, and regulations promulgated thereunder is grounds for enforcement action, Permit termination, revocation and reissuance, modification, or denial of a permit renewal application. (40 CFR § 270.30(a))

I.D.2. Duty to Reapply

If the Permittees wishes to or is required to continue an activity regulated by this Permit after the expiration date of this Permit, the Permittees shall apply for and obtain a new permit as specified below.

a. The Permittees shall submit a new and complete permit application for a new Permit at least 180 days before the Permit expires, unless a later date has been approved by the Director.

b. Pursuant to 40 CFR § 270.10(h), the Director shall not grant permission for an application to be submitted later than the expiration date of the existing permit (40 CFR § 270.30(b)).

I.D.3. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense in an enforcement action to argue that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Permit (40 CFR § 270.30(c)).

I.D.4. Duty to Mitigate

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

I.D.5. Proper Operation and Maintenance

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

I.D.6. Duty to Provide Information

The Permittees shall furnish to the Director within a reasonable time, any pertinent information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Permit, or to determine compliance with this Permit. The Permittees shall also furnish to the Director, upon request, copies of records required to be kept by this Permit (40 CFR § 270.30(h)).

I.D.7. Inspection and Entry

The Permittees shall allow the Director or an authorized representative, upon the presentation of credentials and other documents as may be required by law to:

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

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

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

d. Sample or monitor at reasonable times for the purposes of assuring permit compliance or as otherwise authorized by VHWMR, any substances or parameters at any location (40 CFR § 270.30(i)).

I.D.8. Reporting Planned Changes

The Permittees shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility (40 CFR § 270.30(l)(1)). This notice shall include a description of all incidents of noncompliance reasonably expected to result from the proposed changes.

I.D.9. Anticipated Noncompliance

The Permittees shall give advance written notice to the Director of any planned changes in the permitted facility or activity that may result in noncompliance with Permit requirements (40 CFR § 270.30(l)(2)).

I.D.10. New and Modified Portions of Any Waste Management Unit

The Permittees shall not store or treat hazardous waste in any new or modified portion of the facility, except as provided in 40 CFR § 270.42, until the Permittees has submitted to the Director, by certified mail or hand delivery, a letter signed by the Permittees and a professional engineer registered by the Commonwealth stating that the facility has been constructed or modified in compliance with the Permit; and:

a. The Director has inspected the modified or newly constructed facility and finds it is in compliance with the conditions of the Permit; or

b. Within 15 days of the date of submission of the letter required pursuant to permit condition I.D.10, if the Permittees has not received notice from the Director of his intent to inspect, prior inspection is waived and the Permittees may commence treatment of hazardous waste (40 CFR § 270.30(l)(2)).

I.D.11. Twenty-four Hour Reporting

The Permittees shall report to the Director any noncompliance which may endanger human health or the environment. Information shall be provided orally within twenty-four (24) hours from the time the Permittees becomes aware of the circumstances. The information specified (a, b, and c) shall be reported orally within 24 hours:

a. Information concerning the release of any hazardous waste that may cause an endangerment to public drinking water supplies.

b. Any information of a release or discharge of hazardous waste, or of a fire or explosion at the facility, which could threaten the environment or human health outside the facility.

c. The description of the occurrence and its cause shall include at least the following:

   i. Name, address, and telephone number of the owner or operator;

ii. Name, address, and telephone number of the facility;

iii. Date, time, and type of incident;

iv. Names and quantities of material(s) involved;

v. The extent of injuries, if any;

vi. An assessment of actual or potential hazard to the environment and human health outside the facility, where this is applicable; and

vii. Estimated quantity and disposition of recovered material that resulted from the incident (40 CFR § 270.30(l)(6)).

d. A written submission shall also be provided to the Director within five (5) days of the time the Permittees becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the periods of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated duration of noncompliance; the steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The Director may waive the 5-day notice requirement in favor of a written report within fifteen (15) days (40 CFR § 270.30(l)(6)(iii)).

I.D.12. Other Noncompliance
The Permittees shall report all other instances of noncompliance not otherwise required to be reported above, at the time monitoring reports are submitted. The reports shall contain the information listed in permit condition I.D.11 (40 CFR § 270.30(l)(10)).

I.D.13. Other Information
Whenever the Permittees becomes aware that it failed to submit any relevant facts in the permit application, or submitted incorrect information in a permit application or in any report to the Director, the Permittees shall promptly submit such facts or information to the Director (40 CFR § 270.30(l)(11)).

I.E. MONITORING AND RECORDS

I.E.1. Monitoring Reports
Monitoring shall be performed and results shall be reported at the intervals specified in the Permit.

I.E.2. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity (40 CFR § 270.30 (j)(1)). The method used to obtain a representative sample of the waste to be analyzed must be the appropriate method specified in 40 CFR 261, Appendix I, or an equivalent method

approved by the EPA. Laboratory methods must be those specified in *Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846* (3rd ed.; November, 1986, as updated), *Standard Methods of Wastewater Analysis* (16th ed.; 1985, as updated), or an equivalent method approved by the EPA. Additionally, the laboratory must be accredited for the analytical method, matrix and target analyte (where applicable) by the Virginia Environmental Laboratory Accreditation Program (VELAP).

I.E.3. The Permittees shall retain records of monitoring information, including calibration and maintenance records, and original strip chart recordings for continuous monitoring instrumentation, copies of reports and records required by this Permit, certifications required by 40 CFR § 264.73(b)(9), and records of data used to complete the application for this Permit, for a period of at least 3 years (or longer if specified elsewhere in this Permit) from the date of the sample collection, measurement, report, certification, or application. These retention periods may be extended by the request of the Director at any time and are automatically extended during the course of any unresolved enforcement actions regarding this facility. The Permittees shall maintain records from all groundwater monitoring wells and associated groundwater surface elevations, for the active life of the facility, and for disposal facilities for the post-closure care period as well.

Records of monitoring information shall include at a minimum:

a. The date, exact place, and time of sampling or measurements;

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

c. The date(s) analyses were performed;

d. The individual(s) who performed the analyses;

e. The analytical techniques or test methods used; and

f. The results of such analyses. (40 CFR § 270.30(j))

I.F. COMPLIANCE NOT CONSTITUTING DEFENSE

Compliance with the terms of this Permit does not constitute a defense to any action brought under Chapter 14, Article 8 of Title 10.1, Code of Virginia (1950) as amended or any other Commonwealth law governing protection of the public or the environment.

I.G. TRANSFER OF PERMITS

This Permit is not transferable to any person except after notice to the Director (40 CFR § 270.30(l)(3)). This Permit may be transferred by the Permittees to a new owner or operator only if the Permit has been modified or revoked and reissued under 40 CFR § 270.40(b) or § 270.42(b)(2) to identify the new Permittees and to incorporate such other requirements as may be necessary under the RCRA (40 CFR § 270.40). Before transferring ownership or operation of the facility during its operation life, the Permittees shall notify the new owner or operator in writing of the requirements of 9 VAC 20-60-264 and 40 CFR Part 264 and 270 and at the same time shall send a copy of such notice to the Director (40 CFR § 264.12(c)).

I.H. PERMIT EXPIRATION AND CONTINUATION

Pursuant to 9 VAC 20-60-270 B 15 this Permit will remain in force until the effective date of a new permit if the Permittees has submitted a timely, complete application pursuant to Permit Condition I.D.2.a., and through no fault of the Permittees, the Director has not issued a new permit with an effective date on or before the expiration date of this Permit. All conditions of the continued Permit shall remain fully effective and enforceable (40 CFR § 270.51).

I.I. REPORTS, NOTIFICATIONS, AND SUBMISSIONS TO THE DEPARTMENT

I.I.1. Reporting

The Permittees shall submit a groundwater monitoring and remedial measures effectiveness report. The report shall be submitted upon completion of data collection for a year. The report shall be submitted within 120 days after receiving the final analytical data from the laboratory.

At a minimum, the report will include groundwater monitoring results for each monitoring event including applicable summary tables and figures. Specific reporting requirements are presented in the approved work plan for the unit.

This report may be combined with other reporting required in the approved work plans as referenced in Section II.B.3.

I.I.2. Duty to Submit Certified Documents

All work plans, reports, notifications or other submissions which are required by this Permit to be sent or given to the Director shall be sent certified mail, sent by certified carrier (including overnight commercial delivery services), electronic submission or be hand- delivered to:

Department of Environmental Quality
Groundwater/Corrective Action Program Manager
Office of Remediation Programs
PO Box 1105
Richmond, Virginia 23218
Telephone Number (804) 698-4099

Street Address:
629 East Main Street
Richmond, Virginia 23219

And one (1) copy of all such correspondence, reports, and submissions shall also be sent to:

Deputy Director, Blue Ridge Regional Office
Department of Environmental Quality
3019 Peters Creek Road
Roanoke, Virginia 24019
Telephone Number (540) 562-6700

Associate Director, Office of Remediation
U.S. Environmental Protection Agency, Region III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029
Mail Code: (3LC20)

I.I.3. Signatory Requirements
All applications, work plans, reports, and other information submitted shall be signed and certified as specified by 40 CFR § 270.11.

I.J. DOCUMENTS TO BE MAINTAINED AT THE FACILITY SITE

I.J.1. Current copies of the following documents, as amended, revised, and modified, shall be maintained at the facility. These documents shall be maintained until corrective action is completed and certified by the Permittees and by an independent, Virginia-registered professional engineer, unless a lesser time is specified in the Permit.

a. The Permit, including all attachments;

b. All Part A and B Permit Applications supporting the Permit;

c. Inspection schedules and logs required by 40 CFR § 264.15(b)(2) and§ 264.15(d), as applicable;

d. Personnel training documents and records required by 40 CFR § 264.16 and this Permit, as applicable;

e. Groundwater sampling and analysis plan for remedial effectiveness and long-term groundwater monitoring required by this Permit, including groundwater monitoring results. and;

f. Corrective Action work plans, reports, and other information and submissions regarding Corrective Action, as applicable under this Permit.

I.K. APPROVAL/DISAPPROVAL OF SUBMISSIONS

I.K.1. The VDEQ will review the plans, reports, schedules and other documents (hereinafter collectively referred to as "submissions") submitted which require the Director's approval. The VDEQ will notify the Permittees in writing of the VDEQ's approval, conditional approval, or disapproval of each submission.

I.K.2. Each submission required by this Permit, upon approval by the Director, is incorporated into this Permit. Any noncompliance with a VDEQ-approved submission shall be deemed as noncompliance with this Permit. A conditionally approved submission, including any terms of such conditional approval set forth in VDEQ's decision, shall constitute the VDEQ-approved submission and shall be incorporated into this Permit.

I.K.3. In the event of the VDEQ's conditional approval of submission, the Director shall specify in writing any deficiencies in the submission and the terms upon which approval of the submission is conditioned. If the Permittees disputes any term upon which approval of the submission was conditioned, the Permittees may initiate Dispute Resolution pursuant to permit condition I.L.

I.K.4. In the event of the VDEQ's disapproval of a submission, the Director or the VDEQ shall specify the deficiencies in writing. The Permittees shall address the specified deficiencies within a reasonable time period established by the Director or the VDEQ taking into account the tasks to be performed, and submit the revised submission, as necessary, to the VDEQ for approval.

I.K.5. If the revised submission is disapproved, the Director or the VDEQ will notify the Permittees of the deficiencies in writing and specify a schedule for the Permittees to correct the deficiencies and resubmit the submission to VDEQ. The Permittees shall correct the deficiencies as directed by VDEQ, and forward the revised submission within the time period specified by VDEQ. In the event the Permittees disagrees with the VDEQ's disapproval of the revised submission, the Permittees shall notify the VDEQ in writing and the disagreement shall be resolved in accordance with the Dispute Resolution provision in permit condition I.L. of this Permit.

I.L. DISPUTE RESOLUTION

I.L.1. Except as otherwise provided in this Permit, in the event the Permittees disagrees, in whole or in part, with Department disapproval of any submission required by this Permit, the Permittees shall notify the Department in writing of its objections, and the basis thereof, within fourteen (14) days of receipt of the Department's disapproval. Such notice shall set forth the specific matters in dispute, the position(s) the Permittees asserts which should be adopted as consistent with the requirements of the Permit, the basis for the Permittees' position, and supporting documentation considered necessary for the Department's determination.

I.L.2. The Department and the Permittees shall have an additional fourteen (14) days from the Department's receipt of the notification to meet or confer to resolve any disagreement/dispute. In the event agreement is reached, the Permittees shall submit the revised submission and implement the same in accordance with such agreement.

I.L.3. In the event the Permittees and the VDEQ are not able to reach an agreement on the dispute items within the additional 14-day period, the Department will notify the Permittees in writing of its decision on the dispute and the Permittees shall comply with the terms and conditions of the Department's decision in the dispute. The Permittees does not waive its right to assert any and all available defenses in a proceeding to enforce this Permit.

I.L.4. In the event the Permittees disagrees with VDEQ's disapproval of a submission or revised submission and the VDEQ's written decision regarding dispute items, the Permittees may file an appeal with the Director within 30 days of the disapproval (as provided for in Rule 2A:2 of the Supreme Court of Virginia).

I.M. FUNDING

I.M.1. Nothing in this permit shall require a violation of the Anti-Deficiency Act, 31 U.S.C.1341. The Permittee agrees to use its best efforts to obtain all necessary funding through the appropriate authorities or source(s) to ensure the compliance with this permit and continued maintenance of all ICs and ECs associated with SWMUs and/or AOCs as identified in the permit, and, where necessary, the timely re-implementation of any ICs or ECs and/or completions of corrective action necessitated by an inappropriate change to a IC or EC.

I.M.2 If the permittee is unable to acquire the necessary funding under this permit, then written notification will be made to the DEQ within 14 days of the Permittee's determination of a funding deficiency. A timeline of when the permittee projects full funding will become available shall be sent to DEQ within 30 days after the written notification is sent.

I.M.3 If appropriated funds are not available to fulfill the Permittee's obligations under this permit, DEQ reserves the right to initiate an action against any other person, or to take any response action, which would be appropriate absent this permit.

MODULE II - SITE-WIDE CORRECTIVE ACTION

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

II.A.1. Section 3004(u) of RCRA, 42 U.S.C. § 6924(u), and regulations codified under 40 CFR § 264.101, provide that all permits issued after November 8, 1984, must require corrective action (CA) as necessary to protect human health and the environment for all releases of hazardous waste or hazardous constituents from any solid waste management unit (SWMU), regardless of when waste was placed in the unit.

II.A.2. Under Section 3004(v) of RCRA, 42 U.S.C. § 6924(v), and 40 CFR § 264.101(c), the Department may require that CA at a permitted facility be taken beyond the facility boundary where necessary to protect human health and the environment, unless the owner or operator of the facility concerned demonstrates to the satisfaction of the Department that, despite the owner or operator's best efforts, the owner or operator was unable to obtain the necessary permission to undertake such action.

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

II.B. CORRECTIVE MEASURES IMPLEMENTATION

II.B.1 Background

The initial requirements for the Corrective Action process were specified in a RCRA Corrective Action Permit issued by EPA to Radford Army Ammunition Plant in 1989 (No. VA1210020730) and reissued by EPA on October 31, 2000. The Corrective Action Permit required RFAAP to complete RCRA Facility Investigations (RFIs), implement interim measures (IMs) as necessary, and complete a Corrective Measures Study (CMS) to address releases for approximately 80 CAUs at the Facility. Work plans and reports submitted by RFAAP to EPA and VDEQ for the activities noted above are located on the RFAAP Installation Restoration Program (IRP) online document repository (http://www.radfordaapirp.org).

Subsequent to the activities noted above, EPA prepared two Statement of Basis (SB) documents (May 2011 and June 2014) detailing proposed remedies for CAUs at the Facility.

In April 2012, EPA issued a Final Decision and Response to Comments (FDRTC

or Final Decision) for the May 2011 SB prepared for a majority of the Facility's CAUs. The Final Decision document described the information gathered during environmental investigations at the Facility and selected Remedy. The selected remedies included Institutional Controls for ten (10) CAUs. Of these ten (10) CAUs, Engineering Controls were also the selected remedy for three (3) units.

In August 2014, EPA issued a FDRTC or Final Decision for the June 2014 issued SB prepared for four (4) CAUs not included in the May 2011 SB. Selected remedies consisted of Institutional Controls, Engineering Controls, and Monitored Natural Attenuation (MNA) and/or Long-term groundwater monitoring.

Since this issuance of the 2000 CA Permit, the EPA transferred the responsibility for renewal of the Permit to the VDEQ's Office of Financial Responsibility and Waste Programs. VDEQ issued RFAAP the Facility's Corrective Action permit renewal application request on January 13, 2015. This Facility RCRA Corrective Action Permit issued by VDEQ addresses implementation of the selected Remedy for CAUs at the RFAAP as well as ongoing obligations for future environmental compliance and cleanup.

Based on the Final Decision and SB documents, this Corrective Action Permit issued by VDEQ, incorporates CAUs at RFAAP subject to RCRA Corrective Action requirements. Table 1 of Attachment A summarizes the Final Remedy for fourteen (14) corrective action units including: nine solid waste management units (SWMUs), four Site Screening Areas (SSAs), and the Army Reserve Small Arms Range (ARSAR). Also listed on Table 1 is the Former Mortar and Gun Range which is included in this Corrective Action Permit. The Former Mortar and Gun Range is currently under active investigation.

II.B.2. Final Remedy.

a. Based on the findings of the RFIs, RFAAP conducted a CMS and completed IM. Based on the CMS results, the final remedy for the facility was developed and is described in two Statement of Basis documents, dated May 2011 and June 2014, respectively. The requirements of this Permit provide for the operation and maintenance of the remedies described in the two Statements of Basis.

b. The goal of the remedy for facility-wide corrective action is to ensure protection of human health and the environment. The final remedy for the facility consists of implementing Institutional Controls, Engineering Controls and Monitored Natural Attenuation in the form of long-term groundwater monitoring. Institutional Controls (ICs) are generally non-engineered mechanisms such as administrative and/or legal controls that minimize the potential for human exposure to contaminants and/or protect the integrity of a remedy. Engineering Controls (ECs) are generally engineered mechanisms

such as a landfill cap.

c. The remedial goals of the final remedies as discussed below are presented in Attachment C of this Permit.

Final Remedies are shown in Table 1 Attachment A and include:

1. Engineering Controls (ECs) and Institutional Controls (ICs): SWMU 40 and SSAs 30 and 79.

2. ICs: SWMUs 13, 41B, 43, 45, 51; and SSAs 72, 77, and Southeast Hillside Area of the Army Reserve Small Arms Range (ARSAR).

3. Monitored Natural Attenuation (MNA) for SWMUs 49 and 54.

4. Implementation and maintenance ICs and ECs including property use restrictions for groundwater and soil in accordance with Permit Section II.B.3 below.

SWMU and/or AOCs not included in the Final Remedy
As previously noted, the Former Mortar and Gun Range was not included in the approved remedy documents. Investigation of the Former Mortar and Gun Range is on-going.

II.B.3. Final Remedy Implementation

a. The Permittees shall use existing approved work plans and/or documents for operation and maintenance of long-term groundwater monitoring and reporting; and implementation of ICs, ECs, and additional Groundwater Use Restrictions. Final remedies shown in Table 1 Attachment A are summarized below:

1. Prohibit the use of groundwater beneath SWMUs 40, 48, 49 and 54;

2. Require inspection and maintenance of landfill caps and/or covers;

3. Restrict earth moving; and

4. Restrict subsurface soil excavation below 15 feet at SWMU 51.

b. The Permittees shall notify the VDEQ in writing of any proposed changes in the use of the property or proposals for any site work that affects the contamination or its disposition on the property.

II.C. EVALUATION OF THE FINAL REMEDY FOR GROUNDWATER MONTITORING

The Permittees shall submit a progress report on groundwater monitoring until remedial clean up requirements have been met. See Section I.I.1 for reporting, notifications and submission requirements. If the VDEQ determines that the final corrective measure(s) remedy will not comply with the media clean-up requirements, the Department may require the Permittees to perform additional studies and/or perform modifications to the existing corrective measure(s) remedy. If necessary, the Department or the Permittees may seek modification of this Permit pursuant to 40 C.F.R. § 270.41 or § 270.42 and § 124.5 to implement modifications to the existing corrective measures remedy.

II.D. EMERGENCY RESPONSE; RELEASE REPORTING

II.D.1. Emergencies

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

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

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

II.D.2. Releases

The Permittees shall notify the Department in writing of the nature, source, extent, and location of a release of hazardous waste or hazardous constituents at or from the facility within seven (7) days of discovery of such release which:

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

b. Is not being addressed pursuant to permit conditions II.D.1., Emergencies.

c. Is not subject to the Contingency Plan and Emergency Procedures, as applicable, if set forth in the portion of the RCRA Permit issued by the Department.

II.D.3. Based on the information submitted in Permit Condition II.D.2 (Releases), the Department may require the SWMUs to be included in an RCRA Facility Investigation or may require Interim Measures.

II.D.4. Nothing in this Permit shall limit the Department's authority to undertake or require any person to undertake response action or corrective action under any law, including but not limited to, Sections 104 or 106 of CERCLA, 42 U.S.C. §§ 9604 or 9606, and Section 7003 of RCRA, 42 U.S.C. § 6973. Nothing in this Permit shall relieve the Permittees of any obligation it may have under any law, including, but not limited to, Section 103 of CERCLA, to report releases of hazardous waste, hazardous constituents or hazardous substances to, at or from the facility.

II.E. GUIDANCE DOCUMENTS

Any corrective action performed at the facility shall be in general accordance with applicable EPA RCRA corrective action guidance available at: http://www.epa.gov/reg3wcmd/ca/ca_resources.htm.

II.F. SOLID WASTE MANAGEMENT UNIT (SWMU) ASSESSMENT

II.F.1. The Permittees shall notify the Department in writing, of any newly identified SWMU at the facility, no later than thirty (30) days after the date of discovery. The notification shall include, but not be limited to, the following known information:

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

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

c. A description of any release (or suspected release) of hazardous waste or hazardous constituents originating from the unit. Include information on the date of release, type of hazardous waste or hazardous constituents, quantity released, nature of the release, extent of release migration, and cause of release (e.g., overflow, broken pipe, tank leak, etc.). Also, provide any available data that quantifies the nature and extent of environmental impact, including the results of soil and/or groundwater sampling and analysis efforts. Likewise, submit any existing monitoring information that

indicates releases of hazardous waste or hazardous constituents has not occurred or is not occurring.

d. A discussion of the need for and feasibility of implementing interim measures immediately.

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

II.F.3. Within 60 days after receipt of the Director's determination that a RCRA Facility Investigation or Interim Measures is necessary the Permittees shall submit a RCRA Facility Investigation Work Plan or Interim Measures Work Plan that meets the applicable guidance. The Department's determination shall either specify the media and/or parameters to be investigated or shall require the Permittees to propose and justify the selection of media and/or parameters.

II.F.4. Within the time specified in the approved RCRA Facility Investigation Work Plan or Interim Measures Work Plan the Permittees shall submit the RCRA Facility Investigation Report or Interim Measures Report. The reports will provide data necessary for the Department to determine whether a Corrective Measures Study or additional Interim Measures Work Plan is required.

II.F.5. In lieu of a separate RCRA Facility Investigation the Permittees may propose to incorporate any newly identified SWMU into the ongoing corrective measures. Any such proposal shall be submitted to the Department along with notification of the discovery of the SWMU(s).

II.G. FINANCIAL ASSURANCE

II.G.1. The VDEQ recognizes that the federal government is self-insured and is exempt from this requirement.

II.H. RECORDKEEPING

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

II.I. ACCESS FOR CORRECTIVE ACTION OVERSIGHT

The Department and its authorized representatives shall have access to the facility at all reasonable times for the purpose of monitoring compliance with the provisions of this Permit. The Permittees shall use its best efforts to obtain access to property beyond the boundaries of the facility at which corrective action is required by this Permit (see Section 3004(v) of RCRA, 42 U.S.C. § 6924(v) and

40 CFR § 264.101(c)) for: (1) the Permittees and any contractor of the Permittees for the purpose of taking corrective action required by this Permit, and (2) the Department and its authorized representatives for the purposes described in this paragraph.

II.J. COMPLETION OF REMEDY

The interim measures/remedy program consisting of monitored natural attenuation in the form of groundwater monitoring shall continue until remedial objectives are met as referenced in the approved work plan for the unit. The remedial groundwater cleanup goals and the exit strategy detailing the requirements to terminate interim measures are presented in Attachment C.

If any of the institutional or engineering controls are no longer necessary to protect human health and the environment, the Permittees shall submit a written notification and certification to the Department by registered mail, stating that the remedy has been completed in accordance with requirements of this Permit and requesting removal of the controls from the Permit. The certification must be signed by the Permittees and by an independent registered professional engineer.

In cases where no other Permit conditions remain, the Permit may be modified not only to reflect the determination that remedy controls are no longer necessary, but also to change the expiration date of the Permit to allow for earlier permit expiration in accordance with 40 CFR § 124, § 270.41, and § 270.42 as applicable.

ATTACHMENT A

FACILITY MAP OF RCRA CORRECTIVE ACTION UNITS – FIGURE 1

And

SUMMARY OF CORRECTIVE ACTION UNITS FINAL REMEDIES – TABLE 1

Figure 1 – Map of RCRA Corrective Action Units

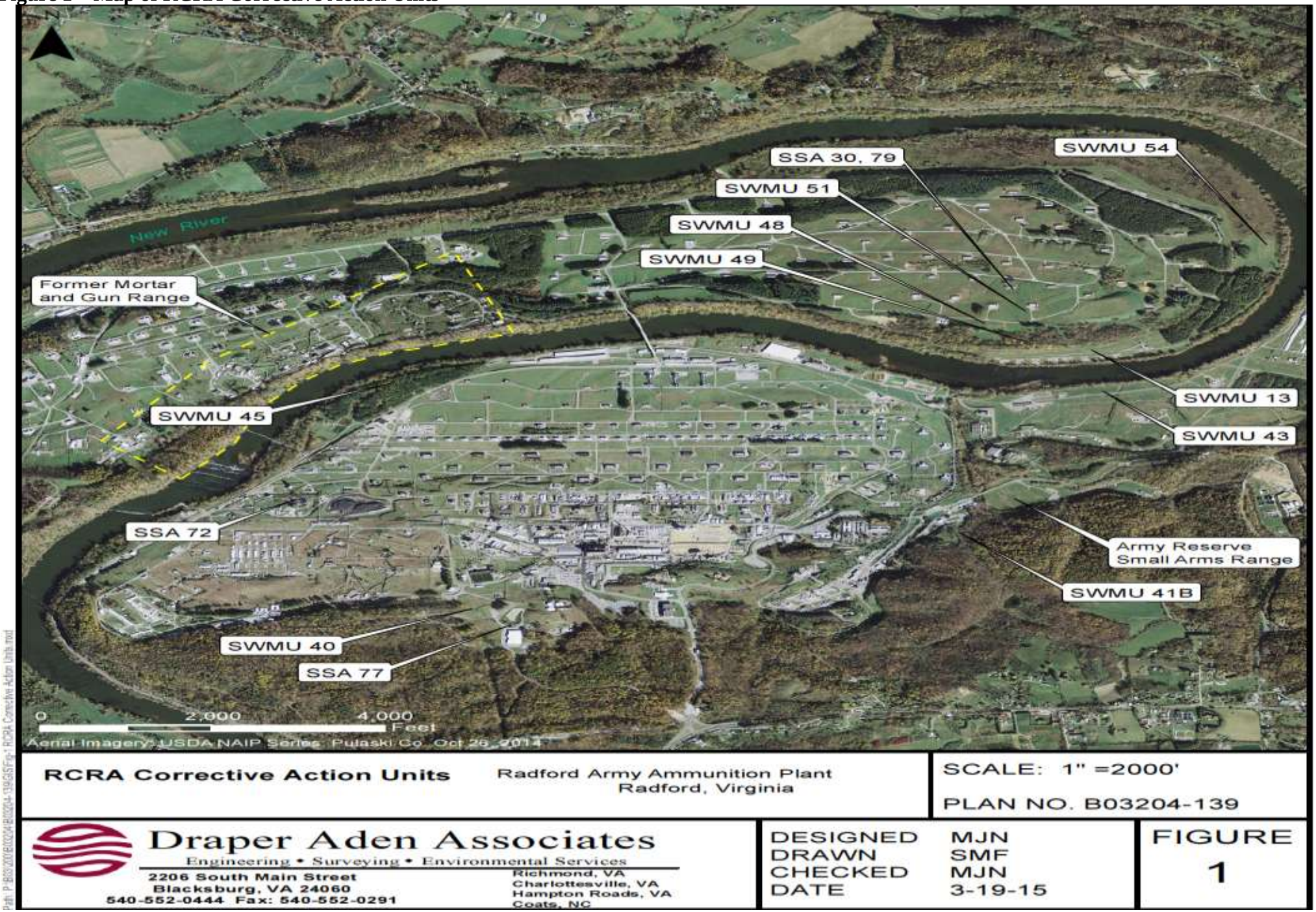

Table 1 – Corrective Action Units Final Remedies

Location	Description	Institutional Controls	Engineering Controls
SWMU 13	Area Between the Open Burning Ground and the New River	Restriction on earth moving, residential use	
SWMU 40	Landfill Nitro Area	Restriction on earth moving, residential use, and groundwater use	Maintain Cover
SWMU 41 B	Red Water Ash Burial Ground	Restriction on earth moving, residential use	
SWMU 43	Sanitary Landfill #2	Restriction on earth moving, residential use	
SWMU 45	Landfill #3	Restriction on earth moving, residential use	
SWMU 48	Oily Water Burial Area	Restriction on groundwater use	
SWMU 49	Red Water Ash Burial #2	Restriction on groundwater use; MNA	
SWMU 51	TNT Waste Neutralization Pits	Restriction on earth moving below 15 feet, residential use	
SWMU 54	Propellant Burning Ash Burial	Restriction on groundwater use; MNA	
SSA 30	Asbestos Disposal Trench #1	Restriction on earth moving, residential use	Maintain Cover
SSA 72	Oleum Plant Acidic Wastewater Sump	Restriction on earth moving, residential use	
SSA 77	Garbage Incinerator	Restriction on earth moving, residential use	
SSA 79	Asbestos Disposal Trench #2	Restriction on earth moving, residential use	Maintain Cover

Location	**Description**	**Institutional Controls**	**Engineering Controls**
Army Reserve Small Arms Range (ARSAR)	Southeast Hillside Area of ARSAR	Restriction on residential use	
Former Mortar and Gun Range	Currently under active investigation		

ATTACHMENT B

FACILITY BACKGROUND, CORRECTIVE ACTION UNIT DESCRIPTIONS AND ENVIRONMENTAL HISTORY

ATTACHMENT B

FACILITY BACKGROUND, CORRECTIVE ACTION UNIT DESCRIPTIONS AND ENVIRONMENTAL HISTORY

FACILITY BACKGROUND

The Radford Army Ammunition Plan (RFAAP) facility is located in the mountains of southwest Virginia in Pulaski and Montgomery Counties and consists of two noncontiguous areas: the Main Manufacturing Area (MMA) and the New River Unit (NRU). The MMA is located approximately five miles northeast of the City of Radford, Virginia, and ten miles west of the Town of Blacksburg, Virginia. The NRU is located approximately six miles west of the MMA and is not the subject of this Corrective Action Permit. SWMUs or areas described in this Corrective Action Permit are located in the MMA and referred to as the RFAAP or the facility.

RFAAP lies in one of a series of narrow valleys typical of the western range of the Appalachian Mountains. Oriented in northeast/southwest direction, the valley is approximately 25 miles long, eight miles wide at the southeast end and narrowing to two miles wide at the northeast end. RFAAP lies along the New River in the relatively narrow northeastern corner of the valley. The New River divides the RFAAP into two areas, the Horseshoe Area (HSA) and the MMA. The HSA (which is part of the MMA) lies within a meander of the New River.

RFAAP is an active manufacturer of explosives and propellants for the US military and other uses. RFAAP began manufacturing propellants in the 1940s and, as noted above, continues that work today. RFAAP has also produced TNT on an intermittent basis. RFAAP was first issued a RCRA Corrective Action Permit by the U.S. EPA in 1989. The permit was reissued in October 2000. Pursuant to the 2000 permit, approximately 80 CAUs were identified for investigation and potential remediation.

A Final Decision and Response to Comments (FDRTC) was issued by the EPA in April 2012 for a majority of the CAUs. The FDRTC references a Statement of Basis (SB) from May 2011 that identifies the remedies to individual CAUs at the facility (SWMUs, AOCs, SSAs, and MUs). Remedies included No Further Action (NFA), Engineering Controls for (ECs), Institutional Controls (ICs), and Monitored Natural Attenuation (MNA) and/or long-term groundwater monitoring. The EPA and VDEQ issued final remedies for four CAUs in an August 2014 FDRTC associated with a SB issued in June 2014. This Corrective Action permit, issued by VDEQ, addresses implementation of the selected Final Remedy for applicable CAUs. Table 1 indicates CAUs which will be addressed by remedies other than No Further Action. Table 1 also includes the Former Mortar and Gun Range which is currently under active investigation.

DESCRIPTION OF SWMUs, SSAs, and MUs

The following information summarizes the SWMUs, SSAs and MUs noted above, the environmental history, and final Remedy for Corrective Action. The information was obtained from the applicable SB.

SWMU 13

SWMU 13 is the area outside the Open Burning Ground (OBG) (see Figure 1, Attachment A). It consists of a 1.6-acre area between the OBG and the north bank of the New River in the western section of the Horseshoe Area. The unit is located topographically downhill from the OBG and likely received drainage from the OBG prior to the reconfiguration of the OBG to prevent storm water runoff from the unit. Open burning of waste and off-specification energetic products has been performed continuously at the OBG since manufacturing operation began at RFAAP in 1941. Open detonation has not been conducted. A RCRA Subpart X Permit (VA1210020730) was issued by the VDEQ in October 2005 for open burning at the OBG.

Environmental History

- 1987: OBG is visually investigated and found to have remnants of incompletely combusted propellant. Area of concern includes SWMU 13.

- 1992: Historical and present-day aerial photographs of the area outside the OBG (SWMU 13) are analyzed. Reports indicate the area is undeveloped and vegetated during the study period.

- 1997: Sediment samples collected adjacent to and downstream of SWMU 13 indicate the presence of metals and semivolatile organic compounds (SVOCs). Surface water samples collected adjacent to SWMU 13 indicates the presence of lead and barium below residential risk screening levels.

- 2005 – 2008: Soil samples collected from SWMU 13 indicate concentrations of metals exceed residential risk screening levels. Groundwater samples collected from the northern boundary of SWMU 13 indicate carbon tetrachloride and perchlorate concentrations exceed the groundwater protection standards set forth in VDEQ's Subpart X Permit.

- 2007: Site Screening Process (SSP) Investigation that includes advancement of five soil borings and collection of two surface water and sediment samples from the New River adjacent to SWMU 13 identifies lead as a primary constituent of concern. SSP report recommends a focused RFI for soils and sediment associated with SWMU 13.

- 2008: Sediment sampling adjacent to SWMU 13 indicates lead and explosive concentrations are below human health residential screening levels.

- 2010: RFI Report recommending institutional controls to prevent earth moving and residential use as the final remedy for SWMU 13 is approved by EPA.

Final Remedy for Corrective Action

EPA selects Institutional Controls as Final Remedy for SWMU 13. The ICs are a restriction on earth moving within SWMU 13 and that future use of the area comprising by SWMU 13 shall not be residential.

SWMU 40

SWMU 40 is the Landfill Nitro Area located within the south-central portion of the MMA (see Figure 1, Attachment A). SWMU 40 is a 2-acre undeveloped, open grass-covered area, with the exception of a gravel covered area used for temporary storage of asbestos located at the eastern edge of the unit. SWMU 40 was used in the 1970s and early 1980s for the burial of paper, office trash, concrete, and rubber tires. The unit was not permitted as a solid waste landfill by the Commonwealth of Virginia. Operation ceased and the unit was closed with a clay cap and grass cover.

Environmental History

- 1987: Unit is assessed by review and evaluation of available information, personnel interviews, and visual inspection.

- 1992: Historical aerial photographs of SWMU 40 are analyzed. Activity is first observed in a 1971 photograph showing significant filling with three fill faces in the SWMU area. The 1986 photograph indicates much of the unit has been re-vegetated except for the northeast corner where evidence of recent filling is apparent.

- Analytical results of surface soil and composite samples collected as part of RFI from SWMU 40 indicate petroleum hydrocarbons were detected at concentrations below the VDEQ action level.

- 2009: Risk assessment of SWMU 40 indicated elevated risk associated with aluminum in soils if the land changed to residential or if the impacted soil material was not left place. Corrective measures were developed based on the following:

  - Current land use of the unit is undeveloped industrial consisting of a 2-acre closed landfill; and,

  - Land use of the unit is unlikely to change in the future due to the presence of closed landfill contained by a surface cap and cover.

- 2011: Interim Measures Work Plan. SWMU 40 Interim Measures Work Plan SWMU 40 (RFAAP-009) Landfill Nitro Area Interim Measures Work Plan Radford Army Ammunition Plant, Radford, VA. Final. August 2011 approved by EPA and VDEQ. This work plan provided the technical approach, data screening, evaluation and assessment criteria and exit strategy for the groundwater monitoring effort. Frequency of groundwater monitoring would

vary, Year 1 frequency would be quarterly, Years 2 to 5 would at a 9 month frequency and Years 6 to 30 (if required) would be at an annual frequency.

- 2012: SWMU 40 Interim Measures Completion Report (IMCR) Work Plan details include mobilization, installation of monitoring well, repairs to landfill cap, and implementation of institutional controls (ICs).

- 2013: Long-Term Monitoring Report SWMU 40 (RFAAP-009) Landfill Nitro Area Annual Long Term Monitoring Report. Radford Army Ammunition Plant, Radford, VA. Draft Final. April 2013 approved by EPA and VDEQ. For this Year 1 report monitoring was conducted quarterly and recommended reductions in the long-term monitoring.

- 2013: Long-Term Monitoring Report SWMU 40 (RFAAP-009) Landfill Nitro Area Annual Long Term Monitoring Report. Radford Army Ammunition Plant, Radford, VA. Draft. October 2013 approved by EPA and VDEQ. For this Year 2 report, monitoring was conducted on a 9 month frequency and recommended reductions in the long-term monitoring.

- 2014: Long-Term Monitoring Report SWMU 40 (RFAAP-009) Landfill Nitro Area Year 3 Long Term Monitoring Report. Radford Army Ammunition Plant, Radford, VA. Draft Final. July 2014 approved by EPA and VDEQ. For this Year 3 report, monitoring was conducted on a 9-month frequency and recommended reduction in the long-term monitoring.

- 2015: Long-Term Monitoring Report SWMU 40 (RFAAP-009) Landfill Nitro Area Year 4 Long Term Monitoring Report. Radford Army Ammunition Plant, Radford, VA. Draft Final. March, 2015 approved by EPA and VDEQ. For this Year 4 report monitoring was conducted on a 9 month frequency and recommended to discontinue the long-term monitoring.

- 2015: Remedy Review Report SWMU 40 (RFAAP-009) Landfill Nitro Area Remedy Review Report. Radford Army Ammunition Plant, Radford, VA. Draft Final. May, 2015 approved by EPA and VDEQ. This remedy review report summarized the actions taken in accordance with the 2012 SWMU 40 IMCR Work Plan and subsequent long term monitoring reports and recommended to maintain the cover and inspections and to discontinue the long term monitoring.

Final Remedy for Corrective Action
EPA selects Engineering Controls (ECs), Institutional Controls (ICs) and Long-Term Monitoring (LTM) as Final Remedy for SWMU 40. The ECs include repairs to the existing landfill cap, long-term inspection and maintenance of the cap, and clear marking of the capped area. ICs include prevention of residential use, prevention of earth-moving, and a restriction on potable use of groundwater.

SWMU 41B

SWMU 41 is located in the southeastern portion of the RFAAP Main Manufacturing Area (see Figure 1, Attachment A). The unit consists of two non-contiguous disposal areas (SWMU 41A and SWMU 41B) for red water ash. Red water ash is a byproduct of

combustion of TNT production wastewater. SWMU 41B is a 0.36-acre natural clay-lined landfill containing red water ash. From approximately 1967 to 1974 and again from 1983 to 1986, RFAAP manufactured TNT by the continuous-type process, which employed chemical recycling and resulted in a smaller quantity of more concentrated waste than older batch-type operations. In TNT manufacture, red colored wastewater, known as red water, is produced. Red water generated from continuous-type process TNT manufacturing was concentrated by evaporation and the residue burned in rotary kilns located in the former TNT manufacturing area. The ash produced from these kilns was disposed of in SWMU 41B from 1967 to 1971. Disposal ceased in 1971 and SWMU 41B was deactivated.

Environmental History

- 1987: Unit is assessed by review and evaluation of available information, personnel interviews, and visual inspection. None of the data collected indicates releases have occurred.

- 1992: Historical aerial photographs of SWMU 41B are analyzed. SWMU 41B is noted as having received considerable amounts of fill material between 1981 and 1986. Area is devoid of vegetation in 1986.

- 1992: Verification investigation performed includes soil, surface water, and groundwater sampling. Soils results indicate metals exceeded residential risk screening levels but were below RFAAP facility-wide background point estimates. Groundwater results indicate SVOCs and metals concentrations exceeded risk screening levels. Detected constituents in surface water were below applicable screening levels.

- 2002: Geophysical survey conducted to delineate potential red water ash burial locations within the unit. Buried material was estimated to be ten feet below ground surface.

- 2005: RFI identifies metals as constituents of potential concern (COPC) in soil and groundwater (SWMU 41B).

- 2010: Groundwater sample results indicate there is no unacceptable risk to human health or the environment.

- 2011: EPA approves final RFI. Final Remedy is proposed as detailed below.

Selected Remedy for Corrective Action

EPA selects Institutional Controls (ICs) as Final Remedy for SWMU 41 B. ICs include prevention of residential use and prevention of earth-moving.

SWMU 43

SWMU 43 is a closed unlined sanitary landfill located immediately adjacent to the New River in the northeast section of the MMA (see Figure 1, Attachment A). SWMU 43 consists of two adjacent approximately 1.5-acre cells divided by a central drainage ditch. Based on geophysics and aerial photography, the landfill extends east-west approximately

700 feet on either side of the drainage ditch. The north and south boundaries are the river bank and the paved road, respectively. The landfill has a north-south dimension of approximately 150 feet. The former trench-fill operation reportedly received at least 300 tons of paper and refuse over its active life. The landfill was reportedly operated from 1958 to the early 1970s.

Environmental History

- 1987: Unit is assessed by review and evaluation of available information, personnel interviews, and visual inspection. No known releases are documented for this unit.

- 1992: Investigation of surface and groundwater is performed. Metals are detected in surface water above EPA MCLs for drinking water. VOCs and metals are detected in groundwater above EPA risk screening levels and MCLs, respectively.

- 2007: Geophysical survey performed to identify landfill cell boundaries. No anomalies or debris detected. Thirty soil samples are collected. Residential screening level exceedances include one PAH, two PCBs, one explosive, two metals, and four dioxin/furans. One VOC and five metal detected above groundwater RSLs.

- 2010: Results of risk assessment performed to evaluate potential human and ecological receptors and exposure pathways indicated no unacceptable risks were identified for industrial and construction workers under current land use conditions. Groundwater sampling results from October 2010 indicated VOCs were within (or below) the range of previous data.

- 2011: Final SWMU 43 RFI report concludes the risk to industrial workers is within the acceptable range and the site and recommends controls at the site prevent residential use.

Final Remedy for Corrective Action

EPA selects Institutional Controls (ICs) to prevent residential use and earth moving as Final Remedy for SWMU 43.

SWMU 45 Landfill #3

SWMU 45, the Inactive Sanitary Landfill (a.k.a., Landfill #3), consists of a 3.4-acre area in the northwest section of the Main Manufacturing Area (see Figure 1, Attachment A). The New River is approximately 200 feet north-northwest of the unit. Historical records indicate the landfill was in operation from 1957 to 1961. Previous investigations determined that a variety of waste, including scrap metal, may have been disposed of in the landfill.

Environmental History

- 1987: Unit is assessed by review and evaluation of available information, personnel interviews, and visual inspection. Reportedly, the area identified by site personnel as the landfill was "indistinguishable from the surrounding area as a landfill site." Reportedly, the disposal unit began operation in the 1970s but was not active at the time of visual inspection in 1986.

- 1992: Investigation of groundwater indicates VOCs and metals were detected above EPA Regional Screening Levels (RSLs). Analysis of historical aerial photography indicated:
  - 1949: substantial clearing and possible fill activity in SWMU 45 area
  - 1954: unit appeared to have been enlarged with access roads and open containers visible; however most of unit appears to be vegetated
  - 1962 and 1966: most of unit vegetated; possible trench and dark-toned material are visible
  - 1971 and 1975: most of unit vegetated except for small ground scarred area
- 2007: Geophysical survey performed to confirm monitoring wells appropriately placed to detect deep releases to groundwater. Areas of metal debris were identified within the boundary of SWMU 45.
- 2010: Site Screening Process (SSP) investigation report concludes unit-related cancer risks are within EPA target ranges for Superfund Sites and ecological risks are negligible.

Final Remedy for Corrective Action
EPA selects Institutional Controls (ICs) to prevent earth moving as Final Remedy for SWMU 45. Table 2 of the FDRTC indicates a restriction on residential use as part of the Final Remedy for SWMU 45.

SWMUs 48 and 49

SWMUs 48 and 49 are combined into one study area which is located in the southeastern portion of the HSA, east of the main bridge over the New River (see Figure 1, Attachment A). The two SWMUs are adjacent, with SWMU 48 located approximately 200 ft northwest of SWMU 49. SWMU 48 is approximately 380 ft long by 120 ft wide; whereas, SWMU 49 is 75 ft long by 83 ft wide. The SWMUs are situated on a bluff approximately 120 ft above the New River. SWMU 48 is known as the Oily Water Burial Area and SWMU 49 is known as the Red Water Ash Burial No. 2; however, SWMUs 48 and 49 are combined into one study area because in previous reports their descriptive titles have been used interchangeably and because of their close proximity to each other. SWMUs 48 and 49 share unlined trenches where oily wastewater and red water ash were disposed starting around 1970.

Environmental History
- 1987: Unit is assessed by review and evaluation of available information, personnel interviews, and visual inspection. The results conclude SWMUs 48 and 49 are contiguous.
- 1992: Verification investigation to characterize nature and extent of impact concludes explosive SVOC compounds were detected at SWMU 48 above heath-based risk levels.

- 1996-2006: Several investigations performed the results of which provided a comprehensive data set to assess concentrations of constituents of concern over time.

- 2007: RFI - Soil at SWMU 48 considered adequately characterized; however, additional soil sampling is conducted at SWMU 49. Four additional monitoring wells are installed and sampled along with existing monitoring wells.

- 2010: Test pits advanced perpendicular to trenches at SWMU 48 where a clayey substance containing high concentrations of metals is discovered.

- 2011: IM performed to remove impacted soil, the ash layer, debris, and clayey substance from southern trench of SWMU 48. Material is disposed of off-site.

  - A total of 3,393 tons of nonhazardous soil and 101.6 tons of hazardous soil were removed from SWMU 48. The area is backfilled with 3,261 cubic yards of general fill and topsoil and hyrdoseeded to finalize site restoration. No further action is necessary for SWMU 48 soils.

- 2013: Supplemental groundwater sampling, including the installation of four additional monitoring wells, is conducted to delineate the extent of chlorinated solvents in the vicinity of SWMUs 48 and 49. Groundwater exceeded MCLs for carbon tetrachloride and TCE.

- 2013: Human health risk assessment (HHRA) determines SWMU 48 cleanup effort achieves residential soil risk guidelines and is now suitable for unrestricted use. The HHRA for SWMU 49 indicates total cancer risk is below or within target risk range and is determined suitable for unrestricted use.

- 2014: *SWMU 49 Monitored Natural Attenuation Groundwater Work Plan Radford Army Ammunition Plant, Virginia. Draft Final Document October 2014* approved by EPA and VDEQ. This work plan provided the technical approach, remedial goals and exit strategy for the groundwater monitored natural attenuation effort.

Final Remedy for Corrective Action

- EPA concludes that, based on available information, there are no unacceptable risks associated with SWMU 48 and 49 soils and are therefore subject to unrestricted use.

- EPA selects monitored natural attenuation as a selected remedy for groundwater until the remedial goals are met (SWMU 49).

- EPA selects ICs in the form of a Groundwater Use Restriction as a selected remedy for SWMU 48 and 49 that indicate groundwater at SWMU 48 and 49 shall not be used for any purpose, including, but not limited to, use as a potable water source, other than to conduct maintenance and monitoring activities required by VDEQ and/or EPA.

SWMU 51 TNT Waste Neutralization Pits

SWMU 51, the TNT Waste Neutralization Pits, consists of one trench, approximately 140 feet long, 23 feet wide, and 14 feet deep, located in the HSA (see Figure 1, Attachment A). The trench has been filled to natural grade with soil and is covered by grass and weeds. A barbed wire fence surrounds SWMU 51.

During the production of TNT, an alkaline, red-colored aqueous waste is generated (red water). Reportedly, this waste stream is composed of TNT purification by-products, air pollution scrubber water, washwater from cleaning of production equipment and facilities and washwater from product washdown operations.

Environmental History

- 1987: Unit is assessed by review and evaluation of available information, personnel interviews, and visual inspection. The assessment concluded that low concentrations of TNT constituents detected in groundwater monitoring wells were indicators of SWMU 51 disposal activities.

- 1992: Historical aerial photographs of SWMU 51 are analyzed and activity is first noted in 1975 based on the presence of a trench that appeared empty. By 1981 the trench had been filled and a revegetated ground scar was the sole feature that remained.

- 1992: Groundwater sample analyses indicate volatile organic compounds (VOCs), SVOCs, explosives and metals were detected at concentrations above risk-based groundwater screening levels.

- 2002: Results of geophysical survey to delineate extent of TNT neutralization sludge disposal trench indicate the area of the waste is approximately 2,300 square feet and the average thickness is 11 feet.

- 2008: The findings documented in the 2008 RFI report concluded impact to soil existed at SWMU 51 and recommended interim measures in the form of soil removal and disposal to mitigate the threat of release, migration, and/or exposure to the public and environment.

- 2010: Approximately 1,245 cubic yards, or 1,867 tons of impacted soil is removed from SWMU 51. The site is backfilled and seeded to complete restoration.

Final Remedy for Corrective Action

EPA selects Institutional Controls (ICs) to prevent future residential use and earth moving below 15 feet below ground surface as the Final Remedy.

SWMU 54

SWMU 54 is located within the easternmost portion of the HSA (see Figure 1, Attachment A). SWMU 54 consists of two non-contiguous disposal areas; Area A is an approximate

0.58-acre triangular shaped area in the southern portion of SWMU 54 and Area B is an approximate 1 - acre area in the northern portion of SWMU 54. SWMU 54 is currently undeveloped. The RFAAP installation security fence is located along the northern and eastern boundaries of SWMU 54. SWMU 54 was reportedly used as a disposal area in the late 1970s for ash from propellant burning activities located at the Waste Propellant Burning Grounds. The propellant ash consisted of a residue resulting from the burning of waste explosives, propellants, and laboratory waste.

Environmental History

- 1987: Unit is assessed by review and evaluation of available information, personnel interviews, and visual inspection.

- 1992: Verification investigation identifies the ash disposal at Area A.

- 1996: Extent of ash and limits of soil impact are defined as part of RFI.

- 1998: Supplemental RFI and CMS conducted to investigate Area B.

- 2008: RFI/CMS conducted to confirm effectiveness of hotspot removal and assess conditions. Risk assessment concluded unacceptable risks to potential future residential and industrial receptors. Corrective measures including soil excavation/off-site disposal and MNA were recommended.

- 2010: *SWMU 54 Interim Measures Work Plan Radford Army Ammunition Plant, Radford, Virginia. Final Document January 2010* approved by EPA and VDEQ. This work plan provided the technical approach for the soil removal effort.

- 2010/2011: Approximately 870 tons of hazardous soil and 4,921 tons of nonhazardous soil were removed from Area A and 2,200 tons of hazardous soil and 2,288 tons of nonhazardous soil are removed from Area B. The areas are backfilled and seeded to complete restoration. This is documented in the *SWMU 54 (RFAAP-014) Interim Measures Completion Report Radford Army Ammunition Plant, Radford, Virginia. Draft Document April 2010* and was approved by EPA and VDEQ.

- 2011: *SWMU 54 (RFAAP-014) Monitored Natural Attenuation Interim Measures Work Plan Radford Army Ammunition Plant, Virginia. Final Document April 2011* approved by EPA and VDEQ. This work plan provided the technical approach, remedial goals and exit strategy for the groundwater monitored natural attenuation effort.

- 2012/2013: *SWMU 54 Monitored Natural Attenuation Sampling Year One Report Radford Army Ammunition Plant, Radford, Virginia. Draft Document February 2013* approved by EPA and VDEQ. For this Year 1 report monitoring was conducted quarterly and recommended reductions in the long-term monitoring.

- 2013: *SWMU 54 Monitored Natural Attenuation Sampling Year Two Report Radford Army*

Ammunition Plant, Radford, Virginia. Draft Document December 2013 approved by EPA and VDEQ. For this Year 2 report monitoring was conducted quarterly and recommended adjustments and reductions in the long-term monitoring. Based on the rapidly decreasing concentrations of COPCs in groundwater, it was determined that active remediation was unnecessary.

- 2014: *SWMU 54 Monitored Natural Attenuation Sampling Year Three Report Radford Army Ammunition Plant, Radford, Virginia. Draft Document October2014* (approved by EPA and VDEQ). For this Year 3 report monitoring was conducted quarterly. Based on the rapidly decreasing concentrations of COPCs in groundwater, it was determined that active remediation was unnecessary.

Final Remedy for Corrective Action

- EPA concludes that, based on available information, there are no unacceptable risks associated with SWMU 54 soils and they are therefore subject to unrestricted use.

- EPA selects MNA as a selected remedy for groundwater until the remedial goals are met.

- EPA selects Groundwater Use Restrictions as the selected remedy for SWMU 54 that indicate groundwater at SWMU 54 shall not be used for any purpose, including, but not limited to, use as a potable water source, other than to conduct maintenance and monitoring activities required by VDEQ and/or EPA.

SITE SCREENING AREAS 30, 72, 77 and 79

Site Screening Area (SSA) 30, Asbestos Disposal Trench No. 1, and SSA 79, Asbestos Disposal Trench No. 2, are co-located in the HSA. SSA 72, the Oleum Plant Acidic Wastewater Sump, are located in the Oleum Plant area of RFAAP. SSA 77, the Garbage Incinerator (Building 7219), is located adjacent to shipping and receiving in the MMA (see Figure 1, Attachment A).

- SSAs 30 and 79 were used for disposal of asbestos containing material from 1982 to 1987. The units received 250 to 500 pounds of double bagged asbestos containing material per day when asbestos removal activities were ongoing at RFAAP.

- SSA 72 operated from 1976 until 1987, when the Oleum Plant was rendered inactive due to TNT manufacturing processes ceasing at RFAAP in 1986.

- SSA 77 operated as a garbage incinerator from the 1940s until 1974, when it was shutdown, rendered inactive, and equipment was removed. The unit was reconstructed and improved in 1953, and garbage incineration operations were reactivated. Incineration operations ceased at the reconstructed unit in 1974. SSA 77 is inactive with no plans to reactivate.

Environmental History

- 1987: Areas are assessed by review and evaluation of available information, personnel

interviews, and visual inspection. The assessment indicated the closure status of SSA 30 was uncertain due to the active status of SSA 79. The assessment did not identify historical releases for SSA 77 and indicated that no visible signs of releases were observed during the site inspection of SSA 72. The assessment noted no data indicating releases at SSAs 30 and 79 had been collected.

- 1992: During work conducted as part of SWMU 51 groundwater assessment, groundwater samples collected from periphery of SSA 30 and 79 indicated one SVOC and one explosive were detected at concentrations above applicable screening levels.

- 1996: Groundwater samples collected from periphery of SSA 77 indicated one dissolved metal was detected at a concentration above its MCL.

- 2004: Site Screening Investigation conducted that included collection of two soil samples and one water sample from the acidic wastewater sump at SSA 72. VOCs, poly-aromatic hydrocarbons (PAHs), and metals were detected above RSLs; however, only PAHs were detected above applicable screening levels. Perchlorate, the only analyte, was not detected in the water sample.

- 2006: Sampling conducted as part of the eastern HSA groundwater sampling event. Groundwater samples collected from vicinity of SSA 30 and 79. Analytical results indicate the detections of VOCs, pesticides, and metals were below MCLs.

- 2007: Environmental Baseline Study conducted at SSA 18 and 72. VOCs, polychlorinated biphenyls (PCBs), pesticides and metals were detected in soil samples collected near SSA 18; however, these detections are below applicable screening levels and/or background soil concentrations. The groundwater samples collected from SSA 18 contained concentrations of chloroform and perchlorate above screening levels. Metals and two pesticides were detected at concentrations above applicable screening levels in the water sample collected at the acidic wastewater sump at SSA 72.

- 2010: Site Screening Process (SSP) report concludes unit-related cancer risks at SSA 72 and 77 are within EPA target ranges, exceeding residential standards, but below industrial standards. Unit-related cancer risks at SSA 30 and 79 were below SSP thresholds. Ecological risks are considered negligible at SSAs 30, 72, 77, and 79.

Final Remedy for Corrective Action
SSAs 72 and 77 - EPA selects ICs to prevent future residential use and earth moving.

SSAs 30 and 79 - EPA selects ICs and ECs to maintain unit as closed solid waste management unit due to presence of bagged asbestos containing material within the trenches. ECs will include a clear marking of the area and maintenance of soil cover to prevent erosion and potential exposure to asbestos. ICs will prevent future residential use and earth moving as Final Remedy.

Army Reserved Small Arms Range (ARSAR)

The ARSAR is a munitions response site investigated under the Military Munitions Response Program (see Figure 1, Attachment A). The ARSAR is an approximately 7.6-acre area located along the southeastern boundary of the MMA. Most of the unit is a grass field with wooded areas located along the banks of Stroubles Creek, which is located along the southern portion of the unit. The ARSAR is divided into two areas consisting of the Firing Point/Berm Area and the Southeast Hillside Area. A target berm, which is approximately eight feet high and 270 feet long, is located along the southeastern portion of the Firing Point/Berm Area. The Southeast Hillside Area is a steep, rocky hillside thought to have been used as a backstop prior to the construction of the target berm. A fence is located at the top of the Southeast Hillside Area, which prevents access to the area. The ARSAR was used as a .30-caliber small arms firing range from approximately 1941 to 1968. The former range is now a grass field surrounded by a fence that is occasionally used as a helicopter landing pad and as a baseball field.

Environmental History

- 2008: Unit is assessed by review and evaluation of available information, personnel interviews, historical records, aerial photography, and environmental restoration documents. The review findings indicate the presence of lead in the target berm and the potential presence of explosives residues at firing points.

- 2008: Soils collected as part of the SSP indicated elevated antimony and lead concentrations in the target berm and elevated arsenic levels in the Southeast Hillside Area. Munitions and Explosives of Concern (MEC) were not identified. Further action was recommended.

- 2011: RFI performed to characterize soil impact and IM performed to remove soil impact in the SSP. Approximately 1-2 feet of soil was excavated from firing berm face and transported off-site for disposal. Approximately 147 tons, or 105 cubic yards, were removed from the firing range berm.

- 2011: Samples collected from the Firing Point/Berm Area during the 2011 RFI/IM indicated that lead and antimony were not detected in soil, surface water, sediment, or groundwater at concentrations exceeding applicable SLs/RGs. Soils at Firing Point/Berm Area are, therefore, subject to unrestricted use.

Final Remedy for Corrective Action

Due to the presence of elevated concentrations of lead in soils, EPA selected the implementation and maintenance of land use restrictions within the boundary of the Southeast Hillside Area of the ARSAR to prevent any residential use of the area.

Former Gun and Mortar Range

The Former Gun and Trench Mortar Area (a.k.a., Former Gun and Mortar Range) consists of two adjacent areas located within the HSA (See Figure 1, Attachment A). The area is located within the current Nitroglycerin 2 (still active) manufacture area and within the

Continuous Automated Multi-Base Line (CAMBL) area (inactive). The Gun Range Area occupies approximately 26 acres and the Trench Mortar Range occupies approximately 87 acres. The Former Gun and Mortar Range is presently regulated under the Military Munitions Response Program (MMRP) which generally follows CERCLA. RCRA is the primary driver for addressing impacts to the Former Gun and Mortar Range; however, RCRA does not provide special provisions for dealing with explosive safety. Investigation of the Former Gun and Mortar Range is on-going.

ATTACHMENT C

REMEDIAL GOALS AND EXIT STRATEGY

ATTACHMENT C
REMEDIAL GOALS FOR GROUNDWATER

Remedial Goals for Groundwater

Constituent of Concern (COC)	Selected Remedial Goals (RGs) for Groundwater (µg/L)
SWMU49	
Carbon tetrachloride	5.0[(1)]
Trichloroethene	5.0[(1)]
SWMU 54	
2,4,6-Trinitrotoluene (2,4,6-	7.82 [(2)]
DNT Mixture	0.932 [(2)]
RDX	6.1 [(2)]
Perchlorate	10.9 [(2)]

Notes:

DNT = Dinitrotoluene
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazacyclohexane
µg/L = micrograms per liter

(1) = Remedial goals for SWMU 49 documented in Table 1-5 *SWMU 49 Monitored Natural Attenuation Groundwater Monitoring Work Plan, Radford Army Ammunition Plant, Radford, VA. Draft Final. October, 2014.*

(2) = Remedial goals for SWMU 54 documented in Table 1-7 *SWMU 54 (RFAAP-14) Monitored Natural Attenuation Interim Measures Work Plan, Radford Army Ammunition Plant, Radford, VA. Final. April, 2011*.

ATTACHMENT C
EXIT STRATEGY

The termination of interim measures and completion of the remedy program of monitored natural attenuation in the form of groundwater monitoring will occur when the remedial objectives have been met.

In general, the remedial objectives for SWMU 49 and SWMU 54 are to achieve and maintain the remedial goals for groundwater for three (3) years.

Remedial objectives and the requirements for the termination of interim measures/remedy program are detailed in the following approved Work Plans:

- *SWMU 49 Monitored Natural Attenuation Groundwater Monitoring Work Plan, Radford Army Ammunition Plant, Radford, VA. Draft Final. October, 2014.*
  - Sections 1.3, 2.2.3 and 2.6.1

- *SWMU 54 (RFAAP-14) Monitored Natural Attenuation Interim Measures Work Plan, Radford Army Ammunition Plant, Radford, VA. Final. April, 2011*.
  - Sections 1.3, 2.2.3 and 2.6.1

In June 2015, a typographical error detected in Section 2.2.3 of the October 2014 *SWMU 49 Monitored Natural Attenuation Groundwater Monitoring Work Plan* was corrected. This correction is documented in the attached Correction of Typographical Error letter dated June 10, 2015 from CB&I Federal Services to Jim McKenna, RFAAP.

Applicable excerpts from the approved Work Plans for SWMUs 49 and 54 that pertain to the achievement of the remediation objective, the completion of the remedy, and the termination of interim measures/remedy program are included in the following pages of this attachment.

SWMU 49 Excerpts

from

SWMU 49 Monitored Natural Attenuation Groundwater Monitoring Work Plan, Radford Army Ammunition Plant, Radford, VA. Draft Final. October, 2014.

solvents in groundwater. Additional investigation activities included the installation and sampling of four additional monitoring wells (49MW02, 49MW03, 49MW04, and 49MW05) and the sampling of 10 existing vicinity wells. All 14 samples were analyzed for TCL VOCs, TAL metals (total and dissolved), and MNA parameters, including methane, ethane, ethene, chloride, nitrate, sulfate, and TOC. In addition, a human health risk assessment and screening level ecological risk assessment were conducted for SWMUs 48 and 49. Four surface soil samples and three subsurface soil samples were also collected from SWMU 49. Eleven VOCs were detected in the 14 groundwater samples. Six VOCs (1,1 DCA; CT; chloroform; cis-1,2-DCE; PCE; and TCE) were detected above their tw-SLs in the groundwater samples. CT and TCE were the only VOCs found above their MCLs. Detected concentrations of CT ranged to 82.7 µg/L in well 48MW2. Detected concentrations of TCE ranged to 10.7 µg/L in well 48MW3. Detected CT and TCE results from the 2013 Supplemental RFI sampling event are presented in **Table 1-6**.

1.3 Corrective Measures Objectives and Remedial Goals

The Corrective Measures Objectives (CMOs) and Remedial Goals (RGs) were developed in the Draft *SWMU 48/49 RFI Report* (Shaw, 2014). The following is a summary of the findings from that process.

The site-specific CMO for SWMU 49 is to reduce COC concentrations to below RGs/MCLs so as to not adversely impact future beneficial use of groundwater; and to the extent practicable, a goal of restoring site groundwater to the most beneficial use. The groundwater COCs for SWMU 49 have been identified as CT and TCE.

RGs for SWMU 49 Groundwater COCs are shown in **Table 1-5**. These RGs will be used at SWMU 49 to compare to results from groundwater monitoring wells to assess the progress of the MNA.

Table 1-5

SWMU 49 Remedial Goals

Chemical of Interest	Groundwater RG/MCL[(1)]
CT	5.0
TCE	5.0

Notes:
µg/L = micrograms per liter
CT = Carbon tetrachloride
MCL = Maximum Contaminant Level
RG = Remedial Goal
TCE = Trichloroethene
(1) = The RGs are also the MCLs listed in the USEPA 2011 Edition of the Drinking Water Standards and Health Advisories (USEPA, 2011a).

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June 10, 2015

Jim McKenna
Environmental Coordinator
Radford Army Ammunition
Plant Radford, Virginia
24143

Subject: **Correction of Typographical Error -** Solid Waste Management Unit (SWMU) 49 Monitored Natural Attenuation Work Plan (October, 2014) Contract Number W912QR-04-D-0027, Delivery Order **DAD]**

Dear Mr. McKenna,

This correspondence documents the identification and correction of the following typographical error noted in Section 2.2.3 - *Remedial Objectives* of the RFAAP SWMU 49 MNA Work Plan (Shaw, 2014), The typographical error was discovered subsequent to USEPA final approval of the document (December 1, 2014).

The original document incorrectly references Table 1-6 in the above noted section. The correct table reference is Table 1-5 (SWMU 49 Remedial Goals).

A copy of the original document page with the typographical error, page 2-5, and the corrected page is provided as an attachment.

Sincerely,

Timothy
Leahy
Project
Manager

Attachments **Reference:**

Shaw Environmental, Inc. (Shaw), 2014. *SWMU 49 Monitored Nanifal Attenuation Groundwater Monitoring Work Plan.* Draft Final. October 2014. Radford Army Ammunition Plant, Radford,

2.2.2 Groundwater Monitoring System

The groundwater beneath SWMU 49 will be monitored with one existing upgradient groundwater monitoring well; three existing cross-gradient monitoring wells; seven existing disposal area POC wells; and four existing downgradient POC wells. Sampling locations are illustrated on **Figure 1-6**. Monitoring locations/purposes, types, and sampling frequency are shown in **Table 2-2**.

2.2.3 Remedial Objectives

The remedial objective is to achieve and maintain the RGs for the groundwater COCs shown in **Table 1-5** for 3 years in accordance with the Draft *SWMU 48/49 RFI Report* (Shaw, 2014). To accomplish this objective, data from the monitoring and compliance wells will be collected and evaluated against the chemical-specific RGs.

2.2.4 Sampling and Analysis Schedule

All of the wells listed in **Table 2-2** will be sampled in accordance with the methods and procedures specified in the EPA/VDEQ approved Draft *SWMU 48/49 RFI Report* (Shaw, 2014), this WP, and the following schedule:

a. The wells specified in **Table 2-2** will be sampled for TCL VOCs which include the analysis of the targeted constituents listed in **Table 2-3**. POC wells located within and downgradient of the CT and TCE plumes will be sampled quarterly. The upgradient well and cross-gradients wells will be sampled annually. The sampling frequency for the POC wells will be reduced from quarterly to annually, if VOC concentrations in the well are below RGs in four consecutive quarters. In addition, groundwater samples collected during the first year of monitoring will be analyzed for MNA indicators (TOC, ferrous iron, methane, ethane, ethene, chloride, nitrate, and sulfate), also listed in **Table 2-3,** for the purpose of establishing a baseline concentration of the analyses. For wells that exhibit good degradation, *Dehalococcoides ethenogenes* analysis will also be performed as one more piece of evidence. The off-site analytical laboratory shall analyze these samples in accordance with the sampling and analytical methods listed in *Section 4.0* of this WP. The ferrous iron analysis will be performed in the field using Hach kits.

b. Static groundwater elevations and total depths will be measured at all wells during each sampling event. Hydrogeologic and physical parameters pH, temperature, turbidity, specific conductivity, dissolved oxygen (DO), and oxidation-reduction potential (ORP) will be measured in the field at each well sampled.

2.3 Measurement and Maintenance of Natural Attenuation Remedy

The groundwater gradient and flow direction in the uppermost aquifer will be calculated annually. Constituent migration rates will be calculated, if necessary, to demonstrate the effectiveness of the MNA process and the groundwater monitoring program. Potentiometric maps showing groundwater elevation contours and flow direction during each sampling event shall be prepared annually.

Natural attenuation is the reduction of COC concentrations in the environment through destructive biological processes (including, but not limited to, aerobic and anaerobic biodegradation, plant and animal uptake), non-destructive physical mechanisms (advection

c. Review of constituent concentrations and evaluation of natural attenuation processes/progress possibly occurring. For example, potential for biodegradation occurrence, detection of daughter products, and general water quality conditions.

d. Modifications to the Remedy proposed to correct deficiencies/malfunctions or enhance performance.

e. Provide other recommendations regarding the MNA program, as appropriate.

Sampling frequency for POC wells will be reduced to annually, if COC concentrations in the wells are reported below RGs in four consecutive quarters. A constituent will be removed from the sampling program, if it is consistently found below its respective RGs for 2 consecutive years. Wells will be removed from the monitoring network, if all constituents of concern are found below their respective RGs for 2 consecutive years. If after 2 years of monitoring the MNA plan is not shown to be working, a contingency plan will be developed at that time, as discussed in the SWMU 48/49 RFI Report, Draft 2014, (Shaw, 2014).

2.6.1 Termination of the MNA Program

The MNA program at SWMU 49 will continue until the remedial objective specified in *Section 2.2.3* has been met. The following steps are to be taken in establishing that the MNA objective has been met:

- Termination of the use of MNA as a remedy shall be based on the interpretation and evaluation of the data (concentrations, parameters, and indicators). The data from the following groundwater monitoring wells (13MW3, 13MW4, 48MW1, 48MW2, 48MW3, 48MW06, 49MW01, 49MW02, and 50MW02) must be at or below the RGs to demonstrate that the objectives have been met.

- Notification to terminate the MNA program will be provided to USEPA/VDEQ 60 days in advance together with the pertinent supporting data and evaluations.

- Existing ground monitoring wells will be abandoned in accordance with VDEQ Memorandum dated January 8, 2008 (**Appendix F)**.

2.7 Waste Characterization and Off-Site Disposal

The monitoring of natural attenuation of groundwater is expected to generate approximately one 55-gallon drum of purge water for each sampling event.

Purge water and decontamination fluids generated through the wells purged and sampled by Shaw will be containerized in 55-gallon labeled drums and sampled for TAL metals, corrosivity as pH, and chemical oxygen demand (COD) prior to disposal.

2.8 MNA Groundwater Monitoring Schedule

The proposed schedule of project tasks is provided on **Figure 2-2**.

[Note: The project schedule will be updated in each subsequent edition of this Work Plan and will be updated and maintained throughout the project.]

SWMU 54 Excerpts

from

*SWMU 54 (RFAAP-14) Monitored Natural Attenuation Interim Measures Work Plan, Radford Army Ammunition Plant, Radford, VA. Final. April, 2011***.**

a CMS was performed to address the propellant ash material and grossly-contaminated soil under the ash material at SWMU 54. The alternatives evaluated were as follows:

- Alternative One: No Further Action.
- Alternative Two: Excavation of Soil at Area A and Area B, Off-site Disposal, and MNA of Groundwater.
- Alternative Three: Excavation of Soil at Area A and Area B, Off-site Disposal, and Enhanced *In Situ* Bioremediation of Groundwater.

These three alternatives were evaluated using the selection criteria: effectiveness, implementability, and cost. The site-specific Corrective Measures Objective (CMO) for

SWMU 54 is to mitigate further leaching of explosives constituents from soil to groundwater at levels that would potentially increase observed concentrations and adversely impact future beneficial use of groundwater, and to eliminate the potential threats to human health and the environment that exist within materials found in SWMU 54. Observations from the SWMU 54 soil investigations indicate that the propellant ash material consisted of a black, ashy material that was very evident when encountered. Therefore, identification and removal of the propellant ash and grossly-contaminated soil will be partially based on visual observations during excavation.

Alternative Two, which entails excavation and off-site disposal as the primary remediation process, was found to achieve the CMO. Therefore, Alternative Two was selected as the final alternative for SWMU 54 because it is implementable and provides a greater level of protection to human health and the environment not provided by other alternatives. In addition, Alternative Two is the sole alternative that facilitates remedial goals (RGs) without potential adverse effects to groundwater (i.e., degradation of secondary water quality parameters) from remedial implementation activities, which would occur with implementation of Alternative Three. By achieving the CMOs, Alternative Two accomplishes the Army's goal for the Installation Restoration Program and its funding source the Environmental Restoration, Army account.

1.3 Corrective Measures Objectives and Remedial Goals

The CMOs and RGs were developed in the Final *SWMU 54 RFI/CMS Report* (URS, 2008). The following is a summary of the findings from that process.

The site-specific CMO for SWMU 54 Area A is to mitigate further leaching of explosives constituents from soil to groundwater at levels that would potentially increase observed concentrations and adversely impact future beneficial use of groundwater; and to the extent practicable, a goal of restoring site groundwater to the most beneficial use. The soil CMOs for Area A have been met and the purpose of this WP is to implement the groundwater IMs to meet the CMOs for groundwater.

The site-specific CMO for SWMU 54 Area B is to mitigate the potential hypothetical future risks that have been identified for exposure to soil under a future construction worker scenario; and to prevent leaching of contaminants of concern (COCs) from soil-to-groundwater at levels that would potentially adversely impact future beneficial use of groundwater. The site-specific CMOs have been met through the soil excavation and off-site disposal completed in 2010.

RGs for Area A are shown in **Table 1-7**. These RGs were used at SWMU 54 to confirm that all COIs were removed from soil to levels that are safe for human health and the environment. The groundwater RGs will be used to compare results from groundwater monitoring wells to assess the progress of the MNA.

Table 1-7

SWMU 54 Area A Remedial Goals

Chemical of Interest	Groundwater RG (mg/L)	Groundwater RG Source(3)	Area A - Soil RG (mg/kg)	Soil RG Source
2,4,6-TNT	0.00782	RG	1.7	SSL[4]
DNT Mixture	0.000932	RG	0.044 or Lab RL (if higher)	SSL[4]
RDX	0.0061	RG	0.161	SSL[4]
Perchlorate	0.0109	RG	--	--
Amino DNTs(1)	--	--	1.095	SSL[5]
Nitroglycerin(2)	--	--	0.069 or Lab RL (if higher)	SSL[5]
Heptachlor Epoxide(2)	--	--	0.0047	SSL[5]
2,3,7,8-TCDD (TEQ)(1)	--	--	7.89E-06	SSL[5]

Notes:

TNT = Trinitrotoluene

DNT = Dinitrotoluene

RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazacyclohexane

TCDD = Tetrachlorodibenzodioxin

mg/kg = milligrams per kilogram

mg/L = milligrams per liter

RG = Remedial Goal

RL = Reporting Limit

SSL = Soil Screening Level

(1) =Not identified as COPC in groundwater.
(2) =Not detected in groundwater.
(3) = The lowest of calculated carcinogenic and noncarcinogenic groundwater RGs used (see Appendix G.1, Table G.1-1c in URS, 2008).
Carcinogenic and noncarcinogenic RG values for groundwater COCs (2,4,6-TNT, DNT Mixture, RDX, and perchlorate) calculated using target risk 1E.-05 for the lifetime resident (see Appendix G.1 Table G.1-1c in URS, 2008) and a target hazard of 1 for the adult and child resident (see Appendix G.1 Table G.1-1b in URS, 2008).

(4) = Soil SSL RG values for soil-to-groundwater migration pathway calculated with SSL equation using groundwater RGs as target groundwater concentrations (see Tables G.1-2a - G.1-2c in URS, 2008).
(5) = Soil SSL RG values for soil-to-groundwater migration pathway calculated with SSL equation using T-RSLs as target groundwater concentrations (see Tables G.1-2d - G.1-2g in URS, 2008).

2.2.2 Groundwater Monitoring System

The groundwater beneath SWMU 54 will be monitored with two existing upgradient groundwater monitoring wells; five existing disposal area POC wells; three existing downgradient POC wells adjacent to the New River; and five surface water/pore water sampling locations located as specified on **Figure 2-2**. Monitoring locations/purposes, types, and sampling frequency are shown in **Table 2-2**. Two monitoring wells (54MW-11 and 54MW-12) will be installed for performance monitoring between the POC wells (54MW-2 and 54MW-3) and downgradient wells (54MW-8 and 54MW-10) adjacent to the New River. An additional two wells (54MW-13 and 54MW-14) will be installed north and south of the unit.

2.2.3 Remedial Objectives

The remedial objective is to achieve and maintain the RGs for the groundwater COCs shown in **Table 1-1** for 3 years in accordance with the Final *SWMU 54 RFI/CMS Report* (URS, 2008). To accomplish this objective, data from the monitoring and compliance wells will be collected and evaluated against the chemical-specific RGs.

2.2.4 Sampling and Analysis Schedule

All of the wells listed in **Table 2-2** will be sampled in accordance with the methods and procedures specified in the EPA/VDEQ approved Final *SWMU 54 RFI/CMS Report* (URS, 2008) and this WP and the following schedule:

a. The wells specified in **Table 2-2** will be sampled for the analysis of the current IM-targeted constituents listed **Table 2-3**. In addition, groundwater samples collected during the first year of monitoring will be analyzed for MNA indicators (total organic carbon, dissolved inorganic carbon, dissolved ferrous iron, dissolved manganese, nitrate, and sulfate) for the purpose of establishing a baseline concentration of the analyses.
Analyses shall be obtained using the EPA SW-846 Methods specified in *Section 4* of this WP.

b. The New River Sediment Pore water/Surface water sampling locations (NRSW-1/PW-1, NRSW-3/PW-3, NRSW-5/PW-5, NRSW-8/PW-8, and NRSW-9/PW-9, all shown on **Figure 2-2**) shall be sampled annually for the analytical parameters in **Table 2-3** using the EPA SW-846 Methods.

c. Static groundwater elevations and total depths as well as the hydrogeologic and physical parameters pH, temperature, specific conductivity, dissolved oxygen (DO), and oxidation-reduction potential (ORP) will be measured at all wells during each sampling event.

2.3 Measurement and Maintenance of Natural Attenuation Remedy

The groundwater gradient and flow direction in the uppermost aquifer will be calculated annually. Constituent migration rates will be calculated, if necessary, to demonstrate the effectiveness of the IM and the IM monitoring program. Potentiometric maps showing groundwater elevation contours and flow direction during each sampling event shall be prepared at least annually.

c. Review of constituent concentrations and evaluation of natural attenuation processes/progress possibly occurring. For example, potential for biodegradation occurrence, detection of daughter products, and general water quality conditions.

d. Modifications to the Remedy proposed to correct deficiencies/malfunctions or, enhance performance.

e. Provide other recommendations regarding the IM program, as appropriate.

A constituent will be removed from the sampling program if it is consistently found below its respective RGs for 2 consecutive years. Wells will be removed from the monitoring network if all constituents of concern are found below their respective RGs for 2 consecutive years. If after 2 years of monitoring the MNA plan is not shown to be working, a contingency plan will be developed at that time, as discussed in the SWMU 54 RFI/CMS Report, Final September 2008, URS (URS, 2008).

2.6.1 Termination of IM/Remedy Program

The MNA at SWMU 54 will continue until the remedial objective specified in *Section 2.2.3* has been met. The following steps are to be taken in establishing that the MNA objective has been met:

- Termination of the use of MNA as a remedy shall be based on the interpretation and evaluation of the data (concentrations, parameters, and indicators). The data from the following groundwater monitoring wells (54MW2, 54MW3, 54MW4, 54MW5, 54MW7, 54MW8, 54MW9, 54MW10, 54MW11, 54MW12, 54MW13, and 54MW14) and from the pore water/surface water samples must be at or below the RGs to demonstrate that the objectives have been met.
- Notification to terminate the MNA program will be provided to EPA/VDEQ 60 days in advance together with the pertinent supporting data and evaluations.
- Existing ground monitoring wells will be abandoned in accordance with VDEQ Memorandum of January 8, 2008, in **Appendix F**.

2.7 Waste Characterization and Off-Site Disposal

The monitoring of natural attenuation of groundwater is expected to generate approximately (14) 55-gallon drums of non-hazardous soil from monitoring well installation; approximately seven 55-gallon drums of decontamination and well development water from monitoring well installation, and approximately one 55-gallon drum of purge water for each sampling event.

Purge water and decontamination fluids generated through the wells purged and sampled by Shaw will be containerized in 55-gallon labeled drums and sampled for target analyte list (TAL) metals, corrosivity as pH, and chemical oxygen demand (COD) prior to disposal.

2.8 Interim Measures Schedule

The field activities to be performed as part of the SWMU 54 IM began in April 2010. The proposed schedule of project tasks is provided on **Figure 2-3**.

[Note: The project schedule will be updated in each subsequent edition of this Work Plan and will be updated and maintained throughout the project.]

Comment Response Summary
Radford Army Ammunition Plant
VA1210020730

March 24, 2016

Comment 1 – Reference February 10, 2016 verbal comment by Denise Boor at Public Hearing held at the Radford Public Library, Radford, Virginia, Page 8, Lines 5-10 - Question: I just wanted to, I was just wondering after, after everything I have seen and I've lived here for a long time, why the EPA and DEQ have not enforced the Clean Water Clear Air Act involving the companies that are involved over at the arsenal? Why those companies have been allowed to operate with, with impunity? That's all.

Response: The permit action being considered is for a RCRA Corrective Action Permit which is not associated with the Clean Air and Clean Water Acts. However regarding the commenter's assertion that the EPA and DEQ have not pursued compliance violations for Clean Water and Clean Air Act violations, there are multiple Notices of Violation which have been issued to the facility by the regulatory agencies. Copies of these documents may be obtained by contacting the DEQ Blue Ridge Regional Office (http://www.deq.virginia.gov/Locations/BlueRidgeRegionalOffice.aspx) and/or EPA Region III

Comment 2 – Reference February 10, 2016 verbal comment by Gregory Nelson at Public Hearing held at the Radford Public Library, Radford, Virginia, Page 8, Lines 16-25, Page 9, Lines 1-5 - Question: We question the official comments that were made in the WVTF report that EPA and plant officials say that they have no evidence of pollution migrating to the surrounding community and further, the comments that Mr. Scott gave on January 27 , 2016, that actually nothing is escaping the site itself. Quote, "What we're seeing is levels are going down. The controls are actually working. It's protecting human health and safety." These claims cannot be made because there are no reproducible offsite empirical scientific studies, ambient air quality monitoring, community well testing, and community soil testing and the site was delisted from the Superfund in 2000. It was removed from the Superfund.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. However, DEQ does not concur with Mr. Nelson's assertions that there is no evidence to support Mr. Scott's quote. EPA's RCRA Corrective Action Environmental Indicator reports for Current Human Exposures Under Control (EPA CA EI Human Exposures Report), dated July 17, 2012, and Migration of Contaminated Groundwater Under Control (EPA CA RI Groundwater Report), June 11, 2011 state:

"Yes, 'Current Human Exposures Under Control' has been verified. Based on a review of the information contained in this EI Determination, 'Current Human Exposures' are expected to be 'Under Control' at the Radford Army Arsenal Plant facility, EPA ID # VA 1210020730, located at Route 114, Radford, VA 24141-0100 under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility." – Page 8, EPA CI RI Human Exposures Report.

"Yes, 'Migration of Contaminated Groundwater under Control' has been verified. Based on a review of the information contained in this EI determination at the Radford Army Arsenal Plant, EPA ID # VA 1210020730, located at Route 114, Radford, VA 24141-0100. Specifically, this determination indicates that the migration of 'contaminated' groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater.'." – Page 9, EPA CA RI Groundwater Report

These reports both directly support the statement Mr. Scott made on January 27, 2016 and are publicly available on EPA's corrective action page for the Radford Army Ammunition Plant. Additionally, the ATSDR Health Consultation Report (ATSDR Report), dated January 28, 2015 states:

"Conclusion 1 - Public water systems in the area are not affected by releases from RFAAP. Therefore, contaminants from RFAAP in drinking water from public water systems cannot harm people's health." – Page ii, ATSDR Report

"Conclusion 2 - Private wells near RFAAP are unlikely to be affected by releases from the facility. Therefore, contaminants from RFAAP in drinking water from private wells near RFAAP are unlikely to harm people's health." – Page ii, ATSDR Report

Again the ATSDR Report directly supports Mr. Scott's statement regarding contamination levels in the units covered under the Corrective Action Permit. Testing of soil and groundwater wells in the surrounding community would lead to no tangible benefit to the community's health as no migration pathway has been identified for groundwater and the maximum area of deposition for soil impacts has been determined based on modeling to be inside of the Radford facility boundaries per the Human Health Risk Assessment for the Open Burning Ground (OBG), dated October 2005.

Comment 3 – Reference February 10, 2016 verbal comment by Gregory Nelson at Public Hearing held at the Radford Public Library, Radford, Virginia, Page 9, Lines 5-13 - Question: Again, data must be shared with the public prior to making this administrative record with this permit, and due to the fact that no data exits about the monitoring in the community, these ideas that are being proposed in the Corrective Action Permit are preposterous. The notion that the community is being adequately informed with regards to this hearing and permit motion is preposterous due to the fact that no outside expertise can be brought to this and that we've continually requested for an extension of the public comment period.

Response: This is not a technical comment related to the draft permit conditions as requested by DEQ in the published notice of the Corrective Action Permit renewal. The public comment period, as well as notice of the public meeting and public hearing was published in two newspapers, The Southwest Times and Roanoke Times: General Edition, on December 22, 2015. The notice was also broadcast on two radio stations, WVRU FM 89.9 and WBRW FM 105.3, on December 22, 2015. The facility mailing list was sent notice

of the Corrective Action Permit renewal via electronic and postal mail on December 22, 2015 as well.

DEQ also publishes annual monitoring reports for soil and groundwater on the DEQ external website's page (http://www.deq.virginia.gov/ConnectWithDEQ/EnvironmentalInformation/RadfordArmyAmmunitionPlant.asp) specifically developed to allow the community to review material received from and sent to the Radford Army Ammunition Plant.

Additionally the Radford facility has established the Restoration Advisory Board (RAB). The RAB has been in place since 1998, and was established for the main purpose of maintaining community involvement and informing the public about the investigation and remediation activities at the RAAP. Community members are part of the board, and are invited to meetings where investigation and remediation plans and reports are presented and discussed. All work plans and reports are available at its website http://www.radfordaapirp.org/inforepo/online-index.htm. In addition, all of the data and reports that were part of remedy selection have been available for years to months and were previously presented to the public.

The request for extension of the public comment period was denied via electronic mail to Mr. Nelson on 2/1/2016 and again 2/9/2016 as no adverse technical comments against the conditions of the RCRA Corrective Action Permit for the Radford Army Ammunition Plant were received.

Comment 4 – Reference February 10, 2016 verbal comment by Gregory Nelson at Public Hearing held at the Radford Public Library, Radford, Virginia, Page 9, Lines 17-24 - Question: We should have adequate air quality monitoring to ensure that deposition, and soil monitoring, and Solid Waste Management at Unit 13 which is being proposed for closure should continue due to the fact that it's in the open burning ground hazardous waste risk assessment, human health risk assessment showing that Solid Waste Management 13 is still receiving contamination for operations at the open burning ground.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. DEQ would like to clarify that Solid Waste Management Unit (SWMU) 13, the Area Between the OBG and the New River, is not being closed, nor is closure being proposed for the unit at this time, under the proposed Corrective Action Permit. A Final Remedy in the form of an institutional control, a restriction on earth moving and residential future use, for the unit is included in the proposed Corrective Action Permit in Table 1. Soil monitoring at the OBG is conducted under the facility's RCRA Subpart X permit's Soil Monitoring Program, Attachment II.C of Module II. New releases are required to be reported to the DEQ under Condition II.D of the proposed Corrective Action Permit. An assessment of any newly discovered SWMU is required by Condition II.F of the proposed permit.

Comment 5 – Reference February 10, 2016 verbal comment by Gregory Nelson at Public Hearing held at the Radford Public Library, Radford, Virginia, Page 9, Line 25, Page 10, Lines 1-7 - Question: Given my 45 seconds left, we question the officials on the ability of the EPA to hand off authority of this facility which is a U.S. Army facility to the Department of Environmental Quality. This is preposterous given that this is a federally owned military facility with a U.K. multi-national arms dealer BAE poisoning a multi-state area through the dumping and the releasing of toxic inventory which is continuing to dispose toxins at these sites and in the surrounding community.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. Virginia is an authorized state under RCRA and as such has the authority to implement the RCRA regulations, as per RCRA Section 3006, 42 U.S.C. § 6926. Additionally the Federal Facilities Compliance Act, H.R. 4016, signed into law by President George H.W. Bush on October 19, 1992, finalized the authority of authorized and delegated states to enforce federal environmental regulations at federal facilities.

Comment 6 – Reference February 10, 2016 verbal comment by Meriel Russell at Public Hearing held at the Radford Public Library, Radford, Virginia, Page 10, Lines 20-25, Page 11, Lines 1-3 - Question: "…I would like to ask for an extension of 60 days for public comment. I downloaded the fact sheet from the DEQ website and I did not find it very helpful. I heard that this permit would be about things such as oversight of the arsenal changing from the EPA to the DEQ. I didn't see anything about that on this fact sheet. It just had some information and was not very helpful. So, I would like to ask for that extension for public comment.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. DEQ publishes fact sheets on RCRA permits to inform the public about what permitted activity the proposed permit will be covering. Details on the transfer of responsibility for permit issuance from DEQ to EPA is not detailed in the fact sheets as the transfer of authority between the two agencies is implied given that DEQ is the agency publishing notice for permit renewal and not EPA. On July 31, 2000 Virginia received authorization from EPA by demonstrating that its RCRA Corrective Action program was equivalent and no less stringent than the Federal program. Subsequently DEQ has taken the lead responsibility for the implementation and oversight of facilities subject to the RCRA CA program in the Commonwealth. However, DEQ encourages the public to inform the agency if it believes the information provided is not sufficient to describe the proposed permit action and will gladly accept comments or suggestions from the public to revise the documents accordingly.

The request for an extension to the comment period was not granted as there were no adverse technical comments received on the proposed Corrective Action Permit.

Comment 7 – Reference February 10, 2016 verbal comment by Alan Moore at Public Hearing held at the Radford Public Library, Radford, Virginia, Page 12, Lines 3-6, Question: Officials have failed to address repeated public concerns about the proposed corrective action which discontinues soil sampling at Solid Waste Management Unit 13 which directly receives fallout from the open burning ground.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. Soil monitoring at the Open Burning Ground is conducted under the facility's RCRA Subpart X permit's Soil Monitoring Program, Attachment II.C of Module II.

On June 27, 2011 and on June 4, 2014, EPA issued a Corrective Action Statement of Basis (SB) in which it described the information gathered during environmental investigations at RAAP and proposed a Final Remedy for the Facility, including SWMU 13. Consistent with the public participation provisions under the RCRA, EPA solicited public comment on its proposed Final Remedies. The public participation provisions require the public comment period to last 30 calendar days from the date of notice. The notices of the SBs were made public on the EPA website and in the Roanoke Times Newspaper on May 25, 2011 and on June 27, 2014. Below you will find links to the Final Decision Response to Comments:
http://www3.epa.gov/reg3wcmd/ca/va/otherdocs/RadfordArmyAmmoP-FDRTC_040312.pdf
http://www3.epa.gov/reg3wcmd/ca/va/otherdocs/fdrtc_va121002730.pdf

The current public comment period is for the DEQ Corrective Action Permit which incorporates the Final Remedy Decision into a legal instrument to give the Agencies enforcement authorities over the implementation of the Remedy. However, it is important to note that should you, or anyone in the community, finds relevant new information that may be related to the Final Remedy Decisions, you may present that information to the EPA and/or DEQ *at any time* for consideration. The public comment period in no way affects your ability to present new information or for the Agencies to consider the new information.

In addition, the community is encouraged to participate in the Restoration Advisory Board (RAB), that has been in place since 1998, and was established for the main purpose of maintaining community involvement and informing the public about the investigation and remediation activities at the RAAP. Community members are part of the board, and are invited to meetings where investigation and remediation plans and reports are presented and discussed.

Comment 8 – Reference February 10, 2016 verbal comment by Phyllis Albritton at Public Hearing held at the Radford Public Library, Radford, Virginia, Page 13, Lines 21-25, Page 14, Lines 1-13 - Question: And I too would like to ask that we, cause this is a government project, that we extend the public comment period for 60 more days. I think that's very

important, this is such a crucial issue in our area. And again, I'm really concerned, I was shocked when I learned this. Is it true that the responsibility for overseeing our Radford Arsenal which is in Montgomery County we know, isn't being given to the Virginia --being given to the Virginia -- why it isn't being given – why - I'm sorry, the National Environment Protection Agency since it is a National Army Program, why it isn't overseeing this and it's being given to a State Department of Environmental Quality when, as I understand it, and I could be wrong, and I'd love to be corrected, the Virginia Department of Environmental Quality is unable to regulate a federal project. That's a very important question to me. Why should it be given to the state if it can't oversee? And I still think since it's a federal, my state, my federal tax dollars are paying for the arsenal that it should be overseen by a federal environmental protection, the National Environmental Protection Agency.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. This comment has been answered previously; please see the response to Comment 5.

Comment 9 – Reference February 10, 2016 verbal comment by Phyllis Albritton at Public Hearing held at the Radford Public Library, Radford, Virginia, Page 14, Lines 14-22 - Question: And my other question, and I've wondered about it for a long time so I'm glad I could ask it is why is -- why are we --it's my Army, it's my tax dollars, contracting with a British firm? I just think that that's very interesting and I'd love to know how they got the contract. I know they're all over the world, they have a wonderful, quote/unquote, "reputation." But, I want to know why a British firm is involved with something that does affect our air, and our water, and our citizens. Thanks.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. The Radford Army Ammunition Plant (RAAP) is a Government Owned, Contractor Operated (GO-CO) facility and has always been operated in this manner. Hercules was the first contacted company to run the RAAP facility, and then ATK. Presently BAE is the operating contactor. Who and why the Army contracts with to operate the facility is outside the scope of this permitting action.

Comment 10 – Reference February 10, 2016 verbal comment by Don Langrehr at Public Hearing held at the Radford Public Library, Radford, Virginia, Page 15, Lines 8-13 - Question: Regarding the permit for corrective action, I think at the minimum I urge you to have ongoing soil sampling particularly at the sites where the open burning occurs. I mean we're dealing with hundreds of tons of toxic material and that permit should be paying attention to where that material is being burned. So, I would appreciate it if you'd take that into account.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. This comment has been answered previously; please see the responses to Comments 4 and 7.

Comment 11 – Reference February 10, 2016 verbal comment by Don Langrehr at Public Hearing held at the Radford Public Library, Radford, Virginia, Page 15, Lines 14-22 - Question: Also, I'd like to see that permit at least make mention of the alternative methods of burning this toxic material since we do have an example in Louisiana where similar materials are being burned in a more controlled fashion rather than openly burning them on the banks of a river that's really an important water source for the region. And with that said, I think it probably would be a good idea as information does get out about this permit that the comment period be extended for at least another 60 days, and that's it.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. A new RCRA Subpart O hazardous waste incinerator is currently in the design phase for the Radford facility. A white paper on the proposed design has been published by the Radford facility and is available for public review. (http://www.rfaap.army.mil/docs/Radford%20Public%20Web%20Update%20Nov%202015%20(for%20website).pdf)

Comment 12 – Reference January 6, 2016 written comment by Devawn Oberlander, Question: The DEQ meeting later this month regarding the RCRA permit renewal is not listed on the DEQ website set up specifically to provide information to stakeholders on RAAP. Nor has notice been sent to the list of attendees at prior RAAP public meetings. Members of the media have not been informed of this important public meeting. Environmental Patriots of the NRV requests that the DEQ be properly announced and promoted with 30 days public notice from the date of that public announcement on your webpage to satisfy the requirement of community engagement.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. The public meeting and public hearing dates were posted to the Town Hall website along with the DEQ's external website listing upcoming public meetings and hearings. The DEQ's Radford Army Ammunition Plant webpage was updated with the meeting information following this comment.

Comment 13 – Reference January 16, 2016 written comment by Devawn Oberlander, Question:
Hello regulatory officials,

Why is this important public meeting not listed on the calendar for community involvement set up on the VA DEQ webpage for RAAP? Why has no one in local government or local media been informed of this regulatory meeting?

It is listed on VA Town Hall:

http://townhall.virginia.gov/L/ViewMeeting.cfm?MeetingID=24030

But does not appear on this site the the DEQ has repeatedly told the impacted community will list all important meetings and actions:

http://www.deq.virginia.gov/ConnectWithDEQ/EnvironmentalInformation/RadfordArmyAmmunitionPlant.aspx#calendar

Environmental Patriots request the meeting, hearing and comment periods be extended to comply with community engagement guidelines. Stakeholders and the media are unaware of this meeting.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. This comment has previously been answered. Please see the response to Comment 12.

Comment 14 – Reference January 18, 2016 written comment by Devawn Oberlender, Question: BAE & the Army reassured our community last week that the warning letter the VA DEQ issued to RAAP for burning "too much" lead in 2015 was not an indication of any health threat. When asked what the permitted level of lead is in the permit, no official could answer.

Stakeholders require an answer to this question by 5 pm on Wednesday the 20th to prepare for upcoming meetings. Thank you for getting this fact to us ASAP.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. Information on permitted lead levels in the Radford facility's Subpart X permit was provided to Ms. Oberlender.

Comment 15 – Reference January 19, 2016 written comment by Gregory Nelson, Question: The public seeks an extension of the public comment period on the RCRA draft permit modifications and a delay in the hearing. The reasons for this are explained below including failure of responsible entities to provide information and data in a timely fashion to concerned community members.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. DEQ did not extend the comment period as no adverse technical comments on the draft permit conditions were received.

Comment 16 - Reference January 20, 2016 written comment by Mark and Connie Tooley, Question: Please be advised that it has come to our attention that Radford Arsenal is continuing to open burn toxic materials in Radford Virginia pursuant to a permit which is coming up for proposed renewal. Please let us inform you, if you do not already know, that Congress outlawed the open air burning of military toxic waste many years ago. At that time, the military

complained that it did not have technology available to safely dispose of this waste other than open burning. Because of that fact, Congress temporarily allowed the military to obtain permits to open burn on an interim basis until new technologies could be developed.

As you probably know, those technologies have now been developed, approved by the military and the USEPA, and are currently in use in the United States. Their use is widespread in other parts of the world.

The reason that Congress banned open burning by the military is that Congress recognized that it is harmful to human health. The military's argument that open burning is safe is irrelevant, since it is illegal unless no reasonable safe alternative is available. The military's plans to monitor the air at Radford with drones does not create a loophole which allows the military to continue to engage in otherwise unlawful activity.

We recognize that there are incentives for you to routinely renew permits and that you are also under duress to approve the military's request for a permit renewal that has no rational basis in law or fact. However, you are not employed by the military and we hope that your salaries are not derived from the defense budget, like some USEPA regulatory officials in Washington D.C.

In closing we simply ask that you do your jobs and protect the citizens of Radford. To do otherwise would violate your legal and ethical duties.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. The treatment of energetic waste through open burning/open detonation (OB/OD) is regulated under the federal Resource Conservation and Recovery Act (RCRA) of 1976 (42 U.S.C 6901 *et seq.*), as amended, when these wastes cannot be safely treated or disposed of through other modes of treatment (40 CFR 265.382). The selection and appropriateness of OB/OD treatment is based on a number of criteria which must be demonstrated including, but not limited to, on site specific safety, transportation hazard potential, offsite treatment options and feasibility of alternative technology considerations. The treatment of these wastes by OB/OD is permitted as a treatment, storage and disposal (TSD) unit under 40 CFR 264, Subpart X.

DEQ operates a hazardous waste program which is authorized by EPA under Section 3006 of RCRA. As part of this authorized program, DEQ regulates hazardous waste under the Virginia Hazardous Waste Management Regulations, Title 9, Environment, Virginia Administrative Code (9 VAC 20-60-10), which includes issuing hazardous waste TSD permits.

There have been no changes to the regulations governing the treatment of energetic waste through open burning/open detonation, under the conditions established by a RCRA permit.

Comment 17 – Reference January 21, 2016 written comment by Roger Kirchen, Director, Review and Compliance Division, Virginia Department of Historic Resources, Question: We have received the public notice for the proposed action referenced above. Our records show that the Radford Army Ammunition Plant (DHR ID #060-5044) is greater than fifty years of age and is potentially eligible for listing on the Virginia Landmarks Register and the National Register of Historic Places. Furthermore, several known significant archaeological sites are located within the facility and there is potential for as yet unidentified sites on the property.

It is our opinion that the continued open burning and other waste management in areas previously used for such activity at the facility are unlikely to adversely impact historic properties. However, any remedial activities, such as mechanical removal of contaminated soils and excavation of clean soil for fill, completed as part of groundwater monitoring does have the potential to impact archaeological sites. DHR supports the issuance of this permit, but requests that the Army initiate direct consultation with our office pursuant Section 106 of the National Historic Preservation Act when remedial actions that have the potential to affect historic properties are required under the terms of the permit.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. Please note that DEQ advises DHR staff to contact RAAP directly for historical preservation issues. This is not required by RCRA but the Army has internal procedures that consider historic sites.

Comment 18 – Reference January 25, 2016 written comment by Devawn Oberlender, Question: We had to reschedule our meeting because of the icy roads here in the New River Valley on Friday. I'm hopeful that you have that permit condition regarding lead clarified so that stakeholders can discuss it at our meeting tonight. Considering the VA DEQ issued a warning letter last April to BAE for burning "too much" lead at the Open Burning Ground (attached) there must be a permit limit that triggered this admonition. Please advise our community of the facts, as we have a right to know under the law.

Our group asks that EPA Region 3 include these warning letters in the official administrative record for this federal facility, the Radford Army Ammunition Plant.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. Permit limits for lead emissions are detailed in the operating conditions section of the Radford facility's Subpart X permit.

RAAP has submitted a renewal application to DEQ for the OBG permit. DEQ has set up a website which contains the submitted OBG application, including the information discussed above.
http://www.deq.virginia.gov/ConnectWithDEQ/EnvironmentalInformation/RadfordArmyAmmunitionPlant.aspx The DEQ Fact Sheet "Steps in HW Permitting Process and Timeline" explains the DEQ permitting process and at which point in the process the draft

permit will be available for public review. The public process provides you with an opportunity to engage both RAAP and DEQ on the decision making process. DEQ encourages the commenter to participate in the public process. The website also provides general information about the purpose and scope of all the regulatory programs at RAAP.

Comment 19 – Reference January 25, 2016 written comment by Gregory Nelson, Question: As the regulators and approvers of the permit to discharge from Open Burning Ground at Radford Arsenal. How much lead is permitted to be burned at Radford Arsenal via incarceration and open burning?

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. This comment has been addressed by a response to a previous comment; please see the response to Comment 18.

Comment 20 – Reference January 28, 2016 written comment by Gregory Nelson, Question: This is the second time the community has requested an extension for the comment period for the Draft RCRA Permit. This time we request a delay until June 2016, as BAE and US Army are frequently made exceptions for with deadlines, operating under an expired open burning ground permit in renewal process, the public hereby requests and extension of the comment period on the pending permit administrative matters.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. DEQ did not extend the comment period as no adverse technical comments on the draft permit conditions were received.

Comment 21 – Reference January 28, 2016 written comment by Travis Williams, Question: There were 80 cites originally and then it was determined 65 of them didn't need any remediation? When was that decided? How many total sites will you all monitor under the Corrective Action permit now?

What does it mean when a site has been remedied?

When sites are moved from the CAU list what does that mean from an environmental perspective? Basically, are things moving in a positive direction?

What kinds of chemicals is BAE still using that you all are currently monitoring under either Corrective Action or Operating permits?

Response: DEQ provided a response via email to Mr. Williams on 1/29/2016. Also please see the response to Comment 7. Those responses are as follows:

76 units were addressed under the 2011 Statement of Basis; 65 were determined to require no further action. 14 total units are included in the draft renewal permit with one Area of Concern, the mortar range, being currently investigated.

The site has been sampled for soil and groundwater contamination and the soil has either been removed, capped in placed or treated using a treatment technology such as Soil Vapor Extraction. The groundwater has either been determined to be allowed to attenuate naturally or has been treated using a technology such as pump and treat.

Yes, this normally means that a determination of no further action has been made.

A groundwater monitoring list for OBG unit was attached to the initial response email. Corrective action unit monitoring lists are included in the work plans for each unit.

Comment 22 – Reference January 31, 2016 written comment by David Jenkins, Question: Thanks for your presentation on the RFAAP permits last Wednesday. I thought the one hour length for the presentation was appropriate, and hope you will keep future presentations at the same length. It was ironic that the people who interrupted causing a delay in your presentation then requested more time at future meetings.

To avoid interruptions in the future, I would suggest you try a format used by RFAAP two weeks earlier at the library. At the meeting the RFAAP staff gave an update on their efforts to mitigate the problem of air pollution at the open burning grounds. The same people who interrupted your meeting were present at the RFAAP meeting. This meeting had a person who took firm control by demanding that one person speak at a time and deferred long discussions to the end. At the opening of the meeting, an announcement was made that a police officer was present and would escort any unruly individuals out of the room. There were few interruptions by this group.

Response: DEQ has revised the policies used for public meetings to address disruptive attendees.

Comment 23 – Reference February 1, 2016 written comment by Phyllis Albritton, Question: I believe Gregory Nelson has asked a legitimate request, as there is still much to research. And, having worked for Senator Claiborne Pell in the 60's, I understand about "applicable laws and regulations", but I also understand that you have the authority to extend. Hope this can happen.

My deepest concern is the lack of real dialogue with those concerned about this situation. Having lead many organizations and been on the local school board all my life (now 77 years old), I have been concerned about this since my first getting involved.
I hope you might want to think of meeting at Christiansburg Library, since the arsenal is in Montgomery County.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. DEQ did not extend the comment period as no adverse technical comments on the draft permit conditions were received. Also please see the response to Comment 3.

Comment 24 – Reference February 3, 2016 written comment by Volunteers for Environment, Question: Perhaps Executives at BAE Systems, Inc., Officials at Radford Army Ammunition Plant, and the regulatory community involved at Radford should pay a visit to the elementary school near the open burn sites, look into the eyes of the children there, and swear on the lives of their own children that no harm will come to the little ones at Radford. See the link below and STOP THE BURN!

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions.

Comment 25 – Reference February 9, 2016 written comment by Donald Langrehr, Question: I am in favor of renewing the permit that allows continuation of various corrective actions at the Radford Arsenal site. However, the public needs clear assurances the issues of groundwater contamination and open air burning are fully investigated and remediated. Considering the egregious amounts of pollution the Radford Arsenal emits, much more attention and corrective action needs to be taken by both the DEQ and BAE.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. With respect to the Corrective Action obligations, this permit serves as the continuation of the enforceable obligations for RAAP to investigate and if necessary remediate, releases of hazardous waste and or hazardous constituent at and from the facility resulting from any SWMU at the facility.

Final remedies which are implemented by the Corrective Action Permit are documented in the 2012 and 2014 Final Remedy Decision and Response to Comments documents issued by EPA Region III.

Comment 26 – Reference February 9, 2016 written comment by Phyllis Albritton, Question: As a local citizen, especially concerned about the poor people living in the region on Prices Fork, whose breathing, gardens, and wells are immediately affected by the Radford Arsenal open burning, I request that the DEQ extend the public comment period for the RCRA permit renewal for 60 days.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. Please see the response to Comment 18 as this comment has been addressed in a previous response. DEQ did not extend the comment period as no adverse technical comments on the draft permit conditions were received.

Comment 27 – Reference February 11, 2016 written comment by Maria Bowling, Question: I've been to your website but can't find a copy of the timeline for the OBG renewal process. As I understand it, DEQ is currently reviewing the completed permit. Will there be more opportunities for public comment, and when is the deadline for written comments?

Response: DEQ provided a response to Ms. Bowling's questions via electronic mail on February 11, 2016. Please also see the response to Comment 18 as this comment has been addressed in a previous response.

Comment 28 – Reference February 12, 2016 written comment by Sally Provo, Question: I am a mother who lives within five miles of the RAAP. I live on a gorgeous rural road in an old farmhouse. I grow a garden, eight chickens, and three beautiful children. I look at the data about chemical emissions from the RAAP and consider leaving my dream house behind.

I used to live in Radford, and now I know why my children had to be tested for lead at their yearly physicals. We live closer to the plant now, the wind generally blows the other way.

In our day open burning seems archaic, like something we did before we realized that chemicals hurt our children, our communities, and our world.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. Please also see the response to Comment 18 as this comment has been addressed in a previous response.

Comment 29 – Reference February 18, 2016 written comment by Phyllis Albritton, Question: I have been concerned for many, many years about the open burning at Radford Arsenal.

Knowing this has been stopped at other arsenals in our nation, I would hope you plan to do this for our community---

PLEASE stop the open burning at the Radford Arsenal.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. Please also see the response to Comment 18 as this comment has been addressed in a previous response.

Comment 30 – Reference February 20, 2016 written comment by Carolyn Kroehler, Question: Please do not allow oversight of the Radford Arsenal to be weakened. We need more regulation, not less, of what is discharged into the air, soil, and water.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. The RCRA CA

permit serves as the continuation of the enforceable obligations for RAAP to investigate and if necessary remediate, releases of hazardous waste and or hazardous constituent at and from the facility resulting from any SWMU at the facility.

Comment 31 – Reference February 21, 2016 written comment by Seth Leonard, Question: The proposed corrective action discontinues soil sampling at Solid Waste Management Unit 13, which directly receives fallout from the open burning ground (OBG). As long as the open burning continues (as it has since 1941), there is no rational basis for DEQ's assertion that toxic particulate matter dispersing from the air into the soil will cease. This is a continuation of the troubling trend to reduce sampling and overall oversight at one of the nation's most hazardous sites. Our nearby communities suffer when environmental agencies fail to do their job. It is hard to understand such a weak response, when the facility operator has already been charged with multiple violations of several environmental statutes in recent years including the EPA's Multimedia Inspection of 2011 and the national investigations enforcement center 2014 investigation. I am also troubled by recent comments you made in the Roanoke Times (28 January 2016), Mr. Scott: "*There's actually none [poison] that's escaping the site itself … What we're seeing is the levels are going down, the controls are actually working. It's protecting human health and safety.*" These claims cannot be validated if there are no reproducible offsite scientific studies or ambient air quality monitoring or community well testing. Data must be shared before the public can comment in an informed manner.

It is essential that you extend the public comment period at least 60 days so that we may continue to gather information, establish a dialogue so that community concerns can be addressed, and find common solutions to issues that affect us all. Thank you for consideration.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. The RCRA CA permit serves as the continuation of the enforceable obligations for RAAP to investigate and if necessary remediate, releases of hazardous waste and or hazardous constituent from any solid waste management unit at the facility.

In addition the community is encouraged to participate in the RAB that has been in place since 1998, and was established for the main purpose of maintaining community involvement and informing the public about the investigation and remediation activities at the RAAP. Community members are part of the Board, and are invited to meetings where investigation and remediation plans and reports are presented and discussed.
The comment period was not extended as no adverse technical comments about the draft permit conditions were received. Comments related to soil monitoring at the OBG have been addressed in previous responses. Please see the responses to Comments 2 and 7.

Comment 32 – Reference February 22, 2016 written comment by Devawn Oberlender, Question: As you know, the permit for Open Burning at the Radford Army Ammunition Plant does not allow for open detonation, yet that is precisely what was observed during the Multi Media Inspection of 2011. Today, it continues fast and furious because EPA has failed to take

any enforcement action following the 2011 inspection nor the 2014 NEIC inspection, both finding numerous, serious violations. The failure of EPA oversight at this federal facility is an egregious violation of the public trust and endangers the lives of every child breathing downwind.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. Open detonation of hazardous waste is not currently allowed under the Subpart X permit for the Radford facility however DEQ is aware that QA/QC testing is performed on the materials manufactured by RAAP and its tenant organizations which would not qualify as open detonation of waste as these are products being tested for their intended use.

Comment 33 – Reference February 23, 2016 written comment by J. Michael Shockley, Question: The proposed corrective action discontinues soil sampling at Solid Waste Management Unit 13, which directly receives fallout from the open burning ground (OBG). As long as the open burning continues (as it has since 1941), there is no rational basis for DEQ\'s assertion that toxic particulate matter dispersing from the air into the soil will cease. This is a continuation of the troubling trend to reduce sampling and overall oversight at one of the nation's most hazardous sites. Our nearby communities suffer when environmental agencies fail to do their job. It is hard to understand such a weak response, when the facility operator has already been found to be in violation of multiple environmental statutes in recent years. I am also troubled by recent comments you made in the Roanoke Times (28 January 2016), Mr. Scott: "There's actually none [poison] that`s escaping the site itself ... What we're seeing is the levels are going down, the controls are actually working. It's protecting human health and safety." These claims cannot be validated if there are no reproducible offsite scientific studies or ambient air quality monitoring or community well testing. Data must be shared before the public can comment in an informed manner.

Furthermore, it is well past time for the open burn operation to be eliminated completely. A contained burn facility equipped with smoke scrubbers would eliminate much of the toxins released from the RAAP. This technology exists today, and by switching to a contained burn, the RAAP would conform to the Code of Federal Regulations 40, Part 264 Subpart X, issued in 1988 which requires the Department of Defense to use alternative disposal methods when they become available.

It is essential that you extend the public comment period at least 60 days so that we may continue to gather information, establish a dialogue so that community concerns can be addressed, and find common solutions to issues that affect us all. Thank you for consideration. Please contact me if you need any assistance.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. The comment period was not extended as no adverse technical comments about the draft permit conditions were

received. Comments related to soil monitoring at the OBG have been addressed in previous responses. Please see the responses to Comments 2, 7 and 11.

Comment 34 – Reference February 23, 2016 written comment by Delegate Joseph Yost, Question: I am writing to you today ask that the Public Comment period for renewal of draft corrective action permit be extended. Currently, this period is set to close on February 26th and I request an extension of at a minimum 30 days and no more than 60 days. This issue is of extreme importance to our community and it is vital that we understand these issues that affect us all especially in light of all the environmental issues nationally. I certainly do not want a Flint, Michigan scenario taking place in Virginia.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. The comment period was not extended as no adverse technical comments about the draft permit conditions were received. DEQ also responded individually to Delegate Yost's comment and the response follows: "Thank you for your e-mail below – I hope this Session is going well for you. I have forwarded your e-mail to our staff to be included in the record for the public comment period on this permitting action.

In all of our permitting and regulatory actions, the agency must ensure that its processes satisfy both the reasonable needs for public participation as well as providing for timely, fair action for the regulated community. With respect to the referenced permit action, the applicable regulatory requirements provide for a 45-day public comment period. In this case, the period for public participation has already exceeded these regulatory requirements and will have provided a total of 66 days (that is from December 22, 2015 – February 26, 2016) for public participation.

Additionally, the advertising of the comment period was more extensive than that required by applicable regulations. Public notice was published in two newspapers and aired on two radio stations in the area: The Southwest Times and the Roanoke Times: General Edition. The radio announcement was broadcast over Radio Stations: WBRW FM 105.3 and WVRU FM 89.9. The notice also was posted on Virginia's regulatory Townhall and on our website: http://www.deq.virginia.gov/ConnectWithDEQ/PublicCalendar.aspx and http://www.deq.virginia.gov/Programs/LandProtectionRevitalization/PublicNotices.aspx. And, all persons listed on the agency's current mailing list for the Radford Army Ammunition Plant were sent a notice on December 22, 2015 via electronic or postal mail.

The agency also has developed a webpage and a newsfeed which provide updated information regarding agency actions associated with this facility: http://www.deq.virginia.gov/ConnectWithDEQ/EnvironmentalInformation/RadfordArmyAmmunitionPlant.aspx

For these reasons, it is my understanding that the agency is not planning to extend the public comment period on this permitting action at this time.

Thank you for your interest in our programs and in this process, please let us know if you have any questions."

Comment 35 – Reference February 23, 2016 written comment by Gregory Nelson,
Question: I am filing these public comments on the VA DEQ's draft RCRA Corrective Action Permit because my family occupies land within the one mile buffer identified in the 2015 ATSDR Final Report on Ground Water at RAAP. ATSDR recommended testing of private wells within this zone.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. DEQ does not concur with Mr. Nelson's statement that ATSDR recommended private wells be tested within a specific zone due to concerns for potential contamination. The ATSDR final report's "next steps" states the following:

"ATSDR does not have site-specific recommendations for well testing since this evaluation showed private wells are unlikely to be affected by RFAAP. However, ATSDR recommends that all private well users monitor the quality of their private water well. Information and recommendations for private well testing can be found at the Virginia Department of Health's Private Well Water Information web page (http://www.vdh.state.va.us/environmentalhealth/onsite/regulations/PrivateWellInfo) and in articles on home water quality available from the Virginia Cooperative Extension Service (http://www.pubs.ext.vt.edu/category/home-water-quality.html)."

Comment 36 – Reference February 23, 2016 written comment by Gregory Nelson,
Question: Your agency is permitting this land's further destruction by this proposed draft RCRA permits proposals to reduce oversight. EPA Region 3, DEQ, and Mr. Ashby Scott are failing to account for future generations by analyzing the epigenetic effects of pollution emitted by RAAP. Your agencies are not bringing in outside experts, toxicologists, and medical expertise and have sacrificed their core mission to protect the environmental and human health.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. As part of the reviews of the work plans and reports submitted by RAAP under the RCRA Corrective Action Permit, DEQ and EPA engage and seek the input of the relevant field experts to assist the agencies in their reviews. Regulatory oversight of the Radford facility is not being reduced due to the transfer of the issuing authority from EPA to DEQ. As noted in the response to Comment 5 Virginia is an authorized state under RCRA.

Comment 37 – Reference February 23, 2016 written comment by Gregory Nelson,
Question: DEQ's proposals in this Draft RCRA permit to reduce oversight of this facility contributes to the deterioration of the security of the United States by allowing a multinational

arms dealer and other companies to abuse their stewardship of the land and people of the fenceline for the sake of profit.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. This comment has already been addressed by a previous response; please see the response to Comment 5.

Comment 38 – Reference February 23, 2016 written comment by Gregory Nelson,
Question: The proposed corrective action discontinues soil sampling at Solid Waste Management Unit 13, which directly receives fallout from the open burning ground (OBG). As long as the open burning continues (as it has since 1941), there is no rational basis for DEQ's assertion that toxic particulate matter dispersing from the air into the soil will cease.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. This comment has already been addressed by a previous response; please see the responses to Comments 4 and 7.

Comment 39 – Reference February 23, 2016 written comment by Gregory Nelson,
Question: I am also troubled by recent comments you made in the Roanoke Times (28 January 2016), Mr. Scott: "There's actually none [poison] that's escaping the site itself … What we're seeing is the levels are going down, the controls are actually working. It's protecting human health and safety." These claims cannot be validated or substantiated if there are no reproducible offsite scientific studies or ambient air quality monitoring or community well testing.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. This comment has already been addressed by a previous response; please see the response to Comment 2.

Comment 40 – Reference February 23, 2016 written comment by Gregory Nelson,
Question: The proposed corrective action discontinues soil sampling at Solid Waste Management Unit (SWMU) 13, which directly receives fallout from the open burning ground (OBG). Remedial investigations report this site contains significant excess levels of chromium, lead, dioxin and volatile organic compounds. Closure of SWMU 13 ignores how sinkholes, water runoff, snow drifting and snow movement, and other ways toxins from the OBG migrate to this area from meteorological influences. Therefore, this site cannot be closed due to ongoing deposition of toxins from ongoing OBG activities. For example, DEQ proposes to eliminate soil monitoring at SWMU 13. This appears inadequate 1) to characterize soil deposits, remediate hot spots, and to minimize off-site migration, 2) to serve as a surrogate for air monitoring to assess air migration, and 3) to serve as a means to protect against the 100 year flood. All hot spots will need to be identified and remediation occur before each flood arrives, likely a different timeframe than "annually." Given the uncontrolled nature of open burning (particulate emissions are a given), it seems questionable that DEQ would allow such an operation within the 100 year

flood plain and so close to the New River which is used recreationally, for fishing, and downstream as public water supply.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. This comment has already been addressed by a previous response; please see the responses to Comments 4 and 7.

Comment 41 – Reference February 23, 2016 written comment by Gregory Nelson,
Question: There is no Human Health Risk Assessment data to confirm the OBG is not an ongoing and significant threat to human health and the environment here as no studies have been conducted regarding the actual dispersion of toxins into the environment.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. DEQ does not concur with Mr. Nelson's assertion that no risk assessment data exists for the units included in the Corrective Action Permit or for the Subpart X permit for the OBG. A Human Health Risk Assessment was performed for all units included in the draft Corrective Action Permit, as documented in the Final Decision Response to Comments documents issued in 2012 and 2014. Additionally a HHRA was performed in 2005 for the Subpart X permit issued for the OBG and a HHRA protocol was submitted with the Radford facility's renewal application. A final HHRA will be developed as part of the Subpart X renewal process for the OBG.

Comment 42 – Reference February 23, 2016 written comment by Gregory Nelson,
Question: You must demonstrate how there are no toxins from Radford Arsenal in well water being used by community members, municipal water systems, Virginia Tech's farm, and others around the facility. You must demonstrate that snow drifting and water runoff has not moved toxic chemicals onto soil offsite of the facility.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. This comment has already been addressed by a previous response; please see the response to Comment 2.

Comment 43 – Reference February 23, 2016 written comment by Gregory Nelson,
Question: If no testing of the soil, air, surface water, and groundwater offsite is being conducted, as the ATSDR 2015 report recommended, to private well owners, then this permit cannot reliably claim that no off site contamination has occurred from the legacy sites proposed for closure.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. This comment has already been addressed by a previous response; please see the response to Comment 35.

Comment 44 – Reference February 23, 2016 written comment by Gregory Nelson,
Question: The proposed Final Remedy for fourteen (14) corrective action units including: nine solid waste management units (SWMUs), four Site Screening Areas (SSAs), and the Army Reserve Small Arms Range (ARSAR) and the Former Mortar and Gun Range cannot be closed from corrective action due to the fact that in the 2005 human health risk assessment for the Open Burning Ground, these areas are all continuing to receive fallout.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. Final remedies for the units included in the Corrective Action Permit are not considered RCRA closure of a unit.

The RCRA CA permit serves as the continuation of the enforceable obligations for RAPP to investigate and, if necessary, remediate the impact from any new releases of hazardous waste and or hazardous constituent at and from the facility resulting from any solid waste management unit at the facility.

Comment 45 – Reference February 23, 2016 written comment by Gregory Nelson,
Question: Officials have failed to characterize the extent of toxic plumes such as the trichloroethylene plume known as Hazardous Waste Management Unit (HWMU) 5 and demonstrate how natural attenuation is an acceptable method of corrective action for unlined landfills such as HWMU 10 & 16, two sites now in this questionable state of "remediation."

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. The 2012 and 2014 Final Remedy Decision Response to Comments documents note the numerous testing performed during the process of characterizing the Radford facility.

Comment 46 – Reference February 23, 2016 written comment by Gregory Nelson,
Question: Weak institutional controls have been proposed for SWMU 41, a site for disposal of red water ash (incinerated TNT production wastewater). According to publically available information, TNT Waste Water ash is very toxic material. There has been no monitoring or sampling to justify such a proposal. Areas such as downgradient and downstream of SWMU 41 must be extensively tested prior to corrective action to make sure that toxins are not migrating off site into the downstream water supply of Pulaski, Montgomery, Giles County, and West Virginia.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. Please refer to the 2012 and 2014 Final Remedy Decision Response to Comments documents as they summarize the characterization and rationale for the institutional controls placed on SWMU 41b. The following language is from the 2012 Final Remedy Decision Response to Comments document:

"2010 RCRA Facility Investigation

An RFI was conducted in 2010 by Shaw Environmental to further characterize SWMU 41. From 2007 to 2010 additional RFI activities included the collection and chemical analysis of surface water samples, sediment samples, direct push groundwater samples from SWMU 41A and groundwater well samples from SWMU 41B. Explosives, PAHs, SVOCs and metals were above screening levels in unit media. Since SWMU 41A was a former lagoon that received rinsate from ash transport vehicle rinsing, dioxins/furans and explosives were the only constituents detected above risk based screening levels that were attributable to past practices at the unit. Based on the nature and extent assessment of Area A it did not appear as though unit media had been significantly impacted as a result of former unit activities. In an attempt to better characterize the potential for impacts to groundwater, a groundwater monitoring well was installed in late 2010 at SWMU 41A to obtain representative groundwater quality data. The data indicated that there is no unacceptable risk to human health or the environment associated with SWMU-41A.

Potential human and ecological receptors and exposure pathways were evaluated as part of the RFI. The risks associated with five exposure scenarios were calculated at the unit: current/hypothetical future maintenance workers, hypothetical future industrial workers, hypothetical future excavation workers, hypothetical future adult residents, and hypothetical future child residents. Exposure scenarios for off-site adult and child residents were also evaluated for potential exposures to groundwater in the event that groundwater migrates off site in the future. Hypothetical future lifetime adult resident and hypothetical future child resident exposure scenarios resulted in a total cancer risk that was within the acceptable risk range of 10E-4 to 10E-6 for SWMUs 41A and 41B.

The screening level ecological risk assessment concluded that due to the fact that no rare, threatened or endangered wildlife species have been confirmed in the SWMU 41A study area, and the relatively small size of the unit, corrective measures solely to address ecological concerns are not warranted at SWMU 41A.

2011 Final Remedy Proposal

In March 2011, EPA approved the final RFI, which proposed:

- **No unacceptable risks were identified for human or ecological receptors in potential contact with SWMU 41A materials; therefore, no further action is warranted to address human health or ecological concerns**

- **Institutional Controls to prevent earth moving and future residential use have been proposed as the final remedy for SWMU 41B. They are described in more detail in Section IV.**

Therefore EPA is proposing no further action for SWMU 41A and institutional controls

for SWMU 41B. These controls are described in more detail in Section IV."

Comment 47 – Reference February 23, 2016 written comment by Gregory Nelson,
Question: Natural attenuation as an effective means of controlling toxic dispersion of legacy site contamination into the environment must be thoroughly explained in the Draft RCRA CA permit. This requires sharing with the public the publication of scientific studies and evidence that demonstrate, using the best available science and technology, independent expertise, and state of the art environmental scientific sciences, medical sciences like epigenetics and toxicology to show that toxins are not moving off site and affecting the community.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. The DEQ highly encourages Mr. Nelson to read the 2012 and 2014 Final Remedy Decision Response to Comments documents as they summarize the characterization and the rationale for the institutional controls placed on SWMUs as well as the remedies selected for those units at the Radford facility.

Comment 48 – Reference February 23, 2016 written comment by Gregory Nelson,
Question: In June and July 2013: The New River Valley Sierra Club found perchlorate in 4 out of 5 private wells outside of the facility at the following levels: 0.529 in well 1, 0.285 in well two, 0.357 in well 3, non-detected in well 4, and 0.387 in well 5. The units here are units in micrograms per liter. While these results are in low levels, the Sierra Club did not use an EPA certified lab, and no chain of custody can be verified after repeated requests for public information about these results. Therefore, the discovery of Perchlorate in 4 out of 5 private wells bordering the facilities at RAAP mandates a prudent approach to further testing and monitoring of the hundreds of wells and soil on the perimeter of the facility on private land. The finding of perchlorate is in direct contradiction to the claims made by Ashby Scott in a DEQ Public Meeting on 1-27-16 regarding corrective action. These results are published on page 27 of the Health Consultation conducted by the ATSDR final report issued 1/28/15.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. The conclusions stated in the ATSDR report are substantially different from the ones drawn in this comment. The following is the language from the ATSDR report regarding the private well sampling:

"Recent Private Well Data
In June and July 2013, the Virginia Chapter of the Sierra Club sponsored testing of a limited number of private wells near RFAAP. The sampling was performed by the New River Valley Sierra Group. The Sierra Club shared the results with ATSDR, and we summarize the findings here.

Five wells were sampled. It is ATSDR's policy not to present identifying information, but the wells sampled were located adjacent to or very close to RFAAP and in various directions from the facility.

Sampling procedures were not available. However, a state-certified laboratory performed analyses using various EPA standard methods. Table 7 shows the results [44-46].

As indicated in Table 7, most contaminants were not detected, and those detected met drinking water standards and/or were at concentrations below health-based screening levels. Some contaminants that were detected in RFAAP groundwater, such as the dinitrotoluenes or trichloroethylene, were not detected in private wells near the facility.

These data appear to be collected and analyzed according to standard practices. Although they may not include stringent quality assurance protocols and documentation such as would be required, for example, to use the data to support regulatory enforcement actions, ATSDR believes them to accurately represent condition of the wells at the time of sampling. The results indicate that currently, these wells do not appear to be affected by releases from RFAAP."

The issue is again discussed in the response to comments section of the ATSDR report:

"ATSDR Response: The recent detections of perchlorate in 4 of 5 offsite private wells were all very low (less than one microgram per liter). These detections are lower than ATSDR's health based screening level for perchlorate in drinking water of 7 micrograms per liter.28 ATSDR does not have exact locations for the private wells tested recently, but we were told the wells were close to the facility in various directions. ATSDR's analysis of groundwater flow patterns indicates that there is no pathway for site groundwater to reach private wells, since all groundwater on both sides of the New River would flow towards and ultimately discharge into the New River. The source of the low levels of perchlorate in private wells is not known, but the concentration of perchlorate in these wells is within the range of perchlorate found in a survey of "pristine" sites across the United States. This indicates that the measured perchlorate detections may not be unique to RFAAP. Because the concentrations detected are below ATSDR's health screening level, there is no public health basis for recommending additional testing. Please see the detailed response to comment PC3-5."

Additionally DEQ would like to provide some context for the perchlorate detections. The Method Detection Level (MDL) for perchlorate is 0.2 ug/L and the OSWER recommended Preliminary Remediation Goal (PRG) 15 µg/L. The detected levels cited in the ATSDR report are close to the MDL and well below the recommended PRG

Comment 49 – Reference February 23, 2016 written comment by Gregory Nelson,
Question: The regulators involved with this issue have a documented history of serving the polluter not the public interest by failing to enforce violations and take action against the multiple violations found at the site. The evidence of this is further documented by the willful

ignoring of RCRA Subpart X's requirements to initiate the use of alternative technology to open burning.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. DEQ received an alternative treatment technology analysis as part of Radford facility's 2015 Subpart X permit renewal package. Review of the document has been completed and comments have been made, which are included in the first technical Notice of Deficiency for the permit application.

Comment 50 – Reference February 23, 2016 written comment by Gregory Nelson, Question: It is essential that you extend the public comment period for at least 60 days so that we may continue to gather information and establish a dialogue so that community concerns can addressed and find solutions.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. The public comment period was not extended as no adverse technical comments to the permit conditions were received.

Comment 51 – Reference February 24, 2016 written comment by Meriel Russell, Question: I would like to request a 60-day extension for public input on the permit.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. The public comment period was not extended as no adverse technical comments to the permit conditions were received.

Comment 52 – Reference February 24, 2016 written comment by Meriel Russell, Question: I understand that under the proposed permit for corrective action, the testing of soil from the Solid Waste Management Unit 13 will be discontinued. This seems like backsliding to me. I believe there should be much more testing around both the arsenal property and the surrounding area.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. This comment has been responded to in a previous comment. Please see the response to Comment 7.

Comment 53 – Reference February 24, 2016 written comment by Meriel Russell, Question: I also understand that oversight of the arsenal is being shifted from the EPA to the Virginia DEQ. This worries me greatly. I do not see how a state agency will have power of enforcement over a U.S. Army facility. And I am concerned that DEQ will not even have the jurisdiction to enforce the Clean Water Act and Clean Air Act.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. This comment has been responded to in previous comments. Please see the responses to Comments 1 and 5.

Comment 54 – Reference February 24, 2016 written comment by Meriel Russell, Question: At your January 27, 2016 DEQ meeting with the public at the Radford library, in reference to pollution migrating to the surrounding area, you said, "There's actually none that's escaping the site itself... What we're seeing is the levels are going down, the controls are actually working." Please share with the public the scientific test data that you based this statement on. I fear that the actual situation is that quite a lot of arsenal pollution migrates throughout a wide area. I am especially concerned about the effects of open burning on the students at Belview Elementary School, which is just downwind of the open burn ground.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. This comment has been responded to in a previous comment. Please see the response to Comment 2.

Comment 55 – Reference February 25, 2016 written comment by David Nachlas, Question: If you want to run it differently I would be happy to help. I am a geologist and have about 15 years experience as an environmental scientist and project manager. I can do all kinds of sampling. I am also a native of the area, an avid kayaker, and familiar with the river. I appreciate your time reading this and hope you will extend the public comment period and continue to sample swmu 13.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. The comment period was not extended as no adverse technical comments about the draft permit conditions were received. Comments related to soil monitoring at the OBG have been addressed in previous responses. Please see the responses to Comments 2 and 7.

Comment 56 – Reference February 25, 2016 written comment by Winema Lanoue, Question: I'm writing as a resident of Montgomery County, VA, where my family and I live near the Radford Arsenal and are exposed to any pollutants from the facility. I am concerned about the environmental oversight at the Radford Arsenal (changing from federal oversight to state DEQ) and I am requesting that you extend the public comment period on the VA DEQ's proposed corrective actions. I have become aware that there are many issues which remain unaddressed by arsenal and public officials such as you, and this has created an atmosphere of mistrust in our community. I do not feel that we have received any information from you that can allow me, as a mother and citizen, to feel confident in the proposed changes which will only worsen an already disastrous situation in our region. Oversight of this facility and standards for environmental testing should be becoming more stringent, not less. The burden of proof should be on the Arsenal to prove that there is no danger, not on local people to prove that there is.

The proposed corrective action discontinues soil sampling at Solid Waste Management Unit 13, which directly receives fallout from the open burning ground (OBG). As long as the open burning continues (as it has since 1941), there is no rational basis for DEQ's assertion that toxic particulate matter dispersing from the air into the soil will somehow cease. This is a continuation of the troubling trend to reduce sampling and overall oversight at one of the nation's most hazardous sites. Our nearby communities suffer when environmental agencies fail to do their job. It is hard to understand such a weak response, when the facility operator has already been found to be in violation of multiple environmental statutes in recent years. I am also troubled by recent comments you made in the Roanoke Times (28 January 2016), Mr. Scott: "*There's actually none [poison] that's escaping the site itself … What we're seeing is the levels are going down, the controls are actually working. It's protecting human health and safety.*" These claims cannot be validated if there are no reproducible offsite scientific studies or ambient air quality monitoring or community well testing, not to mention actual testing of levels of toxins in our children. If there is information that you have to support this then you should be sharing that with the public. Data must be shared before the public can comment in an informed manner.

It is essential that you extend the public comment period at least 60 days so that we may continue to gather information, establish a dialogue so that community concerns can be addressed, and find common solutions to issues that affect us all. Thank you for consideration.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. The comment period was not extended as no adverse technical comments about the draft permit conditions were received. Comments related to soil monitoring at the OBG, DEQ's regulatory authority and site characterization have been addressed in previous responses. Please see the responses to Comments 2, 5, and 7.

Comment 57 – Reference February 25, 2016 written comment by Winema Lanoue,
Question: I'm writing as a resident of Montgomery County, VA, where my family and I live near the Radford Arsenal and are exposed to any pollutants from the facility. I am concerned about the environmental oversight at the Radford Arsenal (changing from federal oversight to state DEQ) and I am requesting that you extend the public comment period on the VA DEQ's proposed corrective actions. I have become aware that there are many issues which remain unaddressed by arsenal and public officials such as you, and this has created an atmosphere of mistrust in our community. I do not feel that we have received any information from you that can allow me, as a mother and citizen, to feel confident in the proposed changes which will only worsen an already disastrous situation in our region. Oversight of this facility and standards for environmental testing should be becoming more stringent, not less. The burden of proof should be on the Arsenal to prove that there is no danger, not on local people to prove that there is.

The proposed corrective action discontinues soil sampling at Solid Waste Management Unit 13, which directly receives fallout from the open burning ground (OBG). As long as the open burning continues (as it has since 1941), there is no rational basis for DEQ's assertion that toxic particulate matter dispersing from the air into the soil will somehow cease. This is a continuation

of the troubling trend to reduce sampling and overall oversight at one of the nation's most hazardous sites. Our nearby communities suffer when environmental agencies fail to do their job. It is hard to understand such a weak response, when the facility operator has already been found to be in violation of multiple environmental statutes in recent years. I am also troubled by recent comments you made in the Roanoke Times (28 January 2016), Mr. Scott: "There's actually none [poison] that's escaping the site itself … What we're seeing is the levels are going down, the controls are actually working. It's protecting human health and safety." These claims cannot be validated if there are no reproducible offsite scientific studies or ambient air quality monitoring or community well testing, not to mention actual testing of levels of toxins in our children. If there is information that you have to support this then you should be sharing that with the public. Data must be shared before the public can comment in an informed manner.

It is essential that you extend the public comment period at least 60 days so that we may continue to gather information, establish a dialogue so that community concerns can be addressed, and find common solutions to issues that affect us all. Thank you for consideration.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. The comment period was not extended as no adverse technical comments about the draft permit conditions were received. Comments related to soil monitoring at the OBG, DEQ's regulatory authority and site characterization have been addressed in previous responses. Please see the responses to Comments 2, 5, and 7.

Comment 58 – Reference February 25, 2016 written comment by Emily Pyne, Question: I am writing to express my concern regarding the environmental oversight at the Radford Arsenal and to request that you extend the public comment period on the VA DEQ's proposed corrective actions. I am an undergraduate alumnus of Virginia Tech and a current graduate student in the Department of Human Nutrition, Foods, and Exercise. I am aware there are many issues which remain unaddressed by arsenal and public officials, and this has created an atmosphere of mistrust in the community. As an academic researcher in the area of cancer, and as a scientist, I request that outside experts be called in to conduct soil, air, surface water, and groundwater monitoring in this area. In my opinion as well as that of others living in the community, it is crucial that medical expertise and monitoring be included in the oversight of the arsenal and its' actions.

The proposed corrective action discontinues soil sampling at Solid Waste Management Unit 13, which directly receives fallout from the open burning ground (OBG). As long as the open burning continues (as it has since 1941), there is no rational basis for DEQ's assertion that toxic particulate matter dispersing from the air into the soil will cease. This is a continuation of the troubling trend to reduce sampling and overall oversight at one of the nation's most hazardous sites. Our nearby communities suffer when environmental agencies fail to do their job. It is hard to understand such a weak response, when the facility operator has already been found to be in violation of multiple environmental statutes in recent years. There are no reproducible offsite scientific studies being conducted or ambient air quality monitoring or community well testing.

This needs to change, and data must be shared before the public can comment in an informed manner. It is extremely concerning to me that data from 2008 New River Health District Child Blood Levels shows extreme levels of lead exposure in children living in zip codes downwind of the Arsenal's open burning ground. Officials must prove this is not due to the Arsenal's reported "fugitive" releases of 4,000+ pounds of lead annually since 2001. Nothing should be left to uncertainty when it comes to the health and safety of the surrounding community. Long-term exposure to the toxins released at the arsenal has been glossed over and written off as ambiguous, unclear, and likely due to other factors. That is an unacceptable and unscientific approach. In many ways, science is only just beginning to elucidate the ways that environmental exposure plays a role in cancer incidence, and the arsenal has a moral obligation to the community it inhabits to investigate and be aware of this.

Natural attenuation as an effective means of controlling toxic dispersion of legacy site contamination into the environment must be thoroughly explained in the Draft RCRA CA permit.

This requires sharing with the public the publication of scientific studies and evidence that demonstrate, using the best available technology, independent expertise, and state of the art environmental scientific sciences, medical sciences like epigenetics and toxicology to show that toxins are not moving off site and affecting the community.

It is essential that you extend the public comment period at least 60 days so that we may continue to gather information, establish a dialogue so that community concerns can be addressed, and find common solutions to issues that affect us all. Thank you for consideration.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. The comment period was not extended as no adverse technical comments about the draft permit conditions were received. Final remedy decisions are detailed in the 2012 and 2014 Final Remedy Decisions and Response to Comments documents which were published by EPA Region III. Comments related to soil monitoring at the OBG and site characterization have been addressed in previous responses. Please see the responses to Comments 2 and 7.

Comment 59 – Reference February 25, 2016 written comment by Alan Moore, Question:
The proposed corrective action discontinues soil sampling at Solid Waste Management Unit (SWMU) 13, which directly receives fallout from the open burning ground. As long as the open burning continues, as it has since 1941, there is no rational basis for DEQ's assertion that toxic particulate matter dispersing from the air into the soil will cease. Officials have failed to characterize the extent of toxic plumes such as the trichloroethylene plume known as Hazardous Waste Management Unit (HWMU) 5 and demonstrate how natural attenuation is an acceptable method of corrective action for unlined landfills such as HWMU 10 & 16. Weak institutional controls have peen proposed for SWMU 41, a site for disposal of red water ash (incinerated TNT production wastewater). There has been no evidence of monitoring or sampling to justify such a proposal. Areas such as SWMU 41 must be extensively tested prior to corrective action. These

risky proposals are only a few examples of an alarming trend to reduce sampling and overall oversight at one of the nation's most hazardous sites. Our nearby communities suffer when environmental agencies fail to do their job. It is hard to understand such a weak response, when the facility operator has already been charged with multiple violations of several environmental statutes in recent years. I am also troubled by recent comments you made in the Roanoke Times (28 January 2016), Mr. Scott: "*There's actually none [poison] that's escaping the site itself … What we're seeing is the levels are going down, the controls are actually working. It's protecting human health and safety.*" These claims cannot be validated if there are insufficient reproducible offsite scientific studies or ambient air quality monitoring or community well testing. Data must be shared before the public can comment in an informed manner. Commonwealth law, and by extension, Federal law, compel you to protect our community, not the polluters. To do this we need a community-backed science-driven EPA-drafted plan to convert from open burning to contained burn of environmental toxins, return the RAAP to the National Priorities List, conduct adequate testing and modeling of air, water, and soil within and outside arsenal property, share all non-classified data, eliminate non-defense commercial waste production, develop and implement medical expertise & community health plans, and clean up all ongoing and legacy waste management sites.

It is essential that you extend the public comment period at least 60 days so that we may continue to gather information, establish a dialogue so that community concerns can be addressed, and find common solutions to issues that affect us all.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. The comment period was not extended as no adverse technical comments about the draft permit conditions were received. Final remedy decisions are detailed in the 2012 and 2014 Final Remedy Decisions and Response to Comments documents which were published by EPA Region III. Comments related to soil monitoring at the OBG and site characterization have been addressed in previous responses. Please see the responses to Comments 2 and 7.

Comment 60 – Reference February 25, 2016 written comment by Kodi Parson, Question: The proposed corrective action discontinues soil sampling at Solid Waste Management Unit 13, which directly receives fallout from the open burning ground (OBG). As long as the open burning continues (as it has since 1941), there is no rational basis for DEQ's assertion that toxic particulate matter dispersing from the air into the soil will cease. This is a continuation of the troubling trend to reduce sampling and overall oversight at one of the nation's most hazardous sites. Our nearby communities suffer when environmental agencies fail to do their job. It is hard to understand such a weak response, when the facility operator has already been found to be in violation of multiple environmental statutes in recent years.. I am also troubled by recent comments you made in the Roanoke Times (28 January 2016), Mr. Scott: "There's actually none [poison] that's escaping the site itself … What we're seeing is the levels are going down, the controls are actually working. It's protecting human health and safety." These claims cannot be validated if there are no reproducible offsite scientific studies or ambient air quality monitoring or community well testing. Data must be shared before the public can comment in an informed

manner.

It is essential that you extend the public comment period at least 60 days so that we may continue to gather information, establish a dialogue so that community concerns can be addressed, and find common solutions to issues that affect us all.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. The comment period was not extended as no adverse technical comments about the draft permit conditions were received. Comments related to soil monitoring at the OBG and site characterization have been addressed in previous responses. Please see the responses to Comments 2 and 7.

Comment 61 – Reference February 26, 2016 written comment by Samantha Longley, Question: I understand that efforts to remediate and clean up the Arsenal are being made and sincerely appreciate the work done there. I am writing to ask you to please extend the public comment period on the VA DEQ's current proposed corrective actions permit renewal (Corrective Action Permit EPA ID No. VA1210020730) by 60 days.

Additionally, I respectfully request that you please schedule another public meeting during those 60 days to allow for a civil discussion between the DEQ and the local communities about this renewal. I would like to better understand what this permit renewal means for the Arsenal and what it means for the local environment and residents.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. The comment period was not extended as no adverse technical comments about the draft permit conditions were received.

Comment 62 – Reference February 26, 2016 written comment by Susan DeLay, Question: I am writing to express my concerns about the environmental oversight at the Radford Arsenal and to request that you extend the public comment period on the VA DEQ's proposed corrective actions. I live in Blacksburg with my family and I am concerned that we are being exposed to pollution from the facility. I have recently become aware that there are many unaddressed issues that state officials need to analyze, explain and resolve in order to protect the environment and the health of the citizens of the New River Valley.

The particulates and hazardous chemicals emitted into the air by the Radford facility's open burning of waste are not sufficiently monitored. Furthermore, the impact on the areas outside of the arsenal that are exposed to the fall out have not been studied at all. Independent sources have documented significant exposure in surrounding communities and show that we are at risk.

An award winning study by *USA Today* called the "The Smokestack Effect: Toxic Air and America's Schools" shows that our area's public schools are more severely impacted by toxic releases than most other American schools. Of the 128,000 schools examined, for example,

Belview Elementary school ranked in the 2nd percentile! According to the article, the investigators used an EPA model to track the path of pollution and determined that our students are exposed to several toxins, including nitroglycerin, di-isocyanates, lead and lead compounds, and hydrochloric acid. In another study conducted within VCU's School of Journalism, Vu and Robertson showed that in six years (2004 -2010) the Radford facility "released more toxic chemicals into the environment than any other facility in Virginia – about 78.5 million pounds of substances that may pose health risks" (https://wp.vcu.edu/mmj-new/2011/12/20/radford-ammo-plant-tops-in-toxic-releases/). Their analysis was based on data reported in the *Toxic Release Inventory*.

Based directly on government data and models, these studies raise serious questions about the impact that releases from the Radford Arsenal are having on human health and the environment. I have not seen any human health studies on local residents or direct air quality monitoring in neighboring communities. Until we know what the impact is, it is irresponsible to continue this arcane practice of burning waste openly and exposing our children to these potentially damaging contaminants. Potential contamination is not only through the air we breathe but also in the in the water we drink. Impacts from all paths of exposure should be evaluated to determine the safety of open burning as a method of waste disposal.

Furthermore, it is my understanding that the practice of open burning waste violates the RCRA regulation, CFR 40 Part 264 Subpart X. It is the duty of our public institutions to follow the laws that have been established to protect American citizens from practices that are known to be detrimental to the environment and people's health. To comply with federal laws and to ensure the public safety, these practices need to be stopped and updated with more technologically advanced and safer practices.

Please extend the review time for at least 60 days so that this issue can be looked at in greater depth. Safer alternatives need to be found.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. The comment period was not extended as no adverse technical comments about the draft permit conditions were received. The RCRA CA permit serves as the continuation of the enforceable obligations for RAAP to investigate and if necessary remediate, the impact from any new releases of hazardous waste and or hazardous constituent at and from the facility resulting from any SWMU at the facility.

With respect to the treatment of energetic waste through open burning/open detonation (OB/OD), this is regulated under federal Resource Conservation and Recovery Act (RCRA) of 1976 (42 U.S.C 6901 *et seq.*), as amended, when these wastes cannot be safely treated or disposed of through other modes of treatment (40 CFR 265.382). The selection and appropriateness of OB/OD treatment is based on a number of criteria which must be demonstrated including, but not limited to, on site specific safety, transportation hazard potential, offsite treatment options and feasibility of alternative technology considerations.

There have been no changes to the regulations governing the treatment of energetic waste through open burning/open detonation, under the conditions established by a RCRA permit.

RAAP has submitted a renewal application to DEQ for its OBG permit. DEQ has set up a website which contains the submitted OBG application, including the information discussed above.
http://www.deq.virginia.gov/ConnectWithDEQ/EnvironmentalInformation/RadfordArmyAmmunitionPlant.aspx The DEQ Fact Sheet "Steps in HW Permitting Process and Timeline" explains the DEQ permitting process and at which point in the process the draft permit will be available for public review. The public process provides you with an opportunity to engage both RAAP and DEQ on the decision making process. We encourage you to participate in the public process. The website also provides general information about the purpose and scope of all the regulatory programs at RAAP.

Comment 63 – Reference February 26, 2016 written comment by Erin Card, Question: I'm asking that you would please do whatever it takes to better protect this great community and surrounding areas. I'm requesting you start by extending the public comment period on the VA DEQ's proposed corrective actions. Please also consider having scientific/outside experts to conduct soil, air, surface water, and groundwater monitoring and studies for chemicals produced and emitted by facilities at Radford Arsenal. The proposed corrective action discontinues soil sampling at Solid Waste Management Unit 13, which directly receives fallout from the open burning ground (OBG). As long as the open burning continues (as it has since 1941), there is no rational basis for DEQ's assertion that toxic particulate matter dispersing from the air into the soil will cease.

There are many people affected by the disposal practices at the Arsenal. It is essential that you extend the public comment period at least 60 days so that we may continue to gather information, establish a dialogue so that community concerns can be addressed, and find common solutions to issues that affect us all.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. The comment period was not extended as no adverse technical comments about the draft permit conditions were received. Comments related to soil monitoring at the OBG have been responded to in previous comments; please see the response to Comment 7.

Comment 64 – Reference February 26, 2016 written comment by Devawn Oberlender, Question: SWMU13 DEQ proposes to discontinue Soil Monitoring Program for the Open Burning Ground (OBG). appears inadequate 1) to characterize soil deposits, remediate hot spots, and to minimize off-site migration, 2) to serve as a surrogate for air monitoring to assess air migration, and 3) to serve as a means to protect against the 100 year flood.

"The analysis of soil samples and subsequent...remediation will...serve as the *procedures which will cause the waste to be removed safely, before flood waters can reach the facility...*" [Permit Attachment II.C-1]. In order for this statement to be practical and valid, all hot spots will need to be identified and remediation occur before each flood arrives, likely a different timeframe than "annually."

"Pads 1, 4 and 7...diesel and kerosene is [sic] occasionally used as an accelerant at those locations" [OBG Permit Attachment II.C-6]. Another reason these pads should be underlain with a liner. Given the uncontrolled nature of open burning (particulate emissions are a given), it seems questionable that DEQ would allow such an operation within the 100 year flood plain and so close to the New River which is used recreationally, for fishing, and as public water supply downstream. The plan to eliminate all monitoring of the soil flies in the face of common sense, let alone scientific prudence.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. Comments related to soil monitoring at the OBG have been responded to in a previous comment; please see the response to Comment 7.

Comment 65 – Reference February 26, 2016 written comment by Devawn Oberlender, Question: <u>SWMU40, SWMU 41B SWMU 43, 45, 48, 49, 51 & 54</u>

Considering the sinkholes documented at the facility by the Virginia Department of Mines and Minerals, Radford NW Quadrant Map, which applies to all sites in this action, it is s impossible to track the migration of contaminants off site without rigorous testing outside of the facility boundary. The EPA directed the facility to conduct this testing subsequent to the U.S. Army Corp of Engineers assessment in 1992, attached. The decision to include the facility on the NPL Superfund List in March of 1999 substantiates the need for testing off site. The decision to issue a "unique" RCRA for the facility in 2000, has resulted in a lack of effective oversight, public engagement and diligence in assuring human health and safety. Now is the time to correct this failure.

The detection of dioxin at 41b previously has not been accounted for in the pending decision. Complete characterization and testing in accord with the EPA's direction in 1992 is warranted. The EPA instructed the facility to test all private drinking water wells within 5 miles of each site under investigation. Until and unless this condition has been met, it is irresponsible for EPA to overlook their own directive by allowing "No Further Action."

See Section 3 on page 4 of the document cover page attached (emphasis added)

GROUND WATER PATHWAY INFORMATION

(see Section3 of the HRS Final Rule - December 1990Federal Register).

3A. Determine if the groundwater within a 4-mile radius of each source is used for any of the following... Provide the depth of each well. (Applies to all sources)

Neither EPA Region 3 nor the Virginia DEQ have provided an explanation as to why this required testing as directed by EPA in 1992 was never accomplished. The population density and number of drinking water wells have increased significantly since 1992 and the testing is needed now more than ever. Please explain why that directive was ignored and how the community will be provided with the answer this query regarding drinking water wells off-site now.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. Comments related to site characterization have been responded to in a previous comment; please see Comment 2.

Comment 66 – Reference February 26, 2016 written comment by Devawn Oberlender, Question: Army Reserved Small Arms Range (ARSAR)

The claim that contaminants at this site have yet to be characterized is troubling given that it was brought under the EPA MMRP in 2012. Please explain the status of testing and provide any results obtained. The plan to have the state site manager, Jim Cutler manage this remediation does not comport with the requirement to inform and engage stakeholders in the decision making process. The lack of due diligence given to addressing this site, which is likely a source of lead contamination, is troubling and points out the failure of DEQ to protect human health and the environment at RAAP.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. Additionally the DEQ would like to clarify that the ARSAR already has a final remedy in place as detailed in the Statement of Basis. The DEQ believes Ms. Oberlender is confusing the ARSAR with the Former Gun and Mortar Range which is currently being investigated under the Corrective Action Permit.

Comment 67 was received after the close of the public comment period but is being included as part of the public record – Reference February 27, 2016 written comment by Tarryn Abrahams, Question: I believe that your proposed actions will only worsen an already disastrous situation in our region. The proposed corrective action discontinues soil sampling at Solid Waste Management Unit 13, which directly receives fallout from the open burning ground (OBG). As long as the open burning continues (as it has since 1941), there is no rational basis for DEQ's assertion that toxic particulate matter dispersing from the air into the soil will cease. This is a continuation of the troubling trend to reduce sampling and overall oversight at one of the nation's most hazardous sites. Our nearby communities suffer when environmental agencies fail to do their job. It is hard to understand such a weak response, when the facility operator has already been found to be in violation of multiple environmental statutes in recent years.. I am also troubled by recent comments you made in the Roanoke Times (28 January 2016), Mr. Scott:

"*There's actually none [poison] that's escaping the site itself … What we're seeing is the levels are going down, the controls are actually working. It's protecting human health and safety.*" These claims cannot be validated if there are no reproducible offsite scientific studies or ambient air quality monitoring or community well testing. Data must be shared before the public can comment in an informed manner.

It is essential that you extend the public comment period at least 60 days so that we may continue to gather information, establish a dialogue so that community concerns can be addressed, and find common solutions to issues that affect us all. Please, our children deserve to live lives where they haven't suffered neurological damage from toxic metal exposure, and don't have an increased risk for cancer.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. The comment period was not extended as no adverse technical comments about the draft permit conditions were received. Comments related to soil monitoring at the OBG and site characterization have been addressed in previous responses. Please see the responses to Comments 2 and 7.

Comment 68 was received after the close of the public comment period but is being included as part of the public record – Reference February 29, 2016 written comment by Sabrena Pagani-Golladay, Question: The proposed corrective action discontinues soil sampling at Solid Waste Management Unit 13, which directly receives fallout from the open burning ground (OBG). As long as the open burning continues (as it has since 1941), there is no rational basis for DEQ's assertion that toxic particulate matter dispersing from the air into the soil will cease. This is a continuation of the troubling trend to reduce sampling and overall oversight at one of the nation's most hazardous sites.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. This comment was addressed in a previous comment response; please see the response to Comment 7.

Comment 69 was received after the close of the public comment period but is being included as part of the public record – Reference February 29, 2016 written comment by Sabrena Pagani-Golladay, Question: I am also troubled by recent comments you made in the Roanoke Times (28 January 2016) Mr. Scott' "*There's actually none [poison] that's escaping the site itself … What we're seeing is the levels are going down, the controls are actually working. It's protecting human health and safety.*" These claims cannot be validated if there are no reproducible offsite scientific studies or ambient air quality monitoring, or community well testing. Data must be shared before the public can comment in an informed manner.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. This comment was addressed in a previous comment response; please see the response to Comment 2.

Comment 70 was received after the close of the public comment period but is being included as part of the public record – Reference February 29, 2016 written comment by Sabrena Pagani-Golladay, Question: It is essential that you extend the public comment period at least 60 days so that we may continue to gather information, establish a dialogue so that community concerns can be addressed, and find common solutions to issues that affect us all.

Response: The permit action being considered is for a RCRA Corrective Action Permit and this is not a technical comment related to the draft permit conditions. The comment period was not extended as no adverse technical comments to the permit conditions were received.