SIXTH FIVE-YEAR REVIEW REPORT FOR C&R BATTERY CO., INC. SUPERFUND SITE CHESTERFIELD COUNTY, VA

August 2023

Prepared by

U.S. Environmental Protection Agency
Region 3
Philadelphia, Pennsylvania

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Superfund and Emergency Management Division
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08/08/2023

Date

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LIST OF ABBREVIATIONS AND ACRONYMS

AET	Apparent Effects Threshold
ARAR	Applicable or Relevant and Appropriate Requirement
BG	Background
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of Concern
EPA	United States Environmental Protection Agency
FS	Feasibility Study
FYR	Five-Year Review
HQ	Hazard Quotient
IC	Institutional Control
MCL	Maximum Contaminant Level
µg/dL	Micrograms per Deciliter
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
MW	Monitoring Well
NA	Not Applicable
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OSHA	Occupational Safety and Health Administration
OU	Operable Unit
PbB	Blood Lead Level
PCOR	Preliminary Close-Out Report
PEC	Probable Effects Concentration
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
RSL	Regional Screening Level
UAO	Unilateral Administrative Order
UU/UE	Unlimited Use and Unrestricted Exposure
VADEQ	Virginia Department of Environmental Quality

I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings and conclusions of reviews are documented in FYR Reports such as this one. In addition, FYR Reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP) (40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the sixth FYR for the C&R Battery Co., Inc. Superfund site (the Site). The triggering action for this statutory review is the completion date of the previous FYR. The FYR has been prepared because hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of one operable unit (OU), which is addressed in this FYR. OU1 addresses contaminated soils, sediments and surface water. Groundwater was also evaluated under OU1 and was determined not to require remedial action.

EPA remedial project manager (RPM), Austin Oelschlager, led the FYR. Participants included EPA RPM Karla Guerrero, EPA community involvement coordinator (CIC) Lisa Trakis, Angela McGarvey from the Virginia Department of Environmental Quality (VADEQ), Brett Fisher from VADEQ, property owner Carter Hall from CD Hall Construction, Inc., and Fred Mayes from Commonwealth Environmental Associates, Inc. The property owner was notified of the initiation of the FYR. The review began on September 8, 2022.

Site Background

The 11-acre Site is in Chesterfield County, about six miles southeast of Richmond, Virginia (Figure C-1). From 1973 to 1985, the C&R Battery Company (C&R Battery) operated a battery breaker on a portion of the Site to separate and recover lead from discarded automobile and truck batteries. During operations, C&R Battery drained battery acid into on-site ponds and lagoons; battery casings were shredded and stockpiled on site. These actions contaminated site soils, sediments and surface water.

In the late 1970s, the Virginia State Water Control Board detected elevated levels of lead in site soil, surface water and groundwater. In 1983, the Virginia Occupational Safety and Health Administration (OSHA) inspected the C&R Battery facility during operation. Air monitoring found lead concentrations well above the OSHA standard and employees had elevated blood lead levels. Previous investigations had found elevated lead levels and low pH in site soils and surface water near the Site.

In November 2021, CD Hall Construction, Inc. purchased both parcels located at 1306 and 1320 Bellwood Road. 1320 Bellwood Road (parcel 7986770448) is a currently vacant, graded lot with a large gravel area. 1306 Bellwood Road (parcel 7986773046) is currently being leased to a Recreational Vehicle (RV) Company for storage of RV vehicles. Additional site features on this parcel include the former Capitol Oil building, fencing and a gravel surface. The Site is in a primarily commercial and industrial area. The Site is bounded to the north by the James River, to the east and west by industrial businesses, and to the south by Bellwood Road, and commercial and industrial businesses. Figure 1 shows relevant site features.

Lithology under the Site consists of a surficial clay and silt layer ranging from 20 to 60 feet in thickness. Below this is an extensive sand and gravel deposit. Groundwater is about 41 to 46 feet below ground surface. Groundwater flow direction within the sand and gravel aquifer is northwest. The closest surface water body is the James River, located about 650 feet north of the Site. The Site is within the drainage basin of the James River,

which is part of the Great Chesapeake system. A drainage ditch runs through the east-central part of the Site and flows into the James River.

Appendix A lists documents reviewed during this FYR. Appendix B provides a chronology of site events.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: C&R Battery Co., Inc.		
EPA ID: VAD049957913		
Region: 3	**State:** VA	**City/County:** Richmond / Chesterfield
SITE STATUS		
NPL Status: Deleted		
Multiple OUs? No	**Has the Site achieved construction completion?** Yes	
REVIEW STATUS		
Lead agency: EPA		
Author name: Austin Oelschlager		
Author affiliation: EPA Region 3		
Review period: 9/8/2022 - 8/4/2023		
Date of site inspection: 1/18/2023		
Type of review: Statutory		
Review number: 6		
Triggering action date: 9/6/2018		
Due date *(five years after triggering action date)*: 9/6/2023		

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

EPA placed the Site on the National Priorities List (NPL) in July 1987. EPA conducted the Site's remedial investigation/feasibility study (RI/FS) from August 1988 to January 1990. The affected media at the site include soil, sediment in the drainage ditch and onsite surface water (due to the effects of the acid pond). The contaminants of concern for surface soil and sediment at the C&R Battery Site are lead, cadmium, arsenic, antimony, nickel, silver, and zinc. Lead was present in high concentrations compared to other contaminants. Contaminated soils were found throughout the entire site as well as in the former acid pond area.

Groundwater sampling revealed no concentrations of contaminations above primary drinking water standards. Surface water sampling indicated that intermittent surface water in the drainage ditch was contaminated with site-related metals, which exceeded acute and chronic toxicity values. The RI indicated that sediment contamination was localized in the drainage ditch.

As part of the RI/FS, EPA completed human health and ecological risk assessments. The human health risk assessment found three primary pathways of potential concern: inhalation of dust from surface soils, dermal

contact with or ingestion of contaminated soil, and leaching of contaminants from soils into groundwater and subsequent ingestion of contaminated groundwater. The ecological risk assessment found very little vegetation on site and concluded that bioaccumulation was not a viable pathway because lead does not bioaccumulate in the edible portions of plants. Aquatic life was not observed in the drainage ditch, but the drainage ditch is a potential pathway for transport of soluble metals to the James River. Bioassay data from sediment elutriate tests indicated toxic effects on the organisms tested in the James River.

Response Actions

In response to potential public health concerns, EPA conducted a removal action at the Site in the summer of 1986. Actions included removing acidic liquid from on-site lagoons, raising the liquid's pH, and discharging the neutralized liquid into ditches on site; removing lagoon sludge, blending it with hydrated lime and returning sludge to the lagoon; mixing lime into the upper 2 feet of site soils; consolidating shredded battery casings, soil and debris found east of the drainage ditch into debris piles on site; installing riprap channels and dams and grading the drainage ditch; and installing a fence inside the tree line.

EPA issued the Site's Record of Decision (ROD) in March 1990. The remedial action objectives (RAOs) for soil and sediment at the Site are to:

- Prevent exposure to soil with lead concentrations greater than 1,000 milligrams per kilogram (mg/kg) or concentrations of the other contaminants of concern (COCs) above their respective action levels.
- Prevent migration of COCs from soil to groundwater that would cause lead concentrations in groundwater to exceed the 0.05 milligrams per liter (mg/L) maximum contaminant level (MCL)[1] or concentrations of the other COCs in groundwater to exceed their respective MCLs.
- Prevent exposure of ecological receptors to drainage ditch sediments containing lead at concentrations that exceed 450 mg/kg or the other COCs at concentrations that exceed their respective action levels.

The remedy selected in the 1990 ROD included:

- Clean closure of the former acid pond according to Resource Conservation and Recovery Act (RCRA) closure requirements, including excavation of soil containing lead above the 220 mg/kg background concentration.
- Excavation of surface and subsurface soil containing lead above the 1,000 mg/kg action level beyond the perimeter of the former acid pond.
- Excavation of debris piles.
- Excavation of drainage ditch sediments containing lead above the 450 mg/kg action level.
- Stabilization of the excavated soil, sediment and debris using a cement/pozzolan-based or other similar stabilization process that provides equivalent protection.
- Disposal of the stabilized material in an approved industrial or sanitary landfill.
- Backfilling of all excavated areas with clean soil.
- Revegetation of the Site following placement of a layer of topsoil (approximately 6 inches) above all backfilled areas and areas with lead levels exceeding 220 mg/kg (background).
- Removal, treatment and disposal of on-site nickel/cadmium batteries in an approved RCRA facility.
- Environmental monitoring during remedy implementation to ensure protection of the environment, particularly potential receptors in the James River.
- Removal and off-site treatment of any contaminated surface water in the drainage ditch.
- Groundwater monitoring at least until completion of the first FYR required under Section 121(c) of CERCLA, 42 U.S.C. Section 9621 (c).
- Appropriate site use restrictions for future use scenarios to ensure protection of public health and the environment.

[1] The federal MCL for lead in drinking water is currently 0.015 mg/L.

Table 1 presents the remedial action levels for contaminated site media established in the 1990 ROD.

Table 1: Soil and Sediment Remedial Action Levels

Contaminant of Concern (COC)	Surface Soil (mg/kg)	Sediment (mg/kg)
Antimony	77.4[a]	NA
Arsenic	10[a]	57
Cadmium	84[a]	5
Lead	1,000	450
Nickel	600[a]	NA
Notes: [a] Based on a 1 x 10^{-6} cancer risk level. NA = not applicable (levels already within acceptable risk range)		

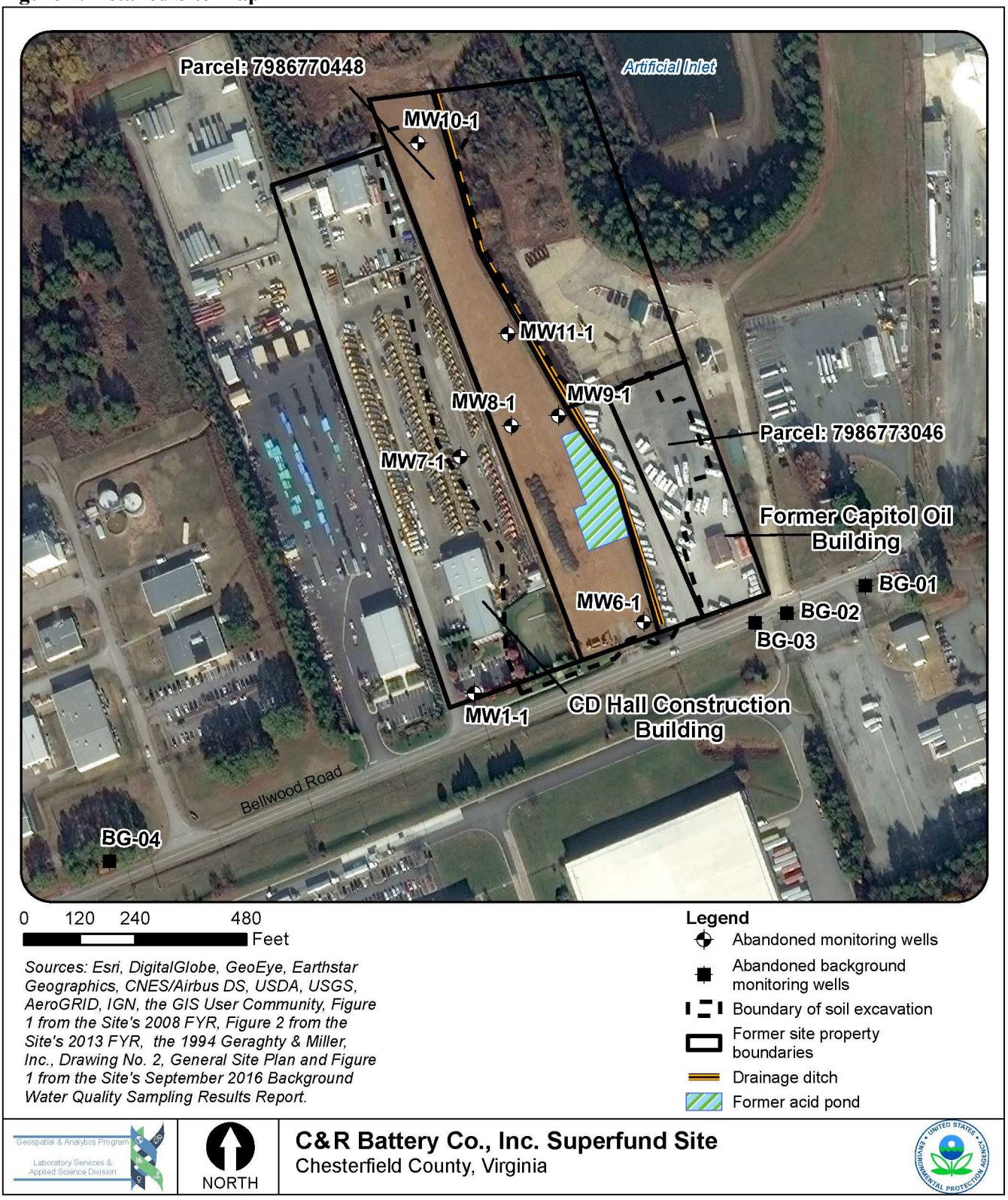
Status of Implementation

A pre-design investigation indicated that lead was present in soil at concentrations exceeding the 1,000 mg/kg action level primarily within two to four feet of fill material overlying the natural alluvium at the Site, and that the alluvium (surficial clay and silt layer) presented a barrier to the downward migration of lead into the natural soil and groundwater. EPA issued a Unilateral Administrative Order (UAO) to PRPs in March 1992 to implement the selected remedial action. UAO Respondent Chesapeake and Potomac Telephone of Virginia, Inc. (C&P Telephone)[2] submitted a final remedial action work plan for EPA approval in December 1992 and conducted on-site remedial action activities from November 1992 through September 1993. C&P Telephone implemented the remedy generally in accordance with the remedial design and the remedial action work plan. The remedial action consisted of site preparation; excavation, solidification/stabilization, and off-site disposal of lead-contaminated soil; debris decontamination and disposal; and site restoration. However, with EPA approval, soil with lead concentrations exceeding the action level was left in place beneath and immediately adjacent to structures, including an office building and tank farm, on the portion of the Site occupied by Capitol Oil Company. At all other areas of the Site, lead-contaminated soil was excavated to a maximum depth of 5 feet. The Site achieved construction completion when EPA signed the Site's Preliminary Close-Out Report (PCOR) in September 1993.

The PRP performed groundwater monitoring at the Site from 1993 to 2016. Site monitoring wells were decommissioned in 2017 with EPA approval. Site use restrictions (institutional controls) are in place at the site. Pursuant to the Virginia Uniform Environmental Covenants Act (UECA), two environmental covenants for 1306 and 1320 Bellwood Road, respectively, were signed and recorded with the Chesterfield County Recorder of Deeds on February 26, 2021. In accordance with the UECA environmental covenant, a gravel surface has been installed on portions of the site where vehicular traffic occurs and where the RV vehicles are parked. The Institutional Control Review section of this FYR Report provides additional details. Following a final inspection and detailed review of Site data, EPA determined that the response at the C&R Battery Site is complete as documented in the November 23, 2021, Final Close Out Report (FCOR). EPA Published a Federal Register Notice on March 31, 2022, proposing to delete the C&R Battery Site from the NPL and opened a 30-day comment period, during which no adverse comments were received. The Site was deleted from the NPL on August 17, 2022.

[2] C&P was succeeded by Verizon, the current PRP.

Figure 1: Detailed Site Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

Institutional Control (IC) Review

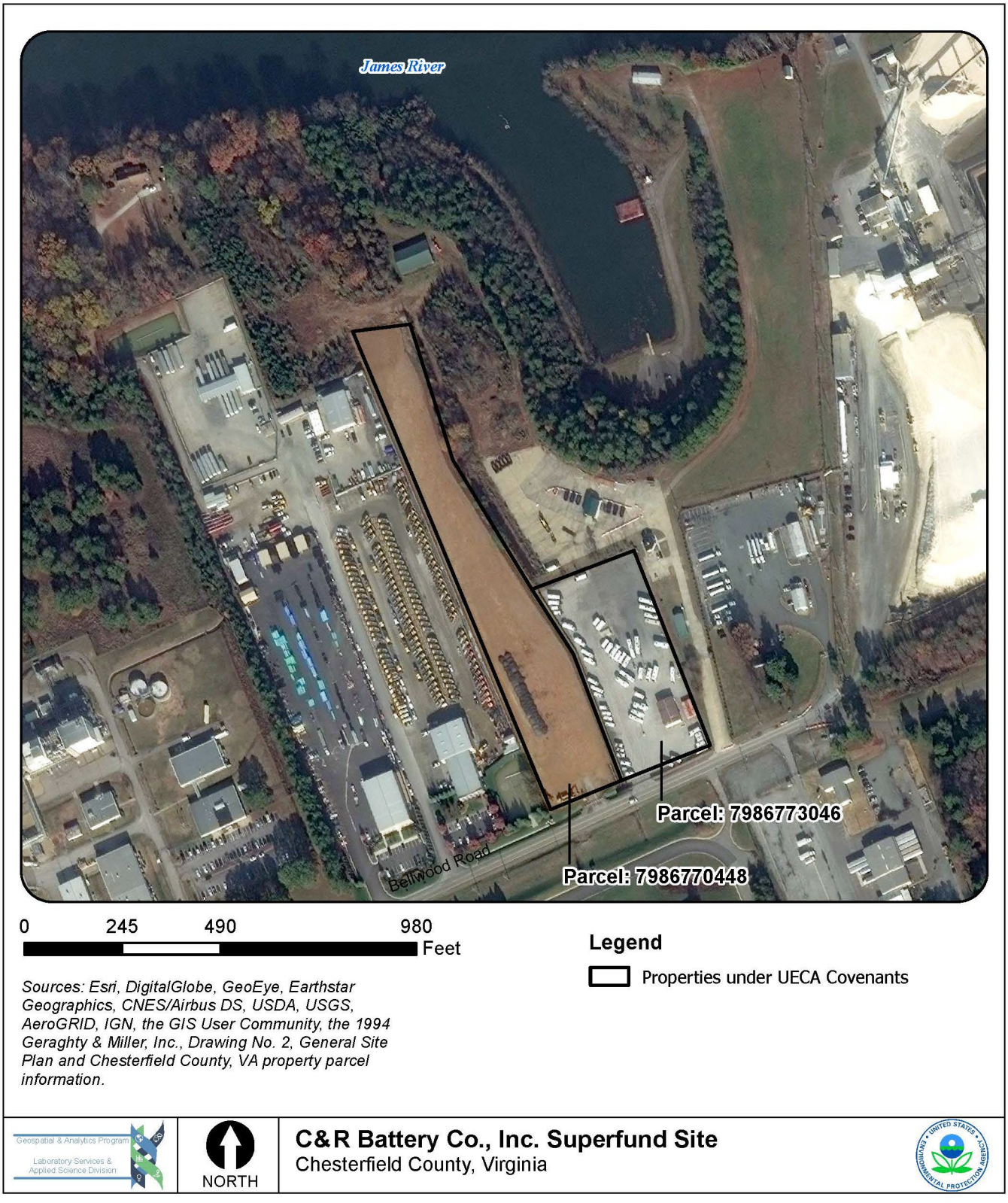
The 1990 ROD called for site use restrictions to ensure protection of public health and the environment. The 2018 FYR recommended implementation of institutional controls that limit land use to industrial/commercial uses. It also recommended to require site owners to obtain EPA approval before excavating or disturbing soils in affected areas of the Site and properly characterize any excavated soil. To implement these recommendations, two UECA environmental covenants for 1306 and 1320 Bellwood Road, respectively, were signed and recorded with the Chesterfield County Recorder of Deeds on February 26, 2021 (see Figure 2). The environmental covenants subjected each parcel to the following activity and use limitations:

- The property shall only be used for commercial and/or industrial uses.
- The property shall not be developed or used for elementary and secondary schools, childcare facilities, or playgrounds.
- There shall be no soil excavation at the property except in accordance with the Soil Management Plan that was approved by EPA on September 1, 2020.
- A suitable wear surface (e.g. gravel, asphalt, or concrete) shall be installed on those portions of the 1320 Bellwood Road property used for vehicular traffic or vehicle parking/storage in order to prevent disturbance of subsurface soil and erosion.
- By July 31, 2025 and every five years thereafter, the property owner(s) shall submit written documentation stating whether or not the activity and use limitations in the environmental covenants are being observed.
- Property access is granted to VADEQ and EPA for implementation, inspection, or enforcement.

Table 2: Summary of Implemented ICs

Media, Engineered Controls, and Areas That Do Not Support UU/UE Based on Current Conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objectives	Title of IC Instrument Planned and Date
Soils	Yes	Yes	7986770448 and 7986773046	Restrict future site uses to commercial/ industrial uses and restrict excavation.	UECA Environmental Covenants (February 26, 2021)

Figure 2: Institutional Controls Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

Systems Operations/Operation and Maintenance (O&M)

O&M activities at the site include verification of ICs per the two parcel UECA environmental covenants (Dated 2-26-21) and implementation of activities in compliance with the Soil Management Plan (Dated 9-1-20). The IC review is discussed above. Two site activities have occurred since the 2020 Soil Management Plan was implemented: (1) Vegetation Removal Phase and (2) Stormwater Management Systems Phase. Both activities resulted in preparation of activities-specific soil management plans that were reviewed and approved by EPA and in consultation with VADEQ.

As stated in the Site Inspection section, the site's vegetation was removed in accordance with the Soil Management Plan Vegetation Removal Phase between April and June 2022. The 1320 Bellwood Road parcel's stormwater management system is planned to be installed in the summer of 2023 in accordance with the March 19, 2023 Soil Management Plan Stormwater Management System. As part of on-going oversight, EPA will ensure proper and consistent implementation of the site-wide soil management plan. EPA will work with the property owner to ensure that the work will be done in a way that is protective of site users and does not impact the site remedy. In addition, the environmental covenant grants EPA and VADEQ a right of reasonable access to the Property in connection with implementation, inspection or enforcement of the environmental covenant.

In July 2017, the PRP plugged and abandoned 10 groundwater monitoring wells. These included six on-site groundwater monitoring wells (MW 6-1, MW 7-1, MW 8-1, MW 9-1, MW 10-1 and MW 11-1) and four background monitoring wells near the Site (BG-01, BG-02, BG-03, BG-04). Figure 1 shows the locations of these wells. MW 1-1 was previously plugged and abandoned.

III. PROGRESS SINCE THE PREVIOUS REVIEW

This section includes the protectiveness determinations and statements from the previous FYR Report as well as the recommendations from the previous FYR Report and the status of those recommendations.

Table 3: Protectiveness Determinations/Statements from the 2018 FYR Report

OU #	Protectiveness Determination	Protectiveness Statement
Sitewide	Short-term Protective	The remedy currently protects human health and the environment because the cleanup excavated and disposed of contaminated surface soils and sediments above action levels and there are no complete exposure pathways to remaining subsurface contaminated soils. For the remedy to be protective in the long term, implement institutional controls that limit land use to commercial/industrial uses and require site owners take appropriate precautions for excavation and handling of excavated soils in affected Site areas.

Table 4: Status of Recommendations from the 2018 FYR Report

OU #	Issue	Recommendation	Current Status	Current Implementation Status Description	Completion Date (if applicable)
1	There are no institutional controls in place to restrict land use, including future excavation at the Site.	Implement institutional controls that limit land use to industrial/commercial uses. Require site owners to obtain EPA approval before excavating or disturbing soils in affected areas of the Site and properly characterize any excavated soil.	Completed	A soil management plan was approved by EPA on September 1, 2020. Two UECA environmental covenants to restrict activity and use limitations for 1306 and 1320 Bellwood Road, respectively, were signed and recorded with the Chesterfield County Recorder of Deeds on February 26, 2021	2/26/2021

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Community Involvement and Site Interviews

A public notice was posted in the Chesterfield Times Dispatch newspaper on December 14, 2022 (Appendix D). It stated that the FYR was underway and invited the public to submit any comments to EPA. No comments were received. The results of the review and the report will be made available at the Site's information repository, Chesterfield County Public Library – Central Library, located at 9501 Lori Road in Chesterfield, Virginia – and online at: https://library.chesterfield.gov/ and www.epa.gov/superfund/crbattery.

During the FYR process, interviews were conducted to document any perceived problems or successes with the remedy that has been implemented to date**.** Those interviewed included state project manager, Angela McGarvey of VADEQ, one of the current site property owners, the site owner's environmental consultant, librarian for the Chesterfield County Public Library, and one nearby resident. The interviews are summarized below. Appendix E contains completed interview forms.

Ms. McGarvey commented that she believes that the remedy was successfully implemented and is protective in the short-term and long-term. The site's UECA covenants and Soil Management Plan will ensure that future development and use of the property are protective. She is happy to see the site being actively reused. The site owner and his consultant are aware of the soil management plan and reported there have not been any issues with vandalism or trespassing at the site. See Appendix E for additional responses.

Data Review

Groundwater

The 2013 FYR Report recommended the development of an appropriate background data set to assess whether the low pH of site groundwater was a result of natural conditions or related to past site activities. For previous evaluations, Verizon used pH data for groundwater samples collected from Defense Supply Center Richmond (DSCR) monitoring wells as a background data set and found that pH levels were similar in groundwater samples collected from DSCR wells and site monitoring wells. However, EPA had concerns about whether the groundwater samples collected from the DSCR wells were representative of background conditions. In August 2015, in accordance with an EPA approved work plan, Verizon constructed four new monitoring wells upgradient of the Site along Bellwood Road to obtain background groundwater quality data. Verizon monitored groundwater pH at the new background wells and the six on-site groundwater monitoring wells in September 2015 and February 2016.

In April 2016, EPA performed a statistical evaluation of the groundwater pH data for three groups of monitoring wells: DSCR wells, newly installed site background wells and site monitoring wells. Based on box plots comparing pH levels among the groups and a one-way analysis of variance, EPA concluded that there was no significant difference between background pH conditions and pH conditions in groundwater at the Site. Verizon conducted additional pH monitoring through September 2016 which corroborated EPA's conclusion. Based on these findings, EPA approved discontinuation of the groundwater monitoring program in April 2017. Figure 1 shows the location of Site monitoring wells and background monitoring wells.

Site Inspection

The site inspection took place on January 18, 2023. In attendance were EPA RPMs Austin Oelschlager and Karla Guerrero, EPA CIC Lisa Trakis, Angela McGarvey and Brett Fisher from VADEQ, property owner, Carter Hall from CD Hall Construction, Inc., and Fred Mayes from Commonwealth Environmental Associates, Inc. The purpose of the inspection was to assess the protectiveness of the remedy. The site inspection checklist and photographs are included in Appendix F and Appendix G, respectively.

Participants met at the entrance of 1320 Bellwood Road (parcel 7986770448). The entrance was blocked off by orange construction cones. Participants walked around the vacant lot which was graded and covered partially in

gravel and dirt. Under EPA's approval, the property owner completed vegetation removal on the parcel, in accordance with the soil management plan, between April and June 2022. During the site visit, the property owner informed EPA of additional redevelopment plans to include the installation of a stormwater retention system on the now cleared lot. These redevelopment activities will be performed under an EPA-approved Activity Specific Soil Management Plan and in accordance with the soil management plan.

Next, participants toured 1360 Bellwood Road (parcel 7986773046). The property was in good condition and includes a gravel surface and fencing around the perimeter. The property is currently being leased by an RV company and is used for storage of RV vehicles. A small building (former Capitol Oil building) was observed on the property and is utilized by the tenant. The parcel includes a fence around the perimeter which appeared to be in good condition. The property owner noted that both parcels are secure, and trespassing has not been an issue.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Question A Summary:

Yes, the site inspection and review of documents, applicable or relevant and appropriate requirements (ARARs) and risk assumptions indicate that the Site's remedy is functioning as intended by site decision documents. Excavation, stabilization, and off-site disposal of impacted soil, sediment, and debris has eliminated exposure of human and ecological receptors to contaminated soil and sediment and prevented migration of contaminants from soil into groundwater, satisfying the RAOs specified in the ROD. The Site achieved construction completion status in September 1993. The 2018 FYR recommended implementation of institutional controls that limit land use to industrial/commercial uses. It also recommended to require site owners to obtain EPA approval before excavating or disturbing soils in affected areas of the Site and properly characterize any excavated soil. These issues and recommendations were addressed by the Soil Management Plan and implementation of the February 2021 UECA Environmental Covenants.

During this FYR, EPA verified that both the Soil Management Plan and the UECA Environmental Covenants are being followed by the current property owners to ensure that future development of land use of the property is protective. The property owners notified EPA of planned construction activities on the site to include the installation of a stormwater retention system. EPA has requested that the property owner develop an activity-specific soil management plan for EPA's approval to ensure that the construction work does not disturb the existing contaminated soil on the site.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of the remedy selection still valid?

Question B Summary:

The RAOs, cleanup levels and exposure assumptions remain valid, and, while some of the toxicity data and EPA current guidance concerning lead contamination have changed, the changes do not affect the protectiveness of the remedy. The RAOs identified in the 1990 ROD are still valid and there are no new site conditions that could impact their validity. The remedial action level of 1,000 mg/kg for lead-contaminated surface soils was in accordance with EPA's guidance at the time of remedy selection. EPA's current guidance for soil lead levels at industrial/commercial sites is 800 mg/kg, which is more stringent than the Site's 1,000 mg/kg action level. However, EPA's most recent Adult Lead Methodology (June 2017, Table H-1 Appendix H) concluded that the projected soil concentration that results in no more than a 5 percent probability that fetal blood-lead exceeds 5 micrograms per deciliter (µg/dL) is 1,050 mg/kg. Based on this, EPA has concluded that the 1,000 mg/kg action level is acceptable for the Site for commercial/industrial uses.

Remedial actions also included placement of topsoil (approximately 6 inches) followed by revegetation over areas with lead levels between 220 mg/kg (background) and 1,000 mg/kg. Action levels for the other contaminants in surface soils were developed using a 1 x 10^{-6} risk scenario. As part of the 2018 FYR, EPA completed a composite worker (industrial/commercial) regional screening level (RSL) evaluation for these other action levels. The evaluation demonstrated that all surface soil action levels remain valid for commercial/industrial use (Table H-2 Appendix H). Appendix H provides a detailed toxicity review. In addition, the ROD action levels for sediment established for the drainage ditch were reviewed and compared against EPA's probable effect concentrations (PECs) for freshwater sediment and contamination concentrations left in place following remediation. The review indicated that the ROD action levels for sediment remain valid (Appendix H).

QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No other information has come to light that could call into question the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the FYR:
OU1 and Sitewide.

Issues and Recommendations Identified in the FYR:
None.

VII. PROTECTIVENESS STATEMENT

Sitewide Protectiveness Statement
Protectiveness Determination: Protective
Protectiveness Statement: The remedy currently protects human health and the environment because the cleanup excavated and disposed of contaminated surface soils and sediments above action levels and there are no current complete exposure pathways to remaining subsurface contaminated soils. In addition, the remedy is protective in the long term because institutional controls have been implemented to limit land use to commercial/industrial uses and require site owners take appropriate precautions for excavation and handling of excavated soils in affected Site areas.

VIII. NEXT REVIEW

The next FYR Report for the C&R Battery Co., Inc. Superfund site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

Background Water Quality Sampling Results, C & R Battery Co., Inc. Superfund Site, Richmond, VA. Prepared by Arcadis for EPA Region 3. November 15, 2016.

Deletion from the National Priorities List. 87 Federal Register 50584. EPA. August 17, 2022.

Evaluation of the pH Background and Monitoring Well Data, C & R Battery Co., Inc. Superfund Site, Richmond, VA. Prepared by Lockheed Martin for EPA Region 3. April 13, 2016.

Final Feasibility Study Report, C & R Battery Co., Inc. Superfund Site, Richmond, VA. Prepared by NUS Corporation for EPA Region 3. January 1990.

Final Remedial Investigation Report, C & R Battery Co., Inc. Superfund Site, Richmond, VA. Prepared by NUS Corporation for EPA Region 3. January 1990.

Final Closeout Report, C & R Battery Co., Inc. Superfund Site, Richmond, VA. EPA Region 3. November 2021.

Fourth Five-Year Review Report, C & R Battery Co., Inc. Superfund Site, Richmond, VA. EPA Region 3. September 30, 2013.

Fifth Five-year Review Report, C & R Battery Co., Inc. Superfund Site, Richmond, VA. EPA Region 3. September 6, 2018

Memorandum for the Document Review and Assessment of Current Site Conditions, C & R Battery Co., Inc. Superfund Site, Richmond, VA. Prepared by Battelle for EPA Region 3. April 24, 2018.

Preliminary Close-Out Report, C & R Battery Co., Inc. Superfund Site, Richmond, VA. EPA Region 3. September 1993.

Record of Decision, C & R Battery Co., Inc. Superfund Site, Richmond, VA. EPA Region 3. March 30, 1990.

Remedial Action Report, C & R Battery Co., Inc. Superfund Site, Richmond, VA. Prepared by Geraghty & Miller for EPA Region 3. May 1994.

Remedial Action Work Plan, C & R Battery Co., Inc. Superfund Site, Richmond, VA. Prepared by Geraghty & Miller, Inc. for C&P Telephone Company of Virginia, Inc. December 1992.

Soil Management Plan for 1306 and 1320 Bellwood Road, North Chesterfield, Virginia. Approved by EPA Region 3. September 1, 2020.

Soil Management Plan Stormwater Management System Phase. 1320 Bellwood Road, North Chesterfield, Virginia, Commonwealth Environmental Associates. Prepared for 1306-1320 Bellwood Road, LLC, North Chesterfield Virginia. March 19, 2023.

Soil Management Plan Vegetation Removal Phase 1320 Bellwood Road, North Chesterfield, Virginia. Commonwealth Environmental Associates. Prepared for 1306-1320 Bellwood Road, LLC, North Chesterfield Virginia. March 30, 2022.

Third Five-Year Review Report, C & R Battery Co., Inc. Superfund Site, Richmond, VA. EPA Region 3. September 22, 2008.

Treatability Study and Site Characterization Report, C & R Battery Co., Inc. Superfund Site, Richmond, VA. Prepared by Woodward-Clyde for the U.S. Department of the Army Corp of Engineers, Omaha District. September 1991.

UECA Environmental Covenant for Tax Map or GPIN No.: 7986773046. Prepared by Williams Mullens. February 23, 2021

UECA Environmental Covenant for Tax Map or GPIN No.: 7986770448. Prepared by Williams Mullens. February 23, 2021

Well Decommissioning Memo, C & R Battery Co., Inc. Superfund Site, Richmond, VA. Prepared by Arcadis for EPA Region 3. July 21, 2017.

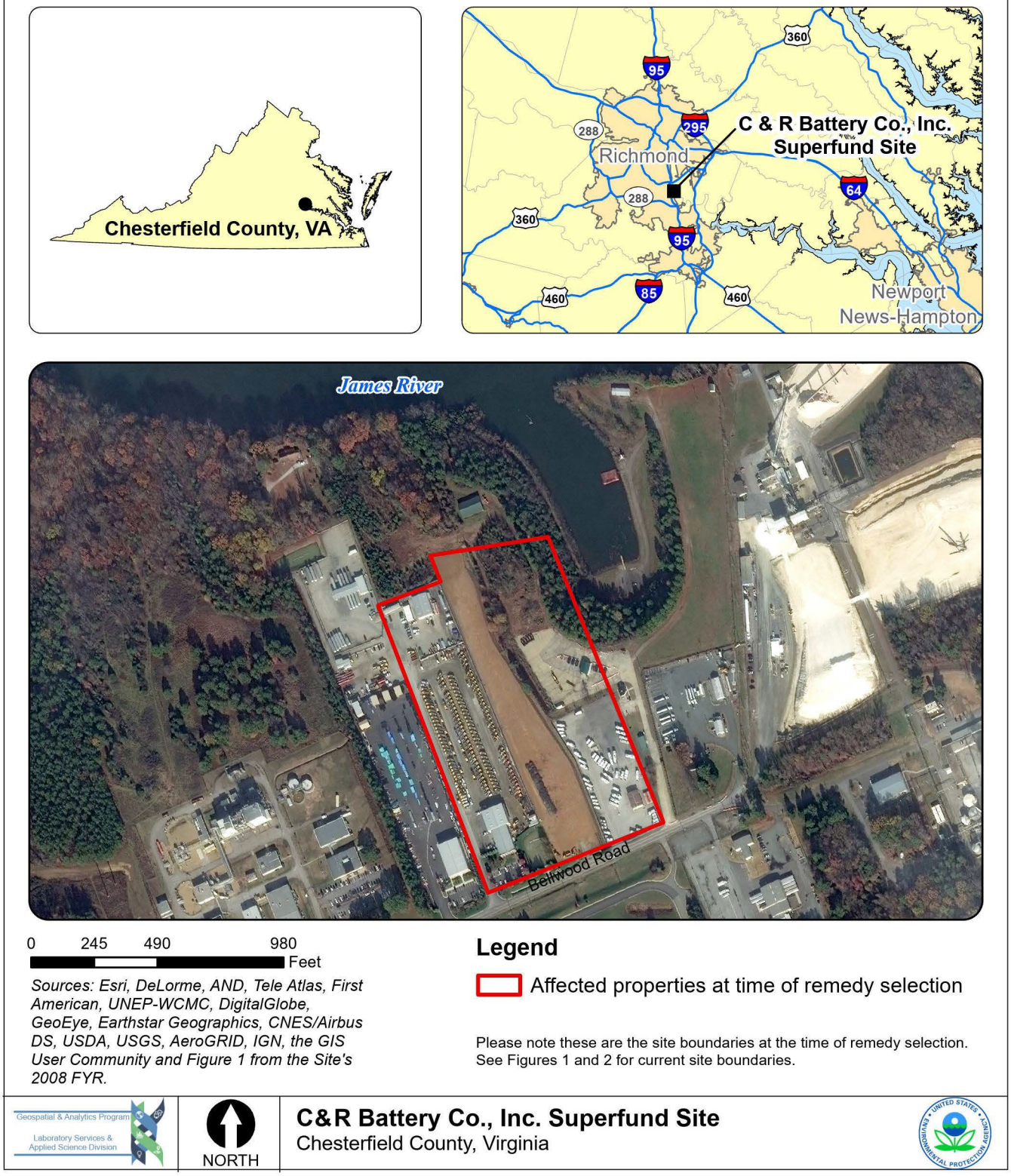
APPENDIX B – SITE CHRONOLOGY

Table B-1: Site Chronology

Event	Date
C&R Battery operated a battery breaking and recycling operation on site	1973 – 1985
The Virginia State Water Control Board began monitoring the Site and detected elevated lead in site soil, surface water and groundwater	Late 1970s
Virginia OSHA inspected the Site and found elevated levels of lead in air and in employees' blood	1983
EPA conducted a removal action	Summer 1986
EPA placed the Site on the NPL	July 22, 1987
EPA began the Site's RI/FS	August 1988
EPA completed the Site's RI/FS	January 1990
EPA issued the ROD for the Site	March 30, 1990
EPA began the Site's remedial design	September 27, 1990
EPA completed the Site's remedial design and issued a UAO to the PRPs to implement the selected remedial action	March 27, 1992
C&P Telephone PRPs began the Site's selected remedial action	November 1992
C&P Telephone completed the Site's remedial action	September 23, 1993
EPA issued the Site's PCOR	September 28, 1993
EPA signed the Site's first FYR Report	July 29, 1998
EPA signed the Site's second FYR Report	September 30, 2003
EPA signed the Site's third FYR Report	September 30, 2008
EPA signed the Site's fourth FYR Report	September 30, 2013
Verizon constructed four off-site background monitoring wells	August 2015
Verizon conducted pH sampling of background and on-site monitoring wells	2015 and 2016
EPA performed statistical evaluation of pH sampling data and found no statistical difference in pH levels between background and on-site wells; EPA concurred that the groundwater monitoring program could be discontinued	April 2016
Verizon plugged and abandoned 10 groundwater monitoring wells (four background wells and six on-site monitoring wells)	July 2017
EPA signed the Site's Fifth FYR Report	September 6, 2018
Soil Management Plan was approved by EPA	September 1, 2020
Two environmental covenants for 1306 and 1320 Bellwood Road, respectively, were signed and recorded with the Chesterfield County Recorder of Deeds	February 26, 2021
1306 and 1320 Bellwood Road properties sold	November 2, 2021
EPA signed the site's FCOR	November 23, 2021
EPA proposed the site for NPL deletion	March 31, 2022
EPA deleted site from the NPL	August 17, 2022

APPENDIX C – SITE MAPS

Figure C-1: Site Vicinity Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

APPENDIX D – PRESS NOTICE

EPA PUBLIC NOTICE

EPA REVIEWS CLEANUP

C&R BATTERY CO., INC. SUPERFUND SITE

The U.S. Environmental Protection Agency (EPA) is reviewing the cleanup that was conducted at the C&R Battery Co., Inc. Superfund Site located in Chesterfield County, Virginia. EPA conducts Five-Year Reviews to ensure that cleanups continue to protect public health and the environment. EPA conducted the previous Five-Year Review in 2018 and concluded that the remedy was working as designed and was protective in the short-term. On August 17,2022, EPA deleted the site from the National Priorities List. The NPL is a list of the nation's most contaminated hazardous waste sites. EPA will make the findings from this Five-Year Review available in September 2023.

To access site information, including the Five-Year Review, visit:
www.epa.gov/superfund/crbattery

If you have questions, would like to participate in an interview or provide site-related information for the review, contact:
Lisa Trakis, EPA Community Involvement Coordinator
215-814-5433 or trakis.lisa@epa.gov

APPENDIX E – INTERVIEW FORMS

C&R Battery Co., Inc. Superfund Site Five-Year Review Interview Form

Site Name: C&R Battery Co., Inc. **EPA ID No.:** VAD049957913

Interviewer Name: Lisa Trakis **Affiliation:** EPA
Subject Name: Angela McGarvey **Affiliation:** VADEQ
Subject Contact Information: Angela.mcgarvey@deq.virginia.gov, (804) 698-4084
Time: NA **Date:** 1/23/2023
Interview Location: NA

Interview Format (circle one): In Person Phone Mail Other: Email

Interview Category: State Agency

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

   The Superfund remedy is complete and is protective in the short-term and long-term. The site's Uniform Environmental Covenant Act (UECAs) and Soil Management Plan will run with the ownership of the land and will ensure that future development and use of the property are protective. It is wonderful to see a former NPL property be put back into active use.

2. Have there been routine communications or activities (site visits, inspections, reporting activities, etc.) conducted by your office regarding the site? If so, please give purpose and results.

   DEQ's role on this project is a supporting state regulatory agency and EPA is the lead regulatory agency. Thus, all VDEQ activities conducted at this site occur with EPA involvement. DEQ conducted a site visit on August 18, 2022 to observe vegetation removal, soil additions, and site grading conducted in accordance with the Soil Management Plan. Communications are on an as-needed basis, since the remedy is complete.

3. Have there been any complaints, violations, or other incidents related to the site requiring a response by your office? If so, please give details of the events and results of the responses.

   No.

4. Do you feel well informed about the site's activities and progress?

   Yes.

5. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

   No.

C&R Battery Co., Inc. Superfund Site Five-Year Review Interview Form

Site Name: C&R Battery Co., Inc. **EPA ID No.:** VAD049957913

Interviewer Name: Austin Oelschlager **Affiliation:** EPA
Subject Name: Carter Hall **Affiliation:** CD Hall Construction
Subject Contact Information:
Time: NA **Date:** 12/13/2022
Interview Location: NA

Interview Format (circle one): In Person Phone Mail Other: Email

Interview Category: Property Owner

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date? YES.

2. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future? YES.

3. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism, or trespassing? NO.

4. Are you aware of any changes to state laws or local regulations that might affect the protectivenessof the Site's remedy? NO.

5. Are you aware of any changes in projected land use(s) at the Site? NO.

6. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future? TO THE BEST OF MY KNOWLEDGE.

7. Do you have any comments, suggestions, or recommendations regarding the project? NO.

C&R Battery Co., Inc. Superfund Site Five-Year Review Interview Form

Site Name: C&R Battery Co., Inc. **EPA ID No.:** VAD049957913

Interviewer Name: Austin Oelschlager **Affiliation:** EPA
Subject Name: Fred Mayes **Affiliation:** Commonwealth Environmental Associates, Inc.

Subject Contact Information:
Time: NA **Date:** 12/13/2022
Interview Location: NA

Interview Format (circle one): In Person Phone Mail Other: Email

Interview Category: Property Owner

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date? Yes

2. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how mightEPA convey site-related information in the future? Yes

3. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism, or trespassing? No

4. Are you aware of any changes to state laws or local regulations that might affect the protectiveness of the Site's remedy? No

5. Are you aware of any changes in projected land use(s) at the Site? No

6. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future? Best of my knowledge

7. Do you have any comments, suggestions, or recommendations regarding the project? No

C&R Battery Co., Inc. Superfund Site Five-Year Review Interview Form

Site Name: C&R Battery Co., Inc. **EPA ID No.:** VAD049957913

Interviewer Name: Lisa Trakis **Affiliation:** EPA
Subject Name: Resident 1 **Affiliation:** NA
Subject Contact Information:
Time: NA **Date:** 1/18/2022
Interview Location: NA

Interview Format (circle one): (In Person) Phone Mail Other: Email

1. Are you aware of the C&R Battery Superfund site?

   Yes, aware.

2. How long have you lived or worked here?

   12 years

3. (If a newcomer - resident, business, local official) Did you know about the superfund site before you moved in or started working here?

   Not aware that it was a Superfund site prior to working in the area, lives in in the area.

4. Are you aware that a cleanup was completed in the 1990s?

   Vaguely aware, not detailed.

5. Are you aware that there are ongoing operation and maintenance activities and the duration of those activities?

   Somewhat, aware of gravel surface coverage.

6. Are you aware of the requirement to have restrictions (ICs) limiting activities and/or land use at the site to protect the community/site users from waste left in place?

   Yes, aware of soil management plan and use restrictions. Not aware of deed restrictions.

7. Do you have any concerns about the cleanup or about potential risks from the site?

   No, not at all.

8. What communication, if any, have you received from local, state or other federal agency officials about the cleanup, O&M and/or restrictions (ICs) at the site?

   No, have not seen anything,

9. Would periodic updates about the O&M and/or restrictions (ICs) be helpful to you and/or your community?

   No

10. What would be the most effective way to inform your community about the cleanup, O&M and/or restrictions (ICs) at the site?

    Post card in the mail is best, doesn't read paper and would think email is spam.

C&R Battery Co., Inc. Superfund Site Five-Year Review Interview Form

Site Name: C&R Battery Co., Inc. **EPA ID No.:** VAD049957913

Interviewer Name: Lisa Trakis **Affiliation:** EPA
Subject Name: Resident 2 **Affiliation:** Chesterfield County Public Library

Subject Contact Information:
Time: NA **Date:** 1/18/2022
Interview Location: NA

Interview Format (circle one): (In Person) Phone Mail Other: Email

1. Are you aware of the C&R Battery Superfund site?

   Vaguely aware. Not aware of specifics related to contamination and cleanup.

2. How long have you lived or worked here?

   Since 2014

3. (If a newcomer - resident, business, local official) Did you know about the superfund site before you moved in or started working here?

   No.

4. Are you aware that a cleanup was completed in the 1990s?

   Yes, read about delisting.

5. Are you aware that there are ongoing operation and maintenance activities and the duration of those activities?

   No.

6. Are you aware of the requirement to have restrictions (ICs) limiting activities and/or land use at the site to protect the community/site users from waste left in place?

   No.

7. Do you have any concerns about the cleanup or about potential risks from the site?

   No.

8. What communication, if any, have you received from local, state or other federal agency officials about the cleanup, O&M and/or restrictions (ICs) at the site?

   No.

9. Would periodic updates about the O&M and/or restrictions (ICs) be helpful to you and/or your community?

   Yes, to be aware.

10. What would be the most effective way to inform your community about the cleanup, O&M and/or restrictions (ICs) at the site?

Social media would be more effective to reach a large group quickly. Community Facebook group – Chester issues.

APPENDIX F – SITE INSPECTION CHECKLIST

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site Name: C&R Battery	**Date of Inspection:** January 18, 2023
Location and Region: Richmond, VA, Region 3	**EPA ID: VAD049957913**
Agency, Office or Company Leading the Five-Year Review: EPA	**Weather/Temperature:** 55 degrees, sunny

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☒ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☒ Surface water collection and treatment
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls
- ☒ Other: Excavation of soils and sediments above cleanup levels, stabilization and off-site disposal, removal and off-site treatment and disposal of contaminated surface water, closure of the former acid pond area, and backfilling of all excavated areas with 6 inches of top soil.

Attachments: ☒ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (check all that apply)

1. **O&M Site Manager** — Carter Hall (Name) — President (Title) — 1/18/23
   Interviewed ☐ at site ☒ at office ☐ by phone Phone: ____
   Problems, suggestions ☐ Report attached: Y

2. **O&M Staff** — Fred Mayes (Name) — Environmental Consultant (Commonwealth Environmental Associates, Inc.) (Title) — 1/18/23 (Date)
   Interviewed ☐ at site ☒ at office ☐ by phone Phone: ____
   Problems/suggestions ☐ Report attached: Y

3. **Local Regulatory Authorities and Response Agencies** (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply.

   Agency VADEQ
   Contact Angela McGarvey — Project Manager (Title) — 1/23/23 (Date) — (804) 774-9026 (Phone No.)
   Problems/suggestions ☐ Report attached: Y____

   Agency ____
   Contact ____ Name — ____ (Title) — ____ (Date) — ____ (Phone No.)
   Problems/suggestions ☐ Report attached: ____

   Agency ____
   Contact ____ (Name) — ____ (Title) — ____ (Date) — ____ (Phone No.)
   Problems/suggestions ☐ Report attached: ____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone No.
Problems/suggestions ☐ Report attached: _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone No.
Problems/suggestions ☐ Report attached: _____

4. **Other Interviews** (optional) ☐ Report attached: _____

Nearby Resident

Librarian, Chesterfield County Public Library

III. ON-SITE DOCUMENTS AND RECORDS VERIFIED (check all that apply)

1. **O&M Documents**

☒ O&M manual	☒ Readily available	☐ Up to date	☐ N/A
☐ As-built drawings	☐ Readily available	☐ Up to date	☒ N/A
☐ Maintenance logs	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

2. **Site-Specific Health and Safety Plan** ☐ Readily available ☐ Up to date ☐ N/A
☐ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☒ N/A

Remarks: Tree Removal occurred in 2022 - develop as needed depending on construction activities

3. **O&M and OSHA Training Records** ☒ Readily available ☒ Up to date ☐ N/A

Remarks: Have available for the workers that are doing work

4. **Permits and Service Agreements**

☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
☐ Other permits: _____	☐ Readily available	☐ Up to date	☒ N/A

Remarks: Stormwater retention system will be built and approved based on as-built document.

5. **Gas Generation Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

6. **Settlement Monument Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

7. **Groundwater Monitoring Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: EPA/state should have copies. Monitoring was done prior to current owner purchasing the property.

8. **Leachate Extraction Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

9. **Discharge Compliance Records**

☐ Air ☐ Readily available ☐ Up to date ☒ N/A

☐ Water (effluent) ☐ Readily available ☐ Up to date ☒ N/A

Remarks: Stormwater retention system will be built and approved based on as-built document

10. **Daily Access/Security Logs** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: There is a fence line.

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐ Contractor for state

☒ PRP in-house ☒ Contractor for PRP

☐ Federal facility in-house ☐ Contractor for Federal facility

☐ _____

2. **O&M Cost Records**

☒ Readily available ☐ Up to date

☐ Funding mechanism/agreement in place ☐ Unavailable

Original O&M cost estimate: _____ ☐ Breakdown attached

Total annual cost by year for review period if available

From: _____ To: _____ _____ ☐ Breakdown attached
Date Date Total cost

From: _____ To: _____ _____ ☐ Breakdown attached
Date Date Total cost

From: _____ To: _____ _____ ☐ Breakdown attached
Date Date Total cost

From: _____ To: _____ _____ ☐ Breakdown attached
Date Date Total cost

From: _____ To: _____ _____ ☐ Breakdown attached
Date Date Total cost

3. **Unanticipated or Unusually High O&M Costs during Review Period**

Describe costs and reasons: NA

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing Damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A

Remarks: Site fencing appeared to be in good condition.

B. Other Access Restrictions

1. **Signs and Other Security Measures** ☐ Location shown on site map ☐ N/A

Remarks: 42 cameras for added security.

C. Institutional Controls (ICs)

1. **Implementation and Enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☒ No ☐ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☒ No ☐ N/A

Type of monitoring (e.g., self-reporting, drive by): Impromptu inspections

Frequency: As needed

Responsible party/agency: EPA_____

Contact _____ _____ _____ _____

Name Title Date Phone no.

Reporting is up to date ☒ Yes ☐ No ☐N/A

Reports are verified by the lead agency ☒ Yes ☐ No ☐ N/A

Specific requirements in deed or decision documents have been met ☒ Yes ☐ No ☐ N/A

Violations have been reported ☐ Yes ☒ No ☐ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☒ ICs are adequate ☐ ICs are inadequate ☐ N/A

Remarks: _____

D. General

1. **Vandalism/Trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks: _____

2. **Land Use Changes On Site** ☐ N/A

Remarks: Property has been sold since last FYR and now used for vehicle storage. Trees removed in April 2022 and now parcel is gravel-covered and vacant.

3. **Land Use Changes Off Site** ☒ N/A

Remarks: _____

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☒ N/A

1. **Roads Damaged** ☐ Location shown on site map ☐ Roads adequate ☒ N/A

Remarks: _____

B. Other Site Conditions

Remarks: Gravel layer now across majority of the site.

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. **Settlement** (low spots) ☐ Location shown on site map ☐ Settlement not evident

	Area extent: _____		Depth: _____
	Remarks: _____		
2.	**Cracks**	☐ Location shown on site map	☐ Cracking not evident
	Lengths: _____	Widths: _____	Depths: _____
	Remarks: _____		
3.	**Erosion**	☐ Location shown on site map	☐ Erosion not evident
	Area extent: _____		Depth: _____
	Remarks: _____		
4.	**Holes**	☐ Location shown on site map	☐ Holes not evident
	Area extent: _____		Depth: _____
	Remarks: _____		
5.	**Vegetative Cover**	☐ Grass	☐ Cover properly established
	☐ No signs of stress	☐ Trees/shrubs (indicate size and locations on a diagram)	
	Remarks: _____		
6.	**Alternative Cover** (e.g., armored rock, concrete)		☐ N/A
	Remarks: _____		
7.	**Bulges**	☐ Location shown on site map	☐ Bulges not evident
	Area extent: _____		Height: _____
	Remarks: _____		
8.	**Wet Areas/Water Damage**	☐ Wet areas/water damage not evident	
	☐ Wet areas	☐ Location shown on site map	Area extent: _____
	☐ Ponding	☐ Location shown on site map	Area extent: _____
	☐ Seeps	☐ Location shown on site map	Area extent: _____
	☐ Soft subgrade	☐ Location shown on site map	Area extent: _____
	Remarks: _____		
9.	**Slope Instability**	☐ Slides	☐ Location shown on site map
	☐ No evidence of slope instability		
	Area extent: _____		
	Remarks: _____		
B. Benches		☐ Applicable ☐ N/A	
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	**Flows Bypass Bench**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		

2. **Bench Breached** ☐ Location shown on site map ☐ N/A or okay

Remarks: _____

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay

Remarks: _____

C. Letdown Channels ☐ Applicable ☐ N/A

(Channel lined with erosion control mats, riprap, grout bags or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ No evidence of settlement

Area extent: _____ Depth: _____

Remarks: _____

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation

Material type:_____ Area extent: _____

Remarks: _____

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion

Area extent: _____ Depth: _____

Remarks: _____

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting

Area extent: _____ Depth: _____

Remarks: _____

5. **Obstructions** Type: _____ ☐ No obstructions

☐ Location shown on site map Area extent: _____

Size: _____

Remarks: _____

6. **Excessive Vegetative Growth** Type: _____

☐ No evidence of excessive growth

☐ Vegetation in channels does not obstruct flow

☐ Location shown on site map Area extent: _____

Remarks: _____

D. Cover Penetrations ☐ Applicable ☐ N/A

1. **Gas Vents** ☐ Active ☐ Passive

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: _____

2. **Gas Monitoring Probes**

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A
Remarks: _____

3. **Monitoring Wells** (within surface area of landfill)
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A
Remarks: _____

4. **Extraction Wells Leachate**
☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition
☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A
Remarks: _____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A
Remarks: _____

E. Gas Collection and Treatment ☐ Applicable ☐ N/A

1. **Gas Treatment Facilities**
☐ Flaring ☐ Thermal destruction ☐ Collection for reuse
☐ Good condition ☐ Needs maintenance
Remarks: _____

2. **Gas Collection Wells, Manifolds and Piping**
☐ Good condition ☐ Needs maintenance
Remarks: _____

3. **Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings)
☐ Good condition ☐ Needs maintenance ☐ N/A
Remarks: _____

F. Cover Drainage Layer ☐ Applicable ☐ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A
Remarks: _____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A
Remarks: _____

G. Detention/Sedimentation Ponds ☐ Applicable ☐ N/A

1. **Siltation** Area extent: _____ Depth: _____ ☐ N/A
☐ Siltation not evident
Remarks: _____

2. **Erosion** Area extent: _____ Depth: _____
☐ Erosion not evident

Remarks: _____

3. **Outlet Works** ☐ Functioning ☐ N/A

Remarks: _____

4. **Dam** ☐ Functioning ☐ N/A

Remarks: _____

H. Retaining Walls ☐ Applicable ☐ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident

Horizontal displacement: _____ Vertical displacement: _____

Rotational displacement: _____

Remarks: _____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident

Remarks: _____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A

☐ Vegetation does not impede flow

Area extent: _____ Type: _____

Remarks: _____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident

Area extent: _____ Depth: _____

Remarks: _____

4. **Discharge Structure** ☐ Functioning ☐ N/A

Remarks: _____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Performance Monitoring** Type of monitoring: _____

☐ Performance not monitored

Frequency: _____ ☐ Evidence of breaching

Head differential: _____

Remarks: _____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable ☒ N/A

A. Groundwater Extraction Wells, Pumps and Pipelines ☐ Applicable ☐ N/A

1. **Pumps, Wellhead Plumbing and Electrical**

   ☐ Good condition ☐ All required wells properly operating ☐ Needs maintenance ☐ N/A

   Remarks: _____

2. **Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances**

   ☐ Good condition ☐ Needs maintenance

   Remarks: _____

3. **Spare Parts and Equipment**

   ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

   Remarks: _____

B. Surface Water Collection Structures, Pumps and Pipelines ☐ Applicable ☐ N/A

1. **Collection Structures, Pumps and Electrical**

   ☐ Good condition ☐ Needs maintenance

   Remarks: _____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes and Other Appurtenances**

   ☐ Good condition ☐ Needs maintenance

   Remarks: _____

3. **Spare Parts and Equipment**

   ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

   Remarks: _____

C. Treatment System ☐ Applicable ☐ N/A

1. **Treatment Train** (check components that apply)

   ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation

   ☐ Air stripping ☐ Carbon adsorbers

   ☐ Filters: _____

   ☐ Additive (e.g., chelation agent, flocculent): _____

   ☐ Others: _____

   ☐ Good condition ☐ Needs maintenance

   ☐ Sampling ports properly marked and functional

   ☐ Sampling/maintenance log displayed and up to date

   ☐ Equipment properly identified

   ☐ Quantity of groundwater treated annually: _____

   ☐ Quantity of surface water treated annually: _____

   Remarks: _____

2. **Electrical Enclosures and Panels** (properly rated and functional)

☐ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Tanks, Vaults, Storage Vessels**

☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs maintenance

Remarks: _____

4. **Discharge Structure and Appurtenances**

☐ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

5. **Treatment Building(s)**

☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair

☐ Chemicals and equipment properly stored

Remarks: _____

6. **Monitoring Wells** (pump and treatment remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: _____

D. Monitoring Data

1. **Monitoring Data**

☐ Is routinely submitted on time ☐ Is of acceptable quality

2. **Monitoring Data Suggests:**

☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: _____

X. OTHER REMEDIES

If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions).

Remedy is functioning as designed to prevent exposure to contaminated soil on the property. ICs have been implemented to restrict site use to commercial/industrial and prevent excavation activities.

B. Adequacy of O&M

Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy.

NA

C. Early Indicators of Potential Remedy Problems

	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. EPA will need to review property owner's plans to finish grading with gravel and a stormwater retention system with a line and basin. This is required by Chesterfield County.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. NA

Site Inspection Participants

- Austin Oelschlager, EPA Region 3
- Karla Guerrero, EPA Region 3
- Lisa Trakis, EPA Region 3
- Angela McGarvey, VDEQ
- Brett Fisher, VDEQ
- Carter Hall, CD Hall Construction, Inc (site owner)
- Fred Mayes, Commonwealth Environmental Associates, Inc.

APPENDIX G – SITE INSPECTION PHOTOS

Entrance to 1320 Bellwood Road, facing southwest (parcel 7986770448)

View of 1320 Bellwood Road, facing north.

View of drainage ditch located on eastern boundary of 1320 Bellwood Road, facing south.

View of northern boundary of 1320 Bellwood Road, facing west.

Entrance to 1306 Bellwood Road, facing east (parcel 7986773046).

View of RV parking area and gravel surface at 1306 Bellwood Road, facing north.

Well located near fencing on eastern side of the 1306 Bellwood Road property. This well is not used for drinking water.

View of storage building, two propane tanks and gravel surface at 1306 Bellwood Road.

APPENDIX H – TOXICITY REVIEW (2018 FYR)

The remedial action level of 1,000 mg/kg for lead-contaminated surface soils was in accordance with EPA's guidance at the time of remedy selection. EPA's current guidance for industrial/commercial use is 800 mg/kg, which is more stringent than the Site's 1,000 mg/kg action level. However, a screening of EPA's most recent Adult Lead Methodology (Table H-1) concluded that the projected soil concentration that results in no more than a 5 percent probability that fetal blood-lead exceeds 5 µg/dL for the Site is 1,050 mg/kg. Based on this evaluation, the ROD cleanup goal remains valid.

Table H-1: Adult Lead Methodology (June 2017)[a]

Variable	Description of Variable	Units	GSDi and PbB_0 from Analysis of NHANES 2009-2014
$PbB_{fetal,\ 0.95}$	Target PbB in fetus (e.g., 2-8 µg/dL)	µg/dL	5
$R_{fetal/maternal}$	Fetal/maternal PbB ratio	--	0.9
BKSF	Biokinetic Slope Factor	µg/dL per µg/day	0.4
GSD_i	Geometric standard deviation PbB	--	1.8
PbB_0	Baseline PbB	µg/dL	0.6
IR_S	Soil ingestion rate (including soil-derived indoor dust)	g/day	0.050
$AF_{S,\ D}$	Absorption fraction (same for soil and dust)	--	0.12
$EF_{S,\ D}$	Exposure frequency (same for soil and dust)	days/year	219
$AT_{S,\ D}$	Averaging time (same for soil and dust)	days/year	365
PRG in Soil for no more than 5% probability that fetal PbB exceeds target PbB		**mg/kg**	**1,050**

Notes:

a. Based on EPA's Update to the Adult Lead Methodology's Default Baseline Blood Lead Concentration and Geometric Standard Deviation Parameters, Office of Land and Emergency Management, May 2017: https://semspub.epa.gov/work/HQ/196766.pdf.

PbB = blood lead level

µg/dL = micrograms per deciliter

The 1990 ROD selected surface soil action levels (except lead) based on risk assessment modeling using a 10^{-6} risk scenario. Table H-2 evaluates the current validity of these actions levels using 2017 EPA Composite Worker RSLs; the RSLs incorporate current toxicity values and standard default exposure factors. Composite Worker RSLs are used because the anticipated future use of the Site is industrial/commercial use.

The evaluation demonstrates that all surface soil action levels remain valid for commercial/industrial use. Concentrations are within EPA's risk management range of 1×10^{-6} to 1×10^{-4} and below EPA's benchmark of 1 for noncarcinogens.

Table H-2: Review of Surface Soil Action Levels – Human Health Direct Contact

COC	Surface Soil Action Level[a] (mg/kg)	Composite Worker RSL[b] (mg/kg)		Risk[c]	HQ[d] (Hazard Quotient)
		Cancer-Based RSL (10^{-6} Risk)	Non-Cancer RSL (HQ = 1.0)		
Antimony	77.4	--	470	NA	0.16
Arsenic	10	3	480	3.3×10^{-6}	0.02
Cadmium	84	9,300	980	9.0×10^{-9}	0.09
Nickel	600	64,000	22,000	9.4×10^{-9}	0.03

Notes:
a. Surface soil action level listed in Table 1 in the 1990 ROD.
b. EPA's composite worker RSLs, dated November 2017, available at https://semspub.epa.gov/work/HQ/197033.pdf (accessed 3/23/18).
c. Cancer risk calculated using the following equation, based on the fact that RSLs are derived based on 1×10^{-6} risk: cancer risk = (remedial goal ÷ cancer-based RSL) × 10^{-6}.
d. Noncancer HQ calculated using the following equation: HQ = (remedial goal ÷ noncancer RSL).
NA = not applicable
-- = EPA has not finalized a carcinogenic or noncarcinogenic toxicity value for this compound.

The drainage ditch on the eastern side of the Site contains water after rain events. According to the 1990 FS Report, lead and other metals were detected in ditch sediment at a pool of standing water while sediment samples collected in the James River were free of contamination. However, EPA developed sediment remedial action levels for arsenic, cadmium and lead due to the drainage ditch being a potential pathway for transport of soluble metals to the James River. In addition, results of sediment elutriate bioassays during the RI indicated toxicity that correlated to elevated levels of trace metals, particularly of lead, in the drainage ditch. According to the 1992 Remedial Design Report, remediation of drainage ditch sediments was based on lead concentrations exceeding the cleanup goal of 450 mg/kg because lead was present at concentrations orders of magnitude higher than the other COCs. Thus, remediation of lead would also remediate the other metals detected less frequently and less widespread.

The ROD established sediment action levels based on apparent effects threshold (AET) values for Puget Sound, which is an estuary and not freshwater. The AETs are given as a range and the ROD chose the most conservative value (the lower end of the range) as action levels. Since the ROD, ecological benchmarks similar to AET values but established for a freshwater system have been published. One of these values is a probable effects concentration (PEC), which is often used by EPA as a performance objective for sediment remediation. A comparison of the Site's sediment action levels and the respective PECs for each COC indicates that the PECs are slightly more stringent for arsenic, nearly the same for cadmium and more stringent for lead (Table H-3). However, the ROD action levels remain valid because remediation focused on lead and the confirmation results for sediments remaining in place ranged from 13 mg/kg to 69 mg/kg, with an average lead concentration of 48 mg/kg; these concentrations are below the ROD action level and current PEC for lead. The reduction of lead is expected to have reduced the concentrations of arsenic and cadmium.

Table H-3: Review of Sediment Action Levels – EPA Region 3 Screening Levels and Current Freshwater Sediment PECs

COC	Sediment Action Level (mg/kg)	PEC Sediment Values[a] (mg/kg) (Freshwater)
Arsenic	57	33
Cadmium	5	4.98
Lead	450	128

Notes:
a. PEC Sediment Values: https://response.restoration.noaa.gov/sites/default/files/SQuiRTs.pdf.