



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
1600 John F Kennedy Blvd
Philadelphia, Pennsylvania 19103-2029**

SUBJECT: Approval and Funding Request for a Removal Action at the Acorn Road Site in Nathalie, Halifax County, Virginia.
Site ID: B3BW

FROM: Christie Torres Rosa, On-Scene Coordinator
Western Response Section

THRU: Michael Towle, Chief
Preparedness and Response Branch (3SD30)

TO: Paul Leonard, Director
Superfund and Emergency Management Division (3SD00)

I. PURPOSE

The purpose of this Action Memorandum is to request and document approval for a Removal Action at the Acorn Road Site (Site), located in the unincorporated community of Nathalie, Halifax County, Virginia. The Site includes a 1.7-acre wooded parcel (property) with a foundation from a schoolhouse building that burned down many years ago. Removal Site Evaluation activities were performed in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. The Removal Site Evaluation documented a threat to public health or welfare or the environment due to the presence of radioactively contaminated soil and radioactive contaminated buried metal objects on the property. High levels of radiation have been documented on-Site. During a gamma radiation survey, gamma radiation identified as Radium-226 radionuclides was detected in the soil and discrete items at levels above three times background. Radium-226 (Ra-226) is listed as a hazardous substance in Table 302.4 at 40 C.F.R. § 302.4 Appendix B.

After reviewing the information obtained from the gamma radiation survey, the OSC concludes that a Removal Action is necessary to mitigate the threat posed by hazardous substances at the Site. In accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended (CERCLA), 42 U.S.C §§ 9601, et seq., funding in the amount of \$1,957,000 (estimated Removal Project Ceiling) is requested to mitigate threats at the Site.

II. SITE CONDITIONS AND BACKGROUND

A. Site Description

The Site includes a privately-owned 1.7 acre wooded parcel located in Nathalie, Halifax County, Virginia. The Site was historically the location of an old schoolhouse that burned to the ground many years ago. The foundation of the building is still present. During the course of conducting a removal action at the Shiloh Church Road Site (Shiloh Site), located in Nathalie, Halifax County, Virginia, and in the general vicinity of the Site, which action commenced in 2018, EPA became aware of the Site as being a potential location at which there has been a release or threatened release of hazardous substances.

1. Removal Site Evaluation

Initial assessments of the Site conducted by EPA in early spring of 2023 indicated the presence of soil containing radiation (Ra-226) and old drum carcasses at the Site. No closed drums or containers were found. The Ra-226 contamination found at the Site was incorporated into soil and discrete buried objects.

During a Site visit in March 2023, EPA performed a rudimentary gamma radiation survey indicating areas of elevated Ra-226 in Site soils. In July 2023, EPA performed a Removal Site Evaluation, which included sampling of soil and buried debris and conducting a detailed gamma radiation survey. For purposes of conducting sampling at the Site, EPA utilized a Site-specific background level for radiation of 8,626 counts per minute (cpm). CPM is a measure of the detection rate of radiation ionization events per minute. In consultation with EPA's Regional Radiation Program Manager, EPA utilized a Site-specific removal action level for radiation of 25,878 cpm, which is equal to three times the background level.

As shown in Attachment 1, several readings were substantially greater than the background level. Areas with radiation above three times background were marked using flags. Debris such as drum carcasses was also flagged.

The highest level of radiation on-Site was 60,382 cpm, which is more than seven times the background radiation level at the Site. The highest radiation readings at the Site are concentrated near the concrete foundation of the former schoolhouse.

As part of the Removal Site Evaluation and as described in the field sampling plan (FSP), EPA had planned to collect samples to be sent to a laboratory to identify and analyze radiation isotopes, radiation levels, metals, and PCBs. However, contractors were advised by the contractor's health physicist and the EPA Regional Radiation Program Manager to stop the sample collection after digging a small volume of soil to the depth of one foot near the concrete foundation. Radiation levels in those soils increased in orders of magnitude, maxing out the capacity of the instruments to read radiation levels, thus presenting a health and safety hazard to

the assessment team. The buried metal object was identified as one source of the radiation (Attachment 2). The item was secured and left on-Site. Finding the metal object emitting radiation suggests that the source of the radiation contamination on-Site are items buried in the soil.

In addition, a radiation isotope identifier device was used to identify and verify that Ra-226 is the radioactive isotope emitting the elevated readings found in soil and buried debris at the Site. Drum carcasses were also present on-Site and in areas of where high radiation levels in soil were found. Trash, such as a mattress, tires, glass bottles, plastics, and more, is scattered across the property. The property is not fenced, making it easy for trespassers to access the area of contamination.

2. Physical Location/Site Characteristics

The Site is located approximately 1,000 feet from the intersection of Acorn Rd and LP Bailey Memorial Highway in the unincorporated community of Nathalie, Halifax County, Virginia with 36.959762, -78.979459 coordinates. The area, located in south central Virginia, is primarily residential with a population of less than 200 (2010 Census Data).

Currently, the 1.7-acre wooded property is vacant. A map of the area is included in Attachment 1. The Site is bounded to the east and west by residential properties and farmlands. There is also a residence across the street from the Site.

The EPA identification number for this Site is B3BW.

3. State, Tribal, and Local Authorities

The OSC is coordinating with the Commonwealth of Virginia and confirmed that the Commonwealth does not have the ability to perform the Removal Action as a response. The OSC will continue to coordinate with VADEQ as well as local authorities if needed.

The OSC will additionally engage the Regional Historic Preservation Act coordinator prior to initiating an on-Site undertaking which may have the potential to cause effects on historic properties, assuming such historic properties are present.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

Section 300.415(b)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. § 300.415(b)(2), identifies factors to be considered in determining the appropriateness of a removal action. Subparagraphs (i), (ii), and (vii) of Section 300.415(b)(2) directly apply as follows to the conditions at the Site:

A. Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants. 40 C.F.R. § 300.415(b)(2)(i).

The primary hazardous substance present at the Site is Ra-226. Ra-226 has a half-life of 1600 years. Soil and metal pieces containing Ra-226 have been found on the property. Ra-226 produces ionizing radiation in the form of gamma rays and other particle radiation. Ionizing radiation is a known carcinogen and exposures may increase the incidence of cancer. Radiation levels detected above soils at the Site could lead to exposures greater than those deemed safe for the general population.

Given that trespassers can easily access the Site, potential exposure to nearby human populations is possible. A person who may come in direct contact with the soil may experience an unknown dose of radiation. A time-critical removal action is needed to remove radiation emitting buried items and contaminated soil, which are the source of elevated radiation.

B. High levels of hazardous substances or pollutants or contaminants in soil largely at or near the surface, that may migrate 40 C.F.R. § 300.415(b)(2)(iv).

Radiation contamination is present on-Site from the surface to a minimum of one foot based on data collection. Discrete items emitting radiation are buried on the Site near the soil surface. Soil might migrate spreading contamination to nearby areas. Migration can occur by people entering the Site and physically moving the soil or by the weathering of the metal contaminated pieces spreading the contamination to a larger area of the property or to areas off-property.

C. Weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released 40 C.F.R. § 300.415(b)(2)(v).

The hazardous substances at the Site are continually exposed to weather. No actions are currently in place to control the release of hazardous substances at or from the property. Contaminated surface soil may migrate from the property due to weather conditions such as rain, flooding, and wind among others spreading contamination to other locations. This can move the contaminated soil and metal items to other areas exposing animals and people to unknown doses of radiation.

D. The availability of other appropriate Federal or State response mechanisms to respond to the release. 40 C.F.R. § 300.415(b)(2)(vii).

No other federal or state response mechanisms are currently available to perform the actions necessary to mitigate the threats to public health and the environment presented by the release of radioactive hazardous substances from the property. If no response is taken, radioactive hazardous substances will likely continue to be released from the property over time.

IV. ENDANGERMENT DETERMINATION

Releases or threatened releases of hazardous substances or pollutants or contaminants from this Site, if not addressed by implementing the response actions outlined in this Action Memorandum, may present an imminent and substantial endangerment to the public health, welfare, or the environment.

Elevated radiation readings are present throughout the Site due to radiologically contaminated soil located on the property. There is no fencing or engineering controls that prevent potential trespassers from accessing the property or from being exposed to potential contamination. Additionally, contaminated soil could migrate from the property and pose a threat to off-site receptors.

Radium has been shown to cause adverse health effects such as anemia, cataracts, fractured teeth, cancer, and death. Some of these effects may take years to develop and are mostly due to gamma radiation. Radium gives off gamma radiation, which can travel fairly long distances through the air. The relationship between the amount of radium that you are exposed to and the amount of time necessary to produce these effects is not known. Although there is some uncertainty as to how much exposure to radium increases your chances of developing a harmful health effect, the greater the total amount of your exposure to radium, the more likely you are to develop one of these diseases. (Agency for Toxic Substances and Disease Registry – ATSDR Public Health Statement, Radium, December 1990)

How radiation affects your health depends on the size of the radiation dose. Scientists have been studying the effects of ionizing radiation in humans and laboratory animals for many years. Studies so far have not shown that the low dose of ionizing radiation we are exposed to every day causes us any harm. We do know that exposure to massive amounts of ionizing radiation can cause great harm, so it is wise to not be exposed to any more ionizing radiation than necessary. (ATSDR Public Health Statement Ionizing Radiation, September 1999)

VI. PROPOSED ACTIONS AND ESTIMATED COSTS

The proposed action is intended to mitigate the threat posed to public health and welfare due to actual and/or substantial threat of release of hazardous substances emitting gamma radiation, primarily Ra-226, which has been found in buried objects and the soil on the Site.

Certain factors of uncertainty exist for the Site. It is not known exactly how many discrete items may be buried at the Site, the extent of radiation contamination beneath the surface, and/or whether there may be other underlying contaminants in the soil. Until the soil has been excavated and sampled, a thorough investigation cannot be fully completed.

A. Proposed Action Description

1. Mobilize personnel and equipment to the Site to implement response actions.
2. Install fencing and/or other barriers to prevent trespassers from accessing the Site while the Removal Action is being performed.
3. Take actions to facilitate safe and efficient access to the Site and to prepare the excavation area. These actions may include but are not limited to building an access road, removing the foundation, removing trees and removing debris. These actions will only be taken to the extent necessary to facilitate the Removal Action.
4. Excavate soil and debris that contain Ra-226 at concentrations greater than three times background (25,878 cpm).
5. Implement engineering controls to prevent erosion of soils and to prevent migration of hazardous substances during the performance of the work or any potential stockpiling of contaminated soil.
6. Analyze excavation samples on-Site during excavation activities using a gamma radiation meter. The data from the gamma radiation meter will be used to guide the actual depth to which contaminated soil may be excavated.
7. Restore areas as necessary that are disturbed or damaged as a result of removal activities. Restoration activities shall include backfilling excavated area(s) with clean fill and re-seeding.
8. Transport and dispose of waste generated by the above activities in accordance with Section 121(d)(3) of CERCLA, 40 C.F.R. § 300.440, and 10 C.F.R. § 31.12(c)(4).
9. Conduct all activities in accordance with the Site Health and Safety Plan (29 C.F.R. § 1910.120).
10. Demobilize personnel and equipment.

B. Contribution to Remedial Performance

The proposed Removal Action will focus on removing the threat currently posed by radiation. The Removal Action proposed in this funding request will not interfere with Remedial Actions that could take place in the future. Any Removal Action performed at the Site will be consistent with the requirements of Section 104(a)(2) of CERCLA, which states that a Removal Action should contribute to the efficient performance of any long-term Remedial Action with respect to the release or threatened release concerned. 42 U.S.C. § 104(a)(2).

C. Applicable or Relevant and Appropriate Requirements

In accordance with Section 300.415(j) of the NCP, the Removal Action will comply with all Applicable or Relevant and Appropriate Requirements (ARARs) to the extent practicable, considering the exigencies of the situation. 40 C.F.R. § 300.415(j). A determination of whether compliance with ARARs is practicable will be based on appropriate factors, including the urgency of the situation and the scope of the removal action to be conducted. 40 C.F.R. § 300.415(j)(1) and (2).

EPA contacted the Virginia Department of Health, Radiation Safety Specialists on July 28, 2023, requesting State ARARs for this Removal Action. As of the date of this document, EPA has not yet received a response. Once ARARs are received, the OSC will coordinate with VADEQ regarding state ARARs for the Site.

Based on evaluation of proposed work at the Site, the following may be potential Federal ARARs for the Site:

Hazardous Waste Management Requirements:

Regulations governing the identification and listing of hazardous waste under the Resource Conservation and Recovery Act of 1976 (RCRA), as amended, 42 U.S.C. §§ 6901 et seq. Potential ARARs may include requirements set forth in 40 C.F.R. Part 261, Subpart C (Characteristics of Hazardous Waste).

Standards applicable to generators of hazardous waste under RCRA. Potential ARARs may include requirements set forth in 40 C.F.R. Part 262, Subpart B (Manifest Requirements Applicable to Small and Large Quantity Generators) and Subpart C (Pre-Transport Requirements Applicable to Small and Large Quantity Generators).

Requirements under RCRA applicable to owners and operators of facilities that treat, store, or dispose of hazardous waste set forth in 40 C.F.R. Part 264. Potential ARARs may include requirements set forth in 40 C.F.R. Part 264, Subpart I (Use and Management of Containers).

D. Project Schedule

If approved, the proposed actions listed above will commence in Fall 2023. The proposed scope of work is dependent on securing disposal arrangements at an approved waste disposal facility pursuant to Section 121(d)(3) of CERCLA, 40 C.F.R. § 300.440. and 10 C.F.R. § 31.12(c)(4). EPA actions are expected to be completed within 12 months.

E. Estimated Costs

The proposed distribution of funding is as follows:

Removal Action Costs:	Total
Extramural Costs: Total Cleanup Contractor Costs (This cost category includes estimates for contractors, subcontractors, Notices to Proceed, and IAGs with other Federal Agencies)	\$1,456,000
Total START	\$ 175,000
Extramural Costs Contingency of 20%	\$326,000
TOTAL REMOVAL ACTION PROJECT CEILING	\$1,957,000

VIII. EXPECTED CHANGE IN SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

If a removal action is not taken or is significantly delayed, then people can easily trespass onto the property and be exposed to Site contaminants that cause harm to human health, welfare, or the environment. In addition, radiation may spread to a larger area of the property or to areas off property because of the migration of soil during rain events or the weathering of the metal contaminated objects.

IX. OUTSTANDING POLICY ISSUES

There are no outstanding policy issues pertaining to the Site.

X. ENFORCEMENT

Based on the information currently available, it is recommended that Superfund monies be allocated to complete the Removal Action at the Site.

A Confidential Enforcement Addendum has been prepared and is included as an attachment to this document.

Based upon full-cost accounting practices, the total EPA costs for this Removal Action that will be eligible for cost recovery are estimated below as follows:

Direct Extramural Costs:	\$1,957,000
Direct Intramural Costs:	\$117,420
Total Direct Costs ¹	\$2,074,420
Indirect Costs (72.48% of the above)	\$1,503,540
Estimated EPA Costs for the Removal Action	\$3,577,960

XI. RECOMMENDATION

This decision document represents the proposed Removal Action for the Acorn Road Site, located in the unincorporated community of Nathalie, Virginia, developed in accordance with CERCLA, and is not inconsistent with the NCP.

This decision is based on the Administrative Record for the Site. By signing this Action Memorandum, you are also hereby establishing the documents listed below as the Administrative Record supporting the issuance of this Action Memorandum, pursuant to Section 113(k) of CERCLA and EPA Delegation No. 14-22.

¹ Direct Costs include direct extramural costs and direct intramural costs. Indirect costs are calculated based on an estimated indirect cost rate expressed as a percentage of site-specific direct costs, consistent with the full cost accounting methodology effective October 2, 2000. These estimates do not include pre-judgment interest, do not take into account other enforcement costs, including Department of Justice costs, and may be adjusted during the course of a removal action. The estimates are for illustrative purposes only and their use is not intended to create any rights for responsible parties. Neither the lack of a total cost estimate nor deviation of actual total costs from this estimate will affect the United States' right to cost recovery.

1. Pollution Report (POLREP) #1. Acorn Road Site Visit, Christie Torres Rosa, OSC, March 2023.
2. Pollution Report (POLREP) # 2 Acorn Road sampling event, July 2023.
2. ATSDR Public Health Statement Ionizing Radiation, September 1999.
3. ATSDR Public Health Statement Radium CAS#: 7440-14-4, December 1990

Action by the Approving Official:

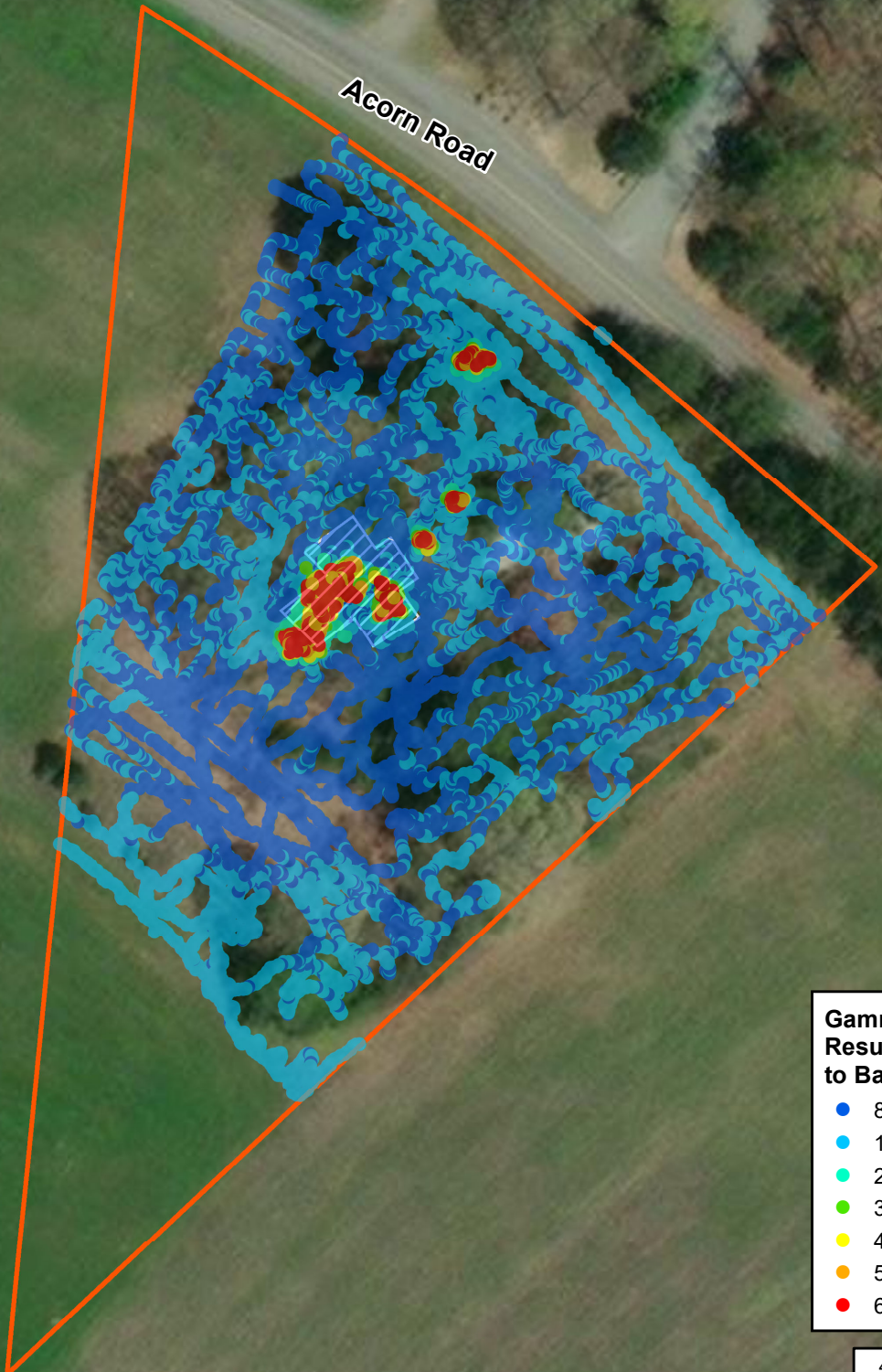
I have reviewed the above-stated facts and, based upon those facts and upon the information in the administrative record supporting selection of the underlying actions, I hereby determine that the release or threatened release of hazardous substances or pollutants or contaminants at or from the Site presents or may present an imminent and substantial endangerment to the public health or welfare or to the environment. I concur with the recommended Removal Action as outlined above.

APPROVED: _____ **DATE:** _____
 Paul Leonard, Director
 Superfund & Emergency Management Division
 EPA Region III

DISAPPROVED: _____ **DATE:** _____
 Paul Leonard, Director
 Superfund & Emergency Management Division
 EPA Region III

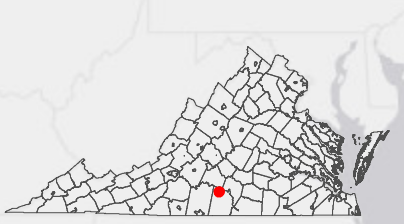
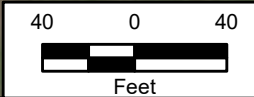




Acorn Road



Gamma Walk Survey Results Compared to Background

- 8,626 cpm (1x)*
- 17,252 cpm (2x)
- 25,878 cpm (3x)
- 34,504 cpm (4x)
- 43,130 cpm (5x)
- 51,756 cpm (6x)
- 60,382 cpm (7x+)



-  Concrete Foundation
-  Site Boundary

*Background level determined from average of readings at multiple off-site locations on 7/10/2023

Acorn Road (Shiloh Church Prop #4) Assessment
Nathalie, Halifax County, Virginia

Attachment 1
Gamma Walk Survey Results





Attachment 2: Metal object (hook) emitting orders of magnitude above background radiation found after digging one foot of soil on-Site.