Ohio Environmental Protection Agency (Ohio EPA)
And
Ravenna Army Ammunition Plant (RVAAP)
2023 Correspondences

Received - January 2, 2024

December 27, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin Sedlak
Restoration Program Manager
ARNG-ILE Clean Up
Camp James A Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID#267000859137

Sent via email to: Kevin.m.sedlak.ctr@army.mil

Subject: Response to Ohio EPA Comments on the "Draft Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP) for Additional Delineation Sampling at RVAAP-34 Sand Creek Disposal Road Landfill" dated November 15, 2023

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the

"Response to Ohio EPA Comments on the "Draft Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP) for Additional Delineation Sampling at RVAAP-34 Sand Creek Disposal Road Landfill" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Camp James A. Garfield). This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) via email on November 15, 2023[1]. The response was prepared for the United States Army Corps of Engineers (USACE) on behalf of the National Guard Bureau by Leidos.

Based on our review of the Army National Guard's Response to Ohio EPA comments provided in your letter dated November 15, 2023, we find the responses generally acceptable, and the document can be finalized. Please be sure that all agreed-upon changes, additions, and clarifications are provided in the final document.

This letter is an official response from Ohio EPA that will be maintained as a public record.

[1] http://edocpub.epa.ohio.gov/publicportal/ViewDocument.aspx?docid=2630991

If you have any questions, please contact me at kevin.palombo@epa.ohio.gov.

Sincerely,

Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/cm

ec: Angela Cobbs, Chenega Reliable Services
Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Jennifer Tierney, Chenega Reliable Services
Megan Oravec, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Liam McEvoy, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR

November 8, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin Sedlak
Restoration Program Manager
ARNG-ILE Clean Up
Camp James A Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444
Sent via email to:
Kevin.m.sedlak.ctr@army.mil

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID#267000859137

Subject: Ohio EPA Comments of the "Draft Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP) for Additional Delineation Sampling at RVAAP-34 Sand Creek Disposal Road Landfill" dated August 28, 2023

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Draft Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP) for Additional Delineation Sampling at RVAAP-34, Sand Creek Disposal Road Landfill" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Camp Garfield).[1] This document was received via email by Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR), on August 31, 2023. The report was prepared for the United States Army Corps of Engineers on behalf of the National Guard Bureau by Leidos under Contract Number W912QR-21-D-0016. Comments on the document based on Ohio EPA's review are provided below. Please provide responses to the enclosed comments in accordance with the Directors Findings and Orders.

Draft Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP) for Additional Delineation Sampling at RVAAP-34 Sand Creek Disposal Road Landfill

After the most recent remedial activities took place, chemicals of concern concentrations at four areas (SCsb-037M, SCsb-049M, SCss-060M, and SCss-062M) at the Sand Creek Disposal Road

[1] http://edocpub.epa.ohio.gov/publicportal/ViewDocument.aspx?docid=2540281

Landfill were still above cleanup goals (CUGs), as presented in the Remedial Action Completion Report for Soil, Sediment, and Surface Water at Multiple Areas of Concern (Alaniz-Endpoint 2022). Concentrations of arsenic at SCsb-037M and SCss-062M and benzo(a)pyrene at SCsb-049M and SCss-060M did not completely meet CUGs, and each area requires further delineation to guide additional soil excavation.

COMMENTS

Comment 1: Section 17.2

Section 17.2 has the statement, "Leidos assumes that the historical data and additional delineation sampling will be adequate for Ohio EPA's acceptance for completion of the RI Addendum." Ohio EPA agrees with this assumption as long as the phrase 'additional delineation sampling' includes additional yet-to-be proposed step-out sampling locations should the data collected from the QAPP proposed sample locations report back chemical concentrations in soil above clean up goals (CUGs).

Comment 2: Section 17.3.1: SCsb-037M

Section 17.3.1 reports that during the previous excavation "the excavation floor [was] 12 feet". However, section 10.3, Table 10-1 and Figure 10-3 report that after the previous excavation the excavation floor depth was 14 feet below ground surface (bgs). Please clarify the depth of the previous excavation and include that depth and an interval(s) below that depth to determine the vertical extent of the arsenic contamination. While the section states that "sampling beyond 14 feet bgs is not required, as the Resident Receptor exposure depth only extends to 13 feet" deeper soil can be brought up to a shallower depth in the future without proper management and/or remedial activities, and thus be introduced into a residential receptor exposure depth.

Comment 3: Figure 17-1: RVAAP-34 Sand Creek Disposal Road Landfill – Proposed Sample Locations

Should sample locations be added/shifted to be located straight out from the corners of those formerly excavated areas that have two perpendicular sides with detections above CUGs? For example, at SCsb-037M should a sample location be added/shifted to be directly out from the NE, SE and SW corners depicted on Figure 17-1; at SCsb-049M should a sample location be added/shifted to be directly out from the SE corner, etc.?

This "Draft Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP) for Additional Delineation Sampling at RVAAP-34, Sand Creek Disposal Road Landfill" was reviewed by personnel from Ohio EPA. Additional information is necessary to approve the document. If you have questions

or would like to set up a meeting to discuss these comments, you can contact me at kevin.palombo@epa.ohio.gov.

Sincerely,

Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/cm

ec: Angela Cobbs, Chenega Reliable Services
Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
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Megan Oravec, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Liam McEvoy, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

August 31, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Kevin Palombo, Site Coordinator
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Draft Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP), RVAAP-34 Sand Creek Disposal Road Landfill (Work Activity No. 267000859137)

Dear Mr. Palombo:

For your review, an electronic version of the *Draft Uniform Federal Policy-Quality Assurance Project Plan for Additional Delineation Sampling at RVAAP-34 Sand Creek Disposal Road Landfill* has been sent using the Ohio EPA LiquidFile system. A hardcopy and CD can be sent upon request by Ohio EPA.

This plan was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.08.31 11:32:50 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Megan Oravec, Ohio EPA, NEDO
Tom Schneider, Ohio EPA, SWDO
Katie Tait, OHARNG
Steve Kvaal, USACE Louisville
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Jed Thomas, Leidos
Ryan Laurich, Leidos
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NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
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October 13, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Kevin Palombo, Site Coordinator
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Draft Facility-wide Groundwater 2023 Semi-Annual Report (Work Activity No. 267000859036)

Dear Mr. Palombo:

An electronic version of the *Draft Facility-wide Groundwater Monitoring Program RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2023 Sampling Event* will be sent using the Ohio EPA LiquidFile system. Due to file size, Appendix E containing the laboratory data packages are not included with the electronic version of this report and are available upon request.

This report was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 330-235-2153 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.10.13 07:49:39 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

ec: Natalie Oryshkewych, Ohio EPA, NEDO
Liam McEvoy, Ohio EPA, NEDO
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NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

September 8, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Kevin Palombo, Project Coordinator
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Notification of Field Work, Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-66 Facility-wide Groundwater
(Work Activity No. 267-000-859-036)

Dear Mr. Palombo:

In accordance with the Director's Final Findings and Orders, Section XIII, #28, for the RVAAP Restoration Program, the Army National Guard (ARNG) is providing notification of field activities at the former RVAAP (Camp James A. Garfield) 15 days prior to the scheduled start date. These field activities and tentative schedule are below:

- 09/25/23-10/6/23: Groundwater sampling per the 2023 Addendum.

In the event that the schedule above needs to change, ARNG will provide an e-mail notification with revised dates. Please contact the undersigned at 330-235-2153, or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.09.08 08:10:22 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA, DERR-NEDO
Liam McEvoy, Ohio EPA, DERR-NEDO
Tom Schneider, Ohio EPA-SWDO
Katie Tait, OHARNG
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NATIONAL GUARD BUREAU
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July 27, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Kevin Palombo, Site Coordinator
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Feasibility Study Monitoring Well Installation for RVAAP-66 Facility-wide Groundwater – Liquid Investigation Derived Waste Letter Report and Request for Land Application (Frac Tank: LEIDOS-FWGW-074-L), Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Work Activity No. 267000859036

Dear Mr. Palombo:

Attached for your review is the liquid Investigation-Derived Waste (IDW) Letter Report and Request for Land Application for recovered liquid as part of the RVAAP-66 Facility-wide Groundwater Monitoring Program Feasibility Study well installations. Although we do not typically request your review and approval on IDW reports, we are sending this submittal for your review so that we may land apply the recovered liquid at Building 1036 at Camp James A. Garfield. We would like to conduct the land application as soon as possible. Your timely review is much appreciated.

This letter report was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.07.27 08:59:19 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA, NEDO
Liam McEvoy, Ohio EPA, NEDO
Megan Oravec, Ohio EPA, NEDO
Tom Schneider, Ohio EPA, SWDO
Katie Tait, OHARNG
Steve Kvaal, USACE Louisville
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Jed Thomas, Leidos
Ryan Laurich, Leidos
Jennifer Tierney, Chenega

July 24, 2023

Ms. Katie Tait, OHARNG
Camp James A. Garfield - Environmental Office
1438 State Route 534 SW
Newton Falls, OH 44444

Subject: **Feasibility Study Monitoring Well Installation Plan for RVAAP-66 Facility-wide Groundwater – Liquid Investigation-Derived Waste (IDW) Characterization and Disposal Plan**

References: **1) Contract No. W912QR-16-D-0003, Delivery Order No. W912QR18F0337, Groundwater Investigation and Reporting Services, RVAAP Restoration Program**

Dear Ms. Tait:

Leidos completed installation of 12 monitoring wells in support of the Feasibility Study (FS) for Facility-wide Groundwater (FWGW) from March 13, 2023 to May 30, 2023. All work was performed in accordance with the *2022 Feasibility Study Monitoring Well Installation Plan* (Leidos 2022). These activities resulted in the generation of a liquid Investigation Derived Waste (IDW) consisting of well development/purge water and equipment decontamination fluids (liquinox wash water, 10% nitric acid, isopropanol, and deionized water). The purpose of this letter report is to characterize and classify the IDW and request approval for land application at Camp James A. Garfield (CJAG) (former RVAAP). This letter report follows guidance established by the following:

- *Remedial Investigation Work Plan for Groundwater and Environmental Investigation Services for RVAAP-66 Facility-Wide Groundwater* (RIWP) (TEC-Weston JV, 2016); and
- *Facility-Wide Sampling and Analysis Plan for Environmental Investigations* (FWSAP) (SAIC, 2011).

Water recovered from the FS well installation activities was containerized in a 20,000-gallon Frac Tank containing approximately 13,217 gallons of purged groundwater and equipment decontamination fluids (Table 1). On May 30, 2023, the frac tank (LEIDOS-FWGW-074-L) was sampled (sample ID: FWGIDW-230301-WW) for IDW characterization parameters: Toxicity Characteristic Leaching Procedure (TCLP) volatile organic compounds (VOCs), TCLP semi-VOCs (SVOCs), TCLP metals, TCLP herbicides, TCLP pesticides, total cyanide, nitrate, nitrite, sulfide, polychlorinated biphenyls (PCBs), corrosivity (pH), and flashpoint. Following Section 7.1.1 of the RIWP and Section 8.4.2 of the FWSAP, a grab sample was collected via disposable bailer from the frac tank.

Table 1. Summary of Investigation-Derived Wastes and Disposal Recommendation

Container Number	Container Type and Size	Contents	Generation Date	Waste Type	Disposal Recommendation
LEIDOS-FWGW-074-L	20,000 Frac Tank	13,217 gallons drilling/purge/decon water	3/24/2023 - 5/22/2023	Non-Hazardous	Land Application

Analytical Screening

Upon receipt of the laboratory results, the analytical data were reviewed to determine if the waste was potentially hazardous and if the waste could be discharged to the land surface.

The data were compared to disposal screening criteria from the following sources:

- Concentration of Contaminants for Toxicity Characteristic (40 Code of Federal Regulations [CFR] 261.24), as listed in Table 8-1 of the FWSAP;
- Table 8-2 of the FWSAP; and
- 40 CFR 261.21 – Characteristic of Ignitability;
- 40 CFR 261.22 – Characteristic of Corrosivity;
- 40 CFR 261.23 – Characteristic of Reactivity; and
- Toxic Substances Control Act (TSCA) – PCB disposal requirements.

If analytical results do not exceed disposal criteria, then the IDW can be classified as "nonhazardous." If analytical results do exceed disposal criteria, then the IDW must be classified as "hazardous." Using the analytical results, this waste is characterized as Nonhazardous, per comparison to the provisions established in the Resource Conservation and Recovery Act (RCRA) and in the *Facility-Wide Sampling and Analysis Plan* (USACE 2011). Attachment A (Table A.1) compares the sample results to the disposal screening criteria. The laboratory analytical report is included as Attachment B. The container log is presented in Attachment C.

Comparison of the analytical results against the TCLP screening criteria shows the liquid IDW is non-hazardous. Three TCLP metals (barium, cadmium, and chromium) were detected at estimated quantities well below applicable screening criteria, all other TCLP metals were undetected. TCLP herbicides, TCLP pesticides, TCLP SVOCs, TCLP VOCs, and PCBs results were all non-detect.

Conclusions and Recommendations

Based on the observed analytical results and previous approvals for land application, Leidos recommends that the liquid IDW from Frac Tank LEIDOS-FWGW-074-L is applied on-site via land application. Liquid IDW from Frac Tank LEIDOS-FWGW-074-L will be filtered through a 100 µm bag filter and straw bale prior to discharging to a well vegetated area near Building 1036 at CJAG (see figure presented in Attachment D). The IDW water will be released at a rate that will prevent ponding of water and/or runoff and will not be released directly to surface water features, such as creeks, ditches, streams, or storm/sanitary sewer lines. Prior to initiating land application, the procedure and setup will be reviewed by the CJAG Environmental Specialist for final approval.

Since the former RVAAP, under RCRA, is the generator of this material, Leidos requests concurrence or direction on the waste classification. Following your concurrence, and Ohio EPA approval of this IDW

Report and proposed land application methodology, Leidos will proceed with appropriate land application as described.

If you have any questions, or require additional information, please do not hesitate to contact me at (330) 998-4246.

Leidos

Ryan Laurich

Ryan Laurich
Deputy Project Manager

cc: Kevin Sedlak, ARNG, Camp James A. Garfield
Jay Trumble, USACE Louisville
Jed Thomas, Leidos

ATTACHMENT A

Laboratory Analytical Results
Sample FWGIDW-230301-WW

Table A.1 Liquid IDW Sample Results FWDIDW-230301-WW

Sample Id							FWGIDW-230301-WW
Date							5/30/2023
Analyte	**CAS Number**	**Units**	**Specific Method**	**Basis**	**Regulatory Level Citation**	**Regulatory Level**	**Sample Result**
Arsenic	7440-38-2	mg/L	Metals (ICP)	TCLP	40 CFR 261.24	5	<0.014 U
Barium	7440-39-3	mg/L	Metals (ICP)	TCLP	40 CFR 261.24	100	0.007 J
Cadmium	7440-43-9	mg/L	Metals (ICP)	TCLP	40 CFR 261.24	1	0.00023 J
Chromium	7440-47-3	mg/L	Metals (ICP)	TCLP	40 CFR 261.24	5	0.00087 J
Lead	7439-92-1	mg/L	Metals (ICP)	TCLP	40 CFR 261.24	5	<0.0075 U
Mercury	7439-97-6	mg/L	Metals (ICP)	TCLP	40 CFR 261.24	0.2	<0.00008 U
Selenium	7782-49-2	mg/L	Metals (ICP)	TCLP	40 CFR 261.24	1	<0.019 U
Silver	7440-22-4	mg/L	Metals (ICP)	TCLP	40 CFR 261.24	5	<0.006 U
2,4-D	94-75-7	mg/L	Herbicides (GC)	TCLP	40 CFR 261.24	10	<0.004 UM
Silvex (2,4,5-TP)	93-72-1	mg/L	Herbicides (GC)	TCLP	40 CFR 261.24	1	<0.002 U
Chlordane (technical)	12789-03-6	mg/L	Organochlorine Pesticides (GC)	TCLP	40 CFR 261.24	--	<0.004 U
Endrin	72-20-8	mg/L	Organochlorine Pesticides (GC)	TCLP	40 CFR 261.24	0.02	<0.0002 U
Heptachlor epoxide	1024-57-3	mg/L	Organochlorine Pesticides (GC)	TCLP	40 CFR 261.24	0.008	<0.0002 U
Heptachlor	76-44-8	mg/L	Organochlorine Pesticides (GC)	TCLP	40 CFR 261.24	0.008	<0.0002 U
Methoxychlor	72-43-5	mg/L	Organochlorine Pesticides (GC)	TCLP	40 CFR 261.24	10	<0.0005 U
Toxaphene	8001-35-2	mg/L	Organochlorine Pesticides (GC)	TCLP	40 CFR 261.24	0.5	<0.0075 U
gamma-BHC (Lindane)	58-89-9	mg/L	Organochlorine Pesticides (GC)	TCLP	40 CFR 261.24	0.4	<0.0002 U
1,4-Dichlorobenzene	106-46-7	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	7.5	<0.0032 U
2,4,5-Trichlorophenol	95-95-4	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	400	<0.008 U
2,4,6-Trichlorophenol	88-06-2	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	2	<0.008 U
2,4-Dinitrotoluene	121-14-2	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	0.13	<0.008 U
2-Methylphenol	95-48-7	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	200	<0.008 U
3 & 4 Methylphenol	15831-10-4	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	200	<0.008 U
Hexachlorobenzene	118-74-1	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	0.13	<0.008 U
Hexachlorobutadiene	87-68-3	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	0.5	<0.008 U
Hexachloroethane	67-72-1	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	3	<0.008 U
Nitrobenzene	98-95-3	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	2	<0.008 U
Pentachlorophenol	87-86-5	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	100	<0.048 U
Pyridine	110-86-1	mg/L	Semivolatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	5	<0.048 UQ
1,1-Dichloroethene	75-35-4	mg/L	Volatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	0.7	<0.008 U
1,2-Dichloroethane	107-06-2	mg/L	Volatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	0.5	<0.008 UH

Table A.1 Liquid IDW Sample Results FWDIDW-230301-WW (Continued)

Sample Id							FWGIDW-230301-WW
Date							5/30/2023
Analyte	**CAS Number**	**Units**	**Specific Method**	**Basis**	**Regulatory Level Citation**	**Regulatory Level**	**Sample Result**
2-Butanone (MEK)	78-93-3	mg/L	Volatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	200	<0.12 UH
Benzene	71-43-2	mg/L	Volatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	0.5	<0.008 U
Carbon tetrachloride	56-23-5	mg/L	Volatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	0.5	<0.008 U
Chlorobenzene	108-90-7	mg/L	Volatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	100	<0.008 U
Chloroform	67-66-3	mg/L	Volatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	6	<0.008 U
Tetrachloroethene	127-18-4	mg/L	Volatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	0.7	<0.008 U
Trichloroethene	79-01-6	mg/L	Volatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	0.5	<0.004 U
Vinyl chloride	75-01-4	mg/L	Volatile Organic Compounds (GC/MS)	TCLP	40 CFR 261.24	0.2	<0.01 U
PCB-1016	12674-11-2	mg/L	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	Total	40 CFR 761.60	50	<0.00041 UQ
PCB-1221	11104-28-2	mg/L	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	Total	40 CFR 761.60	50	<0.00026 U
PCB-1232	11141-16-5	mg/L	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	Total	40 CFR 761.60	50	<0.00061 U
PCB-1242	53469-21-9	mg/L	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	Total	40 CFR 761.60	50	<0.00092 U
PCB-1248	12672-29-6	mg/L	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	Total	40 CFR 761.60	50	<0.00031 U
PCB-1254	11097-69-1	mg/L	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	Total	40 CFR 761.60	50	<0.00026 U
PCB-1260	11096-82-5	mg/L	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	Total	40 CFR 761.60	50	<0.00041 UQ
PCB-1262	37324-23-5	mg/L	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	Total	40 CFR 761.60	50	<0.00051 U
PCB-1268	11100-14-4	mg/L	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	Total	40 CFR 761.60	50	<0.00092 U
Cyanide, Total	57-12-5	mg/L	Cyanide, Total	Total	40 CFR 261.23	See Note 1	<0.009 U
Flashpoint	N/A	Deg C	Ignitability, Pensky-Martens Closed-Cup Method	Total	40 CFR 261.21	>60°C (140°F)	>160
Nitrate as N	14797-55-8	mg/L	Anions, Ion Chromatography	Total	N/A	--	0.52
Nitrite as N	14797-65-0	mg/L	Anions, Ion Chromatography	Total	N/A	--	0.13 J
Sulfide	18496-25-8	mg/L	Sulfide, Acid Soluble and Insoluble (Titrimetric)	Total	40 CFR 261.23	See Note 1	<2 U
Temperature	STL00038	Degrees C	Temperature	Total	N/A	--	20.8 HF
pH adj. to 25 deg C	STL00204	SU	pH	Total	40 CFR 261.22	$2 \leq pH \leq 12.5$	7.8 HF

All analyses were from sample collected on 5/30/2023 under sample ID FWGIDW-230301-WW.

Waste with PCB concentrations greater than 50 ppm (mg/L) are regulated and to be disposed in accordance with the Toxic Substances Control Act (TSCA).

Note 1: The US Environmental Protection Agency requires generators to use their knowledge to make a D003 determination per CFR 261.23(a)(5) for cyanide or sulfide-bearing wastes.

U = Undetected at the Limit of Detection

J = Estimated: The analyte was positively identified; the quantitation is an estimation

Q = One or more quality control criteria failed

M = Manual integrated compound.

HF = Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
HF = Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
H = Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
J1 = Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
NB = No burn
-- = No regulatory standards for determination of hazardous waste exist.

ATTACHMENT B

Laboratory Analytical Report
Job Number: 280-177167-1: Containing Sample FWGIDW-230301-WW

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Rita Schmon-Stasik
Leidos, Inc.
Picatinny Arsenal
356 Ninth Avenue
Suite 106
Dover, New Jersey 07801

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JOB DESCRIPTION

RVAAP FWGW FS Well Install 2023

JOB NUMBER

280-177167-1

Eurofins Denver
4955 Yarrow Street
Arvada CO 80002

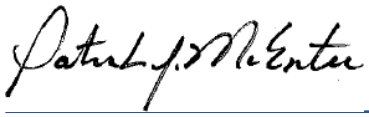
See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins TestAmerica Project Manager.

Authorization



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Authorized for release by
Patrick McEntee, Client Service Manager
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(303)736-0107

Table of Contents

Definitions/Glossary

Client: Leidos, Inc. Job ID: 280-177167-1
Project/Site: RVAAP FWGW FS Well Install 2023

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

GC Semi VOA

Qualifier	Qualifier Description
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

LCMS

Qualifier	Qualifier Description
D	The reported value is from a dilution.
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

Metals

Qualifier	Qualifier Description
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

General Chemistry

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 280-177167-1

Laboratory: Eurofins Denver

Narrative

CASE NARRATIVE

Client: Leidos, Inc.

Project: RVAAP FWGW FS Well Install 2023

Report Number: 280-177167-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

The samples were received on 5/31/2023 10:40 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 1.0º C and 3.7º C.

TCLP VOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples FWGIDW-230301-WW (280-177167-1) and FWGIDW-230301-WS (280-177167-2) were analyzed for TCLP volatile organic compounds (GC-MS) in accordance with 1311. The samples were leached on 05/31/2023 and 06/09/2023 and analyzed on 06/09/2023, 06/12/2023 and 06/14/2023.

Reanalysis of the following samples was performed outside of the analytical holding time due to failure of quality control parameters in the initial analysis. FWGIDW-230301-WW (280-177167-1) These sample was reanalyzed for 2-Butanone and 1,2-Dichloroethane.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TCLP SEMIVOLATILE ORGANIC COMPOUNDS (GC-MS)

Samples FWGIDW-230301-WW (280-177167-1) and FWGIDW-230301-WS (280-177167-2) were analyzed for TCLP semivolatile organic compounds (GC-MS) in accordance with SW-846 1311/8270D. The samples were leached on 06/05/2023 and 06/08/2023, prepared on 06/06/2023 and 06/09/2023 and analyzed on 06/08/2023 and 06/14/2023.

Internal Standard (ISTD) retention times for the following samples were outside the acceptance criteria of +/-0.5 minutes from the mid-point of the initial calibration: FWGIDW-230301-WS (280-177167-2) and (CCVIS 280-615329/2). The samples were within +/-0.5 minutes from the daily calibration verification; therefore, no corrective action was required per the laboratory's SOP. preparation batch 280-614928 and 280-615134 and analytical batch 280-615329

The laboratory control sample and/or the laboratory control sample duplicate (LCS/LCSD) for preparation batch 280-615475 and 280-615587 and analytical batch 280-616031 recovered outside control limits for the following analyte(s): Pyridine. Pyridine has been identified as a poor performing analyte when analyzed using this method; therefore, re-extraction/re-analysis was not performed. Batch precision also exceeded control limits for these analyte(s). These results have been reported and qualified.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TCLP ORGANOCHLORINE PESTICIDES (GC)

Job ID: 280-177167-1 (Continued)

Laboratory: Eurofins Denver (Continued)

Samples FWGIDW-230301-WW (280-177167-1) and FWGIDW-230301-WS (280-177167-2) were analyzed for TCLP Organochlorine Pesticides (GC) in accordance with SW 846 1311/8081B. The samples were leached on 06/05/2023 and 06/08/2023, prepared on 06/08/2023 and 06/09/2023 and analyzed on 06/09/2023 and 06/14/2023.

Surrogate DCB Decachlorobiphenyl recovered outside lower control limits on the back column in the continuing calibration verification (CCV) (CCVIS 280-616066/4) in 280-616066. Surrogates recovered in control in sample and all other QC and all analytes are reported from the front column.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

POLYCHLORINATED BIPHENYLS (PCBS) - Solid

Sample FWGIDW-230301-WS (280-177167-2) was analyzed for polychlorinated biphenyls (PCBs) in accordance with EPA SW-846 Method 8082A. The samples were prepared on 06/12/2023 and analyzed on 06/14/2023.

The following samples in preparation batch 280-615721 and analytical batch 280-616027 required a sulfuric acid clean-up, via EPA Method 3665A, to reduce matrix interferences: FWGIDW-230301-WS (280-177167-2), (LCS 280-615721/2-A), (MB 280-615721/1-A).

The following samples FWGIDW-230301-WS (280-177167-2) in preparation batch 280-615721 could not be thoroughly homogenized before sub-sampling was performed due to sample matrix: The sample was a clay that could not be fully removed from the sample container.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

POLYCHLORINATED BIPHENYLS (PCBS) - Water

Sample FWGIDW-230301-WW (280-177167-1) was analyzed for polychlorinated biphenyls (PCBs) in accordance with SW-846 8082A. The samples were prepared on 06/02/2023 and analyzed on 06/07/2023.

The following samples in preparation batch 280-614674 and analytical batch 280-615208 required a sulfuric acid clean-up, via EPA Method 3665A, to reduce matrix interferences: FWGIDW-230301-WW (280-177167-1), (LCS 280-614674/4-A), (LCSD 280-614674/5-A) and (MB 280-614674/1-A).

The method blank (MB) associated with preparation batch 280-614674 and analytical batch 280-615208 recovered above the upper control limit for DCB Decachlorobiphenyl (Surr). The samples associated with this MB are in control for surrogate; therefore, the data have been reported. The associated samples are impacted: FWGIDW-230301-WW (280-177167-1) and (MB 280-614674/1-A).

The continuing calibration verification (CCV) associated with preparation batch 280-614674 and analytical batch 280-615208 recovered above the upper control limit for PCB-1260, PCB-1016, Tetrachloro-m-xylene (Surr) and DCB Decachlorobiphenyl (Surr). The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: FWGIDW-230301-WW (280-177167-1) and (CCV 280-615208/35).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

HERBICIDES BY LC/MS

Samples FWGIDW-230301-WW (280-177167-1) and FWGIDW-230301-WS (280-177167-2) were analyzed for herbicides by LC/MS in accordance with SW846 8321A. The samples were leached on 06/05/2023 and 06/08/2023 and analyzed on 06/07/2023 and 06/09/2023.

Sample FWGIDW-230301-WS (280-177167-2)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

The following sample in preparation batch 280-614928 and analytical batch 280-615278 was diluted due to the nature of the leach fluid causing internal standard failure: FWGIDW-230301-WS (280-177167-2), (LB 280-614928/1-A), (LCS 280-614928/2-A), (280-177167-A-2-A MS) and (280-177167-A-2-A MSD). Elevated reporting limits (RLs) are provided.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Job ID: 280-177167-1 (Continued)

Laboratory: Eurofins Denver (Continued)

TCLP METALS
Samples FWGIDW-230301-WW (280-177167-1) and FWGIDW-230301-WS (280-177167-2) were analyzed for TCLP metals in accordance with EPA SW846 Methods 1311/6010C. The samples were leached on 06/05/2023 and 06/08/2023, prepared on 06/07/2023 and 06/12/2023 and analyzed on 06/08/2023 and 06/12/2023.

Barium and Chromium were detected in method blank LB 280-614928/1-C at levels that were below one half the LOQ.

Chromium was detected in method blank LB3 280-615475/1-B at a level that was below one half the LOQ.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TCLP MERCURY
Samples FWGIDW-230301-WW (280-177167-1) and FWGIDW-230301-WS (280-177167-2) were analyzed for TCLP mercury in accordance with SW-846 1311/7470. The samples were leached on 06/05/2023 and 06/08/2023, and prepared and analyzed on 06/07/2023 and 06/09/2023.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

IGNITABILITY - Water
Sample FWGIDW-230301-WW (280-177167-1) was analyzed for Ignitability in accordance with EPA SW-846 Method 1010A. The samples were analyzed on 06/13/2023.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

IGNITABILITY FOR SOLIDS
Sample FWGIDW-230301-WS (280-177167-2) was analyzed for ignitability for solids in accordance with EPA SW-846 Method 1030. The samples were analyzed on 06/12/2023.

The following sample did not ignite: FWGIDW-230301-WS (280-177167-2); therefore, an ignitability value could not be obtained. The result has been reported as "No Burn" (NB).

No samples ignited, therefore, there were no sample duplicates. A LCSD was added which met acceptability criteria.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL CYANIDE - Solid
Sample FWGIDW-230301-WS (280-177167-2) was analyzed for Total Cyanide in accordance with 9012B. The samples were prepared and analyzed on 06/08/2023.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL CYANIDE - Water
Sample FWGIDW-230301-WW (280-177167-1) was analyzed for Cyanide, Total in accordance with 9012B. The samples were analyzed on 06/06/2023.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

TOTAL SULFIDE - Solid
Sample FWGIDW-230301-WS (280-177167-2) was analyzed for total sulfide in accordance with EPA SW-846 Method 9034. The samples were prepared and analyzed on 06/01/2023.

Sulfide exceeded the RPD limit for the MSD of sample FWGIDW-230301-WSMSD (280-177167-2) in batch 280-614559. Sample non-homogeneity is suspected.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Job ID: 280-177167-1 (Continued)

Laboratory: Eurofins Denver (Continued)

TOTAL SULFIDE - Water
Sample FWGIDW-230301-WW (280-177167-1) was analyzed for sulfide in accordance with EPA SW-846 Method 9034. The samples were prepared and analyzed on 06/06/2023.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CORROSIVITY (PH) - Water
Sample FWGIDW-230301-WW (280-177167-1) was analyzed for Corrosivity (pH) in accordance with EPA SW-846 9040C. The samples were analyzed on 06/02/2023.

pH adj. to 25 deg C exceeded the RPD limit for the duplicate of sample 280-177173-1. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

CORROSIVITY (PH) - Solid
Sample FWGIDW-230301-WS (280-177167-2) was analyzed for Corrosivity (pH) in accordance with EPA SW-846 Method 9045D. The samples were leached on 06/06/2023 and analyzed on 06/06/2023.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS, ION CHROMATOGRAPHY - Water
Sample FWGIDW-230301-WW (280-177167-1) was analyzed for Anions, Ion Chromatography in accordance with 9056A (48 Hours). The samples were analyzed on 05/31/2023.

Due to the concentration of nitrate in the spiked sample, the matrix spike/ matrix spike duplicate result was higher than the highest calibration point for this analyte. The % recoveries were within % recovery limits so the results have been qualified and reported.FWGIDW-230301-WW (280-177167-1), (280-177167-L-1 MS) and (280-177167-L-1 MSD)

Due to the concentration of nitrite in the spiked sample, the matrix spike/ matrix spike duplicate result was higher than the highest calibration point for this analyte. The % recoveries were within % recovery limits so the results have been qualified and reported.FWGIDW-230301-WW (280-177167-1), (280-177167-L-1 MS) and (280-177167-L-1 MSD)

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

ANIONS, ION CHROMATOGRAPHY - Solid
Sample FWGIDW-230301-WS (280-177167-2) was analyzed for anions in accordance with SW 846 9056A (48 Hours). The samples were leached on 06/09/2023 and analyzed on 06/10/2023.

Due to the concentration of nitrate in the spiked sample and the matrix spike reagent, the matrix spike/ matrix spike duplicate result was higher than the highest calibration point for this analyte. The % recoveries were within % recovery limits so the results have been qualified and reported.FWGIDW-230301-WS (280-177167-2), (280-177167-F-2-D MS) and (280-177167-F-2-E MSD)

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

PERCENT SOLIDS
Sample FWGIDW-230301-WS (280-177167-2) was analyzed for percent solids in accordance with ASTM D2216-90. The samples were analyzed on 06/01/2023.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Detection Summary

Client: Leidos, Inc.
Project/Site: RVAAP FWGW FS Well Install 2023

Job ID: 280-177167-1

Client Sample ID: FWGIDW-230301-WW

Lab Sample ID: 280-177167-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.0070	J	0.010	0.00082	mg/L	1		6010C	TCLP
Cadmium	0.00023	J	0.0050	0.00013	mg/L	1		6010C	TCLP
Chromium	0.00087	J	0.010	0.00066	mg/L	1		6010C	TCLP
Flashpoint	>160		1.00	1.00	Degrees F	1		1010A	Total/NA
pH adj. to 25 deg C	7.8	HF	0.1	0.1	SU	1		9040C	Total/NA
Temperature	20.8	HF	1.0	1.0	Degrees C	1		9040C	Total/NA
Nitrate as N	0.52		0.50	0.090	mg/L	1		9056	Total/NA
Nitrite as N	0.13	J	0.50	0.049	mg/L	1		9056	Total/NA

Client Sample ID: FWGIDW-230301-WS

Lab Sample ID: 280-177167-2

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	0.094		0.010	0.0030	mg/L	1		8260B	TCLP
Barium	0.38		0.050	0.0041	mg/L	1		6010C	TCLP
Cadmium	0.0047	J	0.025	0.00065	mg/L	1		6010C	TCLP
Chromium	0.0083	J	0.050	0.0033	mg/L	1		6010C	TCLP
Lead	0.020	J	0.045	0.014	mg/L	1		6010C	TCLP
Ignitability	NB				mm/sec	1		1030	Total/NA
pH adj. to 25 deg C	10.7	HF	0.1	0.1	SU	1		9045D	Soluble
Temperature	21.3	HF	1.0	1.0	Degrees C	1		9045D	Soluble

This Detection Summary does not include radiochemical test results.

Method Summary

Client: Leidos, Inc.
Job ID: 280-177167-1
Project/Site: RVAAP FWGW FS Well Install 2023

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	EET DEN
8270D	Semivolatile Organic Compounds (GC/MS)	SW846	EET DEN
8081B	Organochlorine Pesticides (GC)	SW846	EET DEN
8082A	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	SW846	EET DEN
8321A Herb	Herbicides (LC/MS)	SW846	EET DEN
6010C	Metals (ICP)	SW846	EET DEN
7470A	Mercury (CVAA)	SW846	EET DEN
1010A	Ignitability, Pensky-Martens Closed-Cup Method	SW846	EET DEN
1030	Ignitability, Solids	SW846	EET SAV
9012B	Cyanide, Total and/or Amenable	SW846	EET DEN
9034	Sulfide, Acid Soluble and Insoluble (Titrimetric)	SW846	EET DEN
9040C	pH	SW846	EET DEN
9045D	pH	SW846	EET DEN
9056	Anions, Ion Chromatography	SW846	EET DEN
9056A	Anions, Ion Chromatography	SW846	EET DEN
Moisture	Percent Moisture	EPA	EET DEN
1311	TCLP Extraction	SW846	EET DEN
3010A	Preparation, Total Metals	SW846	EET DEN
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	EET DEN
3546	Microwave Extraction	SW846	EET DEN
5030B	Purge and Trap	SW846	EET DEN
7470A	Preparation, Mercury	SW846	EET DEN
9012B	Cyanide, Total and/or Amenable, Distillation	SW846	EET DEN
9030B	Sulfide, Distillation (Acid Soluble and Insoluble)	SW846	EET DEN
DI Leach	Deionized Water Leaching Procedure	ASTM	EET DEN

Protocol References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Sample Summary

Client: Leidos, Inc.
Job ID: 280-177167-1
Project/Site: RVAAP FWGW FS Well Install 2023

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
280-177167-1	FWGIDW-230301-WW	Water	05/30/23 12:45	05/31/23 10:40
280-177167-2	FWGIDW-230301-WS	Solid	05/30/23 11:30	05/31/23 10:40

Method: SW846 8260B - Volatile Organic Compounds (GC/MS) - TCLP

Client Sample ID: FWGIDW-230301-WW **Lab Sample ID: 280-177167-1**
Date Collected: 05/30/23 12:45 **Matrix: Water**
Date Received: 05/31/23 10:40

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	0.0080	U	0.010	0.0023	mg/L			06/12/23 21:45	1
Benzene	0.0080	U	0.010	0.0031	mg/L			06/12/23 21:45	1
Carbon tetrachloride	0.0080	U	0.010	0.0057	mg/L			06/12/23 21:45	1
Chlorobenzene	0.0080	U	0.010	0.0042	mg/L			06/12/23 21:45	1
Chloroform	0.0080	U	0.010	0.0036	mg/L			06/12/23 21:45	1
Tetrachloroethene	0.0080	U	0.010	0.0040	mg/L			06/12/23 21:45	1
Trichloroethene	0.0040	U	0.010	0.0030	mg/L			06/12/23 21:45	1
Vinyl chloride	0.010	U	0.020	0.0051	mg/L			06/12/23 21:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*82*		*64 - 129*		*06/12/23 21:45*	*1*
4-Bromofluorobenzene (Surr)	*95*		*78 - 121*		*06/12/23 21:45*	*1*
Dibromofluoromethane (Surr)	*88*		*79 - 119*		*06/12/23 21:45*	*1*
Toluene-d8 (Surr)	*102*		*78 - 120*		*06/12/23 21:45*	*1*

Client Sample ID: FWGIDW-230301-WS **Lab Sample ID: 280-177167-2**
Date Collected: 05/30/23 11:30 **Matrix: Solid**
Date Received: 05/31/23 10:40

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Benzene	0.0080	U	0.010	0.0031	mg/L			06/09/23 04:09	1
2-Butanone (MEK)	0.12	U	0.15	0.060	mg/L			06/09/23 04:09	1
Carbon tetrachloride	0.0080	U	0.010	0.0057	mg/L			06/09/23 04:09	1
Chlorobenzene	0.0080	U	0.010	0.0042	mg/L			06/09/23 04:09	1
Chloroform	0.0080	U	0.010	0.0036	mg/L			06/09/23 04:09	1
1,2-Dichloroethane	0.0080	U M	0.010	0.0054	mg/L			06/09/23 04:09	1
1,1-Dichloroethene	0.0080	U	0.010	0.0023	mg/L			06/09/23 04:09	1
Tetrachloroethene	0.0080	U	0.010	0.0040	mg/L			06/09/23 04:09	1
Trichloroethene	**0.094**		0.010	0.0030	mg/L			06/09/23 04:09	1
Vinyl chloride	0.010	U	0.020	0.0051	mg/L			06/09/23 04:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Toluene-d8 (Surr)	*99*		*78 - 120*		*06/09/23 04:09*	*1*
1,2-Dichloroethane-d4 (Surr)	*103*		*64 - 129*		*06/09/23 04:09*	*1*
4-Bromofluorobenzene (Surr)	*101*		*78 - 121*		*06/09/23 04:09*	*1*
Dibromofluoromethane (Surr)	*100*		*79 - 119*		*06/09/23 04:09*	*1*

Method: SW846 8260B - Volatile Organic Compounds (GC/MS) - TCLP - RA

Client Sample ID: FWGIDW-230301-WW **Lab Sample ID: 280-177167-1**
Date Collected: 05/30/23 12:45 **Matrix: Water**
Date Received: 05/31/23 10:40

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane	0.0080	U H	0.010	0.0054	mg/L			06/14/23 20:57	1
2-Butanone (MEK)	0.12	U H	0.15	0.060	mg/L			06/14/23 20:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*64 - 129*		*06/14/23 20:57*	*1*
4-Bromofluorobenzene (Surr)	*92*		*78 - 121*		*06/14/23 20:57*	*1*
Dibromofluoromethane (Surr)	*102*		*79 - 119*		*06/14/23 20:57*	*1*
Toluene-d8 (Surr)	*97*		*78 - 120*		*06/14/23 20:57*	*1*

Method: SW846 8270D - Semivolatile Organic Compounds (GC/MS) - TCLP

Client Sample ID: FWGIDW-230301-WW
Lab Sample ID: 280-177167-1
Date Collected: 05/30/23 12:45
Matrix: Water
Date Received: 05/31/23 10:40

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	0.0032	U	0.0040	0.0014	mg/L		06/09/23 14:55	06/14/23 14:04	1
2,4-Dinitrotoluene	0.0080	U	0.010	0.0014	mg/L		06/09/23 14:55	06/14/23 14:04	1
Hexachlorobenzene	0.0080	U	0.010	0.00086	mg/L		06/09/23 14:55	06/14/23 14:04	1
Hexachlorobutadiene	0.0080	U	0.010	0.0029	mg/L		06/09/23 14:55	06/14/23 14:04	1
Hexachloroethane	0.0080	U	0.010	0.0045	mg/L		06/09/23 14:55	06/14/23 14:04	1
2-Methylphenol	0.0080	U	0.010	0.00077	mg/L		06/09/23 14:55	06/14/23 14:04	1
3 & 4 Methylphenol	0.0080	U	0.010	0.00080	mg/L		06/09/23 14:55	06/14/23 14:04	1
Nitrobenzene	0.0080	U	0.010	0.0013	mg/L		06/09/23 14:55	06/14/23 14:04	1
Pentachlorophenol	0.048	U	0.050	0.020	mg/L		06/09/23 14:55	06/14/23 14:04	1
Pyridine	0.048	U Q	0.050	0.018	mg/L		06/09/23 14:55	06/14/23 14:04	1
2,4,5-Trichlorophenol	0.0080	U	0.010	0.00090	mg/L		06/09/23 14:55	06/14/23 14:04	1
2,4,6-Trichlorophenol	0.0080	U	0.010	0.00071	mg/L		06/09/23 14:55	06/14/23 14:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*78*		*44 - 119*	*06/09/23 14:55*	*06/14/23 14:04*	*1*
2-Fluorophenol (Surr)	*77*		*19 - 119*	*06/09/23 14:55*	*06/14/23 14:04*	*1*
2,4,6-Tribromophenol (Surr)	*98*		*43 - 140*	*06/09/23 14:55*	*06/14/23 14:04*	*1*
Nitrobenzene-d5 (Surr)	*90*		*44 - 120*	*06/09/23 14:55*	*06/14/23 14:04*	*1*
Phenol-d5 (Surr)	*63*		*10 - 115*	*06/09/23 14:55*	*06/14/23 14:04*	*1*
Terphenyl-d14 (Surr)	*108*		*50 - 134*	*06/09/23 14:55*	*06/14/23 14:04*	*1*

Client Sample ID: FWGIDW-230301-WS
Lab Sample ID: 280-177167-2
Date Collected: 05/30/23 11:30
Matrix: Solid
Date Received: 05/31/23 10:40

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	0.0032	U	0.0040	0.0014	mg/L		06/06/23 18:16	06/08/23 17:54	1
2,4-Dinitrotoluene	0.0080	U	0.010	0.0014	mg/L		06/06/23 18:16	06/08/23 17:54	1
Hexachlorobenzene	0.0080	U	0.010	0.00086	mg/L		06/06/23 18:16	06/08/23 17:54	1
Hexachlorobutadiene	0.0080	U	0.010	0.0029	mg/L		06/06/23 18:16	06/08/23 17:54	1
Hexachloroethane	0.0080	U	0.010	0.0045	mg/L		06/06/23 18:16	06/08/23 17:54	1
2-Methylphenol	0.0080	U	0.010	0.00077	mg/L		06/06/23 18:16	06/08/23 17:54	1
3 & 4 Methylphenol	0.0080	U	0.010	0.00080	mg/L		06/06/23 18:16	06/08/23 17:54	1
Nitrobenzene	0.0080	U	0.010	0.0013	mg/L		06/06/23 18:16	06/08/23 17:54	1
Pentachlorophenol	0.048	U	0.050	0.020	mg/L		06/06/23 18:16	06/08/23 17:54	1
Pyridine	0.048	U	0.050	0.018	mg/L		06/06/23 18:16	06/08/23 17:54	1
2,4,5-Trichlorophenol	0.0080	U	0.010	0.00090	mg/L		06/06/23 18:16	06/08/23 17:54	1
2,4,6-Trichlorophenol	0.0080	U	0.010	0.00071	mg/L		06/06/23 18:16	06/08/23 17:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*77*		*44 - 119*	*06/06/23 18:16*	*06/08/23 17:54*	*1*
2-Fluorophenol (Surr)	*69*		*19 - 119*	*06/06/23 18:16*	*06/08/23 17:54*	*1*
2,4,6-Tribromophenol (Surr)	*97*		*43 - 140*	*06/06/23 18:16*	*06/08/23 17:54*	*1*
Nitrobenzene-d5 (Surr)	*80*		*44 - 120*	*06/06/23 18:16*	*06/08/23 17:54*	*1*
Phenol-d5 (Surr)	*62*		*10 - 115*	*06/06/23 18:16*	*06/08/23 17:54*	*1*
Terphenyl-d14 (Surr)	*102*		*50 - 134*	*06/06/23 18:16*	*06/08/23 17:54*	*1*

Method: SW846 8081B - Organochlorine Pesticides (GC) - TCLP

Client Sample ID: FWGIDW-230301-WW **Lab Sample ID: 280-177167-1**
Date Collected: 05/30/23 12:45 **Matrix: Water**
Date Received: 05/31/23 10:40

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Endrin	0.00020	U	0.00050	0.000079	mg/L		06/09/23 15:02	06/14/23 17:09	1
Heptachlor	0.00020	U	0.00050	0.000077	mg/L		06/09/23 15:02	06/14/23 17:09	1
Heptachlor epoxide	0.00020	U	0.00050	0.000075	mg/L		06/09/23 15:02	06/14/23 17:09	1
gamma-BHC (Lindane)	0.00020	U	0.00050	0.000069	mg/L		06/09/23 15:02	06/14/23 17:09	1
Methoxychlor	0.00050	U	0.0010	0.00013	mg/L		06/09/23 15:02	06/14/23 17:09	1
Toxaphene	0.0075	U	0.020	0.0037	mg/L		06/09/23 15:02	06/14/23 17:09	1
Chlordane (technical)	0.0040	U	0.0050	0.0014	mg/L		06/09/23 15:02	06/14/23 17:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*50*		*28 - 115*	*06/09/23 15:02*	*06/14/23 17:09*	*1*
DCB Decachlorobiphenyl	*76*		*34 - 122*	*06/09/23 15:02*	*06/14/23 17:09*	*1*

Client Sample ID: FWGIDW-230301-WS **Lab Sample ID: 280-177167-2**
Date Collected: 05/30/23 11:30 **Matrix: Solid**
Date Received: 05/31/23 10:40

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Endrin	0.00020	U	0.00050	0.000079	mg/L		06/08/23 12:12	06/09/23 23:45	1
Heptachlor	0.00020	U	0.00050	0.000077	mg/L		06/08/23 12:12	06/09/23 23:45	1
Heptachlor epoxide	0.00020	U	0.00050	0.000075	mg/L		06/08/23 12:12	06/09/23 23:45	1
gamma-BHC (Lindane)	0.00020	U	0.00050	0.000069	mg/L		06/08/23 12:12	06/09/23 23:45	1
Methoxychlor	0.00050	U	0.0010	0.00013	mg/L		06/08/23 12:12	06/09/23 23:45	1
Toxaphene	0.0075	U	0.020	0.0037	mg/L		06/08/23 12:12	06/09/23 23:45	1
Chlordane (technical)	0.0040	U	0.0050	0.0014	mg/L		06/08/23 12:12	06/09/23 23:45	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*72*		*28 - 115*	*06/08/23 12:12*	*06/09/23 23:45*	*1*
DCB Decachlorobiphenyl	*81*		*34 - 122*	*06/08/23 12:12*	*06/09/23 23:45*	*1*

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Client Sample ID: FWGIDW-230301-WW **Lab Sample ID: 280-177167-1**
Date Collected: 05/30/23 12:45 **Matrix: Water**
Date Received: 05/31/23 10:40

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	0.41	U Q	1.0	0.13	ug/L		06/02/23 16:17	06/07/23 21:26	1
PCB-1221	0.26	U	1.0	0.22	ug/L		06/02/23 16:17	06/07/23 21:26	1
PCB-1232	0.61	U	1.0	0.17	ug/L		06/02/23 16:17	06/07/23 21:26	1
PCB-1242	0.92	U	1.0	0.43	ug/L		06/02/23 16:17	06/07/23 21:26	1
PCB-1248	0.31	U	1.0	0.093	ug/L		06/02/23 16:17	06/07/23 21:26	1
PCB-1254	0.26	U	1.0	0.12	ug/L		06/02/23 16:17	06/07/23 21:26	1
PCB-1260	0.41	U Q	1.0	0.16	ug/L		06/02/23 16:17	06/07/23 21:26	1
PCB-1262	0.51	U	1.0	0.23	ug/L		06/02/23 16:17	06/07/23 21:26	1
PCB-1268	0.92	U	1.0	0.37	ug/L		06/02/23 16:17	06/07/23 21:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*93*	*Q*	*25 - 120*	*06/02/23 16:17*	*06/07/23 21:26*	*1*
DCB Decachlorobiphenyl	*134*	*Q*	*30 - 136*	*06/02/23 16:17*	*06/07/23 21:26*	*1*

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Client Sample ID: FWGIDW-230301-WS **Lab Sample ID: 280-177167-2**
Date Collected: 05/30/23 11:30 **Matrix: Solid**
Date Received: 05/31/23 10:40 **Percent Solids: 80.0**

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	38	U M	83	26	ug/Kg	☼	06/12/23 12:18	06/14/23 14:14	1
PCB-1221	75	U	120	39	ug/Kg	☼	06/12/23 12:18	06/14/23 14:14	1
PCB-1232	27	U M	83	13	ug/Kg	☼	06/12/23 12:18	06/14/23 14:14	1
PCB-1242	75	U M	83	23	ug/Kg	☼	06/12/23 12:18	06/14/23 14:14	1
PCB-1248	38	U M	83	20	ug/Kg	☼	06/12/23 12:18	06/14/23 14:14	1
PCB-1254	38	U	83	14	ug/Kg	☼	06/12/23 12:18	06/14/23 14:14	1
PCB-1260	38	U	83	21	ug/Kg	☼	06/12/23 12:18	06/14/23 14:14	1
PCB-1262	27	U	83	6.8	ug/Kg	☼	06/12/23 12:18	06/14/23 14:14	1
PCB-1268	75	U	83	26	ug/Kg	☼	06/12/23 12:18	06/14/23 14:14	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*84*		*44 - 130*	*06/12/23 12:18*	*06/14/23 14:14*	*1*
DCB Decachlorobiphenyl	*70*		*59 - 130*	*06/12/23 12:18*	*06/14/23 14:14*	*1*

Method: SW846 8321A Herb - Herbicides (LC/MS) - TCLP

Client Sample ID: FWGIDW-230301-WW **Lab Sample ID: 280-177167-1**
Date Collected: 05/30/23 12:45 **Matrix: Water**
Date Received: 05/31/23 10:40

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	4.0	U M	5.0	1.6	ug/L			06/09/23 20:43	1
Silvex (2,4,5-TP)	2.0	U	5.0	0.97	ug/L			06/09/23 20:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid (Surr)	*90*		*25 - 125*		*06/09/23 20:43*	*1*

Client Sample ID: FWGIDW-230301-WS **Lab Sample ID: 280-177167-2**
Date Collected: 05/30/23 11:30 **Matrix: Solid**
Date Received: 05/31/23 10:40

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	40	U M	50	16	ug/L			06/07/23 19:05	10
Silvex (2,4,5-TP)	20	U	50	9.7	ug/L			06/07/23 19:05	10

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid (Surr)	*98*		*25 - 125*		*06/07/23 19:05*	*10*

Method: SW846 6010C - Metals (ICP) - TCLP

Client Sample ID: FWGIDW-230301-WW **Lab Sample ID: 280-177167-1**
Date Collected: 05/30/23 12:45 **Matrix: Water**
Date Received: 05/31/23 10:40

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.014	U	0.015	0.0044	mg/L		06/12/23 07:57	06/12/23 15:57	1
Barium	**0.0070**	**J**	0.010	0.00082	mg/L		06/12/23 07:57	06/12/23 15:57	1
Cadmium	**0.00023**	**J**	0.0050	0.00013	mg/L		06/12/23 07:57	06/12/23 15:57	1
Chromium	**0.00087**	**J**	0.010	0.00066	mg/L		06/12/23 07:57	06/12/23 15:57	1
Lead	0.0075	U	0.0090	0.0027	mg/L		06/12/23 07:57	06/12/23 15:57	1
Selenium	0.019	U	0.020	0.0063	mg/L		06/12/23 07:57	06/12/23 15:57	1
Silver	0.0060	U	0.010	0.0020	mg/L		06/12/23 07:57	06/12/23 15:57	1

Method: SW846 6010C - Metals (ICP) - TCLP

Client Sample ID: FWGIDW-230301-WS — **Lab Sample ID: 280-177167-2**
Date Collected: 05/30/23 11:30 — **Matrix: Solid**
Date Received: 05/31/23 10:40

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.071	U	0.075	0.022	mg/L		06/07/23 14:07	06/08/23 13:17	1
Barium	**0.38**		0.050	0.0041	mg/L		06/07/23 14:07	06/08/23 13:17	1
Cadmium	**0.0047**	**J**	0.025	0.00065	mg/L		06/07/23 14:07	06/08/23 13:17	1
Chromium	**0.0083**	**J**	0.050	0.0033	mg/L		06/07/23 14:07	06/08/23 13:17	1
Lead	**0.020**	**J**	0.045	0.014	mg/L		06/07/23 14:07	06/08/23 13:17	1
Selenium	0.095	U	0.10	0.032	mg/L		06/07/23 14:07	06/08/23 13:17	1
Silver	0.030	U	0.050	0.0098	mg/L		06/07/23 14:07	06/08/23 13:17	1

Method: SW846 7470A - Mercury (CVAA) - TCLP

Client Sample ID: FWGIDW-230301-WW — **Lab Sample ID: 280-177167-1**
Date Collected: 05/30/23 12:45 — **Matrix: Water**
Date Received: 05/31/23 10:40

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.000080	U	0.00020	0.000061	mg/L		06/09/23 14:00	06/09/23 17:36	1

Client Sample ID: FWGIDW-230301-WS — **Lab Sample ID: 280-177167-2**
Date Collected: 05/30/23 11:30 — **Matrix: Solid**
Date Received: 05/31/23 10:40

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.000080	U	0.00020	0.000061	mg/L		06/07/23 16:11	06/07/23 21:19	1

General Chemistry

Client Sample ID: FWGIDW-230301-WW — **Lab Sample ID: 280-177167-1**
Date Collected: 05/30/23 12:45 — **Matrix: Water**
Date Received: 05/31/23 10:40

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Flashpoint (SW846 1010A)	**>160**		1.00	1.00	Degrees F			06/13/23 14:04	1
Cyanide, Total (SW846 9012B)	0.0090	U	0.010	0.0050	mg/L			06/06/23 10:36	1
Sulfide (SW846 9034)	2.0	U	4.0	1.6	mg/L		06/06/23 12:06	06/06/23 12:08	1
pH adj. to 25 deg C (SW846 9040C)	**7.8**	**HF**	0.1	0.1	SU			06/02/23 16:11	1
Temperature (SW846 9040C)	**20.8**	**HF**	1.0	1.0	Degrees C			06/02/23 16:11	1
Nitrate as N (SW846 9056)	**0.52**		0.50	0.090	mg/L			05/31/23 18:16	1
Nitrite as N (SW846 9056)	**0.13**	**J**	0.50	0.049	mg/L			05/31/23 18:16	1

Client Sample ID: FWGIDW-230301-WS — **Lab Sample ID: 280-177167-2**
Date Collected: 05/30/23 11:30 — **Matrix: Solid**
Date Received: 05/31/23 10:40

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Ignitability (SW846 1030)	**NB**				mm/sec			06/12/23 13:31	1
Percent Moisture (EPA Moisture)	**20.0**		0.1	0.1	%			06/01/23 12:23	1
Percent Solids (EPA Moisture)	**80.0**		0.1	0.1	%			06/01/23 12:23	1

Client Sample ID: FWGIDW-230301-WS — **Lab Sample ID: 280-177167-2**
Date Collected: 05/30/23 11:30 — **Matrix: Solid**
Date Received: 05/31/23 10:40 — **Percent Solids: 80.0**

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total (SW846 9012B)	0.45	U	0.57	0.28	mg/Kg	☼	06/08/23 09:43	06/08/23 13:37	1
Sulfide (SW846 9034)	9.3	U J1	12	5.0	mg/Kg	☼	06/01/23 11:49	06/01/23 13:56	1

Client: Leidos, Inc.
Job ID: 280-177167-1
Project/Site: RVAAP FWGW FS Well Install 2023

General Chemistry - Soluble

Client Sample ID: FWGIDW-230301-WS
Lab Sample ID: 280-177167-2
Date Collected: 05/30/23 11:30
Matrix: Solid
Date Received: 05/31/23 10:40

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
pH adj. to 25 deg C (SW846 9045D)	10.7	HF	0.1	0.1	SU			06/06/23 11:58	1
Temperature (SW846 9045D)	21.3	HF	1.0	1.0	Degrees C			06/06/23 11:58	1

Client Sample ID: FWGIDW-230301-WS
Lab Sample ID: 280-177167-2
Date Collected: 05/30/23 11:30
Matrix: Solid
Date Received: 05/31/23 10:40
Percent Solids: 80.0

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N (SW846 9056A)	5.8	U	6.2	1.1	mg/Kg	☼		06/10/23 05:36	1
Nitrite as N (SW846 9056A)	5.8	U H	6.2	1.6	mg/Kg	☼		06/10/23 05:36	1

Surrogate Summary

Client: Leidos, Inc.
Project/Site: RVAAP FWGW FS Well Install 2023

Job ID: 280-177167-1

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Solid — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	TOL	BFB	DBFM
Lab Sample ID	Client Sample ID	(64-129)	(78-120)	(78-121)	(79-119)
LCS 280-614442/2-A	Lab Control Sample	102	100	104	99

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
TOL = Toluene-d8 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Solid — **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)			
		TOL	DCA	BFB	DBFM
Lab Sample ID	Client Sample ID	(78-120)	(64-129)	(78-121)	(79-119)
280-177167-2	FWGIDW-230301-WS	99	103	101	100
LB 280-614442/1-A	Method Blank	100	106	99	104
LCSD 280-614442/3-A	Lab Control Sample Dup	99	103	100	100

Surrogate Legend

TOL = Toluene-d8 (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Matrix: Water — **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(64-129)	(78-121)	(79-119)	(78-120)
280-177167-1	FWGIDW-230301-WW	82	95	88	102
280-177167-1 - RA	FWGIDW-230301-WW	99	92	102	97
LB3 280-615640/1-A	Method Blank	83	95	89	99
LB3 280-615640/1-A	Method Blank	98	94	101	98
LCS 280-615640/2-A	Lab Control Sample	84	97	90	99
LCS 280-615640/2-A	Lab Control Sample	98	95	101	96
LCSD 280-615640/3-A	Lab Control Sample Dup	85	99	91	100
LCSD 280-615640/3-A	Lab Control Sample Dup	100	93	101	97

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid — **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)					
		FBP	2FP	TBP	NBZ	PHL	TPHL
Lab Sample ID	Client Sample ID	(44-119)	(19-119)	(43-140)	(44-120)	(10-115)	(50-134)
280-177167-2	FWGIDW-230301-WS	77	69	97	80	62	102

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)					
		FBP	2FP	TBP	NBZ	PHL	TPHL
Lab Sample ID	Client Sample ID	(44-119)	(19-119)	(43-140)	(44-120)	(10-115)	(50-134)
LB 280-614928/1-B	Method Blank	82	58	89	80	46	96
LCS 280-614928/2-B	Lab Control Sample	82	69	85	76	66	88

Surrogate Legend

FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPHL = Terphenyl-d14 (Surr)

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Matrix: Water **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)					
		FBP	2FP	TBP	NBZ	PHL	TPHL
Lab Sample ID	Client Sample ID	(44-119)	(19-119)	(43-140)	(44-120)	(10-115)	(50-134)
280-177167-1	FWGIDW-230301-WW	78	77	98	90	63	108
LB3 280-615475/1-D	Method Blank	85	82	99	96	67	115
LCS 280-615475/2-D	Lab Control Sample	90	74	102	94	61	104
LCSD 280-615475/3-B	Lab Control Sample Dup	90	77	105	94	64	105

Surrogate Legend

FBP = 2-Fluorobiphenyl
2FP = 2-Fluorophenol (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
PHL = Phenol-d5 (Surr)
TPHL = Terphenyl-d14 (Surr)

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)	
		TCX1	DCBP1
Lab Sample ID	Client Sample ID	(28-115)	(34-122)
280-177167-2	FWGIDW-230301-WS	72	81
LB 280-614928/1-E	Method Blank	73	78 M
LCS 280-614928/2-E	Lab Control Sample	88	92
LCS 280-614928/2-G	Lab Control Sample	77	84
LCSD 280-614928/3-B	Lab Control Sample Dup	83	88

Surrogate Legend

TCX = Tetrachloro-m-xylene
DCBP = DCB Decachlorobiphenyl

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Water **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)	
		TCX1	DCBP1
Lab Sample ID	Client Sample ID	(28-115)	(34-122)
280-177167-1	FWGIDW-230301-WW	50	76

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Matrix: Water **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)	
		TCX1	DCBP1
Lab Sample ID	Client Sample ID	(28-115)	(34-122)
LB3 280-615475/1-F	Method Blank	65	83
LCS 280-615475/2-F	Lab Control Sample	71	82
LCS 280-615475/2-G	Lab Control Sample	66	77
LCSD 280-615475/3-D	Lab Control Sample Dup	69	84
LCSD 280-615475/3-E	Lab Control Sample Dup	73	85

Surrogate Legend

TCX = Tetrachloro-m-xylene

DCBP = DCB Decachlorobiphenyl

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)	
		TCX1	DCBP1
Lab Sample ID	Client Sample ID	(44-130)	(59-130)
280-177167-2	FWGIDW-230301-WS	84	70
LCS 280-615721/2-A	Lab Control Sample	101	97
MB 280-615721/1-A	Method Blank	106	107

Surrogate Legend

TCX = Tetrachloro-m-xylene

DCBP = DCB Decachlorobiphenyl

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)	
		TCX1	DCBP1
Lab Sample ID	Client Sample ID	(25-120)	(30-136)
280-177167-1	FWGIDW-230301-WW	93 Q	134 Q
LCS 280-614674/4-A	Lab Control Sample	93	134
LCSD 280-614674/5-A	Lab Control Sample Dup	94	136
MB 280-614674/1-A	Method Blank	79	142 Q

Surrogate Legend

TCX = Tetrachloro-m-xylene

DCBP = DCB Decachlorobiphenyl

Method: 8321A Herb - Herbicides (LC/MS)

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)
		DCPAA
Lab Sample ID	Client Sample ID	(25-125)
280-177167-2	FWGIDW-230301-WS	98
280-177167-2 MS	FWGIDW-230301-WS	98
280-177167-2 MSD	FWGIDW-230301-WS	102
LB 280-614928/1-A	Method Blank	95
LCS 280-614928/2-A	Lab Control Sample	104

Surrogate Legend

DCPAA = 2,4-Dichlorophenylacetic acid (Surr)

Surrogate Summary

Client: Leidos, Inc. Job ID: 280-177167-1
Project/Site: RVAAP FWGW FS Well Install 2023

Method: 8321A Herb - Herbicides (LC/MS)

Matrix: Water **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	DCPAA (25-125)
280-177167-1	FWGIDW-230301-WW	90
280-177167-1 MS	FWGIDW-230301-WW	96
280-177167-1 MSD	FWGIDW-230301-WW	94
LB3 280-615475/1-A	Method Blank	99
LCS 280-615475/2-A	Lab Control Sample	96

Surrogate Legend

DCPAA = 2,4-Dichlorophenylacetic acid (Surr)

Method: 8260B - Volatile Organic Compounds (GC/MS)

Lab Sample ID: LCS 280-614442/2-A
Matrix: Solid
Analysis Batch: 615474

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
2-Butanone (MEK)			2.00	2.27		mg/L		113	44 - 150		
1,2-Dichloroethane			0.500	0.527		mg/L		105	70 - 135		
Benzene			0.500	0.449		mg/L		90	74 - 135		
1,1-Dichloroethene			0.500	0.413		mg/L		83	71 - 136		
Carbon tetrachloride			0.500	0.477		mg/L		95	67 - 135		
Chlorobenzene			0.500	0.473		mg/L		95	76 - 135		
Chloroform			0.500	0.479		mg/L		96	76 - 120		
Tetrachloroethene			0.500	0.478		mg/L		96	70 - 135		
Trichloroethene			0.500	0.458		mg/L		92	73 - 135		
Vinyl chloride			0.500	0.409		mg/L		82	40 - 144		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*102*		*64 - 129*
Toluene-d8 (Surr)	*100*		*78 - 120*
4-Bromofluorobenzene (Surr)	*104*		*78 - 121*
Dibromofluoromethane (Surr)	*99*		*79 - 119*

Lab Sample ID: LB 280-614442/1-A
Matrix: Solid
Analysis Batch: 615474

Client Sample ID: Method Blank
Prep Type: TCLP

Analyte	LB Result	LB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
2-Butanone (MEK)	0.12	U	0.15	0.060	mg/L			06/08/23 23:56	1
1,2-Dichloroethane	0.0080	U M	0.010	0.0054	mg/L			06/08/23 23:56	1
Benzene	0.0080	U	0.010	0.0031	mg/L			06/08/23 23:56	1
1,1-Dichloroethene	0.0080	U	0.010	0.0023	mg/L			06/08/23 23:56	1
Carbon tetrachloride	0.0080	U	0.010	0.0057	mg/L			06/08/23 23:56	1
Chlorobenzene	0.0080	U	0.010	0.0042	mg/L			06/08/23 23:56	1
Chloroform	0.0080	U	0.010	0.0036	mg/L			06/08/23 23:56	1
Tetrachloroethene	0.0080	U	0.010	0.0040	mg/L			06/08/23 23:56	1
Trichloroethene	0.0040	U	0.010	0.0030	mg/L			06/08/23 23:56	1
Vinyl chloride	0.010	U	0.020	0.0051	mg/L			06/08/23 23:56	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*106*		*64 - 129*		*06/08/23 23:56*	*1*
Toluene-d8 (Surr)	*100*		*78 - 120*		*06/08/23 23:56*	*1*
4-Bromofluorobenzene (Surr)	*99*		*78 - 121*		*06/08/23 23:56*	*1*
Dibromofluoromethane (Surr)	*104*		*79 - 119*		*06/08/23 23:56*	*1*

Lab Sample ID: LCSD 280-614442/3-A
Matrix: Solid
Analysis Batch: 615474

Client Sample ID: Lab Control Sample Dup
Prep Type: TCLP

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
2-Butanone (MEK)			2.00	2.40		mg/L		120	44 - 150	6	32
1,2-Dichloroethane			0.500	0.566		mg/L		113	70 - 135	7	20
Benzene			0.500	0.497		mg/L		99	74 - 135	10	20
1,1-Dichloroethene			0.500	0.456		mg/L		91	71 - 136	10	20

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 280-614442/3-A
Matrix: Solid
Analysis Batch: 615474

Client Sample ID: Lab Control Sample Dup
Prep Type: TCLP

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Carbon tetrachloride			0.500	0.537		mg/L		107	67 - 135	12	21
Chlorobenzene			0.500	0.511		mg/L		102	76 - 135	8	20
Chloroform			0.500	0.522		mg/L		104	76 - 120	9	20
Tetrachloroethene			0.500	0.515		mg/L		103	70 - 135	7	20
Trichloroethene			0.500	0.508		mg/L		102	73 - 135	10	20
Vinyl chloride			0.500	0.449		mg/L		90	40 - 144	9	24

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*64 - 129*
Toluene-d8 (Surr)	*99*		*78 - 120*
4-Bromofluorobenzene (Surr)	*100*		*78 - 121*
Dibromofluoromethane (Surr)	*100*		*79 - 119*

Lab Sample ID: LB3 280-615640/1-A
Matrix: Water
Analysis Batch: 615800

Client Sample ID: Method Blank
Prep Type: TCLP

Analyte	LB3 Result	LB3 Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
2-Butanone (MEK)	0.12	U	0.15	0.060	mg/L			06/12/23 19:53	1
1,2-Dichloroethane	0.0080	U	0.010	0.0054	mg/L			06/12/23 19:53	1
Benzene	0.0080	U	0.010	0.0031	mg/L			06/12/23 19:53	1
1,1-Dichloroethene	0.0080	U	0.010	0.0023	mg/L			06/12/23 19:53	1
Carbon tetrachloride	0.0080	U	0.010	0.0057	mg/L			06/12/23 19:53	1
Chlorobenzene	0.0080	U	0.010	0.0042	mg/L			06/12/23 19:53	1
Chloroform	0.0080	U	0.010	0.0036	mg/L			06/12/23 19:53	1
Tetrachloroethene	0.0080	U	0.010	0.0040	mg/L			06/12/23 19:53	1
Trichloroethene	0.0040	U	0.010	0.0030	mg/L			06/12/23 19:53	1
Vinyl chloride	0.010	U	0.020	0.0051	mg/L			06/12/23 19:53	1

Surrogate	*LB3 %Recovery*	*LB3 Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*83*		*64 - 129*		*06/12/23 19:53*	*1*
Toluene-d8 (Surr)	*99*		*78 - 120*		*06/12/23 19:53*	*1*
4-Bromofluorobenzene (Surr)	*95*		*78 - 121*		*06/12/23 19:53*	*1*
Dibromofluoromethane (Surr)	*89*		*79 - 119*		*06/12/23 19:53*	*1*

Lab Sample ID: LCS 280-615640/2-A
Matrix: Water
Analysis Batch: 615800

Client Sample ID: Lab Control Sample
Prep Type: TCLP

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
2-Butanone (MEK)			2.00	1.59		mg/L		79	44 - 150		
1,2-Dichloroethane			0.500	0.396		mg/L		79	70 - 135		
Benzene			0.500	0.435		mg/L		87	74 - 135		
1,1-Dichloroethene			0.500	0.452		mg/L		90	71 - 136		
Carbon tetrachloride			0.500	0.470		mg/L		94	67 - 135		
Chlorobenzene			0.500	0.488		mg/L		98	76 - 135		
Chloroform			0.500	0.427		mg/L		85	76 - 120		
Tetrachloroethene			0.500	0.533		mg/L		107	70 - 135		

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 280-615640/2-A
Matrix: Water
Analysis Batch: 615800

Client Sample ID: Lab Control Sample
Prep Type: TCLP

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Trichloroethene	0.500	0.481		mg/L		96	73 - 135
Vinyl chloride	0.500	0.365		mg/L		73	40 - 144

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*64 - 129*
Toluene-d8 (Surr)	*99*		*78 - 120*
4-Bromofluorobenzene (Surr)	*97*		*78 - 121*
Dibromofluoromethane (Surr)	*90*		*79 - 119*

Lab Sample ID: LCSD 280-615640/3-A
Matrix: Water
Analysis Batch: 615800

Client Sample ID: Lab Control Sample Dup
Prep Type: TCLP

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
2-Butanone (MEK)	2.00	1.59		mg/L		79	44 - 150	0	32
1,2-Dichloroethane	0.500	0.398		mg/L		80	70 - 135	1	20
Benzene	0.500	0.433		mg/L		87	74 - 135	0	20
1,1-Dichloroethene	0.500	0.453		mg/L		91	71 - 136	0	20
Carbon tetrachloride	0.500	0.473		mg/L		95	67 - 135	1	21
Chlorobenzene	0.500	0.492		mg/L		98	76 - 135	1	20
Chloroform	0.500	0.427		mg/L		85	76 - 120	0	20
Tetrachloroethene	0.500	0.517		mg/L		103	70 - 135	3	20
Trichloroethene	0.500	0.485		mg/L		97	73 - 135	1	20
Vinyl chloride	0.500	0.368		mg/L		74	40 - 144	1	24

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*85*		*64 - 129*
Toluene-d8 (Surr)	*100*		*78 - 120*
4-Bromofluorobenzene (Surr)	*99*		*78 - 121*
Dibromofluoromethane (Surr)	*91*		*79 - 119*

Lab Sample ID: LB3 280-615640/1-A
Matrix: Water
Analysis Batch: 616166

Client Sample ID: Method Blank
Prep Type: TCLP

Analyte	LB3 Result	LB3 Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
2-Butanone (MEK)	0.12	U	0.15	0.060	mg/L			06/14/23 20:14	1
1,2-Dichloroethane	0.0080	U	0.010	0.0054	mg/L			06/14/23 20:14	1

Surrogate	*LB3 %Recovery*	*LB3 Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*64 - 129*		*06/14/23 20:14*	*1*
Toluene-d8 (Surr)	*98*		*78 - 120*		*06/14/23 20:14*	*1*
4-Bromofluorobenzene (Surr)	*94*		*78 - 121*		*06/14/23 20:14*	*1*
Dibromofluoromethane (Surr)	*101*		*79 - 119*		*06/14/23 20:14*	*1*

Method: 8260B - Volatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 280-615640/2-A
Matrix: Water
Analysis Batch: 616166

Client Sample ID: Lab Control Sample
Prep Type: TCLP

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
2-Butanone (MEK)			2.00	2.11		mg/L		105	44 - 150		
1,2-Dichloroethane			0.500	0.549		mg/L		110	70 - 135		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*98*		*64 - 129*
Toluene-d8 (Surr)	*96*		*78 - 120*
4-Bromofluorobenzene (Surr)	*95*		*78 - 121*
Dibromofluoromethane (Surr)	*101*		*79 - 119*

Lab Sample ID: LCSD 280-615640/3-A
Matrix: Water
Analysis Batch: 616166

Client Sample ID: Lab Control Sample Dup
Prep Type: TCLP

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
2-Butanone (MEK)			2.00	2.58		mg/L		129	44 - 150	20	32
1,2-Dichloroethane			0.500	0.565		mg/L		113	70 - 135	3	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*64 - 129*
Toluene-d8 (Surr)	*97*		*78 - 120*
4-Bromofluorobenzene (Surr)	*93*		*78 - 121*
Dibromofluoromethane (Surr)	*101*		*79 - 119*

Method: 8270D - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: LB 280-614928/1-B
Matrix: Solid
Analysis Batch: 615329

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 615134

Analyte	LB Result	LB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	0.0032	U	0.0040	0.0014	mg/L		06/06/23 18:16	06/08/23 13:26	1
2,4-Dinitrotoluene	0.0080	U	0.010	0.0014	mg/L		06/06/23 18:16	06/08/23 13:26	1
Hexachlorobenzene	0.0080	U	0.010	0.00086	mg/L		06/06/23 18:16	06/08/23 13:26	1
Hexachlorobutadiene	0.0080	U	0.010	0.0029	mg/L		06/06/23 18:16	06/08/23 13:26	1
Hexachloroethane	0.0080	U	0.010	0.0045	mg/L		06/06/23 18:16	06/08/23 13:26	1
2-Methylphenol	0.0080	U	0.010	0.00077	mg/L		06/06/23 18:16	06/08/23 13:26	1
3 & 4 Methylphenol	0.0080	U	0.010	0.00080	mg/L		06/06/23 18:16	06/08/23 13:26	1
Nitrobenzene	0.0080	U	0.010	0.0013	mg/L		06/06/23 18:16	06/08/23 13:26	1
Pentachlorophenol	0.048	U	0.050	0.020	mg/L		06/06/23 18:16	06/08/23 13:26	1
Pyridine	0.048	U	0.050	0.018	mg/L		06/06/23 18:16	06/08/23 13:26	1
2,4,5-Trichlorophenol	0.0080	U	0.010	0.00090	mg/L		06/06/23 18:16	06/08/23 13:26	1
2,4,6-Trichlorophenol	0.0080	U	0.010	0.00071	mg/L		06/06/23 18:16	06/08/23 13:26	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*82*		*44 - 119*	*06/06/23 18:16*	*06/08/23 13:26*	*1*
2-Fluorophenol (Surr)	*58*		*19 - 119*	*06/06/23 18:16*	*06/08/23 13:26*	*1*
2,4,6-Tribromophenol (Surr)	*89*		*43 - 140*	*06/06/23 18:16*	*06/08/23 13:26*	*1*
Nitrobenzene-d5 (Surr)	*80*		*44 - 120*	*06/06/23 18:16*	*06/08/23 13:26*	*1*

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LB 280-614928/1-B
Matrix: Solid
Analysis Batch: 615329

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 615134

Surrogate	LB %Recovery	LB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Phenol-d5 (Surr)	*46*		*10 - 115*	*06/06/23 18:16*	*06/08/23 13:26*	*1*
Terphenyl-d14 (Surr)	*96*		*50 - 134*	*06/06/23 18:16*	*06/08/23 13:26*	*1*

Lab Sample ID: LCS 280-614928/2-B
Matrix: Solid
Analysis Batch: 615329

Client Sample ID: Lab Control Sample
Prep Type: TCLP
Prep Batch: 615134

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,4-Dichlorobenzene	0.0800	0.0363		mg/L		45	29 - 112
2,4-Dinitrotoluene	0.0800	0.0670		mg/L		84	57 - 128
Hexachlorobenzene	0.0800	0.0670		mg/L		84	53 - 125
Hexachlorobutadiene	0.0800	0.0432		mg/L		54	22 - 124
Hexachloroethane	0.0800	0.0334		mg/L		42	21 - 115
2-Methylphenol	0.0800	0.0545		mg/L		68	30 - 117
3 & 4 Methylphenol	0.0800	0.0558		mg/L		70	29 - 110
Nitrobenzene	0.0800	0.0534		mg/L		67	45 - 121
Pentachlorophenol	0.160	0.135		mg/L		84	35 - 138
Pyridine	0.160	0.0705		mg/L		44	10 - 120
2,4,5-Trichlorophenol	0.0800	0.0694		mg/L		87	53 - 123
2,4,6-Trichlorophenol	0.0800	0.0703		mg/L		88	50 - 125

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Fluorobiphenyl	*82*		*44 - 119*
2-Fluorophenol (Surr)	*69*		*19 - 119*
2,4,6-Tribromophenol (Surr)	*85*		*43 - 140*
Nitrobenzene-d5 (Surr)	*76*		*44 - 120*
Phenol-d5 (Surr)	*66*		*10 - 115*
Terphenyl-d14 (Surr)	*88*		*50 - 134*

Lab Sample ID: LB3 280-615475/1-D
Matrix: Water
Analysis Batch: 616031

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 615587

Analyte	LB3 Result	LB3 Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	0.0032	U	0.0040	0.0014	mg/L		06/09/23 14:55	06/14/23 12:57	1
2,4-Dinitrotoluene	0.0080	U	0.010	0.0014	mg/L		06/09/23 14:55	06/14/23 12:57	1
Hexachlorobenzene	0.0080	U	0.010	0.00086	mg/L		06/09/23 14:55	06/14/23 12:57	1
Hexachlorobutadiene	0.0080	U	0.010	0.0029	mg/L		06/09/23 14:55	06/14/23 12:57	1
Hexachloroethane	0.0080	U	0.010	0.0045	mg/L		06/09/23 14:55	06/14/23 12:57	1
2-Methylphenol	0.0080	U	0.010	0.00077	mg/L		06/09/23 14:55	06/14/23 12:57	1
3 & 4 Methylphenol	0.0080	U	0.010	0.00080	mg/L		06/09/23 14:55	06/14/23 12:57	1
Nitrobenzene	0.0080	U	0.010	0.0013	mg/L		06/09/23 14:55	06/14/23 12:57	1
Pentachlorophenol	0.048	U	0.050	0.020	mg/L		06/09/23 14:55	06/14/23 12:57	1
Pyridine	0.048	U	0.050	0.018	mg/L		06/09/23 14:55	06/14/23 12:57	1
2,4,5-Trichlorophenol	0.0080	U	0.010	0.00090	mg/L		06/09/23 14:55	06/14/23 12:57	1
2,4,6-Trichlorophenol	0.0080	U	0.010	0.00071	mg/L		06/09/23 14:55	06/14/23 12:57	1

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LB3 280-615475/1-D
Matrix: Water
Analysis Batch: 616031

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 615587

Surrogate	LB3 %Recovery	LB3 Qualifier	Limits	Prepared	Analyzed	Dil Fac
2-Fluorobiphenyl	85		44 - 119	06/09/23 14:55	06/14/23 12:57	1
2-Fluorophenol (Surr)	82		19 - 119	06/09/23 14:55	06/14/23 12:57	1
2,4,6-Tribromophenol (Surr)	99		43 - 140	06/09/23 14:55	06/14/23 12:57	1
Nitrobenzene-d5 (Surr)	96		44 - 120	06/09/23 14:55	06/14/23 12:57	1
Phenol-d5 (Surr)	67		10 - 115	06/09/23 14:55	06/14/23 12:57	1
Terphenyl-d14 (Surr)	115		50 - 134	06/09/23 14:55	06/14/23 12:57	1

Lab Sample ID: LCS 280-615475/2-D
Matrix: Water
Analysis Batch: 616031

Client Sample ID: Lab Control Sample
Prep Type: TCLP
Prep Batch: 615587

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,4-Dichlorobenzene	0.0800	0.0338		mg/L		42	29 - 112
2,4-Dinitrotoluene	0.0800	0.0814		mg/L		102	57 - 128
Hexachlorobenzene	0.0800	0.0793		mg/L		99	53 - 125
Hexachlorobutadiene	0.0800	0.0395		mg/L		49	22 - 124
Hexachloroethane	0.0800	0.0312		mg/L		39	21 - 115
2-Methylphenol	0.0800	0.0662		mg/L		83	30 - 117
3 & 4 Methylphenol	0.0800	0.0665		mg/L		83	29 - 110
Nitrobenzene	0.0800	0.0662		mg/L		83	45 - 121
Pentachlorophenol	0.160	0.143		mg/L		90	35 - 138
Pyridine	0.160	0.0362	J	mg/L		23	10 - 120
2,4,5-Trichlorophenol	0.0800	0.0790		mg/L		99	53 - 123
2,4,6-Trichlorophenol	0.0800	0.0806		mg/L		101	50 - 125

Surrogate	LCS %Recovery	LCS Qualifier	Limits
2-Fluorobiphenyl	90		44 - 119
2-Fluorophenol (Surr)	74		19 - 119
2,4,6-Tribromophenol (Surr)	102		43 - 140
Nitrobenzene-d5 (Surr)	94		44 - 120
Phenol-d5 (Surr)	61		10 - 115
Terphenyl-d14 (Surr)	104		50 - 134

Lab Sample ID: LCSD 280-615475/3-B
Matrix: Water
Analysis Batch: 616031

Client Sample ID: Lab Control Sample Dup
Prep Type: TCLP
Prep Batch: 615587

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,4-Dichlorobenzene	0.0800	0.0332		mg/L		42	29 - 112	2	20
2,4-Dinitrotoluene	0.0800	0.0828		mg/L		103	57 - 128	2	20
Hexachlorobenzene	0.0800	0.0775		mg/L		97	53 - 125	2	20
Hexachlorobutadiene	0.0800	0.0346		mg/L		43	22 - 124	13	20
Hexachloroethane	0.0800	0.0290		mg/L		36	21 - 115	7	20
2-Methylphenol	0.0800	0.0700		mg/L		87	30 - 117	6	20
3 & 4 Methylphenol	0.0800	0.0679		mg/L		85	29 - 110	2	20
Nitrobenzene	0.0800	0.0662		mg/L		83	45 - 121	0	20
Pentachlorophenol	0.160	0.150		mg/L		93	35 - 138	4	20
Pyridine	0.160	0.048	U Q	mg/L		5	10 - 120	126	20

Method: 8270D - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 280-615475/3-B
Matrix: Water
Analysis Batch: 616031

Client Sample ID: Lab Control Sample Dup
Prep Type: TCLP
Prep Batch: 615587

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
2,4,5-Trichlorophenol			0.0800	0.0835		mg/L		104	53 - 123	6	20
2,4,6-Trichlorophenol			0.0800	0.0815		mg/L		102	50 - 125	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2-Fluorobiphenyl	*90*		*44 - 119*
2-Fluorophenol (Surr)	*77*		*19 - 119*
2,4,6-Tribromophenol (Surr)	*105*		*43 - 140*
Nitrobenzene-d5 (Surr)	*94*		*44 - 120*
Phenol-d5 (Surr)	*64*		*10 - 115*
Terphenyl-d14 (Surr)	*105*		*50 - 134*

Method: 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: LB 280-614928/1-E
Matrix: Solid
Analysis Batch: 615561

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 615360

Analyte	LB Result	LB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Endrin	0.00020	U	0.00050	0.000079	mg/L		06/08/23 12:12	06/09/23 21:44	1
Heptachlor	0.00020	U	0.00050	0.000077	mg/L		06/08/23 12:12	06/09/23 21:44	1
Heptachlor epoxide	0.00020	U	0.00050	0.000075	mg/L		06/08/23 12:12	06/09/23 21:44	1
gamma-BHC (Lindane)	0.00020	U	0.00050	0.000069	mg/L		06/08/23 12:12	06/09/23 21:44	1
Methoxychlor	0.00050	U	0.0010	0.00013	mg/L		06/08/23 12:12	06/09/23 21:44	1
Toxaphene	0.0075	U	0.020	0.0037	mg/L		06/08/23 12:12	06/09/23 21:44	1
Chlordane (technical)	0.0040	U	0.0050	0.0014	mg/L		06/08/23 12:12	06/09/23 21:44	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*73*		*28 - 115*	*06/08/23 12:12*	*06/09/23 21:44*	*1*
DCB Decachlorobiphenyl	*78*	*M*	*34 - 122*	*06/08/23 12:12*	*06/09/23 21:44*	*1*

Lab Sample ID: LCS 280-614928/2-E
Matrix: Solid
Analysis Batch: 615561

Client Sample ID: Lab Control Sample
Prep Type: TCLP
Prep Batch: 615360

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Endrin			0.00500	0.00479	M	mg/L		96	66 - 143
Heptachlor			0.00500	0.00476	M	mg/L		95	59 - 143
Heptachlor epoxide			0.00500	0.00469	M	mg/L		94	37 - 142
gamma-BHC (Lindane)			0.00500	0.00471		mg/L		94	68 - 142
Methoxychlor			0.00500	0.00536	M	mg/L		107	30 - 150

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene	*88*		*28 - 115*
DCB Decachlorobiphenyl	*92*		*34 - 122*

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCS 280-614928/2-G
Matrix: Solid
Analysis Batch: 615561

Client Sample ID: Lab Control Sample
Prep Type: TCLP
Prep Batch: 615360

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Toxaphene			0.200	0.178		mg/L		89	63 - 142		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene	*77*		*28 - 115*
DCB Decachlorobiphenyl	*84*		*34 - 122*

Lab Sample ID: LCSD 280-614928/3-B
Matrix: Solid
Analysis Batch: 615561

Client Sample ID: Lab Control Sample Dup
Prep Type: TCLP
Prep Batch: 615360

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Toxaphene			0.200	0.189		mg/L		95	63 - 142	6	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Tetrachloro-m-xylene	*83*		*28 - 115*
DCB Decachlorobiphenyl	*88*		*34 - 122*

Lab Sample ID: LB3 280-615475/1-F
Matrix: Water
Analysis Batch: 616066

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 615593

Analyte	LB3 Result	LB3 Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Endrin	0.00020	U	0.00050	0.000079	mg/L		06/09/23 15:02	06/14/23 14:50	1
Heptachlor	0.00020	U	0.00050	0.000077	mg/L		06/09/23 15:02	06/14/23 14:50	1
Heptachlor epoxide	0.00020	U	0.00050	0.000075	mg/L		06/09/23 15:02	06/14/23 14:50	1
gamma-BHC (Lindane)	0.00020	U	0.00050	0.000069	mg/L		06/09/23 15:02	06/14/23 14:50	1
Methoxychlor	0.00050	U	0.0010	0.00013	mg/L		06/09/23 15:02	06/14/23 14:50	1
Toxaphene	0.0075	U	0.020	0.0037	mg/L		06/09/23 15:02	06/14/23 14:50	1
Chlordane (technical)	0.0040	U	0.0050	0.0014	mg/L		06/09/23 15:02	06/14/23 14:50	1

Surrogate	*LB3 %Recovery*	*LB3 Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*65*		*28 - 115*	*06/09/23 15:02*	*06/14/23 14:50*	*1*
DCB Decachlorobiphenyl	*83*		*34 - 122*	*06/09/23 15:02*	*06/14/23 14:50*	*1*

Lab Sample ID: LCS 280-615475/2-F
Matrix: Water
Analysis Batch: 616066

Client Sample ID: Lab Control Sample
Prep Type: TCLP
Prep Batch: 615593

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Endrin			0.00500	0.00416		mg/L		83	66 - 143		
Heptachlor			0.00500	0.00379		mg/L		76	59 - 143		
Heptachlor epoxide			0.00500	0.00409		mg/L		82	37 - 142		
gamma-BHC (Lindane)			0.00500	0.00411		mg/L		82	68 - 142		
Methoxychlor			0.00500	0.00444		mg/L		89	30 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene	*71*		*28 - 115*

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCS 280-615475/2-F
Matrix: Water
Analysis Batch: 616066

Client Sample ID: Lab Control Sample
Prep Type: TCLP
Prep Batch: 615593

Surrogate	LCS %Recovery	LCS Qualifier	Limits
DCB Decachlorobiphenyl	82		34 - 122

Lab Sample ID: LCS 280-615475/2-G
Matrix: Water
Analysis Batch: 616066

Client Sample ID: Lab Control Sample
Prep Type: TCLP
Prep Batch: 615593

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Toxaphene			0.200	0.209		mg/L		104	63 - 142		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Tetrachloro-m-xylene	66		28 - 115
DCB Decachlorobiphenyl	77		34 - 122

Lab Sample ID: LCSD 280-615475/3-D
Matrix: Water
Analysis Batch: 616066

Client Sample ID: Lab Control Sample Dup
Prep Type: TCLP
Prep Batch: 615593

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Endrin			0.00500	0.00427		mg/L		85	66 - 143	2	30
Heptachlor			0.00500	0.00359		mg/L		72	59 - 143	6	30
Heptachlor epoxide			0.00500	0.00417		mg/L		83	37 - 142	2	30
gamma-BHC (Lindane)			0.00500	0.00419		mg/L		84	68 - 142	2	30
Methoxychlor			0.00500	0.00451		mg/L		90	30 - 150	2	30

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Tetrachloro-m-xylene	69		28 - 115
DCB Decachlorobiphenyl	84		34 - 122

Lab Sample ID: LCSD 280-615475/3-E
Matrix: Water
Analysis Batch: 616066

Client Sample ID: Lab Control Sample Dup
Prep Type: TCLP
Prep Batch: 615593

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Toxaphene			0.200	0.211		mg/L		106	63 - 142	1	30

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Tetrachloro-m-xylene	73		28 - 115
DCB Decachlorobiphenyl	85		34 - 122

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Lab Sample ID: MB 280-614674/1-A
Matrix: Water
Analysis Batch: 615208

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 614674

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	0.40	U Q	1.0	0.12	ug/L		06/02/23 16:17	06/07/23 20:31	1
PCB-1221	0.25	U Q	1.0	0.21	ug/L		06/02/23 16:17	06/07/23 20:31	1

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Lab Sample ID: MB 280-614674/1-A
Matrix: Water
Analysis Batch: 615208

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 614674

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1232	0.60	U Q	1.0	0.17	ug/L		06/02/23 16:17	06/07/23 20:31	1
PCB-1242	0.90	U Q	1.0	0.42	ug/L		06/02/23 16:17	06/07/23 20:31	1
PCB-1248	0.30	U Q	1.0	0.092	ug/L		06/02/23 16:17	06/07/23 20:31	1
PCB-1254	0.25	U Q	1.0	0.11	ug/L		06/02/23 16:17	06/07/23 20:31	1
PCB-1260	0.40	U Q	1.0	0.16	ug/L		06/02/23 16:17	06/07/23 20:31	1
PCB-1262	0.50	U Q	1.0	0.22	ug/L		06/02/23 16:17	06/07/23 20:31	1
PCB-1268	0.90	U Q	1.0	0.36	ug/L		06/02/23 16:17	06/07/23 20:31	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*79*		*25 - 120*	*06/02/23 16:17*	*06/07/23 20:31*	*1*
DCB Decachlorobiphenyl	*142*	*Q*	*30 - 136*	*06/02/23 16:17*	*06/07/23 20:31*	*1*

Lab Sample ID: LCS 280-614674/4-A
Matrix: Water
Analysis Batch: 615208

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 614674

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
PCB-1016			2.00	2.44		ug/L		122	46 - 129		
PCB-1260			2.00	2.58		ug/L		129	45 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene	*93*		*25 - 120*
DCB Decachlorobiphenyl	*134*		*30 - 136*

Lab Sample ID: LCSD 280-614674/5-A
Matrix: Water
Analysis Batch: 615208

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 614674

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
PCB-1016			2.00	2.46		ug/L		123	46 - 129	1	30
PCB-1260			2.00	2.65		ug/L		132	45 - 134	3	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Tetrachloro-m-xylene	*94*		*25 - 120*
DCB Decachlorobiphenyl	*136*		*30 - 136*

Lab Sample ID: MB 280-615721/1-A
Matrix: Solid
Analysis Batch: 616027

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 615721

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016	30	U M	66	21	ug/Kg		06/12/23 12:18	06/14/23 11:57	1
PCB-1221	60	U	94	31	ug/Kg		06/12/23 12:18	06/14/23 11:57	1
PCB-1232	21	U M	66	10	ug/Kg		06/12/23 12:18	06/14/23 11:57	1
PCB-1242	60	U M	66	18	ug/Kg		06/12/23 12:18	06/14/23 11:57	1
PCB-1248	30	U M	66	16	ug/Kg		06/12/23 12:18	06/14/23 11:57	1
PCB-1254	30	U M	66	11	ug/Kg		06/12/23 12:18	06/14/23 11:57	1
PCB-1260	30	U	66	17	ug/Kg		06/12/23 12:18	06/14/23 11:57	1

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Lab Sample ID: MB 280-615721/1-A
Matrix: Solid
Analysis Batch: 616027

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 615721

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1262	21	U M	66	5.5	ug/Kg		06/12/23 12:18	06/14/23 11:57	1
PCB-1268	60	U M	66	21	ug/Kg		06/12/23 12:18	06/14/23 11:57	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene	*106*		*44 - 130*	*06/12/23 12:18*	*06/14/23 11:57*	*1*
DCB Decachlorobiphenyl	*107*		*59 - 130*	*06/12/23 12:18*	*06/14/23 11:57*	*1*

Lab Sample ID: LCS 280-615721/2-A
Matrix: Solid
Analysis Batch: 616027

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 615721

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
PCB-1016	133	122		ug/Kg		91	47 - 134
PCB-1260	133	132		ug/Kg		99	53 - 140

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene	*101*		*44 - 130*
DCB Decachlorobiphenyl	*97*		*59 - 130*

Method: 8321A Herb - Herbicides (LC/MS)

Lab Sample ID: LB 280-614928/1-A
Matrix: Solid
Analysis Batch: 615278

Client Sample ID: Method Blank
Prep Type: TCLP

Analyte	LB Result	LB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	40	U M	50	16	ug/L			06/07/23 18:52	10
Silvex (2,4,5-TP)	20	U	50	9.7	ug/L			06/07/23 18:52	10

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid (Surr)	*95*		*25 - 125*		*06/07/23 18:52*	*10*

Lab Sample ID: LCS 280-614928/2-A
Matrix: Solid
Analysis Batch: 615278

Client Sample ID: Lab Control Sample
Prep Type: TCLP

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
2,4-D	200	206	D	ug/L		103	70 - 130
Silvex (2,4,5-TP)	200	176	D	ug/L		88	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid (Surr)	*104*		*25 - 125*

Method: 8321A Herb - Herbicides (LC/MS) (Continued)

Lab Sample ID: 280-177167-2 MS
Matrix: Solid
Analysis Batch: 615278

Client Sample ID: FWGIDW-230301-WS
Prep Type: TCLP

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
2,4-D	40	U M	200	200	D	ug/L		100	70 - 130
Silvex (2,4,5-TP)	20	U	200	178	D	ug/L		89	70 - 130

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid (Surr)	*98*		*25 - 125*

Lab Sample ID: 280-177167-2 MSD
Matrix: Solid
Analysis Batch: 615278

Client Sample ID: FWGIDW-230301-WS
Prep Type: TCLP

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
2,4-D	40	U M	200	205	D	ug/L		102	70 - 130	2	20
Silvex (2,4,5-TP)	20	U	200	178	D	ug/L		89	70 - 130	0	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid (Surr)	*102*		*25 - 125*

Lab Sample ID: LB3 280-615475/1-A
Matrix: Water
Analysis Batch: 615604

Client Sample ID: Method Blank
Prep Type: TCLP

Analyte	LB3 Result	LB3 Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	4.0	U	5.0	1.6	ug/L			06/09/23 20:30	1
Silvex (2,4,5-TP)	2.0	U	5.0	0.97	ug/L			06/09/23 20:30	1

Surrogate	*LB3 %Recovery*	*LB3 Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4-Dichlorophenylacetic acid (Surr)	*99*		*25 - 125*		*06/09/23 20:30*	*1*

Lab Sample ID: LCS 280-615475/2-A
Matrix: Water
Analysis Batch: 615604

Client Sample ID: Lab Control Sample
Prep Type: TCLP

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
2,4-D	20.0	22.4		ug/L		112	70 - 130
Silvex (2,4,5-TP)	20.0	19.1		ug/L		95	70 - 130

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid (Surr)	*96*		*25 - 125*

Lab Sample ID: 280-177167-1 MS
Matrix: Water
Analysis Batch: 615604

Client Sample ID: FWGIDW-230301-WW
Prep Type: TCLP

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
2,4-D	4.0	U M	20.0	22.0		ug/L		110	70 - 130

Method: 8321A Herb - Herbicides (LC/MS) (Continued)

Lab Sample ID: 280-177167-1 MS
Matrix: Water
Analysis Batch: 615604

Client Sample ID: FWGIDW-230301-WW
Prep Type: TCLP

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Silvex (2,4,5-TP)	2.0	U	20.0	21.3		ug/L		106	70 - 130

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid (Surr)	*96*		*25 - 125*

Lab Sample ID: 280-177167-1 MSD
Matrix: Water
Analysis Batch: 615604

Client Sample ID: FWGIDW-230301-WW
Prep Type: TCLP

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
2,4-D	4.0	U M	20.0	22.4		ug/L		112	70 - 130	2	20
Silvex (2,4,5-TP)	2.0	U	20.0	21.6		ug/L		108	70 - 130	2	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2,4-Dichlorophenylacetic acid (Surr)	*94*		*25 - 125*

Method: 6010C - Metals (ICP)

Lab Sample ID: LB 280-614928/1-C
Matrix: Solid
Analysis Batch: 615432

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 615163

Analyte	LB Result	LB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.071	U	0.075	0.022	mg/L		06/07/23 14:07	06/08/23 12:01	1
Barium	0.00484	J	0.050	0.0041	mg/L		06/07/23 14:07	06/08/23 12:01	1
Cadmium	0.0023	U	0.025	0.00065	mg/L		06/07/23 14:07	06/08/23 12:01	1
Chromium	0.00402	J	0.050	0.0033	mg/L		06/07/23 14:07	06/08/23 12:01	1
Lead	0.038	U	0.045	0.014	mg/L		06/07/23 14:07	06/08/23 12:01	1
Selenium	0.095	U	0.10	0.032	mg/L		06/07/23 14:07	06/08/23 12:01	1
Silver	0.030	U	0.050	0.0098	mg/L		06/07/23 14:07	06/08/23 12:01	1

Lab Sample ID: LCS 280-614928/2-C
Matrix: Solid
Analysis Batch: 615432

Client Sample ID: Lab Control Sample
Prep Type: TCLP
Prep Batch: 615163

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	8.00	7.77		mg/L		97	87 - 113
Barium	15.0	14.3		mg/L		95	88 - 113
Cadmium	6.00	5.74		mg/L		96	88 - 113
Chromium	10.0	9.71		mg/L		97	90 - 113
Lead	10.0	9.39		mg/L		94	86 - 113
Selenium	6.00	5.71		mg/L		95	83 - 114
Silver	1.25	1.24		mg/L		100	84 - 115

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LB3 280-615475/1-B
Matrix: Water
Analysis Batch: 615825

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 615545

Analyte	LB3 Result	LB3 Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.014	U	0.015	0.0044	mg/L		06/12/23 07:57	06/12/23 15:48	1
Barium	0.0020	U	0.010	0.00082	mg/L		06/12/23 07:57	06/12/23 15:48	1
Cadmium	0.00045	U	0.0050	0.00013	mg/L		06/12/23 07:57	06/12/23 15:48	1
Chromium	0.000770	J	0.010	0.00066	mg/L		06/12/23 07:57	06/12/23 15:48	1
Lead	0.0075	U	0.0090	0.0027	mg/L		06/12/23 07:57	06/12/23 15:48	1
Selenium	0.019	U	0.020	0.0063	mg/L		06/12/23 07:57	06/12/23 15:48	1
Silver	0.0060	U	0.010	0.0020	mg/L		06/12/23 07:57	06/12/23 15:48	1

Lab Sample ID: LCS 280-615475/2-B
Matrix: Water
Analysis Batch: 615825

Client Sample ID: Lab Control Sample
Prep Type: TCLP
Prep Batch: 615545

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	1.60	1.65		mg/L		103	87 - 113
Barium	3.00	3.12		mg/L		104	88 - 113
Cadmium	1.20	1.21		mg/L		101	88 - 113
Chromium	2.00	2.02		mg/L		101	90 - 113
Lead	2.00	2.05		mg/L		103	86 - 113
Selenium	1.20	1.21		mg/L		101	83 - 114
Silver	0.250	0.261		mg/L		104	84 - 115

Lab Sample ID: 280-177167-1 MS
Matrix: Water
Analysis Batch: 615825

Client Sample ID: FWGIDW-230301-WW
Prep Type: TCLP
Prep Batch: 615545

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	0.014	U	1.60	1.67		mg/L		104	87 - 113
Barium	0.0070	J	3.00	3.15		mg/L		105	88 - 113
Cadmium	0.00023	J	1.20	1.22		mg/L		101	88 - 113
Chromium	0.00087	J	2.00	2.04		mg/L		102	90 - 113
Lead	0.0075	U	2.00	2.07		mg/L		104	86 - 113
Selenium	0.019	U	1.20	1.22		mg/L		102	83 - 114
Silver	0.0060	U	0.250	0.265		mg/L		106	84 - 115

Lab Sample ID: 280-177167-1 MSD
Matrix: Water
Analysis Batch: 615825

Client Sample ID: FWGIDW-230301-WW
Prep Type: TCLP
Prep Batch: 615545

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	0.014	U	1.60	1.66		mg/L		104	87 - 113	1	20
Barium	0.0070	J	3.00	3.13		mg/L		104	88 - 113	1	20
Cadmium	0.00023	J	1.20	1.21		mg/L		101	88 - 113	1	20
Chromium	0.00087	J	2.00	2.02		mg/L		101	90 - 113	1	20
Lead	0.0075	U	2.00	2.06		mg/L		103	86 - 113	1	20
Selenium	0.019	U	1.20	1.21		mg/L		101	83 - 114	1	20
Silver	0.0060	U	0.250	0.262		mg/L		105	84 - 115	1	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: LB 280-614928/1-D
Matrix: Solid
Analysis Batch: 615344

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 615217

Analyte	LB Result	LB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.000080	U	0.00020	0.000061	mg/L		06/07/23 16:11	06/07/23 20:34	1

Lab Sample ID: LCS 280-614928/2-D
Matrix: Solid
Analysis Batch: 615344

Client Sample ID: Lab Control Sample
Prep Type: TCLP
Prep Batch: 615217

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00500	0.00497		mg/L		99	82 - 119

Lab Sample ID: LB3 280-615475/1-C
Matrix: Water
Analysis Batch: 615705

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 615550

Analyte	LB3 Result	LB3 Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.000080	U	0.00020	0.000061	mg/L		06/09/23 14:00	06/09/23 17:31	1

Lab Sample ID: LCS 280-615475/2-C
Matrix: Water
Analysis Batch: 615705

Client Sample ID: Lab Control Sample
Prep Type: TCLP
Prep Batch: 615550

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.00500	0.00500		mg/L		100	82 - 119

Lab Sample ID: 280-177167-1 MS
Matrix: Water
Analysis Batch: 615705

Client Sample ID: FWGIDW-230301-WW
Prep Type: TCLP
Prep Batch: 615550

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.000080	U	0.00500	0.00508		mg/L		102	82 - 119

Lab Sample ID: 280-177167-1 MSD
Matrix: Water
Analysis Batch: 615705

Client Sample ID: FWGIDW-230301-WW
Prep Type: TCLP
Prep Batch: 615550

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.000080	U	0.00500	0.00504		mg/L		101	82 - 119	1	10

Method: 1010A - Ignitability, Pensky-Martens Closed-Cup Method

Lab Sample ID: MB 280-615923/13
Matrix: Water
Analysis Batch: 615923

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Flashpoint	>160.0		1.00	1.00	Degrees F			06/13/23 14:04	1

Method: 1010A - Ignitability, Pensky-Martens Closed-Cup Method (Continued)

Lab Sample ID: MB 280-615923/2
Matrix: Water
Analysis Batch: 615923

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Flashpoint	>160.0		1.00	1.00	Degrees F			06/13/23 14:04	1

Lab Sample ID: LCS 280-615923/1
Matrix: Water
Analysis Batch: 615923

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Flashpoint	90.0	93.00		Degrees F		103	98 - 114

Lab Sample ID: LCSD 280-615923/12
Matrix: Water
Analysis Batch: 615923

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Flashpoint	90.0	93.00		Degrees F		103	98 - 114	0	10

Method: 1030 - Ignitability, Solids

Lab Sample ID: MB 680-783171/1
Matrix: Solid
Analysis Batch: 783171

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Ignitability	NB				mm/sec			06/12/23 13:31	1

Lab Sample ID: LCS 680-783171/2
Matrix: Solid
Analysis Batch: 783171

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Ignitability	2.61	2.611		mm/sec		100	75 - 125

Lab Sample ID: LCSD 680-783171/22
Matrix: Solid
Analysis Batch: 783171

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Ignitability	2.54	2.543		mm/sec		100	75 - 125	3	10

Method: 9012B - Cyanide, Total and/or Amenable

Lab Sample ID: MB 280-615094/20
Matrix: Water
Analysis Batch: 615094

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	0.0090	U	0.010	0.0050	mg/L			06/06/23 09:26	1

Method: 9012B - Cyanide, Total and/or Amenable (Continued)

Lab Sample ID: HLCS 280-615094/17
Matrix: Water
Analysis Batch: 615094
Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	HLCS Result	HLCS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	0.350	0.358		mg/L		102	90 - 110

Lab Sample ID: LCS 280-615094/19
Matrix: Water
Analysis Batch: 615094
Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	0.100	0.0963		mg/L		96	83 - 116

Lab Sample ID: LLCS 280-615094/18
Matrix: Water
Analysis Batch: 615094
Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	0.100	0.104		mg/L		104	44 - 167

Lab Sample ID: MB 280-615349/4-A
Matrix: Solid
Analysis Batch: 615426
Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 615349

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Total	0.40	U	0.50	0.24	mg/Kg		06/08/23 09:43	06/08/23 13:35	1

Lab Sample ID: HLCS 280-615349/1-A
Matrix: Solid
Analysis Batch: 615426
Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 615349

Analyte	Spike Added	HLCS Result	HLCS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	17.5	17.8		mg/Kg		101	90 - 110

Lab Sample ID: LCS 280-615349/3-A
Matrix: Solid
Analysis Batch: 615426
Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 615349

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	5.00	4.85		mg/Kg		97	76 - 120

Lab Sample ID: LLCS 280-615349/2-A
Matrix: Solid
Analysis Batch: 615426
Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 615349

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	5.00	5.05		mg/Kg		101	51 - 150

Lab Sample ID: 280-177167-2 MS
Matrix: Solid
Analysis Batch: 615426
Client Sample ID: FWGIDW-230301-WS
Prep Type: Total/NA
Prep Batch: 615349

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Total	0.45	U	5.94	5.82		mg/Kg	☼	98	76 - 120

Method: 9012B - Cyanide, Total and/or Amenable

Lab Sample ID: 280-177167-2 MSD
Matrix: Solid
Analysis Batch: 615426

Client Sample ID: FWGIDW-230301-WS
Prep Type: Total/NA
Prep Batch: 615349

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Cyanide, Total	0.45	U	5.71	5.58		mg/Kg	☼	98	76 - 120	4	10

Method: 9034 - Sulfide, Acid Soluble and Insoluble (Titrimetric)

Lab Sample ID: MB 280-614526/2-A
Matrix: Solid
Analysis Batch: 614559

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 614526

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	7.7	U	9.7	4.2	mg/Kg		06/01/23 11:49	06/01/23 13:56	1

Lab Sample ID: LCS 280-614526/1-A
Matrix: Solid
Analysis Batch: 614559

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 614526

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfide	90.6	63.9		mg/Kg		71	35 - 119

Lab Sample ID: 280-177167-2 MS
Matrix: Solid
Analysis Batch: 614559

Client Sample ID: FWGIDW-230301-WS
Prep Type: Total/NA
Prep Batch: 614526

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfide	9.3	U J1	117	43.5		mg/Kg	☼	37	35 - 119

Lab Sample ID: 280-177167-2 MSD
Matrix: Solid
Analysis Batch: 614559

Client Sample ID: FWGIDW-230301-WS
Prep Type: Total/NA
Prep Batch: 614526

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Sulfide	9.3	U J1	114	99.5	J1	mg/Kg	☼	87	35 - 119	78	35

Lab Sample ID: MB 280-615057/1-A
Matrix: Water
Analysis Batch: 615058

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 615057

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	2.0	U	4.0	1.6	mg/L		06/06/23 12:06	06/06/23 12:08	1

Lab Sample ID: LCS 280-615057/2-A
Matrix: Water
Analysis Batch: 615058

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 615057

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfide	17.1	12.0		mg/L		70	44 - 110

Method: 9034 - Sulfide, Acid Soluble and Insoluble (Titrimetric) (Continued)

Lab Sample ID: 280-177167-1 MS
Matrix: Water
Analysis Batch: 615058

Client Sample ID: FWGIDW-230301-WW
Prep Type: Total/NA
Prep Batch: 615057

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfide	2.0	U	17.1	11.2		mg/L		66	44 - 110

Lab Sample ID: 280-177167-1 MSD
Matrix: Water
Analysis Batch: 615058

Client Sample ID: FWGIDW-230301-WW
Prep Type: Total/NA
Prep Batch: 615057

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Sulfide	2.0	U	17.1	12.0		mg/L		70	44 - 110	7	20

Method: 9040C - pH

Lab Sample ID: LCS 280-614834/31
Matrix: Water
Analysis Batch: 614834

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH adj. to 25 deg C	7.00	7.0		SU		101	99 - 101

Method: 9045D - pH

Lab Sample ID: LCS 280-615054/3
Matrix: Solid
Analysis Batch: 615054

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH adj. to 25 deg C	7.00	7.0		SU		100	99 - 101

Lab Sample ID: LCSD 280-615054/4
Matrix: Solid
Analysis Batch: 615054

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
pH adj. to 25 deg C	7.00	7.0		SU		100	99 - 101	0	5

Method: 9056 - Anions, Ion Chromatography

Lab Sample ID: MB 280-614359/13
Matrix: Water
Analysis Batch: 614359

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.20	U	0.50	0.090	mg/L			05/31/23 18:01	1
Nitrite as N	0.10	U M	0.50	0.049	mg/L			05/31/23 18:01	1

Lab Sample ID: LCS 280-614359/11
Matrix: Water
Analysis Batch: 614359

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Nitrate as N	2.50	2.47		mg/L		99	88 - 111
Nitrite as N	2.50	2.40		mg/L		96	87 - 111

Method: 9056 - Anions, Ion Chromatography

Lab Sample ID: LCSD 280-614359/12
Matrix: Water
Analysis Batch: 614359

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Nitrate as N			2.50	2.46		mg/L		99	88 - 111	0	10
Nitrite as N			2.50	2.41		mg/L		96	87 - 111	0	10

Lab Sample ID: MRL 280-614359/10
Matrix: Water
Analysis Batch: 614359

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits		
Nitrate as N			0.250	0.250	J	mg/L		100	50 - 150		
Nitrite as N			0.250	0.261	J	mg/L		104	50 - 150		

Lab Sample ID: 280-177167-1 MS
Matrix: Water
Analysis Batch: 614359

Client Sample ID: FWGIDW-230301-WW
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Nitrate as N	0.52		5.00	5.64	J1	mg/L		102	88 - 111		
Nitrite as N	0.13	J	5.00	5.56	J1	mg/L		109	87 - 111		

Lab Sample ID: 280-177167-1 MSD
Matrix: Water
Analysis Batch: 614359

Client Sample ID: FWGIDW-230301-WW
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Nitrate as N	0.52		5.00	5.75	J1	mg/L		105	88 - 111	2	10
Nitrite as N	0.13	J	5.00	5.67	J1	mg/L		111	87 - 111	2	10

Lab Sample ID: 280-177167-1 DU
Matrix: Water
Analysis Batch: 614359

Client Sample ID: FWGIDW-230301-WW
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Nitrate as N	0.52			0.503		mg/L				3	10
Nitrite as N	0.13	J		0.127	J	mg/L				2	10

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MRL 280-615525/3
Matrix: Solid
Analysis Batch: 615525

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	MRL Result	MRL Qualifier	Unit	D	%Rec	%Rec Limits		
Nitrate as N			0.250	0.219	J	mg/L		87	50 - 150		
Nitrite as N			0.250	0.231	J	mg/L		92	50 - 150		

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: MB 280-615559/3-A
Matrix: Solid
Analysis Batch: 615525

Client Sample ID: Method Blank
Prep Type: Soluble

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	4.6	U	5.0	0.84	mg/Kg			06/10/23 05:21	1
Nitrite as N	4.6	U	5.0	1.3	mg/Kg			06/10/23 05:21	1

Lab Sample ID: LCS 280-615559/1-A
Matrix: Solid
Analysis Batch: 615525

Client Sample ID: Lab Control Sample
Prep Type: Soluble

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Nitrate as N			24.9	24.0		mg/Kg		96	87 - 111		
Nitrite as N			24.9	24.7		mg/Kg		99	86 - 115		

Lab Sample ID: LCSD 280-615559/2-A
Matrix: Solid
Analysis Batch: 615525

Client Sample ID: Lab Control Sample Dup
Prep Type: Soluble

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Nitrate as N			24.9	24.0		mg/Kg		96	87 - 111	0	10
Nitrite as N			24.9	24.7		mg/Kg		99	86 - 115	0	10

Lab Sample ID: 280-177167-2 MS
Matrix: Solid
Analysis Batch: 615525

Client Sample ID: FWGIDW-230301-WS
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Nitrate as N	5.8	U	62.5	63.3	J1	mg/Kg	☼	101	87 - 111		
Nitrite as N	5.8	U H	62.5	58.7		mg/Kg	☼	94	86 - 115		

Lab Sample ID: 280-177167-2 MSD
Matrix: Solid
Analysis Batch: 615525

Client Sample ID: FWGIDW-230301-WS
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Nitrate as N	5.8	U	62.5	63.4	J1	mg/Kg	☼	101	87 - 111	0	10
Nitrite as N	5.8	U H	62.5	58.9		mg/Kg	☼	94	86 - 115	0	10

Lab Sample ID: 280-177167-2 DU
Matrix: Solid
Analysis Batch: 615525

Client Sample ID: FWGIDW-230301-WS
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Nitrate as N	5.8	U		5.8	U	mg/Kg	☼			NC	10
Nitrite as N	5.8	U H		5.8	U	mg/Kg	☼			NC	10

QC Association Summary

Client: Leidos, Inc.
Job ID: 280-177167-1
Project/Site: RVAAP FWGW FS Well Install 2023

GC/MS VOA

Leach Batch: 614442

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	TCLP	Solid	1311	
LB 280-614442/1-A	Method Blank	TCLP	Solid	1311	
LCSD 280-614442/3-A	Lab Control Sample Dup	TCLP	Solid	1311	

Analysis Batch: 615474

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	TCLP	Solid	8260B	614442
LB 280-614442/1-A	Method Blank	TCLP	Solid	8260B	614442
LCS 280-614442/2-A	Lab Control Sample	Total/NA	Solid	8260B	
LCSD 280-614442/3-A	Lab Control Sample Dup	TCLP	Solid	8260B	614442

Leach Batch: 615640

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1 - RA	FWGIDW-230301-WW	TCLP	Water	1311	
280-177167-1	FWGIDW-230301-WW	TCLP	Water	1311	
LB3 280-615640/1-A	Method Blank	TCLP	Water	1311	
LCS 280-615640/2-A	Lab Control Sample	TCLP	Water	1311	
LCSD 280-615640/3-A	Lab Control Sample Dup	TCLP	Water	1311	

Analysis Batch: 615800

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1	FWGIDW-230301-WW	TCLP	Water	8260B	615640
LB3 280-615640/1-A	Method Blank	TCLP	Water	8260B	615640
LCS 280-615640/2-A	Lab Control Sample	TCLP	Water	8260B	615640
LCSD 280-615640/3-A	Lab Control Sample Dup	TCLP	Water	8260B	615640

Analysis Batch: 616166

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1 - RA	FWGIDW-230301-WW	TCLP	Water	8260B	615640
LB3 280-615640/1-A	Method Blank	TCLP	Water	8260B	615640
LCS 280-615640/2-A	Lab Control Sample	TCLP	Water	8260B	615640
LCSD 280-615640/3-A	Lab Control Sample Dup	TCLP	Water	8260B	615640

GC/MS Semi VOA

Leach Batch: 614928

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	TCLP	Solid	1311	
LB 280-614928/1-B	Method Blank	TCLP	Solid	1311	
LCS 280-614928/2-B	Lab Control Sample	TCLP	Solid	1311	

Prep Batch: 615134

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	TCLP	Solid	3510C	614928
LB 280-614928/1-B	Method Blank	TCLP	Solid	3510C	614928
LCS 280-614928/2-B	Lab Control Sample	TCLP	Solid	3510C	614928

Analysis Batch: 615329

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	TCLP	Solid	8270D	615134
LB 280-614928/1-B	Method Blank	TCLP	Solid	8270D	615134

GC/MS Semi VOA (Continued)

Analysis Batch: 615329 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 280-614928/2-B	Lab Control Sample	TCLP	Solid	8270D	615134

Leach Batch: 615475

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1	FWGIDW-230301-WW	TCLP	Water	1311	
LB3 280-615475/1-D	Method Blank	TCLP	Water	1311	
LCS 280-615475/2-D	Lab Control Sample	TCLP	Water	1311	
LCSD 280-615475/3-B	Lab Control Sample Dup	TCLP	Water	1311	

Prep Batch: 615587

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1	FWGIDW-230301-WW	TCLP	Water	3510C	615475
LB3 280-615475/1-D	Method Blank	TCLP	Water	3510C	615475
LCS 280-615475/2-D	Lab Control Sample	TCLP	Water	3510C	615475
LCSD 280-615475/3-B	Lab Control Sample Dup	TCLP	Water	3510C	615475

Analysis Batch: 616031

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1	FWGIDW-230301-WW	TCLP	Water	8270D	615587
LB3 280-615475/1-D	Method Blank	TCLP	Water	8270D	615587
LCS 280-615475/2-D	Lab Control Sample	TCLP	Water	8270D	615587
LCSD 280-615475/3-B	Lab Control Sample Dup	TCLP	Water	8270D	615587

GC Semi VOA

Prep Batch: 614674

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1	FWGIDW-230301-WW	Total/NA	Water	3510C	
MB 280-614674/1-A	Method Blank	Total/NA	Water	3510C	
LCS 280-614674/4-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 280-614674/5-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Leach Batch: 614928

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	TCLP	Solid	1311	
LB 280-614928/1-E	Method Blank	TCLP	Solid	1311	
LCS 280-614928/2-E	Lab Control Sample	TCLP	Solid	1311	
LCS 280-614928/2-G	Lab Control Sample	TCLP	Solid	1311	
LCSD 280-614928/3-B	Lab Control Sample Dup	TCLP	Solid	1311	

Analysis Batch: 615208

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1	FWGIDW-230301-WW	Total/NA	Water	8082A	614674
MB 280-614674/1-A	Method Blank	Total/NA	Water	8082A	614674
LCS 280-614674/4-A	Lab Control Sample	Total/NA	Water	8082A	614674
LCSD 280-614674/5-A	Lab Control Sample Dup	Total/NA	Water	8082A	614674

Prep Batch: 615360

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	TCLP	Solid	3510C	614928
LB 280-614928/1-E	Method Blank	TCLP	Solid	3510C	614928

GC Semi VOA (Continued)

Prep Batch: 615360 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 280-614928/2-E	Lab Control Sample	TCLP	Solid	3510C	614928
LCS 280-614928/2-G	Lab Control Sample	TCLP	Solid	3510C	614928
LCSD 280-614928/3-B	Lab Control Sample Dup	TCLP	Solid	3510C	614928

Leach Batch: 615475

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1	FWGIDW-230301-WW	TCLP	Water	1311	
LB3 280-615475/1-F	Method Blank	TCLP	Water	1311	
LCS 280-615475/2-F	Lab Control Sample	TCLP	Water	1311	
LCS 280-615475/2-G	Lab Control Sample	TCLP	Water	1311	
LCSD 280-615475/3-D	Lab Control Sample Dup	TCLP	Water	1311	
LCSD 280-615475/3-E	Lab Control Sample Dup	TCLP	Water	1311	

Analysis Batch: 615561

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	TCLP	Solid	8081B	615360
LB 280-614928/1-E	Method Blank	TCLP	Solid	8081B	615360
LCS 280-614928/2-E	Lab Control Sample	TCLP	Solid	8081B	615360
LCS 280-614928/2-G	Lab Control Sample	TCLP	Solid	8081B	615360
LCSD 280-614928/3-B	Lab Control Sample Dup	TCLP	Solid	8081B	615360

Prep Batch: 615593

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1	FWGIDW-230301-WW	TCLP	Water	3510C	615475
LB3 280-615475/1-F	Method Blank	TCLP	Water	3510C	615475
LCS 280-615475/2-F	Lab Control Sample	TCLP	Water	3510C	615475
LCS 280-615475/2-G	Lab Control Sample	TCLP	Water	3510C	615475
LCSD 280-615475/3-D	Lab Control Sample Dup	TCLP	Water	3510C	615475
LCSD 280-615475/3-E	Lab Control Sample Dup	TCLP	Water	3510C	615475

Prep Batch: 615721

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	Total/NA	Solid	3546	
MB 280-615721/1-A	Method Blank	Total/NA	Solid	3546	
LCS 280-615721/2-A	Lab Control Sample	Total/NA	Solid	3546	

Analysis Batch: 616027

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	Total/NA	Solid	8082A	615721
MB 280-615721/1-A	Method Blank	Total/NA	Solid	8082A	615721
LCS 280-615721/2-A	Lab Control Sample	Total/NA	Solid	8082A	615721

Analysis Batch: 616066

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1	FWGIDW-230301-WW	TCLP	Water	8081B	615593
LB3 280-615475/1-F	Method Blank	TCLP	Water	8081B	615593
LCS 280-615475/2-F	Lab Control Sample	TCLP	Water	8081B	615593
LCS 280-615475/2-G	Lab Control Sample	TCLP	Water	8081B	615593
LCSD 280-615475/3-D	Lab Control Sample Dup	TCLP	Water	8081B	615593
LCSD 280-615475/3-E	Lab Control Sample Dup	TCLP	Water	8081B	615593

LCMS

Leach Batch: 614928

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	TCLP	Solid	1311	
LB 280-614928/1-A	Method Blank	TCLP	Solid	1311	
LCS 280-614928/2-A	Lab Control Sample	TCLP	Solid	1311	
280-177167-2 MS	FWGIDW-230301-WS	TCLP	Solid	1311	
280-177167-2 MSD	FWGIDW-230301-WS	TCLP	Solid	1311	

Analysis Batch: 615278

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	TCLP	Solid	8321A Herb	614928
LB 280-614928/1-A	Method Blank	TCLP	Solid	8321A Herb	614928
LCS 280-614928/2-A	Lab Control Sample	TCLP	Solid	8321A Herb	614928
280-177167-2 MS	FWGIDW-230301-WS	TCLP	Solid	8321A Herb	614928
280-177167-2 MSD	FWGIDW-230301-WS	TCLP	Solid	8321A Herb	614928

Leach Batch: 615475

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1	FWGIDW-230301-WW	TCLP	Water	1311	
LB3 280-615475/1-A	Method Blank	TCLP	Water	1311	
LCS 280-615475/2-A	Lab Control Sample	TCLP	Water	1311	
280-177167-1 MS	FWGIDW-230301-WW	TCLP	Water	1311	
280-177167-1 MSD	FWGIDW-230301-WW	TCLP	Water	1311	

Analysis Batch: 615604

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1	FWGIDW-230301-WW	TCLP	Water	8321A Herb	615475
LB3 280-615475/1-A	Method Blank	TCLP	Water	8321A Herb	615475
LCS 280-615475/2-A	Lab Control Sample	TCLP	Water	8321A Herb	615475
280-177167-1 MS	FWGIDW-230301-WW	TCLP	Water	8321A Herb	615475
280-177167-1 MSD	FWGIDW-230301-WW	TCLP	Water	8321A Herb	615475

Metals

Leach Batch: 614928

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	TCLP	Solid	1311	
LB 280-614928/1-C	Method Blank	TCLP	Solid	1311	
LB 280-614928/1-D	Method Blank	TCLP	Solid	1311	
LCS 280-614928/2-C	Lab Control Sample	TCLP	Solid	1311	
LCS 280-614928/2-D	Lab Control Sample	TCLP	Solid	1311	

Prep Batch: 615163

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	TCLP	Solid	3010A	614928
LB 280-614928/1-C	Method Blank	TCLP	Solid	3010A	614928
LCS 280-614928/2-C	Lab Control Sample	TCLP	Solid	3010A	614928

Prep Batch: 615217

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	TCLP	Solid	7470A	614928
LB 280-614928/1-D	Method Blank	TCLP	Solid	7470A	614928
LCS 280-614928/2-D	Lab Control Sample	TCLP	Solid	7470A	614928

Metals

Analysis Batch: 615344

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	TCLP	Solid	7470A	615217
LB 280-614928/1-D	Method Blank	TCLP	Solid	7470A	615217
LCS 280-614928/2-D	Lab Control Sample	TCLP	Solid	7470A	615217

Analysis Batch: 615432

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	TCLP	Solid	6010C	615163
LB 280-614928/1-C	Method Blank	TCLP	Solid	6010C	615163
LCS 280-614928/2-C	Lab Control Sample	TCLP	Solid	6010C	615163

Leach Batch: 615475

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1	FWGIDW-230301-WW	TCLP	Water	1311	
LB3 280-615475/1-B	Method Blank	TCLP	Water	1311	
LB3 280-615475/1-C	Method Blank	TCLP	Water	1311	
LCS 280-615475/2-B	Lab Control Sample	TCLP	Water	1311	
LCS 280-615475/2-C	Lab Control Sample	TCLP	Water	1311	
280-177167-1 MS	FWGIDW-230301-WW	TCLP	Water	1311	
280-177167-1 MSD	FWGIDW-230301-WW	TCLP	Water	1311	

Prep Batch: 615545

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1	FWGIDW-230301-WW	TCLP	Water	3010A	615475
LB3 280-615475/1-B	Method Blank	TCLP	Water	3010A	615475
LCS 280-615475/2-B	Lab Control Sample	TCLP	Water	3010A	615475
280-177167-1 MS	FWGIDW-230301-WW	TCLP	Water	3010A	615475
280-177167-1 MSD	FWGIDW-230301-WW	TCLP	Water	3010A	615475

Prep Batch: 615550

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1	FWGIDW-230301-WW	TCLP	Water	7470A	615475
LB3 280-615475/1-C	Method Blank	TCLP	Water	7470A	615475
LCS 280-615475/2-C	Lab Control Sample	TCLP	Water	7470A	615475
280-177167-1 MS	FWGIDW-230301-WW	TCLP	Water	7470A	615475
280-177167-1 MSD	FWGIDW-230301-WW	TCLP	Water	7470A	615475

Analysis Batch: 615705

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1	FWGIDW-230301-WW	TCLP	Water	7470A	615550
LB3 280-615475/1-C	Method Blank	TCLP	Water	7470A	615550
LCS 280-615475/2-C	Lab Control Sample	TCLP	Water	7470A	615550
280-177167-1 MS	FWGIDW-230301-WW	TCLP	Water	7470A	615550
280-177167-1 MSD	FWGIDW-230301-WW	TCLP	Water	7470A	615550

Analysis Batch: 615825

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1	FWGIDW-230301-WW	TCLP	Water	6010C	615545
LB3 280-615475/1-B	Method Blank	TCLP	Water	6010C	615545
LCS 280-615475/2-B	Lab Control Sample	TCLP	Water	6010C	615545
280-177167-1 MS	FWGIDW-230301-WW	TCLP	Water	6010C	615545
280-177167-1 MSD	FWGIDW-230301-WW	TCLP	Water	6010C	615545

General Chemistry

Analysis Batch: 614359

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1	FWGIDW-230301-WW	Total/NA	Water	9056	
MB 280-614359/13	Method Blank	Total/NA	Water	9056	
LCS 280-614359/11	Lab Control Sample	Total/NA	Water	9056	
LCSD 280-614359/12	Lab Control Sample Dup	Total/NA	Water	9056	
MRL 280-614359/10	Lab Control Sample	Total/NA	Water	9056	
280-177167-1 MS	FWGIDW-230301-WW	Total/NA	Water	9056	
280-177167-1 MSD	FWGIDW-230301-WW	Total/NA	Water	9056	
280-177167-1 DU	FWGIDW-230301-WW	Total/NA	Water	9056	

Prep Batch: 614526

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	Total/NA	Solid	9030B	
MB 280-614526/2-A	Method Blank	Total/NA	Solid	9030B	
LCS 280-614526/1-A	Lab Control Sample	Total/NA	Solid	9030B	
280-177167-2 MS	FWGIDW-230301-WS	Total/NA	Solid	9030B	
280-177167-2 MSD	FWGIDW-230301-WS	Total/NA	Solid	9030B	

Analysis Batch: 614542

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	Total/NA	Solid	Moisture	

Analysis Batch: 614559

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	Total/NA	Solid	9034	614526
MB 280-614526/2-A	Method Blank	Total/NA	Solid	9034	614526
LCS 280-614526/1-A	Lab Control Sample	Total/NA	Solid	9034	614526
280-177167-2 MS	FWGIDW-230301-WS	Total/NA	Solid	9034	614526
280-177167-2 MSD	FWGIDW-230301-WS	Total/NA	Solid	9034	614526

Analysis Batch: 614834

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1	FWGIDW-230301-WW	Total/NA	Water	9040C	
LCS 280-614834/31	Lab Control Sample	Total/NA	Water	9040C	

Leach Batch: 615023

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	Soluble	Solid	DI Leach	

Analysis Batch: 615054

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	Soluble	Solid	9045D	615023
LCS 280-615054/3	Lab Control Sample	Total/NA	Solid	9045D	
LCSD 280-615054/4	Lab Control Sample Dup	Total/NA	Solid	9045D	

Prep Batch: 615057

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1	FWGIDW-230301-WW	Total/NA	Water	9030B	
MB 280-615057/1-A	Method Blank	Total/NA	Water	9030B	
LCS 280-615057/2-A	Lab Control Sample	Total/NA	Water	9030B	
280-177167-1 MS	FWGIDW-230301-WW	Total/NA	Water	9030B	
280-177167-1 MSD	FWGIDW-230301-WW	Total/NA	Water	9030B	

General Chemistry

Analysis Batch: 615058

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1	FWGIDW-230301-WW	Total/NA	Water	9034	615057
MB 280-615057/1-A	Method Blank	Total/NA	Water	9034	615057
LCS 280-615057/2-A	Lab Control Sample	Total/NA	Water	9034	615057
280-177167-1 MS	FWGIDW-230301-WW	Total/NA	Water	9034	615057
280-177167-1 MSD	FWGIDW-230301-WW	Total/NA	Water	9034	615057

Analysis Batch: 615094

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1	FWGIDW-230301-WW	Total/NA	Water	9012B	
MB 280-615094/20	Method Blank	Total/NA	Water	9012B	
HLCS 280-615094/17	Lab Control Sample	Total/NA	Water	9012B	
LCS 280-615094/19	Lab Control Sample	Total/NA	Water	9012B	
LLCS 280-615094/18	Lab Control Sample	Total/NA	Water	9012B	

Prep Batch: 615349

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	Total/NA	Solid	9012B	
MB 280-615349/4-A	Method Blank	Total/NA	Solid	9012B	
HLCS 280-615349/1-A	Lab Control Sample	Total/NA	Solid	9012B	
LCS 280-615349/3-A	Lab Control Sample	Total/NA	Solid	9012B	
LLCS 280-615349/2-A	Lab Control Sample	Total/NA	Solid	9012B	
280-177167-2 MS	FWGIDW-230301-WS	Total/NA	Solid	9012B	
280-177167-2 MSD	FWGIDW-230301-WS	Total/NA	Solid	9012B	

Analysis Batch: 615426

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	Total/NA	Solid	9012B	615349
MB 280-615349/4-A	Method Blank	Total/NA	Solid	9012B	615349
HLCS 280-615349/1-A	Lab Control Sample	Total/NA	Solid	9012B	615349
LCS 280-615349/3-A	Lab Control Sample	Total/NA	Solid	9012B	615349
LLCS 280-615349/2-A	Lab Control Sample	Total/NA	Solid	9012B	615349
280-177167-2 MS	FWGIDW-230301-WS	Total/NA	Solid	9012B	615349
280-177167-2 MSD	FWGIDW-230301-WS	Total/NA	Solid	9012B	615349

Analysis Batch: 615525

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	Soluble	Solid	9056A	615559
MB 280-615559/3-A	Method Blank	Soluble	Solid	9056A	615559
LCS 280-615559/1-A	Lab Control Sample	Soluble	Solid	9056A	615559
LCSD 280-615559/2-A	Lab Control Sample Dup	Soluble	Solid	9056A	615559
MRL 280-615525/3	Lab Control Sample	Total/NA	Solid	9056A	
280-177167-2 MS	FWGIDW-230301-WS	Soluble	Solid	9056A	615559
280-177167-2 MSD	FWGIDW-230301-WS	Soluble	Solid	9056A	615559
280-177167-2 DU	FWGIDW-230301-WS	Soluble	Solid	9056A	615559

Leach Batch: 615559

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	Soluble	Solid	DI Leach	
MB 280-615559/3-A	Method Blank	Soluble	Solid	DI Leach	
LCS 280-615559/1-A	Lab Control Sample	Soluble	Solid	DI Leach	
LCSD 280-615559/2-A	Lab Control Sample Dup	Soluble	Solid	DI Leach	

General Chemistry (Continued)

Leach Batch: 615559 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2 MS	FWGIDW-230301-WS	Soluble	Solid	DI Leach	
280-177167-2 MSD	FWGIDW-230301-WS	Soluble	Solid	DI Leach	
280-177167-2 DU	FWGIDW-230301-WS	Soluble	Solid	DI Leach	

Analysis Batch: 615923

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-1	FWGIDW-230301-WW	Total/NA	Water	1010A	
MB 280-615923/13	Method Blank	Total/NA	Water	1010A	
MB 280-615923/2	Method Blank	Total/NA	Water	1010A	
LCS 280-615923/1	Lab Control Sample	Total/NA	Water	1010A	
LCSD 280-615923/12	Lab Control Sample Dup	Total/NA	Water	1010A	

Analysis Batch: 783171

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
280-177167-2	FWGIDW-230301-WS	Total/NA	Solid	1030	
MB 680-783171/1	Method Blank	Total/NA	Solid	1030	
LCS 680-783171/2	Lab Control Sample	Total/NA	Solid	1030	
LCSD 680-783171/22	Lab Control Sample Dup	Total/NA	Solid	1030	

Client Sample ID: FWGIDW-230301-WW
Lab Sample ID: 280-177167-1

Date Collected: 05/30/23 12:45
Matrix: Water
Date Received: 05/31/23 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	1311	RA		1.0 g	1.0 mL	615640	06/09/23 20:59	DFB1	EET DEN
							Completed:	06/09/23 22:47 [1]		
TCLP	Analysis	8260B	RA	1	0.5 mL	5 mL	616166	06/14/23 20:57	CCF	EET DEN
TCLP	Leach	1311			1.0 g	1.0 mL	615640	06/09/23 20:59	DFB1	EET DEN
							Completed:	06/09/23 22:47 [1]		
TCLP	Analysis	8260B		1	0.5 mL	5 mL	615800	06/12/23 21:45	CCF	EET DEN
TCLP	Leach	1311			1.0 g	1.0 mL	615475	06/08/23 15:30	DFB1	EET DEN
TCLP	Prep	3510C			125 mL	1 mL	615587	06/09/23 14:55	KAS	EET DEN
TCLP	Analysis	8270D		1	1 mL	1 mL	616031	06/14/23 14:04	DNM	EET DEN
TCLP	Leach	1311			1.0 g	1.0 mL	615475	06/08/23 15:30	DFB1	EET DEN
TCLP	Prep	3510C			100 mL	10 mL	615593	06/09/23 15:02	KAS	EET DEN
TCLP	Analysis	8081B		1	1 mL	1 mL	616066	06/14/23 17:09	ECM	EET DEN
Total/NA	Prep	3510C			979.8 mL	10 mL	614674	06/02/23 16:17	MAS	EET DEN
Total/NA	Analysis	8082A		1	1 mL	1 mL	615208	06/07/23 21:26	SP	EET DEN
TCLP	Leach	1311			1.0 g	1.0 mL	615475	06/08/23 15:30	DFB1	EET DEN
TCLP	Analysis	8321A Herb		1	0.5 mL	1 mL	615604	06/09/23 20:43	JZ	EET DEN
TCLP	Leach	1311			1.0 g	1.0 mL	615475	06/08/23 15:30	DFB1	EET DEN
TCLP	Prep	3010A			50 mL	50 mL	615545	06/12/23 07:57	LJS	EET DEN
TCLP	Analysis	6010C		1			615825	06/12/23 15:57	ADL	EET DEN
TCLP	Leach	1311			1.0 g	1.0 mL	615475	06/08/23 15:30	DFB1	EET DEN
TCLP	Prep	7470A			30 mL	50 mL	615550	06/09/23 14:00	PFM	EET DEN
TCLP	Analysis	7470A		1			615705	06/09/23 17:36	PFM	EET DEN
Total/NA	Analysis	1010A		1			615923	06/13/23 14:04	MEC	EET DEN
Total/NA	Analysis	9012B		1	10 mL	10 mL	615094	06/06/23 10:36	MMP	EET DEN
Total/NA	Prep	9030B			50 mL	50 mL	615057	06/06/23 12:06	SAH	EET DEN
Total/NA	Analysis	9034		1			615058	06/06/23 12:08	SAH	EET DEN
Total/NA	Analysis	9040C		1			614834	06/02/23 16:11	KEG	EET DEN
Total/NA	Analysis	9056		1	10 mL	10 mL	614359	05/31/23 18:16	MEC	EET DEN

Client Sample ID: FWGIDW-230301-WS
Lab Sample ID: 280-177167-2

Date Collected: 05/30/23 11:30
Matrix: Solid
Date Received: 05/31/23 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	1311			1.0 g	1.0 mL	614442	05/31/23 19:00	DFB1	EET DEN
							Completed:	06/01/23 21:56 [1]		
TCLP	Analysis	8260B		1	0.5 mL	5 mL	615474	06/09/23 04:09	CCF	EET DEN
TCLP	Leach	1311			1.0 g	1.0 mL	614928	06/05/23 16:10	DFB1	EET DEN
TCLP	Prep	3510C			125 mL	1 mL	615134	06/06/23 18:16	ANV	EET DEN
TCLP	Analysis	8270D		1	1 mL	1 mL	615329	06/08/23 17:54	DNM	EET DEN
TCLP	Leach	1311			1.0 g	1.0 mL	614928	06/05/23 16:10	DFB1	EET DEN
TCLP	Prep	3510C			100 mL	10 mL	615360	06/08/23 12:12	KAS	EET DEN
TCLP	Analysis	8081B		1	1 mL	1 mL	615561	06/09/23 23:45	SMQ	EET DEN
TCLP	Leach	1311			1.0 g	1.0 mL	614928	06/05/23 16:10	DFB1	EET DEN
TCLP	Analysis	8321A Herb		10	0.5 mL	1 mL	615278	06/07/23 19:05	JZ	EET DEN

Lab Chronicle

Client: Leidos, Inc.
Job ID: 280-177167-1
Project/Site: RVAAP FWGW FS Well Install 2023

Client Sample ID: FWGIDW-230301-WS
Lab Sample ID: 280-177167-2
Date Collected: 05/30/23 11:30
Matrix: Solid
Date Received: 05/31/23 10:40

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	1311			1.0 g	1.0 mL	614928	06/05/23 16:10	DFB1	EET DEN
TCLP	Prep	3010A			10 mL	50 mL	615163	06/07/23 14:07	LJS	EET DEN
TCLP	Analysis	6010C		1			615432	06/08/23 13:17	LMT	EET DEN
TCLP	Leach	1311			1.0 g	1.0 mL	614928	06/05/23 16:10	DFB1	EET DEN
TCLP	Prep	7470A			30 mL	50 mL	615217	06/07/23 16:11	PFM	EET DEN
TCLP	Analysis	7470A		1			615344	06/07/23 21:19	PFM	EET DEN
Total/NA	Analysis	1030		1			783171	06/12/23 13:31	SM	EET SAV
Soluble	Leach	DI Leach			39.95 g	40 mL	615023	06/06/23 09:35	KEG	EET DEN
Soluble	Analysis	9045D		1			615054	06/06/23 11:58	KEG	EET DEN
Total/NA	Analysis	Moisture		1			614542	06/01/23 12:23	ZPM	EET DEN

Client Sample ID: FWGIDW-230301-WS
Lab Sample ID: 280-177167-2
Date Collected: 05/30/23 11:30
Matrix: Solid
Date Received: 05/31/23 10:40
Percent Solids: 80.0

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			15.0 g	10 mL	615721	06/12/23 12:18	EDW	EET DEN
Total/NA	Analysis	8082A		1	1 mL	1 mL	616027	06/14/23 14:14	SP	EET DEN
Total/NA	Prep	9012B			1.1005 g	50 mL	615349	06/08/23 09:43	ZPM	EET DEN
Total/NA	Analysis	9012B		1	50 mL	50 mL	615426	06/08/23 13:37	ZPM	EET DEN
Total/NA	Prep	9030B			10.72 g	50 mL	614526	06/01/23 11:49	ZPM	EET DEN
Total/NA	Analysis	9034		1			614559	06/01/23 13:56	ZPM	EET DEN
Soluble	Leach	DI Leach			10.02 g	100 mL	615559	06/09/23 12:19	MEC	EET DEN
Soluble	Analysis	9056A		1	10 mL	10 mL	615525	06/10/23 05:36	MEC	EET DEN

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

EET DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: Leidos, Inc.
Job ID: 280-177167-1
Project/Site: RVAAP FWGW FS Well Install 2023

Laboratory: Eurofins Denver

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	2907.01	10-31-23

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
7470A	7470A	Solid	Mercury
8321A Herb		Solid	2,4-D
8321A Herb		Water	2,4-D
9040C		Water	Temperature
9045D		Solid	Temperature
Moisture		Solid	Percent Solids

Laboratory: Eurofins Savannah

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
	AFCEE	SAVLAB	
Alabama	State	41450	06-30-23
ANAB	Dept. of Defense ELAP	L2463	09-22-24
Arkansas DEQ	State	19-015-0	02-01-24
California	State	2939	06-30-23
Florida	NELAP	E87052	06-30-23
Georgia	State	E87052	06-30-23
Georgia (DW)	State	803	06-30-23
Guam	State	19-007R	04-17-24
Hawaii	State	<cert No.>	06-30-23
Illinois	NELAP	200022	11-30-23
Indiana	State	C-GA-02	06-30-23
Iowa	State	353	06-30-23
Kentucky (UST)	State	NA	06-30-23
Louisiana	NELAP	30690	06-30-23
Louisiana (All)	NELAP	30690	06-30-23
Louisiana (DW)	State	LA009	12-31-23
Maine	State	GA00006	09-25-24
Maryland	State	250	12-31-23
Massachusetts	State	M-GA006	06-30-23
Michigan	State	9925	06-30-23
Mississippi	State	<cert No.>	06-30-23
Nebraska	State	NE-OS-7-04	06-30-23
New Jersey	NELAP	GA769	06-30-23
New Mexico	State	GA00006	06-30-23
North Carolina (DW)	State	13701	07-31-23
North Carolina (WW/SW)	State	269	12-31-23
Pennsylvania	NELAP	68-00474	06-30-23
Puerto Rico	State	GA00006	01-01-24
South Carolina	State	98001	06-30-23
Tennessee	State	TN02961	06-30-23
Texas	NELAP	T1047004185-19-14	11-30-23
Texas	TCEQ Water Supply	T104704185	06-30-23
USDA	US Federal Programs	P330-18-00313	09-03-24
Virginia	NELAP	460161	06-14-23

Accreditation/Certification Summary

Client: Leidos, Inc. Job ID: 280-177167-1
Project/Site: RVAAP FWGW FS Well Install 2023

Laboratory: Eurofins Savannah (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Wyoming	State	8TMS-L	06-30-23

Chain of Custody Record

leidos

COC No.: RVAAP-349-TA

Page: 1 / 1 Date: 5/30/23

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW FS Well Install 2023
Job/P.O. No.: P010216426

Sampler (Signature) [signature] (Printed Name) Charles Spurr

Requested Parameters

Laboratory No.	Sample ID	Depth	Date	Time	Matrix	TCLP VOCs	TCLP SVOC	TCLP Pest	TCLP Herb	TCLP Metals	Total Sulfide	Total Cyanide	pH	Ignitability	Nitrate/Nitrite	PCBs		Temperature Blank	Total Number of Containers	OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS
	FWGIDW-230301-WW	NA	5/30/2023	1245	W	X	X	X	X	X	X	X	X	X	X	X			19	** 10-DAY TURNAROUND **
	FWGIDW-230301-WS	NA	5/30/2023	1130	S	X	X	X	X	X	X	X	X	X	X	X			7	** 10-DAY TURNAROUND **

CS 5/30/23

280-177167 Chain of Custody

Laboratory Name: Eurofins-Denver
Address: 4955 Yarrow Street
Denver, CO 80002
Phone: (303) 736-0100
Fax:
Contact: Patrick McEntee

Total Number of Containers: 26

Relinquished by	Date	Received by	Date	Time
[signature]	5/30/23	[signature]	5-31-23	1040
Signature		Signature		
Charles Spurr	Time 1700	Printed Name	Time	
Printed Name				
Leidos		Company		
Company				
Relinquished by	Date	Received by	Date	
Signature		Signature		
Printed Name	Time	Printed Name	Time	
Company		Company		

Notes:

Shipment Method: FedEx

Tracking Numbers:
818036580793
818036580782

Temperature upon receipt

Leidos
8866 Commons Drive
Twinsburg, OH 44087
(330) 405-5802

0.9, 3.6 CF 0.1 1214

ORIGIN ID:SKYA

SHIP DATE: 30MAY23
ACTWGT: 46.95 LB
CAD: /SSF02420
DIMS: 25X14X14 IN

Part # 156297-435-HN0B2 EXP 11/23

TO

Custody Seal

ARVADA CO 80002-4517 (US)
(303) 736-0100 REF:
INV:
PO: DEPT:

FedEx Express

E

J232023040502uv

280-177167 Waybill

WED - 31 MAY 10:30A
PRIORITY OVERNIGHT

TRK# 0667 8180 3658 0793

NX LAAA

80002
CO-US DEN


ORIGIN ID:SKYA
SHIP DATE: 30MAY23
ACTWGT: 46.95 LB
CAD: /SSF02420
DIMS: 25x14x14 IN
eurofins
Environment Testing
TestAmerica
2205840
ARVADA CO
(US)
FedEx
Express
TRK# 0667 8180 3658 0782
WED - 31 MAY 10:30A
PRIORITY OVERNIGHT
NX LAAA
80002
CO-US DEN

Eurofins Denver
4955 Yarrow Street
Arvada, CO 80002
Phone 303-736-0100 Fax 303-431-7171

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler	Lab PM: McEntee, Patrick J	Carrier Tracking No(s)	COC No: 280-658646 1
Client Contact: Shipping/Receiving	Phone	E-Mail: Patrick McEntee@et eurofinsus com	State of Origin: Ohio	Page: Page 1 of 1
Company: Eurofins Environment Testing Southeast,		Accreditations Required (See note): DoD - A2LA		Job #: 280-177167-1
Address: 5102 LaRoche Avenue,	Due Date Requested: 6/13/2023			
City: Savannah	TAT Requested (days):			
State, Zip: GA, 31404				
Phone: 912-354-7858(Tel) 912-352-0165(Fax)	PO #			
Email	WO #			
Project Name: RVAAP FWGW FS Well Install 2023	Project #: 28018729			
Site:	SSOW#:			

Analysis Requested

Preservation Codes

A HCL, B NaOH, C Zn Acetate, D Nitric Acid, E NaHSO4, F MeOH, G Amchlor, H - Ascorbic Acid, I Ice, J DI Water, K EDTA, L EDA, M - Hexane, N None, O AsNaO2, P Na2O4S, Q Na2SO3, R Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4-5, Y Trizma, Z other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	1030/ Ignitability, Solids	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
FWGIDW-230301-WS (280-177167-2)	5/30/23	11 30 Eastern		Solid			X	1	Q5 3

Note Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories This sample shipment is forwarded under chain-of-custody If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately If all requested accreditations are current to date return the signed Chain of Custody attesting to said compliance to Eurofins TestAmerica

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested I, II, III, IV, Other (specify) Primary Deliverable Rank 4	Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment:

Relinquished by:	Date/Time: 6/1/23 1550	Company: ETADEN	Received by: TH	Date/Time: 06-02-23	Company
Relinquished by:	Date/Time	Company	Received by:	Date/Time: 10:05	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks: 2.4 - 2.2

Login Sample Receipt Checklist

Client: Leidos, Inc.

Job Number: 280-177167-1

Login Number: 177167
List Number: 1
Creator: Little, Matthew L

List Source: Eurofins Denver

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: Leidos, Inc.

Job Number: 280-177167-1

Login Number: 177167
List Number: 2
Creator: Harley, Tynisha

List Source: Eurofins Savannah
List Creation: 06/02/23 12:07 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

ATTACHMENT C

Container Log

CONTAINER LOG

Container No. (1) **LEIDOS-FWGW-074-L (Frac Tank)**

Drum Staging Area: Building 1036

Date (2)	Material Name (3)	Quantity Added (4)	Cumulative Quantity (5)	Person Adding Material (6)	Label	Notes
3/24/2023	Decon/Drilling/Purge Water	37	37	Rockwater	Pending Analysis	N/A
3/24/2023	Decon/Drilling/Purge Water	35	72	Leidos	Pending Analysis	N/A
3/27/2023	Decon/Drilling/Purge Water	800	872	Rockwater	Pending Analysis	N/A
3/28/2023	Decon/Drilling/Purge Water	800	1,672	Rockwater	Pending Analysis	N/A
3/29/2023	Decon/Drilling/Purge Water	5	1,677	Leidos	Pending Analysis	N/A
4/4/2023	Decon/Drilling/Purge Water	400	2,077	Rockwater	Pending Analysis	N/A
4/6/2023	Decon/Drilling/Purge Water	400	2,477	Rockwater	Pending Analysis	N/A
4/10/2023	Decon/Drilling/Purge Water	700	3,177	Rockwater	Pending Analysis	N/A
4/12/2023	Decon/Drilling/Purge Water	1,500	3,927	Rockwater	Pending Analysis	N/A
4/13/2023	Decon/Drilling/Purge Water	1,600	5,527	Rockwater	Pending Analysis	N/A
4/14/2023	Decon/Drilling/Purge Water	1,100	6,627	Rockwater	Pending Analysis	N/A
4/20/2023	Decon/Drilling/Purge Water	400	7,027	Rockwater	Pending Analysis	N/A
4/21/2023	Decon/Drilling/Purge Water	800	7,827	Rockwater	Pending Analysis	N/A
4/24/2023	Drilling Water	1,600	9,427	Rockwater	Pending Analysis	N/A
4/25/2023	Drilling Water	2,400	11,827	Rockwater	Pending Analysis	N/A
4/27/2023	Drilling Water	500	12,327	Rockwater	Pending Analysis	N/A
4/28/2023	Decon Water	100	12,427	Rockwater	Pending Analysis	N/A
5/1/2023	Development Water	40	12,467	Leidos	Pending Analysis	N/A
5/2/2023	Development Water	70	12,537	Leidos	Pending Analysis	N/A
5/2/2023	Development Water	65	12,602	Leidos	Pending Analysis	N/A
5/3/2023	Development Water	70	12,672	Leidos	Pending Analysis	N/A
5/9/2023	Development Water	200	12,872	Rockwater	Pending Analysis	N/A
5/10/2023	Development Water	160	13,032	Rockwater	Pending Analysis	N/A
5/11/2023	Development Water	100	13,132	Rockwater	Pending Analysis	N/A
5/15/2023	Purge Water	20	13,152	Leidos	Pending Analysis	N/A
5/16/2023	Purge Water	30	13,182	Leidos	Pending Analysis	N/A

CONTAINER LOG

Container No. (1) LEIDOS-FWGW-074-L (Frac Tank)

Drum Staging Area: Building 1036

Date (2)	Material Name (3)	Quantity Added (4)	Cumulative Quantity (5)	Person Adding Material (6)	Label	Notes
5/17/2023	Purge Water	10	13,192	Leidos	Pending Analysis	N/A
5/22/2023	Purge Water	25	13,217	Leidos	Pending Analysis	N/A

(When 55 gals total reached, must move from SAA within 3 calendar days.)

Date Container Transferred to Generator Accumulation Area _____

Materials shipped offsite date: _____

(1) Container ID Number (e.g., FC-FMS#1-2)
(2) Date when waste was added to container
(3) Name of waste added (e.g., Diesel Fuel)
(4) For items such as filters, note the number of items. For liquids, note the number of gallons.
(5) The total quantity of items of numbers of gallon currently in the container
(6) The name of the person adding the waste

ATTACHMENT D

Proposed Land Application Location

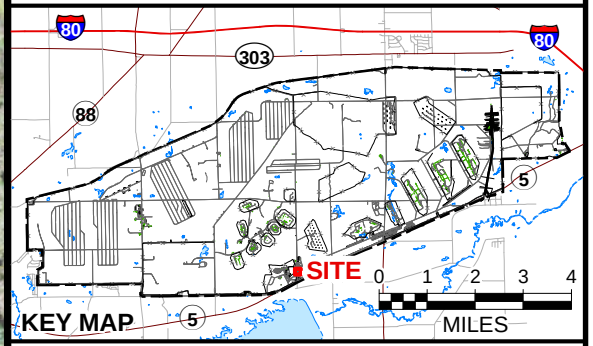
LEGEND:

- EXISTING/FORMER STRUCTURE
- ROAD
- FENCE LINE
- GROUND CONTOUR 10-FT INTERVAL
- GROUND CONTOUR 100-FT INTERVAL
- CAMP JAMES A. GARFIELD BOUNDARY

OHIO STATE PLANE NAD83 NORTH FT

0 50 100 150 200

FEET



U.S. ARMY CORPS OF ENGINEERS ®
LOUISVILLE DISTRICT

leidos

FORMER RVAAP/
CAMP JAMES A. GARFIELD
PORTAGE/TRUMBULL COUNTIES, OHIO

DRAWN BY:	REQUESTOR:	DATE:
R. BEELER	RYAN LAURICH	JUL 26, 2023

GIS FILE:
\\chs-fs01\CAD\19009\MXD\U31_B1036_FTANK-01_R0.mxd

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

May 30, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin Sedlak
Restoration Project Manager
ARNG-ILE Clean up
Camp James A. Garfield CJAG
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Remedial Response
Project Records
RI
Portage County
267000859036

Sent via email to:
Kevin.m.sedlak.ctr@army.mil

Subject: **Approval of the "Final Facility-wide Groundwater Program Plan, RVAAP-66 Facility-wide Groundwater Annual Report for 2022"**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received the "Final Facility-wide Groundwater Program Plan, RVAAP-66 Facility-wide Groundwater Annual Report for 2022" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio dated May 4, 2023. This document was received via email at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on May 4, 2023. The document was prepared for the U.S Army Corps of Engineers on behalf of the Army National Guard Directorate by Leidos.

The final document was reviewed by personnel from Ohio EPA's DERR. Pursuant to the Director's Findings and Orders paragraph 39 (b), Ohio EPA considers the document final and approved.

If you have any questions, please contact me at kevin.palombo@epa.ohio.gov or call me at (330) 963-1292.

Sincerely,

Kevin M. Palombo, Environmental Specialist
Division of Environmental Response and Revitalization

KP/cm

ec: Angela Cobbs, Chenega Reliable Services
Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Megan Oravec, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Liam McEvoy, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR
Al Brillinger Chenega Reliable Services Info Only

Received 31 May 2023

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

May 30, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin Sedlak
Restoration Project Manager
ARNG-ILE Clean up
Camp James A. Garfield CJAG
1438 State Route 534 SW
Newton Falls, OH 44444

Sent via email to:
Kevin.m.sedlak.ctr@army.mil

RE: US Army Ammunition Plt RVAAP
Remediation Response
Remedial Response
Project Records
RI
Portage County
267000859036

Subject: **Approval of the "Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Final Facility-wide Groundwater 2023 Addendum" dated May 3, 2023**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received the "Final Facility-wide Groundwater Monitoring Program Plan 2023 Addendum" for the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio dated May 3, 2023. This document was received via email by Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on May 3, 2023. The document was prepared for the U.S Army Corps of Engineers on behalf of the Army National Guard Directorate by Leidos.

The final document was reviewed by personnel from Ohio EPA's DERR. Pursuant to the Director's Findings and Orders paragraph 39 (b), Ohio EPA considers the document final and approved.

If you have any questions, please contact me at kevin.palombo@epa.ohio.gov or (330) 963-1292.

Sincerely,

Kevin M. Palombo, Environmental Specialist
Division of Environmental Response and Revitalization

KP/cm

ec: Angela Cobbs, Chenega Reliable Services
Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Megan Oravec, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Liam McEvoy, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR
Al Brillinger, Chenega Reliable Services, Info Only

Received 31 May 2023

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

May 16, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Kevin Palombo, Site Coordinator
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Final Facility-wide Groundwater 2022 Semi-Annual Report (Work Activity No. 267000859036)

Dear Mr. Palombo:

An electronic version of the *Final Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2022 Sampling Event* will be sent using the Ohio EPA LiquidFile system. A hard copy and CD can be sent upon request by Ohio EPA. Due to file size, the main text is a separate file from the appendices. In addition, Appendix E containing the laboratory data packages are not included with the electronic version of this report.

This report was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.05.16 12:53:10 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA, NEDO
Liam McEvoy, Ohio EPA, NEDO
Tom Schneider, Ohio EPA, SWDO
Katie Tait, OHARNG
Steve Kvaal, USACE Louisville
Jay Trumble, USACE Louisville
Jed Thomas, Leidos
Ryan Laurich, Leidos
Jennifer Tierney, Chenega

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

May 3, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Kevin Palombo, Site Coordinator
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Final Facility-wide Groundwater 2023 Addendum (Work Activity No. 267000859036)

Dear Mr. Palombo:

Attached for your concurrence is an electronic version of the *Final Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Addendum for 2023.* Due to small file size, this document will only be sent via email and not through the Ohio EPA LiquidFile system. A hard copy and CD can be sent upon request by Ohio EPA.

This Addendum was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.05.03 12:49:48 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA, NEDO
Megan Oravec, Ohio EPA, NEDO
Liam McEvoy, Ohio EPA, NEDO
Tom Schneider, Ohio EPA, SWDO
Katie Tait, OHARNG
Steve Kvaal, USACE Louisville
Jay Trumble, USACE Louisville
Jed Thomas, Leidos
Ryan Laurich, Leidos
Jennifer Tierney, Chenega

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

April 28, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin Sedlak
Restoration Program Manager
ARNG-ILE Clean Up
Camp James A Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID#267000859036

Sent via email to: Kevin.m.sedlak.ctr@army.mil

Subject: **Response to Ohio EPA Comments on the "Draft RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2022 Sampling Event" dated March 14, 2023**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Response to Ohio EPA Comments on the "Draft RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2022 Sampling Event" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Camp James A. Garfield). This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) via email on March 14, 2023. The response was prepared for the United States Army Corps of Engineers (USACE) on behalf of the National Guard Bureau by Leidos.

Based on our review of the Army National Guard's Response to Ohio EPA comments provided in your letter dated March 14, 2023, we find the responses generally acceptable, and the document can be finalized. Please be sure that all agreed-upon changes, additions, and clarifications are provided in the final document.

If you have questions, you can reach me at kevin.palombo@epa.ohio.gov or at (330) 963-1292.

Sincerely,

Kevin M. Palombo, Environmental Specialist
Division of Environmental Response and Revitalization

KP/cm

ec: Jennifer Tierney, Chenega,
Katie Tait, OHARNG RTLS
Steven Kvaal, USACE Louisville
Nat Peters, USACE Louisville
Megan Oravec, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Liam McEvoy, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR
Allan Brillinger, Chenega (Info Only)

RECEIVED 1 MAY 2023

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

April 28, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin Sedlak
Restoration Program Manager
ARNG-ILE Clean Up
Camp James A Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID#267000859036

Sent via email to: Kevin.m.sedlak.ctr@army.mil

Subject: **Response to Ohio EPA Comments on the "Draft RVAAP-66 Facility-wide Groundwater Addendum for 2023" dated March 14, 2023**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Response to Ohio EPA Comments on the "Draft RVAAP-66 Facility-wide Groundwater Addendum for 2023" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Camp James A. Garfield). This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) via email on March 14, 2023. The response was prepared for the United States Army Corps of Engineers (USACE) on behalf of the National Guard Bureau by Leidos.

Based on our review of the Army National Guard's Response to Ohio EPA comments provided in your letter dated March 14, 2023, we find the responses generally acceptable, and the document can be finalized. Please be sure that all agreed-upon changes, additions, and clarifications are provided in the final document.

If you have questions, you can reach me at kevin.palombo@epa.ohio.gov or at (330) 963-1292.

Sincerely,

Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

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Allan Brillinger, Chenega (Info Only)

RECEIVED 1 MAY 2023

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

April 19, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin Sedlak
Restoration Program Manager
ARNG-ILE Clean Up
Camp James A Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID#267000859036

Sent via email to: Kevin.m.sedlak.ctr@army.mil

Subject: Ohio EPA Comments on the "Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Annual Report for 2022" dated February 13, 2023.

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the **"Draft Facility-wide Ground Water Monitoring Program Plan RVAAP-66 Facility-wide Ground Water Annual Report for 2022"** at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Camp James A. Garfield Joint Training Facility). This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on February 13, 2023. The report was prepared for the United States Army Corps of Engineers on behalf of the National Guard Bureau by Leidos under Contract Number W912QR-16-D-0003. Comments on the document based on Ohio EPA review are provided below. Please provide responses to the following comments in accordance with the Directors Findings and Orders.

DRAFT FACILITY-WIDE GROUNDWATER MONITORING PROGRAM (FWGWMP) ANNUAL REPORT FOR 2022

Ground water samples were analyzed for: volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), organochlorinated pesticides, polychlorinated biphenol (PCBs), explosives/propellants, cyanide, nitrate/nitrite, sulfate/sulfide, and metals (total and field filtered) including hexavalent chromium. Ground water results were screened in part according to the 2012 EQM FWGMP Addendum using background data, facility-wide cleanup goals (FWCUGs), Ohio EPA Drinking Water Maximum Contaminant Levels (MCLs) and U.S. EPA Regional Screening Levels (RSLs) for tap water.

Updated metals background concentrations used for this report were generated from the Background Study for Metals for RVAAP-66 Facility-wide Ground Water (Leidos 2019b) completed in 2019 and approved by Ohio EPA on September 9, 2019. Background calculations for metals concentration in the Unconsolidated, Homewood Sandstone, Upper Sharon, and Basal Sharon Conglomerate aquifers

are presented in Table 4-5 of the Background Study and referenced in Section 6.1 Screening Levels of the Annual Report as part of the sample results discussion.

Total wells sampled from each aquifer are as follows: 23 wells from the Unconsolidated, four wells from the Homewood Sandstone, 19 wells from the Upper Sharon, two wells from the Basal Sharon Conglomerate (including the four off-site property wells) for a total of 48 wells sampled for 2022.

COMMENTS

1. Carbon Tetrachloride detections:

Carbon tetrachloride was detected in LL10mw-003 below the screening level of 5ug/L, with historical results ranging from 1 ug/L to 8 ug/L. While no trend is visibly apparent in the attached graphs, Ohio EPA review of the 2023 Draft Sampling Addendum conducted in February 2023 indicated that there may be a statistically significant increasing trend of carbon tetrachloride in this well. Additional sampling data as well as statistical analysis of the carbon tetrachloride levels in this well may be beneficial in demonstrating actual trend directions of this data.

Based on the March 14, 2023, Army responses to Ohio EPA review of the 2023 Draft Sampling Addendum and request for continued sampling at LL10mw-003, the Army has agreed to analyze for carbon tetrachloride in LL10mw-003 in the Spring 2023 and Fall 2023 sampling events. Ohio EPA understands that The Army will not be analyzing daughter products and assessing degradation of carbon tetrachloride during 2023 but should sample results indicate that carbon tetrachloride is above the MCL in the future, a sampling and analysis of daughter products should be considered.

Ohio EPA recommends statistical evaluation of the carbon tetrachloride data using Sanitas software or other equal statistical software to evaluate possible trend slopes for the 2023 data and prior years' data (overall/historical trend (all data) and current/recent trend (last 8 rounds of data)) .

2. Statistical data evaluation:

While this Ohio EPA comment was previously noted in the 2021 Annual Report, and an Army response was provided in a July 11, 2022, letter, the comment is being memorialized below for future reference:

"While the visibly recognizable best linear fit evaluations presented in the time series graphs are useful, please explain if further statistical evaluation of these data (in future reports) will be used to more accurately determine decreasing, stable or increasing trend lines in the data (utilizing Sanitas or some other acceptable form of statistical evaluation program). Statistical trend analyses would be recommended to help evaluate the ongoing FWGWMP and/or to help support future proposed well abandonment decisions."

The July 11, 2022, Army response to this comment stated that the linear fit evaluations were useful and indicated that further statistical evaluation of the chemicals of concern (COCs) will be provided in the Feasibility Study to then determine long-term monitoring needs and evaluate the long-term monitoring well network. Ohio EPA concurs with this approach and adds that such further

statistical evaluation would also be appropriate in determining the trends and/or discontinuation of specific well sampling (rather than the visual method).

RISK COMMENTS

Section 7.0 and Appendix I Time-Trend Graphs

3. FBQmw-174: Trendline for 2-Amino-4,6-Dinitrotoluene – The report states the trendlines show decreasing ground water concentrations. Ohio EPA noted that the concentration of 0.017 mg/L in spring of 2022 has nearly rebounded back to the Spring 2019 concentration of 0.014 mg/L. Observation of the future trends in this well will be important in future decision making.

4. LL1mw-083 various explosives: The report states 2-amino-4,6-DNT, TNT, 2,4-DNT, and 2,6-DNT trendlines show decreasing ground water concentrations. Ohio EPA noted that the 2022 detections appear to be back where they were in the Mid-2010s. Observation of the future trends in this well will be important in future decision making.

5. LL3mw-237: Report states, "...decreasing trend. However, the sample collected in Spring 2022 was detected at a concentration of 6.9 µg/L, which is the highest concentration since semi-annual monitoring began in 2016." Ohio EPA noted that this well will be one to watch to see if trend in 2023 Annual Report changes to "increasing".

This **"Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Annual Report for 2022"** was reviewed by personnel from Ohio EPA. Additional information is necessary to approve the document. If you have questions or would like to set up a meeting to discuss these comments, you can contact me at kevin.palombo@epa.ohio.gov.

Sincerely,

Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/cm

ec: Jennifer Tierney, Chenega Reliable Services
Katie Tait, OHARNG RTLS
Steven Kvaal, USACE Louisville
Nat Peters, USACE Louisville
Megan Oravec, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Liam McEvoy, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR
Allan Brillinger, Chenega Reliable Service (Info Only)

Received 20 Apr 2023

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

April 10, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Kevin Palombo, Project Coordinator
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Notification of Field Work, Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-66 Facility-wide Groundwater
(Work Activity No. 267-000-859-036)

Dear Mr. Palombo:

In accordance with the Director's Final Findings and Orders, Section XIII, #28, for the RVAAP Restoration Program, the Army National Guard (ARNG) is providing notification of field activities at the former RVAAP (Camp James A. Garfield) 15 days prior to the scheduled start date. These field activities and the tentative schedule are below:

- 04/24/23-04/28/23: Annual well gauging.
- 05/01/23-05/12/23: Groundwater sampling per the 2023 Addendum.

In the event that the schedule above changes, the Army will provide an e-mail notification with revised dates. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.04.11 07:39:19 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA
Liam McEvoy, Ohio EPA
Megan Oravec, Ohio EPA
Tom Schneider, Ohio EPA
Katie Tait, OHARNG
Steve Kvaal, USACE Louisville
Jay Trumble, USACE Louisville
Jed Thomas, Leidos
Ryan Laurich, Leidos
Jenifer Tierney, Chenega

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

March 14, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Kevin Palombo
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Responses to Comments on the Draft RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2022 Sampling Event (Work Activity No. 267-000-859-036)

Reference: 1) Ohio EPA Comment Letter, dated 1/25/23
2) Army Responses to Ohio EPA Comments, dated 2/7/23
3) Ohio EPA's Response Letter, dated 3/6/23

Dear Mr. Palombo:

The Army appreciates your comments on the Draft RVAAP-66 Facility-wide Groundwater Monitoring Program Semi-Annual Report for Spring 2022 Sampling Event and feedback provided regarding the Army's comment response letter. Enclosed for your review is a revised response to Ohio EPA Comment 4. Upon final resolution of all comments, the Army will provide a Final version of the report for Ohio EPA concurrence.

These comment responses were prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.03.14 10:10:22 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

ec: Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Liam McEvoy, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
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Katie Tait, OHARNG
Steve Kvaal, USACE Louisville
Jay Trumble, USACE Louisville
Jed Thomas, Leidos
Ryan Laurich, Leidos
Jennifer Tierney, Chenega Reliable Services

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2022 Sampling Event (Work Activity No. 267-000-859-036)

COMMENTS

Ohio EPA Comment 1: Appendix B Completeness: A review of Appendix B (Field Forms) included daily log sheets, well purge forms, chain-of-custody sheets, and calibration reports for field equipment.

Appendix B.3 Chains of Custody section still has the first three pages denoted as place holders for "RVAAP-191-TA_06142022", "RVAPP-192-TA_06142022", and "RVAAP193-TA_06152022". Appropriate Chains of Custody documents should be inserted into the final version of the report.

> *Army Response*: Agree. Appendix B has been revised to include Chains of Custody for RVAAP-191-TA_06142022, RVAPP-192-TA_06142022, and RVAAP193-TA_06152022.

Ohio EPA Response (dated 3/6/23): Ohio finds the response generally acceptable.

Ohio EPA Comment 2: Section 3.2 Field Change Requests: Section 3.2 (Page 3-1, line 153) documents four previously approved field change requests (FCR) submitted and applicable to the Spring 2022 sampling event, (LEIDOS_FWGW_001, LEIDOS_FWGW_004, and LEIDOS_FWGW_006 from 2018 and LEIDOS_FWGW_010 from 2019).

These four FCRs are included within Appendix A, along with LEIDOS_FWGW_009, (October 2019 FWGWMP-Additional Sampling Suite) which was submitted September 26, 2019, and LEIDOS_FWGW_0011 (December 2021 FWGWMP-Additional Sampling Suite) was submitted December 15, 2021.

Since LEIDOS_FWGW_009 and LEIDOS_FWGW_0011 are included in Appendix A, they should also be included in the Section 3.2 list.

> *Army Response*: Clarification and agree. As noted in the comment, FCRs LEIDOS_FWGW_009 and LEIDOS_FWGW_0011 are not applicable to the Spring 2022 sampling event. Accordingly, these FCRs have been removed from Appendix A and a description of these FCRs will not be added to Section 3.2.

Ohio EPA Response (dated 3/6/23): Ohio finds the response generally acceptable.

Ohio EPA Comment 3: Table 4-1 Data Summary Completeness: Table 4-1 of the Draft FWGWMP Semi-Annual Report for Spring 2022 indicated that all 48 wells were analyzed for the proper analytical parameters in accordance with the Final FWGWMP Addendum for 2022 (well-specific combinations of volatile organic compounds (VOCs), semi-volatile organic compound (SVOCs), polycyclic aromatic hydrocarbons (PAHs), phenols, polychlorinated biphenyls (PCBs), perchlorate, explosives, expanded explosives, phthalates, pesticides, cyanide, phosphorus, anions, pH, alkalinity, nitrate, ammonia, carbon tetrachloride and metals).

Table 4-1 generally presented summaries of all the available well-specific data results but presented confusing information when compared to Appendix D.1 and Appendix D.3 tables. Table 4.1 sometimes presents any detected data concentrations and sometimes it only presents concentrations that exceed screening or background criteria. Additionally, reporting units ug/L and mg/L are alternately used on the D.1 and D.3 tables, and to a lesser degree within Table 4.1. The Appendix D.3 Table has been modified from the 2021 version to add a "Results Exceeds Screening and Background Criteria (Y/N)" column, which shows a "N" if the concentration

did not exceed both values, but Table 4.1 sometimes presents summaries if either value is exceeded, or if there are no screening criteria. To clarify and avoid the need to consult multiple tables to get the whole picture of the available lab data, it may be beneficial to reconfigure tables throughout the report to have a consistent viewpoint and consistent reporting units. It had previously been suggested (during the Spring 2021 report review) that Appendix D.3 table denote all laboratory detections, and then presents just the exceedances in BOLD font, that way both detections and exceedances are clearly denoted and comparing two or three tables is not necessary.

Army Response: Agree. The following revisions have been made to the report:

1) The data table presented as Appendix D.3 has been revised so that results exceeding the applicable screening criteria are highlighted in bold text.
2) The data table presented as Appendix D.2 has been revised so that units of concentration are presented consistently across Tables 4.1, D.1, D.2, and D.3. Units of concentration for Explosives, SVOCs, PCBs, Pesticides, VOCs are presented in µg/L, this is consistent with the presentation of historical data results. Units of concentration for Metals and Miscellaneous analytes are presented in mg/L. This is consistent with the presentation of historical data results.

Ohio EPA Response (dated 3/6/23): Ohio finds the response generally acceptable.

Ohio EPA Comment 4: Well Redevelopment – Elevated Turbidity Results: Section 6.0 Well redevelopment of the Draft FWGWMP Semi-Annual Report for Spring 2022 indicated that no permanent monitoring wells were redeveloped for the 2022 spring sampling event. This section also stated that a list of recommended wells to be redeveloped was presented within the 2021 Annual Report (Leidos 2022c). Upon review of the 2021 Annual Report, Section 8.2.1 Well Redevelopment, wells to be considered for redevelopment prior to sampling included LL1mw-086, LL1mw-089, and LL12mw-244. It is not further explained as to why these proposed wells were not redeveloped prior to sampling for this Spring 2022 event.

It should be noted that well LL12mw-244 was found to have a reading of 7,537.2 NTUs during 2021 sampling, and Ohio EPA comment at that time was that further discussion may be warranted to evaluate if additional potential well redevelopment activities using methods other than surging and pumping until dry (such as purging with a Waterra pump or equivalent) could help lower the elevated turbidity numbers in well LL12mw244."

Future well redevelopment activities should be conducted in accordance with Section 3.5.2 of the approved Revised Final Remedial Investigation Work Plan (RIWP) produced by TEC-Weston and dated December 21, 2016, and in accordance with the Ohio EPA's Technical Guidance Manual for Ground Water Investigations – Chapter 8: Monitoring Well Development, Maintenance, and Redevelopment (Ohio EPA 2009).

Please provide further explanation as to why wells LL1mw-086, LL1mw-089, and LL12mw-244 were not redeveloped prior to sampling for this Spring 2022 event and provide a potential schedule or rationale to follow for future redevelopment.

Army Response: Clarification and agree. While Section 8.2.1 of the FWGWMP Annual Report present recommendations for future monitoring well redevelopment, these are only provided as proposed recommendations. LL1mw-086 was redeveloped in April 2020, and LL12mw-244 was recently redeveloped on April 21, 2021. The Army elected not to redevelop the wells in 2022. These wells will continue to be analyzed for COCs identified in the RI Report (explosives, nitrate, and ammonia), and

the results are not influenced by elevated turbidity. The high turbidity associated with these wells do not appear to create issues with the dataset and risk management decisions.

Ohio EPA Response (dated 3/6/23): Previous Ohio EPA comment was that wells to be considered for redevelopment prior to sampling included LL1mw-086, LL1mw-089, and LL12mw-244, but that these proposed wells were not redeveloped prior to sampling for this Spring 2022 event. Well LL12mw-244 was found to have a turbidity reading of 7,537.2 NTUs during 2021 sampling. Ohio EPA requested further information on not redeveloping these wells prior to the 2022 sampling events, or possibly present a schedule for future redevelopment. Army responded that the redevelopment of these wells in their 2021 Annual Report was a proposed recommendation and was decided to not redevelop as they state that the elevated turbidity does not influence the explosives, nitrate or ammonia readings from these wells. The Army also states that the high turbidity associated with these wells does not appear to create issues with the dataset or risk management decisions.

Ohio EPA states that while high turbidity levels might not interfere with the chemicals of concern (COCs) directly, it can present a Data Quality Objectives (DQO) issue if the wells are becoming silted and starts filling the well screen (resulting in not getting a representative sample across the screened zone). Chapter 8 of the Ohio EPA Technical Guidance Manual (TGM) states "At minimum, wells should be redeveloped when 20% of the well screen is occluded by sediments". Monitoring well sampling events should include total depth measurements to help determine if sediment is obscuring the well screen interval. DERR does not necessarily concur with the Army statements, but will review the data from these wells in the future to evaluate if turbidity is affecting the quality of the analytical data from the wells.

Army Response (Revised): Agree. During the upcoming 2023 Spring FWGWMP sampling event, the permanent pumps will be removed from monitoring wells LL1mw-086, LL1mw-089, and LL12mw-244 and total depth of the wells will be measured. If it is concluded that a well screen is in excess of 20% occluded by sediments, that monitoring well will be redeveloped prior to sampling.

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

March 14, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Kevin Palombo
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, RVAAP-66 Facility-Wide Groundwater, Responses to Comments on the Draft RVAAP-66 Facility-wide Groundwater Addendum for 2023 (Work Activity No. 267-000-859-036)

Dear Mr. Palombo:

The Army appreciates your comments on the Draft Facility-wide Groundwater Monitoring Program Plan, RVAAP-66 Facility-wide Groundwater, Addendum for 2023. Enclosed for your review are responses to your comments. Upon final resolution of the comments, the Army will provide a Final version of the addendum for Ohio EPA concurrence.

These comment responses were prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275
Digitally signed by TAIT.KATHRYN.SERENA.1289508275
Date: 2023.03.14 10:04:56 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

ec: Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Liam McEvoy, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Katie Tait, OHARNG
Steve Kvaal, USACE Louisville
Jay Trumble, USACE Louisville
Jed Thomas, Leidos
Ryan Laurich, Leidos
Jennifer Tierney, Chenega Reliable Services

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-66 Facility-Wide Groundwater, Responses to Comments on the Draft RVAAP-66 Facility-wide Groundwater Addendum for 2023 (Work Activity No. 267-000-859-036)

COMMENTS

Ohio EPA Comment 1 Revisions to the 2023 Sampling Scheme:

The Draft Facility-wide Groundwater Monitoring Program (FWGWMP) Addendum for 2023 proposed a total of 47 wells for sampling during 2023, down from 48 wells sampled in 2022) one well, LL10mw-003, was proposed to be deleted from 2023 sampling since the carbon tetrachloride results for this well had been below the maximum contaminant level (MCL) of 5.0 ug/L for the last eight sampling events, and carbon tetrachloride had not been identified as a Chemical of Concern (COC) for Load Line 10 (2022 RI Report, Leidos).

Ohio EPA agrees that the last eight sampling events for LL10mw-003 indicated carbon tetrachloride levels below the MCL of 5.0 ug/L (results ranging from 0.63 ug/L to 4.0 ug/L). Analysis of these nine results (eight sampling events plus one duplicate sample) using Sanitas statistical software indicated that Sen's Slope/Mann-Kendal trend test of these results show a visual upward sloping trend (slope = 0.68 units per year) but no significant trend in the data. However, a linear regression analysis indicated a similar visual upward sloping trend line (slope = 0.66 units per year) which was found to be a significantly increasing trend.

While Ohio EPA concurs that carbon tetrachloride levels are below the MCL, some statistical analyses indicate that levels may be slightly increasing over time. Ohio EPA would suggest that some sampling continues to be conducted at LL10mw-003 for carbon tetrachloride (and other volatile organic compounds (VOCs) to demonstrate daughter products indicating degradation), perhaps at a reduced frequency than the other FWGWMP wells.

> *Army Response*: Agree. Although the carbon tetrachloride concentrations have been below the MCL for 4 years (8 sampling events) and was not identified as a COC in the Facility-wide Groundwater RI Report, the Army agrees to analyze for carbon tetrachloride in LL10mw-003 in spring and fall 2023. The Army will not be analyzing daughter products and assessing degradation of carbon tetrachloride at this time. If results indicate that carbon tetrachloride is above the MCL in the future, a sampling and analysis of daughter products may be considered.

Ohio EPA Comment 2 Revisions to the 2023 Sampling Scheme:

Leidos recommends sampling for carbon tetrachloride be discontinued at ground water monitoring well LL10mw-003 at Load Line 10 because eight consecutive sampling events since 2019 have been below the MCL of 5 µg/l and the remedial investigation (RI) report (Leidos 2022) did not identify carbon tetrachloride as a chemical of concern at Load Line 10. Ohio EPA risk recommends sampling for carbon tetrachloride be continued; while the detections are below the MCL, the detections are on an upward trend and the current sampling in winter and fall is not the season in which the highest concentration was detected, which was summer.

> *Army Response*: Please refer to response to Ohio EPA Comment 1.

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

March 6, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin Sedlak
Restoration Program Manager
ARNG-ILE Clean Up
Camp James A Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID#267000859036

Sent via email to: Kevin.m.sedlak.ctr@army.mil

Subject: Response to Ohio EPA Comments on the Draft RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2022 Sampling Event dated February 7, 2023

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the Response to Ohio EPA Comments on the Draft RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2022 Sampling Event at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Camp James A. Garfield). This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) via email on February 7, 2023. The response was prepared for the United States Army Corps of Engineers (USACE) on behalf of the National Guard Bureau by Leidos under Contract Number W912QR-21-D-0016.

Based on our review of the Army National Guard's Response to Ohio EPA comments provided in in your letter dated February 7, 2023, we find the responses generally acceptable, however, we had an additional comment regarding the response to our comment number 4.

Comment 4 – Previous Ohio EPA comment was that wells to be considered for redevelopment prior to sampling included LL1mw-086, LL1mw-089, and LL12mw-244, but that these proposed wells were not redeveloped prior to sampling for this Spring 2022 event. Well LL12mw-244 was found to have a turbidity reading of 7,537.2 NTUs during 2021 sampling. Ohio EPA requested further information on not redeveloping these wells prior to the 2022 sampling events, or possibly present a schedule for future redevelopment. Army responded that the redevelopment of these wells in their 2021 Annual Report was a proposed recommendation and was decided to not redevelop as they state that the elevated turbidity does not influence the explosives, nitrate or ammonia readings from these wells. The Army

also states that the high turbidity associated with these wells does not appear to create issues with the dataset or risk management decisions.

Ohio EPA states that while high turbidity levels might not interfere with the chemicals of concern (COCs) directly, it can present a Data Quality Objectives (DQO) issue if the wells are becoming silted and starts filling the well screen (resulting in not getting a representative sample across the screened zone). Chapter 8 of the Ohio EPA Technical Guidance Manual (TGM) states "At minimum, wells should be redeveloped when 20% of the well screen is occluded by sediments". Monitoring well sampling events should include total depth measurements to help determine if sediment is obscuring the well screen interval. DERR does not necessarily concur with the Army statements, but will review the data from these wells in the future to evaluate if turbidity is affecting the quality of the analytical data from the wells.

Once this response is clarified, the document can be finalized. Please be sure that all agreed-upon changes, additions and clarifications are provided in the final document.

If you have questions, please contact me at (330) 963-1292 or by email at kevin.palombo@epa.ohio.gov.

Sincerely,

Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/cm

ec: Al Brillinger, Chenega Reliable Services
Katie Tait, OHARNG RTLS
Steven Kvaal, USACE Louisville
Nat Peters, USACE Louisville
Megan Oravec, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Liam McEvoy, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

March 6, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin Sedlak
Restoration Program Manager
ARNG-ILE Clean Up
Camp James A Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444

Sent via email to:
Kevin.m.sedlak.ctr@army.mil

RE: US Army Ammunition Plt RVAAP
Remediation Response
Approval
Remedial Investigation
Remedial Response
Portage County
ID# 267000859036

Subject: Ohio EPA Comments on the Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Addendum for 2023, dated January 23, 2023

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Addendum for 2023 for the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Camp James A. Garfield). This document was received via email at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on January 23, 2023. The report was prepared for the United States Army Corps of Engineers on behalf of the National Guard Bureau by Leidos under Contract Number W912QR-21-D-0016. Comments on the document based on Ohio EPA review are provided below. Please provide responses to the enclosed comments in accordance with the Directors Findings and Orders.

GROUNDWATER COMMENTS

1. Revisions to the 2023 Sampling Scheme:

   The Draft Facility-wide Groundwater Monitoring Program (FWGWMP) Addendum for 2023 proposed a total of 47 wells for sampling during 2023, down from 48 wells sampled in 2022) one well, LL10mw-003, was proposed to be deleted from 2023 sampling since the carbon tetrachloride results for this well had been below the maximum contaminant level (MCL) of 5.0 ug/L for the last eight sampling events, and carbon tetrachloride had not been identified as a Chemical of Concern (COC) for Load Line 10 (2022 RI Report, Leidos).

Ohio EPA agrees that the last eight sampling events for LL10mw-003 indicated carbon tetrachloride levels below the MCL of 5.0 ug/L (results ranging from 0.63 ug/L to 4.0 ug/L). Analysis of these nine results (eight sampling events plus one duplicate sample) using Sanitas statistical software indicated that Sen's Slope/Mann-Kendal trend test of these results show a visual upward sloping trend (slope = 0.68 units per year) but no significant trend in the data. However, a linear regression analysis indicated a similar visual upward sloping trend line (slope = 0.66 units per year) which was found to be a significantly increasing trend.

While Ohio EPA concurs that carbon tetrachloride levels are below the MCL, some statistical analyses indicate that levels may be slightly increasing over time. Ohio EPA would suggest that some sampling continues to be conducted at LL10mw-003 for carbon tetrachloride (and other volatile organic compounds (VOCs) to demonstrate daughter products indicating degradation), perhaps at a reduced frequency than the other FWGWMP wells.

RISK COMMENTS

2. Section 3.1: Revisions to the 2023 Sampling Scheme

Leidos recommends sampling for carbon tetrachloride be discontinued at ground water monitoring well LL10mw-003 at Load Line 10 because eight consecutive sampling events since 2019 have been below the MCL of 5 µg/l and the remedial investigation (RI) report (Leidos 2022) did not identify carbon tetrachloride as a chemical of concern at Load Line 10. Ohio EPA risk recommends sampling for carbon tetrachloride be continued; while the detections are below the MCL, the detections are on an upward trend and the current sampling in winter and fall is not the season in which the highest concentration was detected, which was summer.

2022	2021	2020	2019	2018
Fall: 2.9 µg/l	Winter: 2021: 3.5 µg/l	Fall: 2.6 µg/l	Fall: below MCL	June: 7.5J µg/l
Spring: 4 µg/l	Spring: 2.4 µg/l	Spring: 1.3J µg/l	Spring: below MCL	October: 6.7J µg/l

This Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Addendum for 2023 was reviewed by personnel from Ohio EPA. Additional information is necessary to approve the document.

If you have questions or would like to set up a meeting to discuss these comments, please contact me at kevin.palombo@epa.ohio.gov or at (330) 963-1292.

Sincerely,

Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/cm

ec: Steven Kvaal, USACE, Louisville
Nat Peters, USACE, Louisville
Al Brillinger, Chenega Reliable Services, LLC
Katie Tait, OHARNG RTLS
Megan Oravec, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Manager, Ohio EPA, NEDO, DERR
Liam McEvoy, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR

NATIONAL GUARD BUREAU
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ARLINGTON VA 22204-1373

February 21, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Kevin Palombo, Project Coordinator
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Notification of Field Work, Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-66 Facility-wide Groundwater (Work Activity No. 267-000-859-036)

Dear Mr. Palombo:

In accordance with the Director's Final Findings and Orders, Section XIII, #28, for the RVAAP Restoration Program, the Army National Guard (ARNG) is providing notification of field activities at the former RVAAP (Camp James A. Garfield) 15 days prior to the scheduled start date. These field activities and tentative schedule are below:

- 03/08/23-03/31/23: Vegetation clearing, monitoring well installation, and groundwater sampling.

It is anticipated that field mobilization and minor site preparation activities will take place in advance of 3/8/23. In the event that the schedule above needs to change, the Army will provide an e-mail notification with revised dates. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.02.21 14:37:08 -05'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA, DERR-NEDO
Liam McEvoy, Ohio EPA, DERR-NEDO
Katie Tait, OHARNG
Steve Kvaal, USACE Louisville
Jay Trumble, USACE Louisville
Jed Thomas, Leidos
Ryan Laurich, Leidos

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
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February 13, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Kevin Palombo, Site Coordinator
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Draft Facility-wide Groundwater 2022 Annual Report (Work Activity No. 267000859036)

Dear Mr. Palombo:

An electronic version of the *Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Annual Report for 2022* will be sent using the Ohio EPA LiquidFile system. Due to the file size, the text (including figures and tables) will be included as a separate file from the appendices. A hard copy and CD can be sent upon request by Ohio EPA.

This report was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.02.13 08:23:07 -05'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA, NEDO
Megan Oravec, Ohio EPA, NEDO
Liam McEvoy, Ohio EPA, NEDO
Tom Schneider, Ohio EPA, SWDO
Katie Tait, OHARNG
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Jed Thomas, Leidos
Ryan Laurich, Leidos
Jennifer Tierney, Chenega

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

February 7, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Kevin Palombo
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-66 Facility-Wide Groundwater, Responses to Comments on the Draft RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2022 Sampling Event (Work Activity No. 267-000-859-036)

Dear Mr. Palombo:

The Army appreciates your comments on the Draft Facility-wide Groundwater Monitoring Program RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2022 Sampling Event. Enclosed for your review are responses to your comments. Upon final resolution of the comments, the Army will provide a Final version of the report for Ohio EPA concurrence.

These comment responses were prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.02.07 08:28:31 -05'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

ec: Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Liam McEvoy, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Katie Tait, OHARNG, Camp James A. Garfield
Steve Kvaal, USACE Louisville
Jay Trumble, USACE Louisville
Jed Thomas, Leidos
Ryan Laurich, Leidos
Jennifer Tierney, Chenega Reliable Services

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2022 Sampling Event (Work Activity No. 267-000-859-036)

COMMENTS

Ohio EPA Comment 1: Appendix B Completeness: A review of Appendix B (Field Forms) included daily log sheets, well purge forms, chain-of-custody sheets, and calibration reports for field equipment.

Appendix B.3 Chains of Custody section still has the first three pages denoted as place holders for "RVAAP-191-TA_06142022", "RVAPP-192-TA_06142022", and "RVAAP193-TA_06152022". Appropriate Chains of Custody documents should be inserted into the final version of the report.

> *Army Response*: Agree. Appendix B has been revised to include Chains of Custody for RVAAP-191-TA_06142022, RVAPP-192-TA_06142022, and RVAAP193-TA_06152022.

Ohio EPA Comment 2: Section 3.2 Field Change Requests: Section 3.2 (Page 3-1, line 153) documents four previously approved field change requests (FCR) submitted and applicable to the Spring 2022 sampling event, (LEIDOS_FWGW_001, LEIDOS_FWGW_004, and LEIDOS_FWGW_006 from 2018 and LEIDOS_FWGW_010 from 2019).

These four FCRs are included within Appendix A, along with LEIDOS_FWGW_009, (October 2019 FWGWMP-Additional Sampling Suite) which was submitted September 26, 2019, and LEIDOS_FWGW_0011 (December 2021 FWGWMP-Additional Sampling Suite) was submitted December 15, 2021.

Since LEIDOS_FWGW_009 and LEIDOS_FWGW_0011 are included in Appendix A, they should also be included in the Section 3.2 list.

> *Army Response*: Clarification and agree. As noted in the comment, FCRs LEIDOS_FWGW_009 and LEIDOS_FWGW_0011 are not applicable to the Spring 2022 sampling event. Accordingly, these FCRs have been removed from Appendix A and a description of these FCRs will not be added to Section 3.2.

Ohio EPA Comment 3: Table 4-1 Data Summary Completeness: Table 4-1 of the Draft FWGWMP Semi-Annual Report for Spring 2022 indicated that all 48 wells were analyzed for the proper analytical parameters in accordance with the Final FWGWMP Addendum for 2022 (well-specific combinations of volatile organic compounds (VOCs), semi-volatile organic compound (SVOCs), polycyclic aromatic hydrocarbons (PAHs), phenols, polychlorinated biphenyls (PCBs), perchlorate, explosives, expanded explosives, phthalates, pesticides, cyanide, phosphorus, anions, pH, alkalinity, nitrate, ammonia, carbon tetrachloride and metals).

Table 4-1 generally presented summaries of all the available well-specific data results but presented confusing information when compared to Appendix D.1 and Appendix D.3 tables. Table 4.1 sometimes presents any detected data concentrations and sometimes it only presents concentrations that exceed screening or background criteria. Additionally, reporting units ug/L and mg/L are alternately used on the D.1 and D.3 tables, and to a lesser degree within Table 4.1. The Appendix D.3 Table has been modified from the 2021 version to add a "Results Exceeds Screening and Background Criteria (Y/N)" column, which shows a "N" if the concentration did not exceed both values, but Table 4.1 sometimes presents summaries if either value is exceeded, or if there are no screening criteria. To clarify and avoid the need to consult multiple tables to get the whole picture of the available lab data, it may be beneficial to reconfigure tables throughout the report to have a consistent viewpoint and consistent reporting units. It had previously been suggested (during the Spring 2021 report review) that Appendix D.3 table denote all

laboratory detections, and then presents just the exceedances in BOLD font, that way both detections and exceedances are clearly denoted and comparing two or three tables is not necessary.

Army Response: Agree. The following revisions have been made to the report:

1) The data table presented as Appendix D.3 has been revised so that results exceeding the applicable screening criteria are highlighted in bold text.
2) The data table presented as Appendix D.2 has been revised so that units of concentration are presented consistently across Tables 4.1, D.1, D.2, and D.3. Units of concentration for Explosives, SVOCs, PCBs, Pesticides, VOCs are presented in µg/L, this is consistent with the presentation of historical data results. Units of concentration for Metals and Miscellaneous analytes are presented in mg/L. This is consistent with the presentation of historical data results.

Ohio EPA Comment 4: Well Redevelopment – Elevated Turbidity Results: Section 6.0 Well redevelopment of the Draft FWGWMP Semi-Annual Report for Spring 2022 indicated that no permanent monitoring wells were redeveloped for the 2022 spring sampling event. This section also stated that a list of recommended wells to be redeveloped was presented within the 2021 Annual Report (Leidos 2022c). Upon review of the 2021 Annual Report, Section 8.2.1 Well Redevelopment, wells to be considered for redevelopment prior to sampling included LL1mw-086, LL1mw-089, and LL12mw-244. It is not further explained as to why these proposed wells were not redeveloped prior to sampling for this Spring 2022 event.

It should be noted that well LL12mw-244 was found to have a reading of 7,537.2 NTUs during 2021 sampling, and Ohio EPA comment at that time was that further discussion may be warranted to evaluate if additional potential well redevelopment activities using methods other than surging and pumping until dry (such as purging with a Waterra pump or equivalent) could help lower the elevated turbidity numbers in well LL12mw244."

Future well redevelopment activities should be conducted in accordance with Section 3.5.2 of the approved Revised Final Remedial Investigation Work Plan (RIWP) produced by TEC-Weston and dated December 21, 2016, and in accordance with the Ohio EPA's Technical Guidance Manual for Ground Water Investigations – Chapter 8: Monitoring Well Development, Maintenance, and Redevelopment (Ohio EPA 2009).

Please provide further explanation as to why wells LL1mw-086, LL1mw-089, and LL12mw-244 were not redeveloped prior to sampling for this Spring 2022 event and provide a potential schedule or rationale to follow for future redevelopment.

Army Response: Clarification and agree. While Section 8.2.1 of the FWGWMP Annual Report present recommendations for future monitoring well redevelopment, these are only provided as proposed recommendations. LL1mw-086 was redeveloped in April 2020, and LL12mw-244 was recently redeveloped on April 21, 2021. The Army elected not to redevelop the wells in 2022. These wells will continue to be analyzed for COCs identified in the RI Report (explosives, nitrate, and ammonia), and the results are not influenced by elevated turbidity. The high turbidity associated with these wells do not appear to create issues with the dataset and risk management decisions.

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

January 25, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin Sedlak
Restoration Program Manager
ARNG-ILE Clean Up
Camp James A Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID#267000859036

Sent via email to:
kevin.m.sedlak.ctr@army.mil

Subject: Ohio EPA Comments on the "Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2022 Sampling Event" dated November 17, 2022.

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the **"Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2022 Sampling Event"** at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Camp Garfield). This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on November 21, 2022. The report was prepared for the United States Army Corps of Engineers on behalf of the National Guard Bureau by Leidos under Contract Number W912QR-16-D-0003, Comments on the document based on Ohio EPA review are provided below. Please provide responses to the enclosed comments in accordance with the Directors Findings and Orders.

DRAFT FWGWMP SEMI-ANNUAL REPORT FOR SPRING 2022

The Draft Facility- Wide Groundwater Monitoring Program (FWGWMP) Semi-Annual Report for Spring 2022 summarizes ground water monitoring activities conducted during the Spring 2022 sampling event, and provides descriptions of field activities performed, presents field and analytical results, and evaluates chemical data collected per the approved ground water sampling scheme specified in the Final FWGWMP Addendum for 2022 dated April 28, 2022.

According to the Final FWGWMP Addendum for 2022, a total of 48 wells (including two of the five formerly identified RCRA wells; RVAAP-04 Open Demolition Area #2 wells DETmw-003 and DETmw-004) were slated for resampling in 2022. The remaining three formerly identified RCRA wells, RVAAP-01 Ramsdell Quarry Landfill wells RQLmw-007, RQLmw-008, RQLmw-

Received
25 JAN 2023

009 were not sampled during the 2022 FWGWMP event and are currently being proposed for No Further Action under the Draft Remedial Investigation (RI) report (Leidos 2020b). Ohio EPA requested in our June 28, 2022, correspondence that the remaining three formerly identified RCRA wells around Ramsdell Quarry not be abandoned prior to final remedy selection.

In 2021, a total of 53 wells (including the two former identified RCRA wells (DETmw-003 and DETmw-004) were sampled under the FWGWMP. Based on those results, seven of these wells were discontinued from sampling, while a new set of two wells (not sampled in 2021) were added to the list to achieve the total of 48 wells to be sampled for 2022.

According to Section 3.1, Table 3-1, and Table 4-1 of the Draft FWGWMP Semi-Annual Report for Spring 2022, all 48 wells specified in the Draft FWGWMP Addendum for 2022 were sampled.

COMMENTS

1. Appendix B Completeness:

A review of Appendix B (Field Forms) included daily log sheets, well purge forms, chain-of-custody sheets, and calibration reports for field equipment.

Appendix B.3 Chains of Custody section still has the first three pages denoted as place holders for “RVAAP-191-TA_06142022”, “RVAPP-192-TA_06142022”, and “RVAAP-193-TA_06152022”. Appropriate Chains of Custody documents should be inserted into the final version of the report.

2. Section 3.2 Field Change Requests:

Section 3.2 (Page 3-1, line 153) documents four previously approved field change requests (FCR) submitted and applicable to the Spring 2022 sampling event, (LEIDOS_FWGW_001, LEIDOS_FWGW_004, and LEIDOS_FWGW_006 from 2018 and LEIDOS_FWGW_010 from 2019).

These four FCRs are included within Appendix A, along with LEIDOS_FWGW_009, (October 2019 FWGWMP-Additional Sampling Suite) which was submitted September 26, 2019, and LEIDOS_FWGW_0011 (December 2021 FWGWMP-Additional Sampling Suite) was submitted December 15, 2021.

Since LEIDOS_FWGW_009 and LEIDOS_FWGW_0011 are included in Appendix A, they should also be included in the Section 3.2 list.

3. Table 4-1 Data Summary Completeness:

Table 4-1 of the Draft FWGWMP Semi-Annual Report for Spring 2022 indicated that all 48 wells were analyzed for the proper analytical parameters in accordance with the Final FWGWMP Addendum for 2022 (well-specific combinations of volatile organic compounds (VOCs), semi-volatile organic compound (SVOCs), polycyclic aromatic hydrocarbons (PAHs), phenols, polychlorinated biphenyls (PCBs), perchlorate, explosives, expanded explosives, phthalates, pesticides, cyanide, phosphorus, anions, pH, alkalinity, nitrate, ammonia, carbon tetrachloride and metals).

Table 4-1 generally presented summaries of all the available well-specific data results but presented confusing information when compared to Appendix D.1 and Appendix D.3 tables. Table 4.1 sometimes presents any detected data concentrations and sometimes it only presents concentrations that exceed screening or background criteria. Additionally, reporting units ug/L and mg/L are alternately used on the D.1 and D.3 tables, and to a lesser degree within Table 4.1. The Appendix D.3 Table has been modified from the 2021 version to add a “Results Exceeds Screening and Background Criteria (Y/N)” column, which shows a “N” if the concentration did not exceed both values, but Table 4.1 sometimes presents summaries if either value is exceeded, or if there are no screening criteria. To clarify and avoid the need to consult multiple tables to get the whole picture of the available lab data, it may be beneficial to reconfigure tables throughout the report to have a consistent viewpoint and consistent reporting units. It had previously been suggested (during the Spring 2021 report review) that Appendix D.3 table denote all laboratory detections, and then presents just the exceedances in BOLD font, that way both detections and exceedances are clearly denoted and comparing two or three tables is not necessary.

4. Well Redevelopment – Elevated Turbidity Results:

Section 6.0 Well Redevelopment of the Draft FWGWMP Semi-Annual Report for Spring 2022 indicated that no permanent monitoring wells were redeveloped for the 2022 spring sampling event. This section also stated that a list of recommended wells to be redeveloped was presented within the 2021 Annual Report (Leidos 2022c). Upon review of the 2021 Annual Report, Section 8.2.1 Well Redevelopment, wells to be considered for redevelopment prior to sampling included LL1mw-086, LL1mw-089, and LL12mw-244. It is not further explained as to why these proposed wells were not redeveloped prior to sampling for this Spring 2022 event.

It should be noted that well LL12mw-244 was found to have a reading of 7,537.2 NTUs during 2021 sampling, and Ohio EPA comment at that time was that further discussion may be warranted to evaluate if additional potential well redevelopment activities using methods other than surging and pumping until dry (such as purging with a Waterra pump or equivalent) could help lower the elevated turbidity numbers in well LL12mw-244.”

Future well redevelopment activities should be conducted in accordance with Section 3.5.2 of the approved Revised Final Remedial Investigation Work Plan (RIWP)

produced by TEC-Weston and dated December 21, 2016, and in accordance with the Ohio EPA's Technical Guidance Manual for Ground Water Investigations – Chapter 8: Monitoring Well Development, Maintenance, and Redevelopment (Ohio EPA 2009).

Please provide further explanation as to why wells LL1mw-086, LL1mw-089, and LL12mw-244 were not redeveloped prior to sampling for this Spring 2022 event and provide a potential schedule or rationale to follow for future redevelopment.

This **"Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2022 Sampling Event"** was reviewed by personnel from Ohio EPA. Additional information is necessary to approve the document. If you have questions or would like to set up a meeting to discuss these comments, you can contact me at kevin.palombo@epa.ohio.gov.

Sincerely,

Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/cm

ec: Rebecca Shreffler, Chenega Reliable Services
Katie Tait, OHARNG RTLS
Steven Kvaal, USACE Louisville
Nat Peters, USACE Louisville
Megan Oravec, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Liam McEvoy, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

January 23, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Kevin Palombo, Site Coordinator
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Draft Facility-wide Groundwater 2023 Addendum (Work Activity No. 267000859036)

Dear Mr. Palombo:

An electronic version of the *Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Addendum for 2023* has been sent using the Ohio EPA LiquidFile system. A hard copy and CD can be sent upon request by Ohio EPA.

This plan was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.01.23 07:09:47 -05'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA, NEDO
Megan Oravec, Ohio EPA, NEDO
Liam McEvoy, Ohio EPA, NEDO
Tom Schneider, Ohio EPA, SWDO
Katie Tait, OHARNG
Steve Kvaal, USACE Louisville
Jay Trumble, USACE Louisville
Jed Thomas, Leidos
Ryan Laurich, Leidos
Jennifer Tierney, Chenega Corporation

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

January 11, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin M. Sedlak
Army National Guard
Installation and Environment
Clean-up Branch
IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: **US Army Ammunition Plt RVAAP**
Remediation Response
Project Records
Remedial Response
Portage County
267000859036

Subject: **Approval of the "Final Feasibility Study Monitoring Well Installation Plan for RVAAP-66 Facility-wide Groundwater"**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received the "Final Feasibility Study Monitoring Well Installation Plan for RVAAP-66 Facility-wide Groundwater" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio dated November 17, 2022. This document was received via email at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) on November 23, 2022. The document was prepared for the U.S Army Corps of Engineers on behalf of the Army National Guard Directorate by Leidos.

The final document was reviewed by personnel from Ohio EPA's DERR. Pursuant to the Director's Findings and Orders paragraph 39 (b), Ohio EPA considers the document final and approved.

If you have any questions, please contact me at kevin.palombo@epa.ohio.gov or call me at (330) 963-1292.

Sincerely,

Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/cm

ec: Rebecca Shreffler, Chenega
Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Natalie Oryshkewych, Ohio EPA, NEDO DERR
Megan Oravec, Ohio EPA, NEDO DERR
Liam McEvoy, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO DERR
Carrie Rasik, Ohio EPA, CO DERR

Received
12 JAN 2023

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

October 19, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Edward D'Amato, Site Coordinator
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Draft Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP), CC RVAAP-69 Building 1048 Fire Station Vapor Intrusion Study of Building 1037 (Work Activity No. 267000859269)

Dear Mr. D'Amato:

For your review, an electronic version of the *Draft Uniform Federal Policy-Quality Assurance Project Plan for the CC RVAAP-69 Building 1048 Fire Station Vapor Intrusion Study of Building 1037* has been sent using the Ohio EPA LiquidFile system. A hard copy and CD can be sent upon request by Ohio EPA.

This plan was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at (330)235-2153 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.10.19 10:56:30 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Megan Oravec, Ohio EPA, NEDO
Tom Schneider, Ohio EPA, SWDO
Katie Tait, OHARNG
Steve Kvaal, USACE Louisville
Nathaniel Peters, II, USACE Louisville
Jed Thomas, Leidos
Ryan Laurich, Leidos
Jennifer Tierney, Chenega

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

February 27, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment - Cleanup
Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition
Remediation Response
Correspondence
Remedial Response
Portage County
267000859269

Sent via e-mail to: kevin.m.sedlak.ctr@army.mil

Subject: Approval of Final Remedial Investigation for CC RVAAP-69 Building 1048 Fire Station

Dear Mr. Sedlak:

Thank you for submitting the Final Remedial Investigation for CC RVAAP-69 Building 1048 Fire Station. On February 15, 2023, you submitted a copy of the well sealing report that was requested in Ohio EPA's August 5, 2021, comment letter.

Ohio EPA approves the document.

If you have any questions, please feel free to contact me at (330) 963-1170 or by e-mail at: ed.damato@epa.ohio.gov.

Sincerely,

Edward J D'Amato

Edward J. D'Amato
Site Coordinator
Division of Environmental Response and Revitalization

Received 28 FEB 23

ED/cm

ec: Nat Peters, USACE
Katie Tait, OHARNG RTLS
Steven Kvaal, USACE Kvaal
Natalie Oryshkewych, Ohio EPA, DERR, NEDO
Megan Oravec, Ohio EPA, DERR, NEDO
Liam McEvoy, Ohio EPA, DERR, NEDO
Tom Schneider, Ohio EPA, DERR, SWDO
Brian Tucker, Ohio EPA, DERR, CO

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

February 14, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Edward D'Amato, Site Coordinator
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, RVAAP-69 Building 1048 Fire Station, Final Remedial Investigation at CC RVAAP-69 Building 1048 Fire Station (Work Activity No. 267-000-859-214)

Dear Mr. Palombo:

For your concurrence, an electronic version of the *Final Remedial Investigation for CC RVAAP-69 Building 1048 Fire Station* will be sent using the Ohio EPA LiquidFile system. Due to file size, Appendices B, F, G, and H are provided as different files with the same submittal.

This report was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

MORGAN.TIMOTHY.MICHAEL.1230216351 Digitally signed by MORGAN.TIMOTHY.MICHAEL.1230216351 Date: 2023.02.14 10:39:05 -05'00'

For Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA, NEDO
Megan Oravec, Ohio EPA, NEDO
Tom Schneider, Ohio EPA, SWDO
Katie Tait, OHARNG, Camp James A. Garfield
Steve Kvaal, USACE Louisville
Nathaniel Peters, II, USACE Louisville
Jed Thomas, Leidos
Al Brillinger, Chenega Tri-Services
Jennifer Tierney, Vista Sciences Corporation

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

January 19, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment - Cleanup Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition
Remediation Response
Correspondence
Remedial Response
Portage County
267000859214

Sent via e-mail to: Kevin.m.sedlak.ctr@army.mil

Subject: Remedial Investigation for CC RVAAP-69 Building 1048 Fire Station

Dear Mr. Sedlak:

Thank you for your January 6, 2023, response to the Ohio Environmental Protection Agency's (Ohio EPA) August 5, 2021, comment letter.

Ohio EPA concurs with the response provided we receive a copy of the well sealing report for the former groundwater supply well as requested in the comment letter.

If you have any questions, please feel free to contact me at (330) 963-1170 or by e-mail at ed.damato@epa.ohio.gov.

Sincerely,

Edward J D'Amato

Edward J. D'Amato
Site Coordinator
Division of Environmental Response and Revitalization

ED/cm

ec: Nat Peters, USACE
Katie Tait, OHARNG RTLS
Steven Kvaal, USACE Kvaal
Rebecca Shreffler, Chenega
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Brian Tucker, Ohio EPA, CO, DERR

Received
19 JAN 2023

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

January 6, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Edward D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Responses to Comments on the Draft Remedial Investigation at CC RVAAP-69 Building 1048 Fire Station (Work Activity No. 267-000-859-214)

Dear Mr. D'Amato:

The Army appreciates your time and comments on the Draft Remedial Investigation at CC RVAAP-69 Building 1048 Fire Station. Enclosed for your review are responses to your comments dated August 5, 2021. Upon resolution of these comments, the Army will provide a Final version of the report for Ohio EPA concurrence.

These comment responses were prepared for the Army National Guard in support of the RVAAP restoration program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275
Digitally signed by TAIT.KATHRYN.SERENA.1289508275
Date: 2023.01.06 07:15:47 -05'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Natalie Oryshkewych, Ohio EPA, NEDO
Megan Oravec, Ohio EPA, NEDO
Tom Schneider, Ohio EPA, SWDO
Brian Tucker, Ohio EPA, CO
Katie Tait, OHARNG
Steve Kvaal, USACE Louisville
Nathaniel Peters, II, USACE Louisville
Jed Thomas, Leidos
Rebecca Shreffler, Chenega

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Draft Remedial Investigation at CC RVAAP-69 Building 1048 Fire Station (Work Activity No. 267-000-859-214)

Comments

Ohio EPA Comment 1: Report Documentation Page Entry Question

The Report Documentation Page within the Draft RI for CC RVAAP-69 Building 1048 Fire Station report has an entry within Box #15 Subject Terms as "Building 1034 Motor Pool Hydraulic Lift". While this is downgradient of the Building 1048 Fire Station, it is a different Area of Concern (AOC) than the Building 1048 Fire Station.

Action Item: Please confirm this entry for Box #15 and correct/revise as needed.

Army Response: Agree. The entry for Box #15 will be revised to state "Building 1048 Fire Station."

Ohio EPA Comment 2: Well Abandonments

According to Page 2-6, Lines 880-885: "An inactive groundwater supply well is located approximately 300 feet south-southeast of the AOC. The well was installed to a total depth of 97 feet bgs and cased to 57 feet bgs (water well log number 763132). The well was gauged on 4 June 2018; depth to water was 21.49 feet and depth to soft bottom was 84.75 feet. The well pump was inoperable, and the well is inactive. This drinking water well, along with all others, are scheduled for abandonment by the Ohio National Guard."

Ohio EPA anticipates that well abandonment activities will be conducted in accordance with the Ohio Administrative Code (OAC) rule 3745-9-10, the State of Ohio Regulations and Technical Guidance for Sealing Unused Water Wells and Boreholes - March 2015), and the Ohio EPA Technical Guidance Manual (TGM) for Hydrogeologic Investigations and Ground Water, Chapter 9 (Sealing Boreholes and Decommissioned Monitoring Wells), Section 2.1.2 – Revision 3, September 2016 (or more recent version).

Section 1521.05(C) of the Ohio Revised Code requires completed Water Well Sealing Report Forms (DNR 7810.12e) submitted to the Ohio Department of Natural Resources (ODNR) within 30 days after well sealing, as noted in Chapter 9, Section 2.3 of Ohio EPA's TGM. Also noted in Section 2.3, proper sealing of boreholes should be documented and reported to the Ohio EPA division regulating the site. Report information should include a copy of the ODNR Water Well Sealing Report Forms along with copies of well logs and documentation of steps taken to abandon the wells, and other information as described in Chapter 9, Section 2.3.1 of Ohio EPA's TGM.

Action Item: Please verify that this former drinking water well located near the Building 1034 Motor Pool Hydraulic Lift is scheduled for proper abandonment and provide timeline if known.

Army Response: Comment noted. The groundwater supply well has since been abandoned. As this was a private, potable well, the effort to abandon this well was permitted by the Ohio Department of Health. The well abandonment took place in June 2021 and was inspected by the Portage County Health District on June 30, 2021. The OHARNG will file the Well Sealing Report with ODNR.

October 12, 2023

Received October 13, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment- Cleanup Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444
Sent via email to: Kevin.m.sedlak.ctr@army.mil

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859243, 267000859137, 267000859098, 267000859264 and 267000859127

Subject: Ohio EPA Comments on the "Final Remedial Investigation Addendum for CC RVAAP-79 DLA Ore Storage Sites - Ore Storage Pond Sub-Area" dated August, 2023

Dear Mr. Sedlak:

On August, 9, 2023, the Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), received the Final Remedial Investigation Addendum for CC RVAAP-79 DLA Ore Storage Sites - Ore Storage Pond Sub-Area[1]. It was prepared by the U.S. Army Corps of Engineers.

Ohio EPA has the following comment:

1. Section 4 of the results section does not include the sediment concentration results. Note that the action item below will not change the conclusion of the addendum.

   Action Item: Please include the sediment concentration data, a brief discussion of the results, and a weight of evidence discussion of all the ecological assessment components.

If you have any questions concerning this letter, please contact me at (330) 963-1170 or ed.damato@epa.ohio.gov.

Sincerely,

Edward J D'Amato

Edward D'Amato, Site Coordinator
Division of Environmental Response and Revitalization

ec: Nat Peters, USACE
Katie Tait, OHARNG RTLS
Steven Kvaal, USACE
Angela Cobbs, Chenega
Natalie Oryshkewych, Ohio EPA, DERR, NEDO
Megan Oravec, Ohio EPA, DERR, NEDO
Tom Schneider, Ohio EPA, DERR, SWDO
Brian Tucker, Ohio EPA, DERR, CO

[1] http://edocpub.epa.ohio.gov/publicportal/ViewDocument.aspx?docid=2514547

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

August 25, 2021

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Edward J. D'Amato
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program Draft RI Addendum/ Draft Feasibility Study, CC RVAAP-79 DLA Ore Storage Sites, Ore Storage Pond Sub-Area Portage/Trumbull Counties, Ohio EPA ID # 267-000859-211

Dear Mr. D'Amato:

The Army appreciates the recent opportunity during the August 20, 2021 Conference Call to discuss the Ohio EPA's concerns regarding the Draft Remedial Investigation (RI) Addendum for the CC RVAAP-79 DLA Ore Storage Sites, Ore Storage Pond Sub-Area. Additionally, Ohio EPA expressed concern that new sediment data from the Ore Storage Pond collected for the bioassays may impact the conclusions of the Human Health Risk Assessment for the Ore Storage Pond in the Final 2020 RI (*approved December 17, 2020)*.

The Army proposes the following approach to continue to make progress on this Area of Concern (AOC) while providing a process to address the Ohio EPA's concerns that were provided for discussion on August 20, 2021. The Army plans to address all the concerns provided by the Ohio EPA, in the proposed following approach.

1.) CC RVAAP-79 RI Addendum for Ore Storage Pond

- Ohio EPA should stop review of the Draft CC RVAAP-79 RI Addendum.
- Army will revise the RI Addendum as follows:

  1.) The findings will be revised to state that the "No Further Action" determination only applies for ecological receptors and that no further remedial actions are warranted to address ecological risk.

  2.) A statement, where appropriate, will be added to state:
  "Because the additional data for the Ore Storage Pond sediments collected for this RI Addendum, has concentrations of arsenic that are greater than those used to estimate risks to Human Health Receptors in the CC RVAAP-79 RI, these potential risks need to be reassessed considering the new sediment and pond data. Since the CC RVAAP-79 RI has been finalized, the Army will revise the Draft CC RVAAP-79 Feasibility (FS) to include a reassessment of potential human health risks for current and future receptors of the Ore Storage Pond that includes the new data collected for this RI Addendum. The revised HHRA will be incorporated into the Risk Management Portion of the CC RVAAP-79 FS."

2.) CC RVAAP-79 RI (*approved December 17, 2020)*

- • No change proposed.

3.) CC RVAAP-79 FS (draft and under review by the Ohio EPA)

- Ohio EPA should stop review of this Draft document.
- Army will revise the FS to include a revised Baseline Human Health Risk Assessment for the Ore Storage Pond using all available data (previously and newly collected for CC RVAAP-79 RI Addendum).
- Army will revise the FS to address the applicable Ohio EPA's comments provided on August 20, 2021.
- Army will redevelop Alternatives.
- Army will resubmit revised Draft FS.

If this approach is acceptable, please provide a notification of agreement and the Army will proceed as proposed. Please contact the undersigned at kevin.m.sedlak.ctr@mail.mil or (614) 336-6000 ext 2053 if there are concerns or if you would like to discuss the proposed approach.

Sincerely,

SEDLAK.KEVIN.MICHAEL.1254440171

Digitally signed by SEDLAK.KEVIN.MICHAEL.1254440171
Date: 2021.08.25 13:16:29 -04'00'

Kevin Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA, SWDO
Bob Princic, Ohio EPA, DERR-NEDO
Megan Oravec, Ohio EPA, DERR-NEDO
Mark Leeper, ARNG
Katie Tait, OHARNG, Camp James A. Garfield
Steve Kvaal, USACE Louisville
Angela Schmidt, USACE Louisville
Chenega Tri-Services, LLC
Patrick Ryan, Leidos

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

August 9, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Edward J. D'Amato, Site Coordinator
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Final Remedial Investigation Addendum for CC RVAAP-79 DLA Ore Storage Sites - Ore Storage Pond Sub-Area (Work Activity No. 267000859211)

Dear Mr. D'Amato:

For your concurrence, an electronic version of the Remedial Investigation Addendum for CC RVAAP-79 DLA Ore Storage Sites, Ore Storage Pond Sub-Area will be sent using the Ohio EPA LiquidFile system. A hard copy and CD can be sent upon request by Ohio EPA. To supplement your review, the Army is also providing 1) a letter submitted to Ohio EPA on August 25, 2021 that specifies the revisions to the Draft Remedial Investigation Addendum and 2) a redline version of the main text.

This addendum was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.08.09 07:58:59 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA, SWDO
Megan Oravec, Ohio EPA, NEDO
Katie Tait, OHARNG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Jed Thomas, Leidos
Ryan Laurich, Leidos
Pat Ryan, Leidos
Jennifer Tierney, Chenega

Received 22 November 2023

November 21, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin M. Sedlak
RVAAP Restoration Program Manager
ARNG-Directorate
Camp James A. Garfield JTC
1438 State Route 534
Newton Falls, OH 44444
Sent via email to:
kevin.m.sedlak.ctr@army.mil

RE: US Army Ravenna Ammunition Plt
RVAAP
Remediation Response
Project records
RI
Federal Facilities
Portage County
ID # 267000859274

Subject: Open Demolition Area #2 (ODA2) Munitions Response Site (MRS)
Remedial Investigation (RI) Post-Blow-In-Place (BIP) Munitions Constituent (MC)
Sampling Soil Memo - October 24, 2023
Ohio EPA Comment Letter

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the "Open Demolition Area #2 (ODA2) Munitions Response Site (MRS) Remedial Investigation (RI) Post-Blow-In-Place (BIP) Munitions Constituent (MC) Sampling Soil Memo"[1] (the "Memo") dated October 24, 2023. The Memo was prepared by Arcadis on behalf of the U.S. Army Corps of Engineers, Baltimore District, and submitted by the Ohio Army National Guard. Below are the Agency's comments and requests for action.

COMMENTS

1. Laboratory Report

   The memo did not include the laboratory report with sample results and narrative.

   Action Item: Ohio EPA requests the laboratory report and narrative be provided in a final memo.

[1] http://edocpub.epa.ohio.gov/publicportal/ViewDocument.aspx?docid=2284804

2. Incomplete Table

   Table 1 of the Memo does not include any explosives for comparison of pre- and post-demolition operations but does include project action limits (PALs) in the upper half of Table 1. Though the explosives are missing from the table, the table does contain 17 rows matching the 17 explosive compounds listed in the Remedial Investigation Quality Assurance Project Plan (QAPP), however, the PALs for explosives in soils provided don't appear to be representative of those in the approved QAPP (unless the appropriate units are also specified).

   Action Item: Ohio EPA requests Table 1 be modified to include all the kinetic compounds and munitions constituents (metals) in the Table with their appropriate PALs and/or units.

Please submit the final Memo to Ohio EPA with the necessary information by **December 21, 2023.** If you have any questions regarding this letter, please contact me at (330) 963-1235 or by email at Nicholas.roope@epa.ohio.gov.

Sincerely,

Nicholas Roope
Environmental Specialist
Division of Environmental Response and Revitalization

NR/cm

ec: Nicole Walworth, USACE Baltimore
Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Jennifer M. Tierney, Chenega
Megan Oravec, Ohio EPA, DERR, NEDO
Natalie Oryshkewych, Ohio EPA, DERR, NEDO
Brian Tucker, Ohio EPA, DERR, CO
Thomas Schneider, Ohio EPA, DERR, SWDO

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

October 26, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Nicholas Roope
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant Restoration Program, Post Blow-In-Place Munitions Constituent Soil Sampling Memo, Open Demolition Area #2 (RVAAP-004-R-01), Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (EPA ID# 267000859274)

Dear Mr. Roope:

Attached is the Post Blow-In-Place Munitions Constituent Soil Sampling Memo for Open Demolition Area #2 (RVAAP-004-R-01) at the former Ravenna Army Ammunition Plant. This report was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at (330)235-2153 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.10.26 07:31:48 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

ec: Tom Schneider, Ohio EPA
Megan Oravec, Ohio EPA
Katie Tait, OHARNG
Nicole Walworth, USACE
Jennifer Tierney, Chenega

Memo

SUBJECT
Open Demolition Area #2 (ODA2) Munitions Response Site (MRS) Remedial Investigation (RI) Post-Blow-In-Place (BIP) Munitions Constituent (MC) Sampling Soil

TO
Ms. Nicole Walworth
U.S. Army Corps of Engineers, Baltimore District
2 Hopkins Plaza
Baltimore, MD 21201

DATE
10/24/2023

OUR REF
Contract No. W912DR-15-D-0018
Delivery Order No. W912DR20F0452

DEPARTMENT
Environment

PROJECT NUMBER
30189080

COPIES TO
Kevin Sedlak, RPM, ARNG
Katie Tait, Environmental Specialist III, OHARNG

Arcadis U.S., Inc. (Arcadis) is conducting a remedial investigation (RI) for the Open Demolition Area #2 (ODA2) munitions response site (MRS) at the Former Ravenna Army Ammunition Plant (RVAAP), now known as Camp James A. Garfield (CJAG). RI field work is being performed in accordance with the *Remedial Investigation Quality Assurance Project Plan* (RI QAPP; Arcadis 2023) to assess the nature and extent of munitions and explosives of concern (MEC) and munitions constituents (MC). On 11 August 2023, a blow-in-place (BIP) operation was carried out on a M66 Fuze found within Grid 340 of the Kickout Area portion of the ODA2 MRS. Post-BIP sampling was performed within Grid 340 in the vicinity of the BIP location on 18 August 2023 in accordance with the RI QAPP.

Post-Blow-in-Place Sample Discussion

Per Section 17.6.6 of the RI QAPP, a post-BIP soil sample was collected using the incremental sample methodology (ISM). The sample was collected from the 100-foot (ft) by 100-ft Grid 340, which encompassed the BIP location. The post-BIP sample consisted of 30 soil increments collected from 0 to 1 ft below ground surface (ft bgs) using a gasoline-powered coring tool. The sample was analyzed for MC metals, explosives / propellants, and hexavalent chromium. Analytical results are presented in **Table 1** and the laboratory package is provided in **Attachment 1**. **Table 1** also includes the analytical results for the RI sample (collected in triplicate) from Grid 340 at a depth interval of 0 to 1 ft bgs prior to the BIP operation (i.e., pre-BIP) on 13 June 2023. Below is a summary of the results from the post-BIP sample:

- No explosives or propellants were detected in the pre-BIP or post-BIP soil samples.
- MC metals barium, chromium, copper, iron, manganese, mercury, zinc, and hexavalent chromium exceeded surface soil background values.
- Of the MC metals that exceeded background values, iron, manganese, and hexavalent chromium exceeded human health screening levels.
- With the exception of manganese levels increasing to above background values for surface soil in the post-BIP sample compared with the pre-BIP sample, based on the comparison with pre-BIP results, there was no impact to surface soil resulting from the BIP operation.

If you have any questions, or require additional information, please do not hesitate to contact me at (732) 661-3813.

Arcadis

Ms. Nicole Walworth
USACE, Baltimore District
October 2023

David Heuer
Certified Project Manager

Cc: Kevin Sedlak, RPM, ARNG
Katie Tait, Environmental Specialist III, OHARNG

Table 1
Grid 340 Pre- and Post-BIP Analytical Results
Former Ravenna Army Ammunition Plant
Ravenna, Ohio

Location Code					DA2-340M	DA2-340M	DA2-340M	DA2-340M
Sample ID					DA2SS-340M-01-BIP-SO_20230818	DA2SS-340M-01-SO_20230613	DA2SS-340M-02-SO_20230613	DA2SS-340M-03-SO_20230613
Sample Date					8/18/2023	6/13/2023	6/13/2023	6/13/2023
Sample Depth Range (feet below ground surface)					0-1	0-1	0-1	0-1
Sample Type					Normal	Normal	Duplicate	Triplicate
CAS Number	Analytes	Units	Project Action Limit (PAL) Human Health	Background (surface soil)				
Explosives and Propellants (Method 8330B)								
118-96-7	2,4,6-Trinitrotoluene	ug/kg	3600	NA	74 U	49 U	49 U	44 U
121-14-2	2,4-Dinitrotoluene	ug/kg	1700	NA	74 U	49 U	49 U	44 U
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	ug/kg	8300	NA	74 U	49 X	49 X	44 X
19406-51-0	4-Amino-2,6-dinitrotoluene	ug/kg	770	NA	74 U	49 U	49 U	44 U
2691-41-0	Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine	ug/kg	390000	NA	74 U	49 X	49 X	44 X
35572-78-2	2-Amino-4,6-dinitrotoluene	ug/kg	770	NA	74 U	49 U	49 U	44 U
479-45-8	Tetryl	ug/kg	16000	NA	74 U	49 X	49 X	44 X
55-63-0	Nitroglycerin	ug/kg	630	NA	490 U	390 X	390 X	350 X
606-20-2	2,6-Dinitrotoluene	ug/kg	360	NA	74 U	49 U	49 U	44 U
618-87-1	3,5-Dinitroaniline	ug/kg	2500	NA	74 U	49 X	49 X	44 X
78-11-5	Pentaerythritol Tetranitrate	ug/kg	57000	NA	490 U	390 U	390 U	350 U
88-72-2	2-Nitrotoluene	ug/kg	3200	NA	74 U	49 X	49 X	44 X
98-95-3	Nitrobenzene	ug/kg	5100	NA	74 U	49 X	49 X	44 X
99-08-1	3-Nitrotoluene	ug/kg	630	NA	74 U	49 X	49 X	44 X
99-35-4	1,3,5-Trinitrobenzene	ug/kg	220	NA	74 U	49 U	49 U	44 U
99-65-0	1,3-Dinitrobenzene	ug/kg	655	NA	74 U	49 U	49 U	44 U
99-99-0	4-Nitrotoluene	ug/kg	12000	NA	74 U	49 X	49 X	44 X
Metals (Method 6010D/7471B/3060/7196A)								
7429-90-5	Aluminum	mg/kg	7700	17700	***17000***	***17800 J***	***15400 J***	***17500 J***
7440-36-0	Antimony	mg/kg	3.1	0.96	4.8 U	1.6 UJ	1.3 UJ	0.72 UJ
7440-39-3	Barium	mg/kg	1500	88.4	**118 J**	**99.4**	**84.2**	**94.7**
7440-43-9	Cadmium	mg/kg	0.71	ND	0.95 U	**0.201 J**	0.77 U	**0.208 J**
7440-70-2	Calcium	mg/kg	NA	15800	**1520 J**	**794**	**718**	**724**
7440-47-3	Chromium	mg/kg	NA	17.4	**20.0**	**36.1**	**33.6**	**38.9**
7440-50-8	Copper	mg/kg	310	17.7	**27.8**	**10.7**	**9.93**	**10.3**
7439-89-6	Iron	mg/kg	5500	23100	***24600***	***25000 J***	***23000 J***	***25200 J***
7439-92-1	Lead	mg/kg	400	26.1	**26.1**	**19.4**	**18**	**17.9**
7439-95-4	Magnesium	mg/kg	NA	3030	**2770 J**	**2630**	**2320**	**2630**
7439-96-5	Manganese	mg/kg	180	1450	***1970***	***1330***	***1150***	***1310***
7439-97-6	Mercury	mg/kg	2.3	0.036	**0.17**	**0.0561**	**0.053**	**0.051**
7440-66-6	Zinc	mg/kg	2300	61.8	**92.1**	**67.6**	**64.1**	**64.8**
18540-29-9	Chromium, Hexavalent	mg/kg	0.3	ND	***0.64***	NA	NA	NA

Notes:

ug/kg - micrograms per kilogram

mg/kg - milligrams per kilogram

Bold - Detected results

Italics and underline - Results exceeding human health screening levels (i.e., the USEPA RSLs for Residential Soil in the May 2023 USEPA RSL Table [USEPA, 2023]).

Shaded - Results exceeding surface (0-1 foot below ground surface) soil background values as presented in the Final Facility-Wide Human Health Cleanup Goals for the Ravenna Army Ammunition Plant, Ravenna, Ohio (SAIC, 2010).

J =The reported result was an estimated value with an unknown bias.

NA = not applicable

ND = non-detect

U = The analyte was not detected and was reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

UJ = The analyte was not detected and was reported as less than the LOD. However, the associated numerical value is approximate.

X = The usability of the sample results (including non-detects) will be discussed with the Project Delivery Team.

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

April 3, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin M. Sedlak
RVAAP Restoration Program Manager
ARNG-Directorate
Camp James A. Garfield JTC
1438 State Route 534
Newton Falls, OH 44444

Sent via email to: kevin.m.sedlak.ctr@army.mil

RE: US Army Ravenna Ammunition Plt
RVAAP
Remediation Response
Plans
RI
Federal Facilities
Portage County
267000859274

Subject: **Final Remedial Investigation Quality Assurance Project Plan (QAPP), Open Demolition Area #2, Munitions Response Site - dated March 1, 2023 (with supplemental information provided on – March 21, 2023) - Ohio EPA Concurrence**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the "Final Remedial Investigation Quality Assurance Project Plan, Open Demolition Area #2" (the "QAPP") dated March 1, 2023. In addition, supplemental information was provided on March 21, 2023. The QAPP and supplemental information was submitted by Chenega Reliable Services on behalf of the U.S. Army Corps of Engineers, Baltimore District.

Ohio EPA has no comments and concurs with the Final Remedial Investigation Quality Assurance Project Plan, Open Demolition Area #2, with the supplemental information included in its final format. If you have any questions concerning this correspondence, please contact me at (330) 963-1235.

Sincerely,

Nicholas Roope
Environmental Specialist
Division of Environmental Response and Revitalization

NR/cm

ec: Allan Brillinger, Chenega
Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Brian Tucker, Ohio EPA, CO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR

Received 03 APR 2023

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

21 March 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Nicholas Roope
2110 East Aurora Road
Twinsburg, 011 44087-1924

Subject: Ravenna Army Ammunition Plant Restoration Program, Remedial Investigation Quality Assurance Project Plan, Open Demolition Area #2 (RVAAP-004-R-01), Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio

Dear Mr. Roope:

For your review, revised pages to the Final Remedial Investigation Quality Assurance Project Plan, Open Demolition Area #2 (RVAAP-004-R-01), Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio are submitted with this letter. The revised pages and plan were prepared for the Army National Guard in support of the RVAAP Restoration Program.

Per Ohio EPA's correspondence dated 10 March 2023, Ohio EPA received and reviewed the Final Remedial Investigation Quality Assurance Project Plan for ODA2 on 1 March 2023; however, concurrence cannot be provided until the appropriate changes to Table 11 are addressed to incorporate the approach provided by Ohio EPA on ISM precision and data quality in Comment 2 (Ohio EPA, 13 December 2022) which is based on Hawaii guidance (Section 4 - HEER Office). One additional revision was made in Table 5b. enclosed, to reference the 2014 risk assessment memo. The reference was determined to be missing during a QA check of the document. Both page changes have been included.

The revised pages incorporate the language from the 13 December 2022 Ohio EPA letter without deviations.

Please contact the undersigned at (614) 336-6000 ext. 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

MORGAN.TIMOTHY.MICHAEL.1230216351
Digitally signed by MORGAN.TIMOTHY.MICHAEL.1230216351
Date: 2023.03.21 09:22:35 -04'00'

For
Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA-CO (cover letter via email only)
Natalie Oryshkewych, Ohio EPA-NEDO (cover letter via email only)
Megan Oravec, Ohio EPA-NEDO (cover letter via email only)
Katie Tait, OHARNG-CJAG (cover letter via email only)
Steve Kvaal, USACE-Louisville District (cover letter via email only)
Nicole Walworth, USACE-Baltimore District (cover letter via email only)
Jennifer Tierney, Chenega (one [1] electronic copy)

5b. Develop the Project Chemical Data Collection and Analysis Approach

- Groundwater samples from MWs installed near the Former OB/OD Unit and disposal pits to be analyzed for explosives, metals, and OB/OD-related constituents.

General MC Decision Rules:

- If the MC or OB/OD-related constituent concentrations in all the samples from the investigation area are less than the human health and ecological screening levels identified in Worksheet #15 of this QAPP, then no further action will be recommended with respect to MC and/or OB/OD-related chemical constituents. Evaluation of the uncertainties associated with screening levels that may be below method detection limits (MDLs) will be included in the RI Report.
- If chemical constituents that are not essential nutrients (i.e., calcium, chloride, iodine, iron, magnesium, potassium, phosphorous, and sodium) are detected with sufficient frequency (i.e., 5% or more of samples where there are 20 or more samples), and for metals, exceed site-specific background, then it is considered an SRC.
- Where maximum detected concentrations of SRCs exceed the human health or ecological screening levels identified in QAPP Worksheet #15, they will be identified for defining nature and extent in the RI Report and will be considered chemicals of potential concern (COPCs) for the HHRA and/or chemicals of potential ecological concern (COPECs) for the ERA consistent with the Position Paper (USACE, 2012) on the use of FWCUGs and the Final Technical Memorandum: Land Uses and Revised Risk Assessment Process for the RVAAP (National Guard Bureau, 2014).
- COPCs are then carried through the HHRA and ERA.
- EPCs are derived for each decision unit (DU) or exposure unit (EU) and data set (e.g., surface soil or surface and subsurface soil), represented by 95% upper confidence limits (UCL) on the arithmetic mean (i.e., alpha error rate of 0.05). Discrete and ISM data are not combined for these calculations.
- The decision as to which samples to include in an EU will be made based on data analysis conducted in the RI (e.g., evaluation of standard deviation, coefficient of variation, statistical tests such as two-sample hypothesis tests, analysis of variance, etc., prior to aggregating data).
- COPCs in the HHRA are evaluated to determine COCs based on comparison to Final FWCUGs for the Resident Receptor (Adult and Child) and the Industrial Worker by using the current USEPA RSLs. This is consistent with available guidance and eliminates the need to update resident FWCUGs for current toxicity values. COCs are those COPCs which contribute to a “sum of ratios”, as described in the FWCUG guidance (SAIC, 2010), greater than 1 (for noncancer constituents effecting the same target organ or system contributing at least 10% to the sum of ratios greater than 1).
- A Level II Screening Weight of Evidence evaluation is conducted for COPECs in ERA to determine which COPECs (e.g., hazard quotients greater than 1 suggests a possible environmental consequence) should be carried forward into a Level III baseline evaluation. This includes a refinement step analogous the USEPA Step 3a, where COPECs are evaluated in terms of items including but not limited to:
    - -Comparison of average (i.e., mean) concentration to ecological screening values,
    - -Comparison of mean concentration to background concentration,

17.7.4.2 Grinding of ISM Samples for Explosives Analysis

Studies on explosives / propellants have shown that representative subsampling prior to grinding is problematic in terms of Fundamental Error when dealing with contaminants that have been deposited as solid particulates (e.g., energetics at firing ranges) (Hewitt et al. 2009). Method 8330B for Nitroaromatics, Nitramines, and Nitrate Esters by High Performance Liquid Chromatography (USEPA 2006) includes grinding of soil samples for explosives/ propellants analysis. The 8330B method calls for either 90 seconds of grinding or for five 60-second cycles. Typically, laboratories include a 60-second cool-down period between each grinding cycle to avoid thermal degradation. Studies have been performed to assess analyte loss of explosives / propellants during the grinding protocol specified in Method 8330B. Specifically, Hewitt et al. (2009) used a performance evaluation material composed of 500 grams of soil treated with Method 8330B analytes and ground it for 90 seconds and then for an additional four, 60-second periods prior to subsampling, extraction, and analysis. The average recoveries for seven performance evaluation samples that followed this grinding protocol showed analyte recoveries after grinding that were greater than, or well within, the standard deviation of values from historical data. For instance, the TNT recovery after 90 seconds was 95.7±2.42% and after 90 + four 60 second cycles, the recovery was 93.4 ±2.23 % (Hewitt et al., 2009).

17.7.5 Data Evaluation for ISM Samples

17.7.5.1 Field Replicates

When field sampling is adequately “representative,” repeat measurements within the same SU are expected to estimate the average contaminant concentration similarly. Field replicate results will be used as a QC check to evaluate acceptable performance of the sampling and analysis chain, including having an appropriate number of increments and adequate homogenization in sample preparation. These data will be used to determine the amount of variation from the mean that will be considered when aggregating data and when comparing average contaminant concentrations in each SU to applicable screening levels.

As discussed previously, field replicates will be collected for 10 percent of the total number of ISM samples (as shown on **Figures A-7b** and **A-8b**). Four of the 11 grids with replicates at the Kickout Area and seven of the 21 grids with replicates at the Source Area will be collected at the start of the sampling effort to provide an early indication of the RSDs between replicate results.

17.7.5.2 ISM Data Evaluation

The RSD (also known as the coefficient of variation or CV; RSD = CV * 100%) is a measure of the variation among a group of sample results. The percent RSD is the ratio of the standard deviation to the mean multiplied by 100. The percent RSD will be used to assess the degree of variability between a set of SU field replicate results. The RSD represents the precision (or variability) of the total sampling method, including combined field and laboratory precision.

At SUs without field replicates, if needed, a UCL for analytes of interest will be calculated using an inferred standard deviation (SD) from one or more nearby SUs at which field triplicate replicates were collected. Inferred SDs will be selected from field replicate SUs with similar soil types and similar analyte distributions to the SUs with no field replicates. That is, SDs from multi-replicate SUs in the Kickout Area, Source Area, Soil Cover, and Former OB/OD Unit will be applied to similar SUs without replicate data located within the same areas.

As directed by the Ohio EPA, DQOs for soil samples collected using ISM at RVAAP sites are based on guidance from the Hawaii Department of Health Technical Guidance Manual Subsection 4.2: Use of Multi-Increment Samples to Characterize DUs (Hawaii DOH 2021). This guidance uses the RSD of field replicate samples to assess data quality for the purposes of decision-making. Ohio EPA has directed the Army to use the Hawaii ISM data quality recommendations (with several Ohio EPA-specific modifications) for the ODA2 RI in the context of RI decision making. The primary decision to be made in assessing the ISM data from the Source Area and the Kickout Area is whether the nature and extent of analytes have been adequately characterized so that the data may be used in a quantitative risk assessment. Other evaluation methods (e.g., statistical techniques) will also be used in the evaluation of the nature and extent of analytes of interest. Risk assessment procedures are discussed in Section 17.13.1.

Table 11: Recommendations for Assessment of Data Quality Based on the Relative Standard Deviation of Replicate Samples (based on Hawaii DOH 2021)

RSD Value	**Data Quality Assessment Recommendations to be Applied to Nature and Extent Evaluation**
"Good" precision RSD ≤ 35%	• Compare the mean of the field replicate values to the unadjusted cleanup goal. • Data for SUs where replicate samples were not collected can be assumed to be representative without adjustment.
“Moderate” precision 35%<RSD≤50%	• Review and discuss field sampling methods and laboratory processing and analysis methods and discuss potential sources of error (e.g., improper increment collection methods, inadequate number or mass of increments, unrepresentative laboratory subsampling methods). • Compare unadjusted ISM sample data directly to cleanup goals. For SUs with replicate data, use the maximum field replicate value to compare to the cleanup goal.
"Poor” precision 50%<RSD≤100%	• Review and discuss field sampling methods and laboratory processing and analysis methods and discuss potential sources of error (e.g., improper increment collection methods, inadequate number or mass of increments, unrepresentative laboratory subsampling methods). • If the large majority of total error is attributable to laboratory subsampling and analysis error, request laboratory to subsample and analyze the batch of SU samples again using correct techniques and include additional sub-sampling replicates. • Compare the 95% UCL (Chebyshev method) for replicate data to 150% of the cleanup goal. • Estimate a 95% UCL for SUs where replicates were not collected based on the 95% UCL and mean calculated for the replicate data. Compare results to 150% of the cleanup goal. • Provide additional, multiple lines of evidence for acceptance (or rejection) of the data for decision making purposes including knowledge of the site history, anticipated potential for contamination above cleanup goals, the adequacy of the methods used to collect, process and analyze samples, and the approximation of the data to cleanup goals.

RSD Value	Data Quality Assessment Recommendations to be Applied to Nature and Extent Evaluation
	• Consider re-sampling of SU(s) most suspect for contamination using a larger number of increments and/or smaller SUs.
"Very poor" precision RSD>100%	• Review and discuss field sampling methods and laboratory processing and analysis methods and discuss potential sources of error (e.g., improper increment collection methods, inadequate number or mass of increments, unrepresentative laboratory subsampling methods). • If the large majority of total error is attributable to laboratory sub-sampling and analysis error, request laboratory to subsample and analyze the batch of SU samples again using correct techniques and include additional sub-sampling replicates. • If one or more of the replicate samples exceeds a cleanup goal, then remediation of the SU should be considered even if the mean concentration is well below the cleanup goal. Remediation of associated SUs where replicate samples were not collected should also be considered. • If all replicate sample results are below the cleanup goal, then compare the 95% UCL (Chebyshev method) for replicate data to the unadjusted cleanup goal. • If all replicate samples are below the cleanup goal, estimate a 95% UCL for SUs where replicates were not collected based on the 95% UCL and mean calculated for the replicate data and compare results to the unadjusted cleanup goal. • Provide additional, multiple lines of evidence for acceptance (or rejection) of the data for decision making purposes including knowledge of the site history, anticipated potential for contamination above cleanup goals, the adequacy of the methods used to collect, process and analyze samples, and the approximation of the data to cleanup goals. • Consider re-sampling of SU(s) most suspect for contamination using a larger number of increments and/or smaller SUs.

Evaluation of the % RSD data will consider the following concepts:

1. High variability (poor precision) might not be important if the sample concentrations are far from a cleanup goal. If the mean concentration for an analyte is low compared to the cleanup goal, the 95% UCL may still fall below the cleanup goal even if the % RSD is high. The %RSD is mostly of interest if the mean and 95% UCL straddle the applicable cleanup goal (i.e., the mean is below the cleanup goal but the 95% UCL exceeds the cleanup goal). This means that there is statistical uncertainty about whether the true mean exceeds the applicable cleanup goal.

2. At low detected concentrations (e.g., at or near reporting limits), % RSD will tend to increase even though absolute differences in sample concentrations are small.

The RSD ranges provided in **Table 11** will be used as guidelines for data evaluation and not as prescriptive limits. The data evaluation process to assess the ISM data and evaluate the DQOs described in this UFP-QAPP may use additional techniques, including other statistical methods.

17.8 DFW 7: Sediment and Surface Water Sample Collection from Sand Creek

The Sand Creek sediment and surface water sampling program is designed to evaluate the nature and extent of MC in Sand Creek within the MRS boundary with a focus on the Source Area and to determine a 95% UCL of the mean to support the RI risk assessment. Sand Creek flows from west to east for approximately 5,150 ft within the MRS boundary with approximately 2,300 ft within the Source Area, 1,750 ft in the upstream Kickout Area and 1,100 ft in the downstream Kickout Area. To generate meaningful UCLs, Pro UCL statistical software will be used, which requires a minimum of 8 to 10 samples for each area over which a UCL is computed. Additional samples in the Source Area will also be needed to define the nature and extent of MC in sediments.

17.8.1 Sand Creek Reconnaissance

To evaluate the nature and extent of MC in Sand Creek sediments, Arcadis personnel will conduct a walking reconnaissance of Sand Creek within the Source Area and a portion of the Kickout Area immediately downstream of the Source Area (**Figure A-9b**). This reconnaissance will include the visual identification of eroding bank, outfalls to the creek, significant sediment deposits, and any other unique feature along the stream length. All MC activities in Sand Creek will be performed with the accompaniment of a UXO Technician II (or higher) to provide anomaly avoidance. A systematic sediment probing program will be implemented along 24 regular transects within the Source Area (i.e., a transect approximately every 100 ft) to assess sediment thickness and depth. For the Kickout Area downstream of the Source Area, 8 systematic probing transects will also be established with a transect spacing of approximately 130 ft (**Figure A-9b**). The probing transects will include measurements of creek width, water depth, depth of penetrable sediment and velocity measurements at approximately half of the transects.

The inclusion of the downstream portion of the Kickout Area is important because unlike MEC/MD, MC have likely migrated downstream as part of normal sediment transport processes.

17.8.2 Sediment and Bank Soil Sample Collection

Following the probing and reconnaissance program, sediment core samples will be collected from the creek. Sediment cores will be collected using manually-driven Lexan® tubes that will be advanced to refusal. In the event hand coring is unsuccessful, a grab sampler may be used. One sample per transect (i.e., 32 samples) will be selected based upon the probing results. Transect samples will be biased to areas of thicker sediment accumulations, which are more likely to include finer grained materials and indicate areas where MC may have been deposited. Additionally, up to eight biased sediment cores will be collected from the Source Area from significant deposits identified between transects, or in locations where MEC/MD was identified and removed during the geophysical survey.

A review of existing data indicates that sediment data was not collected at depth and as such depth samples will be included in this program to better define the vertical extent of MC in Sand Creek. Sediment cores will be sectioned into a surface interval and a subsurface interval. The surface interval

NATIONAL GUARD BUREAU
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ARLINGTON VA 22204-1373

March 1, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Nicholas Roope
2110 East Aurora Road
Twinsburg, 44087-1924

Subject: Ravenna Army Ammunition Plant Restoration Program, Remedial Investigation Quality Assurance Project Plan, Open Demolition Area #2 (RVAAP-004-R-01), Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Ohio EPA ID#267000859274)

Dear Mr. Roope:
For your review, an electronic version of the *Final Remedial Investigation Quality Assurance Project Plan, Open Demolition Area #2 (RVAAP-004-R-01), Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio* will be submitted using the Ohio EPA LiquidFile system. This report was prepared for the Army National Guard in support of the RVAAP Restoration Program. Revisions per discussions and comment responses were incorporated into the this Final document and it is being submitted to expedite the schedule.

Per Ohio EPA's correspondence dated January 31, 2023 regarding the Army's response to Ohio EPA's comments dated 14 December 2022, the Army revised the "Poor" precision range to use the 95% Upper Confidence Limit (UCL) of the triplicates and compare that value to 150% of the screening level, as requested. The text suggested by Ohio EPA for the "Very Poor" precision scenario, which refers to "remediation of the DUs" does not align with the goals of the current Remedial Investigation (RI), which are to use the ISM data from the Source Area and the Kickout Area to assess whether the nature and extent of analytes have been adequately characterized so that the data may be used in a quantitative risk assessment. Remediation decisions will not be made during the RI; rather, remediation decisions will be made after completion of the risk assessment (in the RI) and establishment of remedial action objectives (if necessary) and evaluation of remedial alternatives in a Feasibility Study. Therefore, the recommendations for ISM data evaluation, as specified by the Ohio EPA, will be used in the evaluation of nature and extent of analytes in ISM samples. Other evaluation methods (e.g., statistical techniques) will also be used in the evaluation of the nature and extent of analytes of interest.

Please contact the undersigned at (614) 336-6000 ext. 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.03.01 10:38:27 -05'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA-CO (cover letter via email only)
Natalie Oryshkewych, Ohio EPA-NEDO (cover letter via email only)
Megan Oravec, Ohio EPA-NEDO (cover letter via email only)
Katie Tait, OHARNG (cover letter via email only)
Steve Kvaal, USACE-Louisville District (cover letter via email only)
Nicole Walworth, USACE-Baltimore District (cover letter via email only)
Jennifer Tierney, Chenega (one hardcopy, one electronic copy)

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March 1, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Nicholas Roope
2110 East Aurora Road
Twinsburg, Ohio 44087-1924

Subject: Notification of Field Work, Ravenna Army Ammunition Plant Restoration Program, Remedial Investigation, Open Demolition Area #2 (ODA2) (RVAAP-004-R-01), Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Ohio EPA Work ID 267000859274)

Dear Mr. Roope:

In accordance with the Director's Final Findings and Orders, Section XIII, #28, for the RVAAP Restoration Program, the Army National Guard (ARNG) is providing notification of field activities at the former RVAAP (Camp James A. Garfield) 15 days prior to the scheduled start date. Arcadis will begin mobilization on March 7, 2023 and begin setup of the work site. This will kickoff administrative tasks such as mobilization of initial team members (Unexploded Ordnance Quality Control Specialist/Safety Officer [UXOQCS/SO], UXO technicians, and geophysicists) for site set up and training activities, Instrument Verification Strip (IVS) installation, SLAM base mapping, civil survey oversight, quality control (QC) seeding, and munitions constituents (MC) pilot holes clearance. Data collection activities are not scheduled to start until April 2023.

Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.03.01 14:00:39 -05'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc:
Tom Schneider, Ohio EPA-CO
Natalie Oryshkewych, Ohio EPA-NEDO
Megan Oravec, Ohio EPA-NEDO
Katie Tait, OHARNG
Steve Kvaal, USACE-Louisville District
Nicole Walworth, USACE-Baltimore District
Jennifer Tierney, Chenega
Layne Young, Arcadis

NATIONAL GUARD BUREAU
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ARLINGTON VA 22204-1373

January 24, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Nicholas Roope
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant Restoration Program, Remedial Investigation Quality Assurance Project Plan, Open Demolition Area #2 (RVAAP-004-R-01), Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Ohio EPA work ID 267000859274)

Dear Mr. Roope:

For your review, attached are the comment responses to your December 13, 2022 letter on the above referenced report. This includes any clarifications/discussions from the January 6, 2023 meeting between the Ohio EPA, Army, and Arcadis. Due to the small file size, this submittal will only be submitted via email and will not be submitted through the Ohio EPA LiquidFile system.

These responses were prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at (614) 336-6000 ext. 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275
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FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA-SWDO
Natalie Oryshkewych, Ohio EPA-NEDO
Megan Oravec, Ohio EPA-NEDO
Katie Tait, OHARNG
Steve Kvaal, USACE – Louisville District
Nicole Walworth, USACE – Baltimore District

Comments for the DRAFT ODA2 RI QAPP (CJAG) - December 2022
Ravenna Army Ammunition Plant
Ravenna Army Ammunition Plant Restoration Program Contract

Comment Number	Commenter	Page(s)	Section	Line(s)	Comment	Response
					Technical Comments	
1	Ohio EPA				**Monitoring Wells** The Ohio Revised Code (ORC) 1521.01 (F)(2) defines a "well" as any excavation, regardless of design or method of construction, created for any of the following purposes: (2) Determining the quantity, quality, level, or movement of ground water in or the stratigraphy of an aquifer, excluding borings for instrumentation in dams, levees, or highway embankments. Monitoring wells installed at Camp James A. Garfield (CJAG) have not been historically submitted to the Ohio Department of Natural Resources (ODNR). ORC 1521.05 states, "The log shall be filed with the division of water resources within thirty days after the completion of construction of the well on forms prescribed and prepared by the division. The log shall be kept on file by the division." **Action Item: Please provide ODNR with the appropriate well logs per ORC 1521.01.**	The Army agrees and will have the driller file the newly installed wells with the Ohio Department of Natural Resources (ODNR). The OHARNG has coordinated recently with ODNR and have agreed that the bedrock wells at the facility are of the most value and interest to ODNR; therefore, past wells logs installed in the bedrock and not already in the ODNR system for the RVAAP restoration program will also be submitted into the ODNR database by the Army as discussed on the 6 January 2023 QAPP comment resolution call.
2	Ohio EPA				**Incremental Sampling Methodology Precision and Decisions for Results** Ohio EPA and Army National Guard have come to an agreement on precision and interpretation of Incremental Sampling Methodology (ISM) results. below is the finalized approach from November 3, 2020, Response to Comments on RVAAP-42 Load Line 9, Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) (Ohio EPA Work Flow Activity #267000859264). These changes were initially made for the Load Line 1-4 and 12 QAPP to ensure remediation goals were met with a high level of confidence that field sampling errors and laboratory analysis errors would be minimized. The text has been modified slightly to include information provided in the draft (RVAAP-004-R-01) QAPP. For remedial investigations and excavations, confirmation samples will be collected using the Incremental Sampling Methodology (ISM), the current QAPP informs the reader that the first ten samples will be collected in triplicate, (which is the preferred approach for this Munitions Response Site (MRS) than what was used for the confirmation sampling at LL-9). Following review and concurrence by Ohio EPA of the triplicate data, additional ISM field triplicates will be collected such that 10% of confirmation samples are collected in triplicate overall. The results of the initial ISM field triplicate samples and the results of the associated laboratory subsample replicates will be submitted to Ohio EPA for review of the following Data Quality Objectives (DQOs):	Please see responses below to Parts 2a and 2b.
2a	Ohio EPA				For ISM laboratory sub-sample replicate results greater than the Limits of Quantitation (LOQ) (duplicates for Polycyclic aromatic hydrocarbons (PAHs) and Metals; one per laboratory batch of up to 20 samples for each analytical group), and a relative percent difference (RPD) of less than or equal to 20% as a goal. If this DQO is not met, a J-flag will be applied to the associated data.	Table B-23 in the DoD Quality Systems Manual for laboratories requires ISM laboratory replicates to be collected at the subsampling step on one ISM sample per batch. The acceptance criterion is that for results above the LOQ, RSD or RPD must not exceed 20%. The labs will apply a J-flag to all samples within a batch for analytes that do not meet the acceptance criteria.
2b	Ohio EPA		QAPP Worksheet #17		For the field ISM triplicates, a Relative Standard Deviation (RSD) of less than or equal to 30 to 35% as a goal (RSD less than or equal to 35%) will be incorporated into sample data evaluations. If this DQO is not met for the ISM field triplicate samples, then Ohio EPA will work with the Army to determine whether there are concerns with the data quality. If there are concerns with the data quality, then the Army, Ohio EPA and Arcadis U.S., Inc. will work together to determine the path forward, following the guidance below excerpted from the Hawaii Department of Health Technical Guidance Manual Section 4.2.7.3 "Evaluation of Data Representativeness, Table 4-2 Recommended Adjustment of Multi-Increment Data for Decision Making Based on RSD of Replicate Samples", http://havaiidoh.org/tgmpdfs/TGM.pdf (HDOH, 2016): "Good Precision (RSD <35%) • Compare unadjusted ISM sample data directly to cleanup goal for decision making (for RVAAP, the mean field replicate value will be used to compare to the cleanup goal); • Data can be used for confirmation purposes without the need for additional sampling, if cleanup goals are met. Moderate Precision (RSD >35% but <50%) • Review and discuss field sampling methods and laboratory processing and analysis methods and discuss potential sources of error (e.g., improper increment collection methods, inadequate number or mass of increments, unrepresentative laboratory subsampling methods); • Compare unadjusted ISM sample data directly to cleanup goal for decision making (for CJAG, the maximum field replicate value will be used to compare to the cleanup goal); • Additional confirmation sampling recommended following remediation of decision units (DUs) that exceed cleanup goals, including use of smaller DUs and/or a larger number of increments and collection of additional replicate samples. Poor Precision (RSD >50% but <100%) • Review and discuss field sampling methods and laboratory processing and discuss potential sources of error in report; • If the large majority of total error is attributable to laboratory subsampling and analysis error, request laboratory to subsample and analyze the batch of DU samples again using correct techniques, and include additional sub-sampling replicates; • Compare the 95% Upper Confidence Limit (UCL) (Chebyshev method) for replicate data to 150% of the cleanup goal for decision making; • Estimate a 95% UCL for DUs where replicates were not collected based on the 95% UCL and mean calculated for the replicate data; Compare results to 150% of the cleanup goal; Provide additional, multiple lines of evidence for acceptance (or rejection) of the data for decision making purposes including knowledge of the site history and the anticipated potential for contamination above cleanup goal, the adequacy of the methods used to collect, process and analyze samples, and the approximation of the data to cleanup goal; • Additional confirmation sampling recommended following remediation of DUs that exceed cleanup goal, including use of smaller DUs and/or a larger number of increments and collection of additional replicate samples.	The field replicate RSD DQOs proposed by Ohio EPA have been added to Worksheet #17 of the QAPP with the following minor modifications: 1. No changes to the recommendations for "Good" precision. 2. The first two recommendations for "Moderate" precision data have been added to Worksheet #17. The third recommendation, regarding additional confirmation sampling, does not seem to apply to an RI scenario and therefore has not been added to Worksheet #17. 3. For the "Poor" Precision RSD range, the Army proposes to compare the 95% UCL (computed using the Chebyshev method) to the unadjusted screening level as opposed to 150% of the screening level. The 95% UCL will likely be a conservative estimate of the mean analyte concentration in a SU. Furthermore, the screening levels are conservative risk-based values. The "150% of cleanup goal" comparison was used previously for a remediation project at the former RVAAP; however, given that this is an RI, and not a remediation project where cleanup decisions are being made, it is appropriate to compare the 95% UCL to a conservative risk-based screening level at the "Poor" precision RSD range. 4. For the "very Poor" precision RSD range, the recommendations from Ohio EPA have been adopted for SUs where replicate sample results are below the screening levels. The recommendation for data evaluation for the case where at least one of the replicates samples exceeds a cleanup goal has been revised because it refers to soil remediation, which is not applicable to this ODA2 RI. The Army proposes that if at least one replicate sample result is greater than the screening level, then the 95% UCL (Chebyshev method) would be compared to 150% of the screening level. For SUs where replicated were not collected, a 95% UCL would be estimated based on the standard deviation and mean calculated for the replicate data. The results would also be compared to 150% of the screening level for the analytes with "Very Poor" RSDs.
2b (cont.)	Ohio EPA				Very Poor Precision (RSD >100%) • If the large majority of total error is attributable to laboratory sub-sampling and analysis error, request laboratory to subsample and analyze the batch of DU samples again using correct techniques, and include additional sub-sampling replicates; • Review and discuss field sampling methods and laboratory processing and analysis methods and discuss potential sources of error in report; • Consider re-sampling of DU(s) most suspect for contamination using a larger number of increments and/or smaller DUs; • If one or more of the replicate samples exceeds the cleanup goal then remediation of the DU should be considered, even if the mean concentration is well below the cleanup goal. Remediation of associated DUs where replicate samples were not collected should also be considered; • If all replicate samples are below the cleanup goal, then compare the 95% UCL (Chebyshev method) for replicate data to the unadjusted cleanup goal for decision making; • If all replicate samples are below the cleanup goal, estimate a 95% UCL for DUs where replicates were not collected based on the 95% UCL and mean calculated for the replicate data and compare results to unadjusted cleanup goal; • Provide additional, multiple lines of evidence for acceptance (or rejection) of the data for decision making purposes including knowledge of the site history and the anticipated potential for contamination above cleanup goal, the adequacy of the methods used to collect, process and analyze samples and the approximation of the data to cleanup goal; • Additional confirmation sampling recommended following remediation of DUs that exceed cleanup goal, including use of smaller DUs and/or a larger number of increments and collection of additional replicate samples. When field replicates/triplicate samples are being collected for a particular DU, the aliquots will be collected from completely independent systematic random locations in the grid (i.e., aliquots for the field triplicate samples will not be collected around a single grid point used for the parent sample since this may not adequately test smallscale variability within the DU) (HDOH, 2016)." **Action Item: The text above should be reviewed, and changes made in the draft RVAAP-004-R-01 QAPP to be consistent with terminology and approach agreed to in the above.**	
3	Ohio EPA		QAPP Worksheet #11		**Project/Data Quality Objectives, 5b Develop the Project Chemical Data Collection and Analysis Approach** The approach for the refinement of ecological chemical of potential environmental concerns (COPECs) in Level II and Step 3A ecological assessments was negotiated with the use of mean to compare to ecological screening values (ESVs) being recommended by Ohio EPA on an April 2011 teleconference. In addition, the worksheet states, "...if the [munitions constituents] MC or [open burn/open demolition] OB/OD-related constituent concentrations in all the samples from the investigation area are less than the human health and ecological screening levels identified in Worksheet #15 of this QAPP, then no further action will be recommended with respect to MC and/or OB/OD-related chemical constituents." **Action Item: Please note, the mean sediment concentration can be used in the ecological Level II when the Threshold Effect Concentrations (TECs) are the ecological screening value being used; maximum or 95% UCL sediment concentrations need to be used when the Sediment Reference Values or Probable Effect Concentrations are the ecological screening value. Mean surface water concentrations can be compared to the Outside Mixing Zone Average (OMZA) when two or more sample rounds are collected; maximum surface water concentration need to be used when comparing to the Outside Mixing Zone Maximum (OMZM) or when only one round was collected.** **When developing an exposure point concentration to compare to the human health screening levels, the Ohio EPA Division of Environmental Response and Revitalization Technical Decision Compendium generally recommends a maximum concentration be compared to the corresponding screening level (e.g., residential soil RSL, tap water RSL). More detailed information for each media can be found here: https://epa.ohio.gov/static/Portals/30/rules/Use+of+USEPA+RSLs+as+Screening+Values.pdf**	Noted. The previously negotiated process is supported by the Ohio EPA Guidance on Evaluating Sediment Contaminant Results (January 2010) which indicates that while Tier I assessments are generally limited to use of maximum concentrations for screening, Tier II assessments may need to be performed using an average concentration or be made on a sample-by-sample basis and Tier III assessments typically utilize either 95% UCLs or surface area weighted concentrations. This is also consistent with the Ecological Risk Assessment Guidance Document (July 2018), which states: "The maximum sediment concentration value for each constituent detected in lotic sediments is to be compared to the appropriate SRV [sediment reference value]. If the maximum detected value is less than the SRV, then the constituent may be eliminated from further consideration in the aquatic ecological risk assessment. If all site-related constituents are below the appropriate SRVs, then it is considered that the site did not impact the sediments in question." Comparison of maximum concentrations to TECs is only the initial step in defining COPCs. Use of the SRVs and/or mean or 95% UCLs in comparison with TECs may be conducted in the refinement of COPCs steps of the ERA. Similarly noted, we are in agreement that maximum surface water concentrations (or sample-by-sample) will be compared to OMZM criteria and average (where two rounds or multiple sample locations from within specific reaches or subreaches with sufficiently similar characteristics) concentrations will be compared to OMZA criteria.

17.7.5 Field Replicates

When field sampling is adequately "representative," repeat measurements within the same SU are expected to estimate the average contaminant concentration similarly. Field triplicate replicate results will be used as a QC check to evaluate acceptable performance of the sampling and analysis chain, including having an appropriate number of increments and adequate homogenization in sample preparation. These data will be used to determine the amount of variation from the mean that will be considered when aggregating data and when comparing average analyte concentrations in each SU to applicable screening levels.

As discussed previously, field triplicate replicates will be collected for 10 percent of the total number of ISM samples. Four of the 11 grids with triplicate replicates at the Kickout Area and seven of the 20 grids with triplicate replicates at the Source Area will be collected at the start of the sampling effort to provide an early indication of the RSDs between replicate results.

17.7.6 ISM Data Evaluation

The RSD (also known as the coefficient of variation or CV; RSD = CV * 100%) is a measure of the variation among a group of sample results. The percent RSD is the ratio of the standard deviation to the mean multiplied by 100. The percent RSD will be used to assess the degree of variability between a set of SU field replicate results. The RSD represents the precision (or variability) of the total sampling method, including combined field and laboratory precision.

At SUs without field replicates, if needed, a UCL for analytes of interest will be calculated using an inferred standard deviation (SD) from one or more nearby SUs at which field triplicate replicates were collected. Inferred SDs will be selected from field replicate SUs with similar soil types and similar analyte distributions to the SUs with no field replicates. That is, SDs from multi-replicate SUs in the Kickout Area, Source Area, Soil Cover, and Former OB/OD Unit will be applied to similar SUs without replicate data located within the same areas.

Previous soil remediation projects at the former RVAAP with ISM used for soil confirmation sampling have adopted Ohio EPA-recommended DQOs for SU replicate RSDs. The Ohio EPA-recommended DQOs are based on guidance from the Hawaii Department of Health Technical Guidance Manual Subsection 4.2: Use of Multi-Increment Samples to Characterize DUs (Hawaii DOH 2021). The previous DQOs have been adapted for the ODA2 RI as detailed in Table **XX** below.

Table XX – Replicate Sample Data Quality Objectives and Data Evaluation (based on Hawaii DOH 2021)

"Good" precision RSD ≤ 35%	• Compare the mean of the field replicate values to the unadjusted screening level. • Data for SUs where replicate samples were not collected can be assumed to be representative without adjustment.
"Moderate" precision 35%<RSD≤50%	• Review and discuss field sampling methods and laboratory processing and analysis methods and discuss potential sources of error (e.g., improper increment collection methods, inadequate number or mass of increments, unrepresentative laboratory subsampling methods).

RSD Value	
	• Compare unadjusted ISM sample data directly to screening levels. For SUs with replicate data, use the maximum field replicate value to compare to the screening level.
"Poor" precision 50%<RSD≤100%	• Review and discuss field sampling methods and laboratory processing and analysis methods and discuss potential sources of error (e.g., improper increment collection methods, inadequate number or mass of increments, unrepresentative laboratory subsampling methods). • If the large majority of total error is attributable to laboratory subsampling and analysis error, request laboratory to subsample and analyze the batch of SU samples again using correct techniques and include additional sub-sampling replicates. • Compare the 95% Upper Confidence Limit (UCL) (Chebyshev method) for replicate data to the unadjusted screening level for decision making. • Estimate a 95% UCL for nearby SUs where replicates were not collected based on the standard deviation calculated for the replicate data. Compare results to the unadjusted screening levels. • Provide additional, multiple lines of evidence for acceptance (or rejection) of the data for decision making purposes including knowledge of the site history and the anticipated potential for contamination above screening levels, the adequacy of the methods used to collect, process and analyze samples, and the approximation of the data to screening levels. • Consider re-sampling of SU(s) most suspect for contamination using a larger number of increments and/or smaller SUs.
"Very poor" precision RSD>100%	• Review and discuss field sampling methods and laboratory processing and analysis methods and discuss potential sources of error (e.g., improper increment collection methods, inadequate number or mass of increments, unrepresentative laboratory subsampling methods). • If the large majority of total error is attributable to laboratory sub-sampling and analysis error, request laboratory to subsample and analyze the batch of SU samples again using correct techniques and include additional sub-sampling replicates. • If all replicate sample results are below the screening level, then compare the 95% UCL (Chebyshev method) for replicate data to the unadjusted screening level. • If at least one replicate sample result is greater than the screening level, then compare the 95% UCL (Chebyshev method) for replicate data to 150% of the screening level. • Estimate a 95% UCL for nearby SUs where replicates were not collected based on the standard deviation calculated for the replicate data. Compare results to 150% of the screening level. • Provide additional, multiple lines of evidence for acceptance (or rejection) of the data for decision making purposes including knowledge of the site history and the anticipated potential for contamination above screening levels, the

RSD Value	
	adequacy of the methods used to collect, process and analyze samples and the approximation of the data to screening levels. • Consider re-sampling of SU(s) most suspect for contamination using a larger number of increments and/or smaller SUs.

The RSD ranges provided in Table **XX** will be used as guidelines for data evaluation and not as prescriptive limits. The data evaluation process to assess the ISM data and evaluate the DQOs described in this UFP QAPP may be modified depending upon the results. Evaluation of the data will consider the following concepts:

1. Even high variability (poor precision) might not be important if the sample concentrations are far from a screening level. For instance, if the mean concentration for an analyte is low compared to the screening, the 95% UCL may still fall below the action level even if the % RSD is high. The % RSD is mostly of interest if the mean and 95% UCL straddle the applicable screening level (i.e., the mean is below the screening level but the 95% UCL exceeds the screening level). This means that there is statistical uncertainty about whether the true mean exceeds the applicable screening level.

2. At low detected concentrations, % RSD will tend to increase even though absolute differences in sample concentrations are small.

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

January 24, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin M. Sedlak
RVAAP Restoration Program Manager
ARNG-Directorate
Camp James A. Garfield JTC
1438 State Route 534
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition
Plt RVAAP
Remediation Response
Plans
RI
Federal Facilities
Portage County
267000859274

Sent via email to: kevin.m.sedlak.ctr@army.mil

Subject: RVAAP - Open Demolition Area #2
Summary of Findings, Magnetometer-Assisted Survey of Sand Creek – December 6, 2022
Ohio EPA Concurrence

Dear Mr. Sedlak:

On December 8, 2022, the Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) received and has reviewed the "Summary of Findings, Magnetometer-Assisted Survey of Sand Creek" (the "Report") - conducted November 14-18, 2022. The Report supports the Time Critical Removal Action for Open Demolition Area #2 at Camp James A. Garfield Joint Military Training Center. The document was prepared by U. S. Army Corps of Engineers – Baltimore District, and submitted by Chenega Reliable Services, LLC.

Ohio EPA noted an inconsistency with the weight of munitions debris (MD) reported between waypoints three and four in the Report. The body of the text references 25lbs of MD was recovered, while the conclusion references 20lbs of MD being recovered. This small discrepancy in weight is attributed to estimated weights and does not raise concern on the reliability of the conclusions of the Report. Based on the review, there is no evidence that would support Munitions and Explosives of Concern, Material Potentially Presenting an Explosive Hazard, or MD are migrating beyond the Open Demolition Area #2 Munitions Response Site boundary at this time. Ohio EPA will continue to review future Magnetometer-Assisted Surveys of Sand Creek to verify the conclusions of this Report remain valid.

Received
24 JAN 2023

This letter is an official response from Ohio EPA that will be maintained as a public record. If you have any questions concerning this letter, please contact me at (330) 963-1235 or by email at nicholas.roope@epa.ohio.gov .

Sincerely,

Nicholas Roope
Environmental Specialist
Division of Environmental Response and Revitalization

NR/cm

ec: Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Rebecca Shreffler, Chenega
Megan Oravec, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

March 22, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin M. Sedlak
RVAAP Restoration Program Manager
ARNG-Directorate
Camp James A. Garfield JTC
1438 State Route 534
Newton Falls, OH 44444

Sent via email to: kevin.m.sedlak.ctr@army.mil

RE: US Army Ravenna Ammunition Plt
RVAAP
Remediation Response
Plans
RA
Federal Facilities
Portage County
267000859271

Subject: **Final Uniform Federal Policy Quality Assurance Project Plan for Remedial Action at the Former Ravenna Army Ammunition Plant RVAAP-060-R-01 Block D Igloo Munitions Response Site - dated February 9, 2023 – Ohio EPA Concurrence**

Dear Mr. Sedlak:

Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the "Final Uniform Federal Policy Quality Assurance Project Plan for Remedial Action at the Former Ravenna Army Ammunition Plant RVAAP-060-R-01 Block D Igloo Munitions Response Site," (QAPP) dated February 9, 2023. The QAPP was submitted by Chenega Reliable Services on behalf of the U.S. Army Corps of Engineers, Baltimore District.

Ohio EPA has no comments and concurs with the Uniform Federal Policy Quality Assurance Project Plan for the Block D Igloo Munitions Response Site in its final format.

If you have any questions concerning this correspondence, please contact me at (330) 963-1235.

Sincerely,

Nicholas Roope
Environmental Specialist
Division of Environmental Response and Revitalization

NR/cm

ec: Allan Brillinger, Chenega
Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Brian Tucker, Ohio EPA, CO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

February 9, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Nicholas Roope
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Final Uniform Federal Policy Quality Assurance Project Plan/Remedial Action Work Plan for the RVAAP-060-R-01 Block D Igloo Munitions Response Site, Version 1.0, Portage and Trumbull Counties, Ohio, Contract No. W912DR-21-D-0005, Delivery Order No. W912DR21F0327 (Ohio EPA Work Activity # 267-000859-271)

Dear Mr. Roope:

An electronic version of the Final Uniform Federal Policy Quality Assurance Project Plan/ Remedial Action Work Plan for the RVAAP-060-R-01 Block D Igloo Munitions Response Site, Version 1.0 will be sent using the Ohio EPA LiquidFile system.

This document was prepared in support of the Restoration Program at the Former Ravenna Army Ammunition Plant (RVAAP), currently known as Camp James A. Garfield (CJAG) in Portage and Trumbull counties, Ohio. Please contact the undersigned at 614-336-6000, ext 2053 or by email at kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.02.09 13:49:45 -05'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Katie Tait, OHARNG (email transmittal only)
Travis McCoun, USACE Baltimore District (email transmittal only)
Nicole Walworth, USACE Baltimore District (email transmittal only)
Jennifer Tierney, Chenega Reliable Services, LLC (two hard copies, two CDs)
Steve Kvaal, USACE – Louisville Project Manager (email transmittal only)
Tom Schneider, Ohio EPA, DERR, SWDO (email transmittal only)
Megan Oravec, Ohio EPA, DERR, NEDO (email transmittal only)

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

January 24, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin M. Sedlak
RVAAP Restoration Program Manager
ARNG-Directorate
Camp James A. Garfield JTC
1438 State Route 534
Newton Falls, OH 44444

RE: US Army Ravenna Ammunition Plt
RVAAP
Remediation Response
Plans
RA
Federal Facilities
Portage County
267000859271

Sent to: kevin.m.sedlak.ctr@army.mil

Subject: **Response to Comments on Draft Uniform Federal Policy Quality Assurance Project Plan for Remedial Action Former Ravenna Army Ammunition Plant RVAAP-060-R-01 Block D Igloo MRS - dated November 29, 2022 - Request for Final**

Dear Mr. Sedlak:

Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the "Response to Comments on Draft Uniform Federal Policy Quality Assurance Project Plan for Remedial Action Former Ravenna Army Ammunition Plant RVAAP-060-R-01 Block D Igloo Munitions Response Site," dated November 29, 2022.

Ohio EPA has no additional comments, and we request the submittal of the final Uniform Federal Policy Quality Assurance Project Plan for Remedial Action at the Former Ravenna Army Ammunition Plant RVAAP-060-R-01 Block D Igloo Munitions Response Site for review and concurrence.

If you have any questions regarding this letter, please contact me at (330) 963-1235.

Sincerely,

Nicholas Roope
Environmental Specialist
Division of Environmental Response and Revitalization

NR/cm

ec: Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Rebecca Shreffler, Chenega
Brian Tucker, Ohio EPA, CO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR

Received
24 JAN 2023

August 31, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin M. Sedlak
Restoration Program Manager
ARNG-ILE Cleanup
Camp James A. Garfield JTC
1438 State Route 534
Newton Falls, OH 44444

Sent via email to:
kevin.m.sedlak.ctr@army.mil

RE: US Army Ravenna Ammunition Plt
RVAAP
Remediation Response
Plans
Federal Facilities
RA
Portage County
267000859272

Subject: Final Uniform Federal Policy Quality Assurance Project Plan/Remedial Action Work Plan for the RVAAP-063-R-01 Group 8 Munitions Response Site, Version 1.0, Portage and Trumbull Counties, Ohio - Dated July 25, 2023 - Ohio EPA Concurrence

Dear Mr. Sedlak:

On July 25, 2023, the Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) received the "Final Uniform Federal Policy Quality Assurance Project Plan/Remedial Action Work Plan for the RVAAP-063-R-01 Group 8 Munitions Response Site, Version 1.0, Portage and Trumbull Counties, Ohio"[1] (the "Report") dated July 25, 2023. The Report was submitted by Chenega Reliable Services, on behalf of the U.S. Army Corps of Engineers (USACE), Baltimore District, in response to Ohio EPA's June 20, 2023, letter requesting the final document.

Ohio EPA concurs with the Report.

Received 01 SEP 2023

[1] http://edocpub.epa.ohio.gov/publicportal/ViewDocument.aspx?docid=2480136

If you have any questions concerning this letter or report, please contact me at (330) 963-1235 or nicholas.roope@epa.ohio.gov.

Sincerely,

Nicholas Roope
Environmental Specialist
Division of Environmental Response and Revitalization

NR/cm

ec: Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Angela Cobbs, Chenega
Brian Tucker, Ohio EPA, CO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

August 24, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Nicholas Roope
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Notification of Field Work for the RVAAP-063-R-01 Group 8 Munitions Response Site, Portage and Trumbull Counties, Ohio, Contract No. W912DR-21-D-0005, Delivery Order No. W912DR21F0327
(Ohio EPA Work Activity # 267-000859-272)

Dear Mr. Roope:

In accordance with the Director's Final Findings and Orders, Section XIII, #28, for the RVAAP Restoration Program, the Army National Guard (ARNG) is providing notification of field activities at the former RVAAP (now known as Camp James A. Garfield) 15 days prior to the scheduled start date of 11 September 2023. HydroGeoLogic, Inc. will begin mobilization to the Group 8 MRS on 5 September 2023 to setup the work site (mobilization of site supervisor). Data collection will follow site setup and include mobilization for soil sampling.

Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns.

Very Respectfully,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.08.24 13:31:04 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA-SWDO
Megan Oravec, Ohio EPA-NEDO
Katie Tait, OHARNG
Travis McCoun, USACE Baltimore District
Nicole Walworth, USACE Baltimore District
Jennifer Tierney, Chenega Reliable Services, LLC
Steve Kvaal, USACE – Louisville District

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

July 25, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Nicholas Roope
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Final Uniform Federal Policy Quality Assurance Project Plan/Remedial Action Work Plan for the RVAAP-063-R-01 Group 8 Munitions Response Site, Version 1.0, Portage and Trumbull Counties, Ohio, Ohio EPA Work Activity #267-000859-272

Dear Mr. Roope:

An electronic version of the Final Uniform Federal Policy Quality Assurance Project Plan / Remedial Action Work Plan for RVAAP-063-R-01 Group 8 Munitions Response Site will be sent using the Ohio EPA LiquidFile system. Responses to Ohio EPA comments were submitted on May 8, 2023 and concurrence from the Ohio EPA was received on June 21, 2023. This document was prepared in support of the Restoration Program at the Former Ravenna Army Ammunition Plant (RVAAP), currently known as Camp James A. Garfield (CJAG) in Portage and Trumbull counties, Ohio.

Please contact the undersigned at 614-336-6000, ext 2053 or by email at kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275
Digitally signed by TAIT.KATHRYN.SERENA.1289508275
Date: 2023.07.25 08:46:29 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Katie Tait, OHARNG (email transmittal only)
Travis McCoun, USACE Baltimore District (email transmittal only)
Nicole Walworth, USACE Baltimore District (email transmittal only)
Jennifer Tierney, Chenega Reliable Services, LLC (email transmittal only)
Steve Kvaal, USACE – Louisville Project Manager (email transmittal only)
Megan Oravec, Ohio EPA, DERR, NEDO (email transmittal only)
Tom Schneider, Ohio EPA, SWDO (email transmittal only)

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

June 20, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin M. Sedlak
Restoration Program Manager
ARNG-ILE Clean up
Camp James A. Garfield JTC
1438 State Route 534
Newton Falls, OH 44444

Sent via email to:
kevin.m.sedlak.ctr@army.mil

RE: US Army Ravenna Ammunition
Plt RVAAP
Remediation Response
Plans
Federal Facilities
RA
Portage County
267000859272

Subject: Response to Ohio EPA Comments on the Draft Uniform Federal Policy Quality Assurance Project Plan for Remedial Action at RVAAP-063-R-01 Group 8 Munitions Response Site, Version 1.0, Portage and Trumbull Counties, Ohio - Dated May 8, 2023 - Ohio EPA Request for Final

Dear Mr. Sedlak:

On May 8, 2023, the Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) received the "Response to Ohio EPA Comments on the Draft Uniform Federal Policy Quality Assurance Project Plan for Remedial Action at RVAAP-063-R-01 Group 8 Munitions Response Site, Version 1.0, Portage and Trumbull Counties, Ohio"[1] (the "Report") dated May 8, 2023. The Report was submitted by Chenega Reliable Services, on behalf of the U.S. Army Corps of Engineers (USACE), Baltimore District.

Ohio EPA has reviewed the Report and has no further comments. Please provide the final Uniform Federal Policy Quality Assurance Project Plan for Remedial Action at RVAAP-063-R-01 Group 8 Munitions Response Site for Ohio EPA concurrence.

This letter is an official response from Ohio EPA that will be maintained as a public record.

[1] http://edocpub.epa.ohio.gov/publicportal/ViewDocument.aspx?docid=2320688

If you have any questions concerning this letter or report, please contact me at (330) 963-1235 or nicholas.roope@epa.ohio.gov.

Sincerely,

Nicholas Roope
Environmental Specialist
Division of Environmental Response and Revitalization

NR/cm

ec: Angela Cobbs, Chenega
Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Brian Tucker, Ohio EPA, CO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR

Received June 21, 2023

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

May 8, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Nicholas Roope, Project Coordinator
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Response to Ohio EPA Comments on "Draft Uniform Federal Policy Quality Assurance Project Plan for Remedial Action at RVAAP-063-R-01 Group 8 Munitions Response Site, Version 1.0, Portage and Trumbull Counties, Ohio" dated February 2023
(Work Activity No. 267-000-859-036)

Dear Mr. Roope:

Enclosed for your review are responses to the Ohio Environmental Protection Agency (Ohio EPA) comments received April 19, 2023. These comments were received following Ohio EPA review of the above-referenced document, submitted in February 2023. A summary of the responses to the comments received is included below.

Comment Received:

Duplicate sampling vs. Split Sampling
Field duplicate samples are independent samples collected as close as possible in space and time to the original investigative sample. Immediately following collection of the original sample, the field duplicate sample is collected using the same collection method. Care should be taken to collect the field duplicate sample as close to the location of the original sample as possible. Field duplicate samples can measure how sampling and field procedures influence the precision of an environmental measurement. They can also provide information on the heterogeneity of a sampling location. Typically, field duplicates are collected at a frequency of one for every 10 investigative samples of the same matrix type.
Field split samples are usually a set of two or more samples taken from a larger homogenized sample (or individual location). The larger sample is usually collected from a single sampling location but can also be a composite sample. Field split samples can be sent to two or more laboratories and are used to provide comparison data between the laboratories.
Action Item: Please include a brief paragraph similar to the above outlining that the duplicate samples will be collected as a separate/independent sample and that a duplicate sample will not be collected from the other side of the split-spoon.

Response to Comment:

The intent is to collect field duplicate samples. Per the guidance above, field duplicate samples will be collected independently and given a dedicated sample time. Duplicate samples will be retrieved with a separate dedicated push of the DPT rig at a location immediately adjacent to the parent sample. A duplicate soil sample will be collected at a frequency of one for every 10 soil samples. Language will be added following the last sentence of Worksheet 20 of the work plan to read:

During pre-excavation soil and backfill soil characterization sampling, field duplicate samples will be collected at a rate of approximately 1 per 10 regular field samples and MS/MSD pairs will be collected at a rate of approximately 1 per 20 regular field samples. Field duplicate samples will be collected from a separate advancement of the split spoon or auger, immediately adjacent to the parent sample to preserve the independence of the duplicate sample. Field duplicates will receive a dedicated sample time. MS/MSD samples can be collected from homogenized increments within the same split spoon as the parent sample. MS/MSD samples will share the sample time with the parent sample.

Comment Received:

Horizontal Extent
It is unclear how the full horizontal extent for confirmation sampling will occur if the lateral extent begins to go under one of the existing buildings surrounding the excavation area.
Action Item: Though it is not anticipated that there would be anything under the buildings, as most of the deposition/release of any hazardous substance would be on the surface and not at depth based on site history – it is important to provide a brief statement/plan for how to collect samples laterally if a potential limitation exists.

Response to Comment:

As suggested, contaminated soil samples are not expected to be present below buildings. However, the possibility remains that delineation may not be completely realized if exceedances are observed in the soil at the edge of buildings. In this scenario, the results will be discussed in the Pre-Excavation Report and subsequent Data Usability Summaries with context provided that the extent of soil contamination has not been delineated below the building(s). It is not within the scope of this project, at this time, to further delineate or remediate the extent of contamination below the buildings.

Section 11.2.7 (page 34, lines 33-35) states: "*If the horizontal extent of contamination has not been defined at grid locations along the outer boundaries of the quadrants via sidewall sampling, then HGL will coordinate with USACE to determine if additional soil sampling for lateral delineation is required*." The project delivery team and stakeholders, upon review of the Pre-Excavation Report, may revisit and/or expand the scope of the current project or plan for additional future work. In the meantime, a contingency plan has not been formulated in the event the hypothetical situation described is realized. No changes made to the Work Plan.

Comment Received:

Past tense – Grammar
Project Objective 3 states, "Confirmation Soil Sampling. Confirmation sampling following excavation will be performed on the excavation floor of grid-based locations where results continue to exceed PALs [Project Action Limits], thus excavation **was** [emphasis added] complete to 2.0 ft bgs [below ground surface]".
Action Item: This appears to be a typo, as excavation has not been completed yet. Please edit the text accordingly.

Subject: RVAAP-063-R-01 Group 8 MRS QAPP, Response to Comments, RVAAP Restoration Program

Response to Comment:

The intent of the statement was to infer that confirmation samples will be collected only where excavation was completed down to 2.0 ft bgs. The pre-excavation sampling will include the collection of samples to 2.0 ft bgs. For example, if excavation is only required to 1.5 ft bgs, a confirmation sample result will already exist in the 1.5-2.0-foot depth and no additional confirmation sampling will be necessary. However, if soil samples exceed PALs for all increments to the depth of 2.0 feet, the soil will be excavated to 2.0 feet in that grid area and an additional confirmation sample will be collected. The text has been reworded for clarity:

> In the event that all pre-excavation samples including the 1.5–2.0 ft bgs increment exceed PALs (Project Action Limits) for a given grid location, that grid area will be excavated to 2.0 ft bgs. A separate confirmation sampling effort, following excavation will be performed for the excavation floor at those sample locations to collect and analyze for metals of concern at the 2.0-2.5-ft bgs increment. Should confirmation samples result in a PAL exceedance, the next six-inch depth increment will also be collected for analysis.

Summary

These responses to comments were prepared in support of the Munitions Response Services performed at the former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio. This document was prepared in support of the Restoration Program at the former Ravenna Army Ammunition Plant, currently known as Camp James A. Garfield in Portage and Trumbull counties, Ohio. Please contact the undersigned at 614-336-6000, ext. 2053 or by email at kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.05.08 09:06:23 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Kathryn Tait, OHARNG
Travis McCoun, USACE Baltimore District
Nicole Walworth, USACE Baltimore District
Steve Kvaal, USACE – Louisville Project Manager
Jennifer Tierney, Chenega Reliable Services, LLC
Tom Schneider, Ohio EPA, DERR, SWDO

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

February 9, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Nicholas Roope
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Draft Uniform Federal Policy Quality Assurance Project Plan / Remedial Action Work Plan for the RVAAP-063-R-01 Group 8 Munitions Response Site, Version 1.0, Portage and Trumbull Counties, Ohio, Contract No. W912DR-21-D-0005, Delivery Order No. W912DR21F0327 (Ohio EPA Work Activity # 267-000859-201)

Dear Mr. Roope:

An electronic version of the Draft Uniform Federal Policy Quality Assurance Project Plan/Remedial Action Work Plan for the RVAAP-063-R-01 Group 8 Munitions Response Site, Version 1.0 will be sent using the Ohio EPA LiquidFile system.

This document was prepared in support of the Restoration Program at the Former Ravenna Army Ammunition Plant (RVAAP), currently known as Camp James A. Garfield (CJAG) in Portage and Trumbull counties, Ohio. Please contact the undersigned at 614-336-6000, ext 2053 or by email at kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.02.09 13:36:56 -05'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Katie Tait, OHARNG (email transmittal only)
Travis McCoun, USACE Baltimore District (email transmittal only)
Nicole Walworth, USACE Baltimore District (email transmittal only)
Jennifer Tierney, Chenega Reliable Services, LLC (email transmittal only)
Steve Kvaal, USACE – Louisville Project Manager (email transmittal only)
Tom Schneider, Ohio EPA, DERR, SWDO (email transmittal only)
Megan Oravec, Ohio EPA, DERR, NEDO (email transmittal only)

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

December 8, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Ms. Natalie Oryshkewych
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report - November 2023

Dear Ms. Oryshkewych:

Attached for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report – November 2023". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from November 1, 2023, through November 30, 2023. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37. Due to small file size, this report is only being submitted electronically via email.

Please contact the undersigned at (330)235-2153 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.12.07 14:10:28 -05'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Megan Oravec, Ohio EPA, DERR
Tom Schneider, Ohio EPA, DERR
Kevin Palombo, Ohio EPA, DERR
Katie Tait, OHARNG
Steve Kvaal, USACE – Louisville
James Trumble, USACE – Louisville
Jennifer Tierney, Chenega, Administrative Record

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
November 2023

Status of project activities for reporting period (November 2023)

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2021 RI/FS Completion Contract for IRP AOCs	N. Peters / Leidos	The Army awarded a modification to Leidos' contract on September 19, 2023, to get additional support and Leidos began reviewing and evaluating data in response to Ohio EPA concerns about the Draft RI Report for RVAAP-67 Facility-wide Sewers. The Army is looking to schedule a technical meeting with the Ohio EPA for January 2024.
Block D MRS and Group 8 MRS RD/RAs	Travis McCoun & Nicole Walworth / HGL	Field work (tree cutting) at the Block D MRS started in October 2023 and is ongoing. Results for the pre-excavation samples at the Group 8 MRS were received and HGL is refining the excavation plan based on the results from the sampling. HGL conducted waste characterization sampling at the Group 8 MRS.
RVAAP-004-R-01 ODA #2	Nicole Walworth & Travis McCoun / Arcadis	Ohio EPA approved the Final QAPP on April 3, 2023. Field work is ongoing. The Post-BIP Sampling Memo for ODA2 was submitted to the Ohio EPA on October 26, 2023, and comments were received November 22, 2023. The Army held a field update meeting with the Ohio EPA on November 29, 2023.
Remedial Actions for 3 AOCs – RVAAP-06 C Block Quarry, RVAAP-50 Atlas Scrap Yard, CC RVAAP-70 E Classification Yard	N. Peters / PIKA-Insight JV	The Preliminary Draft Work Plan for CC RVAAP-70 was submitted for Army review on November 1, 2023. Pika-Insight continued revisions to the Draft Remedial Design/Work Plan for RVAAP-50 in response to Army comments on the Preliminary Draft. Pika-Insight continued responding to Army comments on the Draft SSHP/APP for the remedial actions. PIKA-Insight is working on the Draft RD for RVAAP-06.
Investigation at 9 AOCs - RVAAP-34 Sand Creek, CC RVAAP-69 Building 1048 Fire Station, CC RVAAP-78 Quarry Pond Dump, CC RVAAP-79 DLA Ore Storage Yard, RVAAP-38 NACA Test Area, RVAAP-45 Wet Storage, RVAAP-42 Load Line 9, CC RVAAP-76 Depot Area, CC RVAAP-70 E Classification Yard	N. Peters / Leidos	On November 8, 2023, the Ohio EPA provided comments on the Draft UFP-QAPP for RVAAP-34 Sand Creek Disposal Road Landfill. On November 15, 2023, the Army provided a response letter to Ohio EPA. On August 31, 2023, the Draft Multi-AOC Delineation Sampling UFP-QAPP for RVAAP-38, RVAAP-42, RVAAP-45, and CC RVAAP-76 was submitted to the Ohio EPA. Ohio EPA comments were received on December 6, 2023. On October 19, 2023, the Draft VI Study Work Plan for CC RVAAP-69 Former Fire Station was submitted to Ohio EPA. Comments are pending. Leidos is working on the Draft QAPP for CC RVAAP-78. On October 13, 2023, the Ohio EPA provided comments on the Final RI Addendum for CC RVAAP-79 DLA Ore Storage Yard. Additional work was requested beyond what is specified in the contractor's scope and previous correspondence. Leidos and the Army are developing a path forward. Leidos continued developing the Accident Prevention Plan and the Site Safety and Health Plan to address all planned field work.
2022 Environmental Program Support Services	N. Peters / Chenega	On November 15, 2023, Chenega submitted the Preliminary Draft 2023 Annual Land Use Control Report for Ramsdell Quarry Landfill, Load Line 1, 2, 3, 4, 12, Dump along Paris-Windham Rd, Open Demolition Area #2, and Winklepeck Burning Grounds for Army review.

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
RVAAP-66 Facility Wide Ground Water Monitoring	J. Trumble / Leidos	Leidos continues to work on the 2023 Draft Annual FWGWMP Report and scheduling the installation of the driveways for the monitoring wells located south of State Route 5. Final approval for the driveway permit was issued by ODOT November 3, 2023.

A. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties

B. Identify changes in key personnel

None.

C. List target and actual completion dates for each element of activity, including project completion

The actual completion dates and target dates where applicable are provided with the status of activities in Section A.

D. Provide an explanation for any deviation from applicable schedules

None.

E. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities

Three 55-gallon drums containing nonhazardous purge water and decontamination water from the Fall 2023 FWGWMP sampling event are staged in Building 1036. The waste is properly staged, labeled, and being inspected at Building 1036 while awaiting proper transport and disposal.

Two 55-gallon drums of nonhazardous IDW was generated during the HGL initial sampling at the Group 8 MRS. The waste is properly staged, labeled, and being inspected at Building 1036 while awaiting proper transport and disposal.

Approximately 2570 tons of trees/wood have been generated so far and taken for recycling as part of the Block D MRS site work.

F. Describe activities planned for the following month (December 2023)

1. HGL will continue remedial action field work at the Block D MRS and the Group 8 MRS.

2. Arcadis will continue field work operations at the Open Demolition Area 2 MRS.

3. Pending resolution of Army comments, PIKA-Insight JV will submit the Draft Remedial Design for RVAAP-06 for Ohio EPA review.

4. Pika-Insight JV plans to submit the Draft Remedial Design for RVAAP-50 Atlas Scrap Yard for Ohio EPA review.

5. Chenega plans to respond to Army comments on the Preliminary Draft Annual 2023 LUC Report. Once

Army comments are resolved, Chenega will submit the Draft to Ohio EPA for review.

6. Leidos will continue preparing for a meeting with the Army and the Ohio EPA regarding the path forward on the RI Report for the Facility-wide Sewers RVAAP-67.

7. Leidos plans to continue developing the Draft APP/SSHP for the Investigation of Nine AOCs for Army review.

8. Leidos plans to submit the Draft UFP-QAPP for CC RVAAP-78 to Ohio EPA after Army comments on the Preliminary Draft are resolved.

9. Leidos plans to respond to Ohio EPA comments on the Draft Work Plan for the Vapor Intrusion Study for CC RVAAP-69 once Ohio EPA comments are received.

10. Upon receipt of Ohio EPA comments on the Army's Response Letter for the Draft UFP-QAPP for RVAAP-34 Sand Creek Disposal Road Landfill, Leidos will prepare the Final document.

11. Leidos will prepare and submit responses to comment on the Draft Multi-AOC Delineation Sampling UFP-QAPP for RVAAP-38, RVAAP-42, RVAAP-45, and CC RVAAP-76.

12. Leidos will continue developing a path forward with the Army regarding Ohio EPA's comments for CC RVAAP-79 DLA Ore Storage Yard RI Addendum.

G. Describe activities currently under Ohio EPA review and/or activities to be submitted for Ohio EPA review in the next 8 weeks.

Site Name/Activity Name	Current Status – In Progress/To Be Submitted	Start Date (Actual or Projected)	End Date (based on 45 day review timeframe)	Ohio EPA Reviewer Name (if known)
Response to Ohio EPA Comments on the Draft QAPP for RVAAP-38, 42, 45, CC RVAAP-76 (Multi-AOC) - Leidos	To be submitted			Ed D'Amato
Responses to Ohio EPA Comments on the Draft QAPP for RVAAP-34 - Leidos	To be submitted			Kevin Palombo/Craig Kowalski
Draft VI Study Work Plan for CC RVAAP-69 - Leidos	In progress	October 19, 2023	January 16, 2024	Ed D'Amato
Draft Remedial Design Work Plan for RVAAP-50 Atlas Scrap Yard - Insight	To be submitted			Ed D'Amato
Draft Remedial Design Work Plan for RVAAP-06 C Block Quarry	To be submitted			
Draft Spring 2023 FWGWMP Semiannual Report - Leidos	In Progress	October 13, 2023	November 27, 2023	Kevin Palombo/Liam McEvoy
Responses to Ohio EPA comments on the Post	To be submitted			Nick Roope

Site Name/Activity Name	Current Status – In Progress/To Be Submitted	Start Date (Actual or Projected)	End Date (based on 45 day review timeframe)	Ohio EPA Reviewer Name (if known)
BIP Sampling Memo for ODA2 - Arcadis				

H. List of FY24 Milestones

Milestone Activity	Milestone Date	Actual Date Achieved
Block D Igloo MRS Draft Remedial Action Completion Report - HGL	August 30, 2024	
Group 8 MRS Draft Remedial Action Completion Report – HGL	August 30, 2024	
Draft 2023 LUC Inspection Report - Chenega	March 31, 2024	
FWGWMP Draft Annual Report - Leidos	February 15, 2024	
FWGWMP Draft Groundwater Addendum - Leidos	February 15, 2024	

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

November 7, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Ms. Natalie Oryshkewych
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report - October 2023

Dear Ms. Oryshkewych:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report – October 2023". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from October 1, 2023, through October 31, 2023. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37. Due to small file size, this monthly report is being submitted via email only and will not be submitted via the Ohio EPA LiquidFile system.

Please contact the undersigned at (330)235-2153 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.11.07 09:16:37 -05'00'

FOR Kevin M. Sedlak
Restoration Project Manager
Army National Guard Directorate

Attachment

ec: Megan Oravec, Ohio EPA
Thomas Schneider, Ohio EPA
Kevin Palombo, Ohio EPA
Katie Tait, OHARNG
Steve Kvaal, USACE – Louisville
James Trumble, USACE – Louisville
Jennifer Tierney, Chenega, Admin Record

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
October 2023

Status of project activities for reporting period (October 2023)

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2021 RI/FS Completion Contract for IRP AOCs	N. Peters / Leidos	A meeting on the Draft Facility-wide Sewers RI Report was held, on January 17, 2023, to discuss the path forward with the Ohio EPA. The Army awarded a modification to Leidos' contract on September 19, 2023, to get additional support and Leidos began more in-depth re-evaluation. The Army will schedule a Technical Project Planning meeting with the Ohio EPA after the additional evaluation is completed.
Block D MRS and Group 8 MRS RD/RAs	Travis McCoun & Nicole Walworth / HGL	Field work (tree cutting) at the Block D MRS started in October 2023 and is ongoing. Results for the pre-excavation samples at the Group 8 MRS were received and HGL is refining the excavation plan based on the results from the sampling. HGL conducted waste characterization sampling at the Group 8 MRS during the week of October 30, 2023.
RVAAP-004-R-01 ODA #2	Nicole Walworth & Travis McCoun / Arcadis	Ohio EPA approved the Final QAPP on April 3, 2023. Field work is ongoing. The Post-BIP Sampling Memo for ODA2 was submitted to the Ohio EPA on October 26, 2023.
Remedial Actions for 3 AOCs – RVAAP-06 C Block Quarry, RVAAP-50 Atlas Scrap Yard, CC RVAAP-70 E Classification Yard	N. Peters / PIKA-Insight JV	Pika-Insight submitted responses to comments on the Preliminary Draft Remedial Design for RVAAP-06 C Block Quarry on October 26, 2023. PIKA-Insight issued the responses to Army comments on the Preliminary Draft Remedial Design for RVAAP-50 on October 3, 2023. The Preliminary Draft Work Plan for CC RVAAP-70 was submitted for Army review on November 1, 2023.
Investigation at 9 AOCs - RVAAP-34 Sand Creek, CC RVAAP-69 Building 1048 Fire Station, CC RVAAP-78 Quarry Pond Dump, CC RVAAP-79 DLA Ore Storage Yard, RVAAP-38 NACA Test Area, RVAAP-45 Wet Storage, RVAAP-42 Load Line 9, CC RVAAP-76 Depot Area, CC RVAAP-70 E Classification Yard	N. Peters / Leidos	On August 31, 2023, the Draft UFP-QAPP for RVAAP-34 Sand Creek Disposal Road Landfill was submitted to the Ohio EPA. An extension was requested until November 9, 2023. On August 31, 2023, the Draft Multi-AOC Delineation Sampling UFP-QAPP for RVAAP-38, RVAAP-42, RVAAP-45, and CC RVAAP-76 was submitted to the Ohio EPA, with an extension requested until November 10, 2023 On October 19, 2023, the Draft VI Study Work Plan for CC RVAAP-69 Former Fire Station was submitted to Ohio EPA. Comments are pending. On October 16, 2023, USACE provided comments to the Pre-Draft UFP-QAPP for CC RVAAP-78 Quarry Pond Surface Dump. Leidos is developing responses to comments. On October 13, 2023, the Ohio EPA provided comments on the Final RI Addendum for CC RVAAP-79 DLA Ore Storage Yard. Additional work was requested beyond what is specified in the RFP and most recent correspondence. Leidos continued developing the Accident Prevention Plan and the Site Safety and Health Plan to address all planned field work.

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2022 Environmental Program Support Services	N. Peters / Chenega	Chenega conducted annual Land Use Control inspections at Ramsdell Quarry Landfill, Load Line 1, 2, 3, 4, 12, Dump along Paris-Windham Rd, Open Demolition Area #2, and Winklepeck Burning Grounds. The Draft RAB Site Tour meeting minutes were submitted to Army on October 31, 2023.
RVAAP-66 Facility Wide Ground Water Monitoring	J. Trumble / Leidos	Leidos completed the Fall 2023 FWGWMP sampling on October 10, 2023. On October 13, 2023, the Draft 2023 Spring Semi-Annual FWGWMP report was submitted to Ohio EPA for review. The Ohio Department of Transportation granted a permit to install driveways for the monitoring wells located south of State Route 5 on November 3, 2023. Once constructed, these will allow the contractor to access the wells safely.

A. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties

B. Identify changes in key personnel

Zack Bayne, PMP, CHMM is a new USACE team member and will be assisting current USACE staff and the ARNG/OHARNG on technical reviews and contract management for the RVAAP restoration program. You may see him included on project correspondence.

C. List target and actual completion dates for each element of activity, including project completion

The actual completion dates and target dates where applicable are provided with the status of activities in Section A.

D. Provide an explanation for any deviation from applicable schedules

None.

E. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities

Three 55-gallon drums containing purge water and decontamination water from the Fall 2023 FWGWMP sampling event are staged in Building 1036. The waste is properly staged, labeled, and being inspected at Building 1036 while awaiting sampling results and proper transport and disposal.

Approximately 100 gallons of soil IDW was generated during the HGL initial sampling at the Group 8 MRS. The waste is Nonhazardous and is properly staged, labeled, and being inspected at Building 1036 while awaiting proper transport and disposal.

Approximately 484 tons of trees/wood have been generated so far and taken for recycling (as firewood and mulch) as part of the Block D MRS site work.

F. Describe activities planned for the following month (November 2023)

1. HGL will continue remedial action field work at the Block D MRS and the Group 8 MRS.

2. Arcadis will continue field work operations at the Open Demolition Area 2 MRS.

3. Pending resolution of Army comments, PIKA-Insight JV will submit the Draft Remedial Designs for RVAAP-06 and RVAAP-50 for Ohio EPA review.

4. Pika-Insight JV plans to submit the Preliminary Draft Remedial Action Work Plan for CC RVAAP-70 for Army review (Received November 1, 2023).

5. Chenega plans to conduct seasonal field work of Seibert Stake and warning sign maintenance and begin preparing the annual LUC inspection report.

6. Leidos will begin preparing for a meeting with the Army and the Ohio EPA regarding the path forward on the RI Report for the Facility-wide Sewers RVAAP-67.

7. Leidos plans to continue developing the Draft APP/SSHP for the Investigation of Nine AOCs for Army review.

8. Leidos plans to respond to Army comments on the Preliminary Draft RI Work Plan (UFP-QAPP) for CC RVAAP-78 and submit the Draft UFP-QAPP for the Ohio EPA after comments are resolved.

9. Leidos plans to respond to Ohio EPA comments for the Draft Work Plan for the Vapor Intrusion Study for CC RVAAP-69 once Ohio EPA comments are received.

10. Upon receipt of Ohio EPA comments on the Draft UFP-QAPP for RVAAP-34 Sand Creek Disposal Road Landfill and the Draft Multi-AOC Delineation Sampling UFP-QAPP for RVAAP-38, RVAAP-42, RVAAP-45, and CC RVAAP-76, Leidos will begin preparing responses to those comments.

11. Leidos plans to develop a path forward with the Army regarding Ohio EPA's comments for CC RVAAP-79 DLA Ore Storage Yard RI Addendum.

G. Describe activities currently under Ohio EPA review and/or activities to be submitted for Ohio EPA review in the next 8 weeks.

Site Name/Activity Name	Current Status – In Progress/To Be Submitted	Start Date (Actual or Projected)	End Date (based on 45 day review timeframe)	Ohio EPA Reviewer Name (if known)
Draft QAPP for RVAAP-38, 42, 45, CC RVAAP-76 (Multi-AOC) - Leidos	In progress	August 31, 2023	November 10, 2023 – extension requested and approved	Ed D'Amato
Draft QAPP for RVAAP-34 - Leidos	In progress	August 31, 2023	November 9, 2023 – extension requested and approved	Kevin Palombo/Craig Kowalski
Draft VI Study Work Plan for CC RVAAP-69 - Leidos	In progress	October 19, 2023	December 5, 2023	Ed D'Amato
Draft Remedial Design Work Plan for RVAAP-50 Atlas Scrap Yard - Insight	To be submitted			Ed D'Amato
Draft Spring 2023 FWGWMP Semiannual Report - Leidos	In Progress	October 13, 2023	November 27, 2023	Kevin Palombo/Liam McEvoy

Site Name/Activity Name	Current Status – In Progress/To Be Submitted	Start Date (Actual or Projected)	End Date (based on 45 day review timeframe)	Ohio EPA Reviewer Name (if known)
Post BIP Sampling Memo for ODA2 - Arcadis	In Progress	October 26, 2023		Nick Roope

H. List of FY24 Milestones

Milestone Activity	Milestone Date	Actual Date Achieved
Block D Igloo MRS Draft Remedial Action Completion Report - HGL	August 30, 2024	
Group 8 MRS Draft Remedial Action Completion Report – HGL	August 30, 2024	
Draft 2023 LUC Inspection Report - Chenega	March 31, 2024	
FWGWMP Draft Annual Report - Leidos	February 15, 2024	
FWGWMP Draft Groundwater Addendum - Leidos	February 15, 2024	

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

October 10, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Ms. Natalie Oryshkewych
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report - September 2023

Dear Ms. Oryshkewych:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report – September 2023". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from September 1, 2023, through September 30, 2023. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37.

Please contact the undersigned at (330)235-2153 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.10.10 07:46:45 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Megan Oravec, Ohio EPA, DERR
Thomas Schneider, Ohio EPA
Kevin Palombo, Ohio EPA, DERR
Katie Tait, OHARNG
Steve Kvaal, USACE – Louisville
James Trumble, USACE – Louisville
Jennifer Tierney, Chenega, Administrative Record

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
September 2023

Status of project activities for reporting period (September 2023)

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2021 RI/FS Completion Contract for IRP AOCs	N. Peters / Leidos	A meeting on the Draft Facility-wide Sewers RI Report was held, on January 17, 2023, to discuss the path forward with the Ohio EPA. The Army awarded a modification to Leidos' contract on September 19, 2023, to get additional support and Leidos began more in-depth re-evaluation. The Army will schedule a Technical Project Planning meeting with the Ohio EPA after the additional evaluation is completed.
Block D MRS and Group 8 MRS RD/RAs	Travis McCoun & Nicole Walworth / HGL	Field work at the Block D MRS started up again during the week of September 25, 2023, and is ongoing. The Final Group 8 MRS QAPP report was submitted to Ohio EPA on July 25, 2023, and Ohio EPA approved the report on September 5, 2023. A Notification of Field Work was submitted to the Ohio EPA on August 24, 2023. Fieldwork at the Group 8 MRS began on September 11, 2023, with initial borings/soil sampling. HGL is awaiting results.
RVAAP-004-R-01 ODA #2	Nicole Walworth & Travis McCoun / Arcadis	Ohio EPA approved the Final QAPP on April 3, 2023. Arcadis mobilized field staff to the site on March 14, 2023. Field work is ongoing.
Remedial Actions for 3 AOCs – RVAAP-06 C Block Quarry, RVAAP-50 Atlas Scrap Yard, CC RVAAP-70 E Classification Yard	N. Peters / PIKA-Insight JV	PIKA-Insight submitted the Draft Accident Prevention plan for Army review on September 25, 2023. Pika-Insight continued developing responses to Army comments on the Work Plans/Remedial Designs for RVAAP-06 and RVAAP-50.
Investigation at 9 AOCs - RVAAP-34 Sand Creek, CC RVAAP-69 Building 1048 Fire Station, CC RVAAP-78 Quarry Pond Dump, CC RVAAP-79 DLA Ore Storage Yard, RVAAP-38 NACA Test Area, RVAAP-45 Wet Storage, RVAAP-42 Load Line 9, CC RVAAP-76 Depot Area, CC RVAAP-70 E Classification Yard	N. Peters / Leidos	On August 31, 2023, the Draft UFP-QAPP for RVAAP-34 Sand Creek Disposal Road Landfill was submitted to Ohio EPA. On August 31, 2023, the Draft Multi-AOC Delineation Sampling UFP-QAPP for RVAAP-38, RVAAP-42, RVAAP-45, and CC RVAAP-76 was submitted to the Ohio EPA. Review comments on both are pending. The Final version of the CC RVAAP-79 DLA Ore Storage Yard RI Addendum was submitted to Ohio EPA on August 9, 2023. Review comments are pending. The Preliminary Draft UFP-QAPP for the CC RVAAP-78 Quarry Pond Surface Dump RI is still under review by USACE. Leidos continued preparing responses to Army comments on the Preliminary Draft UFP-QAPP for the VI Study at CC RVAAP-69 Former Fire Station. Leidos continued developing the Accident Prevention Plan and the Site Safety and Health Plan to address all planned field work.
2022 Environmental Program Support Services	N. Peters / Chenega	Chenega administered a RAB tour on September 6, 2023. Chenega continued seasonal field work of Seibert Stake and warning sign maintenance and continued routine maintenance of the correspondence and Administrative Record files.

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
RVAAP-66 Facility Wide Ground Water Monitoring	J. Trumble / Leidos	On September 8, 2023, Leidos provided the Ohio EPA with a notification of fieldwork for the Fall 2023 FWGWMP sampling. On September 25, 2023, Leidos mobilized to CJAG to begin the Fall sampling.

A. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties

B. Identify changes in key personnel

None

C. List target and actual completion dates for each element of activity, including project completion

The actual completion dates and target dates where applicable are provided with the status of activities in Section A.

D. Provide an explanation for any deviation from applicable schedules

None.

E. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities

Two 55-gallon drums containing purge water and decontamination water from the ongoing Fall 2023 FWGWMP sapling event are staged in Building 1036. The waste is properly staged, labeled, and being inspected at Building 1036 while awaiting proper transport and disposal.

Approximately 1,482 gallons of soil cuttings and 5 gallons of decon water were generated as part of the sampling activities at Open Demolition Area #2. The soil and water were sampled and found to be Nonhazardous. The soil was properly transported and disposed on September 26, 2023, and the water was transported and disposed on October 3, 2023.

Approximately 30 gallons of soil and 10 gallons of liquid IDW was generated during the HGL initial sampling at the Group 8 MRS. The waste is properly staged, labeled, and being inspected at Building 1036 while awaiting sample results and proper transport and disposal.

F. Describe activities planned for the following month (October 2023)

1. HGL will continue remedial action field work at the Block D MRS and the Group 8 MRS.

2. Arcadis will continue field work operations at the Open Demolition Area 2 MRS.

3. PIKA-Insight JV plans to submit responses to Army comments on the Work Plans/Remedial Designs for RVAAP-06 and RVAAP-50. Pending resolution of Army comments, PIKA-Insight JV will submit the Draft Remedial Designs for RVAAP-06 and RVAAP-50 for Ohio EPA review.

4. Pika-Insight JV plans to submit the Preliminary Draft Remedial Action Work Plan for CC RVAAP-70 for

Army review.

5. Chenega plans to conduct Annual Land Use Control Inspections and begin preparing the Preliminary Draft Annual Land Use Control Inspection Report.

6. Leidos will begin preparing for a meeting with the Army and the Ohio EPA regarding the path forward on the RI Report for the Facility-wide Sewers RVAAP-67.

7. Leidos will continue the Fall 2023 FWGWMP well sampling effort.

8. Leidos will complete responses to Army comments on the 2023 Spring Semi-Annual Report and will issue the Draft report to the Ohio EPA.

9. Leidos plans to submit the Draft APP/SSHP for the Investigation of Nine AOCs for Army review.

10. Leidos plans to respond to Army comments on the Preliminary Draft RI Work Plan for CC RVAAP-78 and begin developing the Draft version.

11. Leidos plans to respond to Army comments and submit the Draft Work Plan for the Vapor Intrusion Study for CC RVAAP-69 for Ohio EPA review.

12. Upon receipt of Ohio EPA comments on the Draft UFP-QAPP for RVAAP-34 Sand Creek Disposal Road Landfill and the Draft Multi-AOC Delineation Sampling UFP-QAPP for RVAAP-38, RVAAP-42, RVAAP-45, and CC RVAAP-76, Leidos will begin preparing response to those comments.

G. Describe activities currently under Ohio EPA review and/or activities to be submitted for Ohio EPA review in the next 8 weeks.

Site Name/Activity Name	Current Status – In Progress/To Be Submitted	Start Date (Actual or Projected)	End Date (based on 45 day review timeframe)	Ohio EPA Reviewer Name (if known)
Final RI Addendum for CC RVAAP-79 - Leidos	In progress	August 9, 2023	September 23, 2023 – Letter to be issued next week.	Ed D'Amato
Draft QAPP for RVAAP-38, 42, 45, CC RVAAP-76 - Leidos	In progress	August 31, 2023	November 10,2023 – extension requested and approved	Ed D'Amato
Draft QAPP for RVAAP-34 - Leidos	In progress	August 31, 2023	October 16, 2023	Kevin Palombo
Draft VI Study Work Plan for CC RVAAP-69 - Leidos	To be submitted			Ed D'Amato
Draft Remedial Design Work Plan for RVAAP-50 Atlas Scrap Yard - Insight	To be submitted			Ed D'Amato
Draft Spring 2023 FWGWMP Semiannual Report - Leidos	To be submitted			Kevin Palombo

H. List of FY24 Milestones

Milestone Activity	Milestone Date	Actual Date Achieved
Block D Igloo MRS Draft Remedial Action Completion Report - HGL	August 30, 2024	
Group 8 MRS Draft Remedial Action Completion Report – HGL	August 30, 2024	
Draft 2023 LUC Inspection Report - Chenega	March 31, 2024	
FWGWMP Draft Annual Report - Leidos	February 15, 2024	
FWGWMP Draft Groundwater Addendum - Leidos	February 15, 2024	

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

September 8, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Ms. Natalie Oryshkewych
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report - August 2023

Dear Ms. Oryshkewych:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report – August 2023". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from August 1, 2023, through August 31, 2023. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37. Due to the small file size, this report is being submitted electronically via email only and not through the Ohio EPA LiquidFile system.

Please contact the undersigned at (330)235-2153 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.09.08 13:59:51 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Megan Oravec, Ohio EPA, DERR
Thomas Schneider, Ohio EPA
Kevin Palombo, Ohio EPA, DERR
Katie Tait, OHARNG
Steve Kvaal, USACE – Louisville
James Trumble, USACE – Louisville
Jennifer Tierney, Chenega, Administrative Record

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
August 2023

Status of project activities for reporting period (August 2023)

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2021 RI/FS Completion Contract for IRP AOCs	N. Peters / Leidos	A meeting on the Draft Facility-wide Sewers RI Report was held, on January 17, 2023, to discuss the path forward with the Ohio EPA. Leidos has been working on the re-evaluation and provided preliminary results/suggestions to the Army on a teleconference on May 9, 2023. The Army is working on a modification to Leidos' contract to get additional support. The Army will schedule a Technical Project Planning meeting with the Ohio EPA after additional evaluation is completed.
Block D MRS and Group 8 MRS RD/RAs	Travis McCoun & Nicole Walworth / HGL	Field work at the Block D MRS is on hold and will recommence in the Fall 2023. The Final Group 8 MRS QAPP report was submitted to Ohio EPA on July 25, 2023, and Ohio EPA approved the report on September 5, 2023. A Notification of Field Work was submitted to the Ohio EPA on August 24, 2023. Fieldwork at the Group 8 MRS will begin September 11, 2023, with preliminary borings/soil sampling.
RVAAP-004-R-01 ODA #2	Nicole Walworth & Travis McCoun / Arcadis	Ohio EPA approved the Final QAPP on April 3, 2023. Arcadis mobilized field staff to the site on March 14, 2023. Field work is ongoing and will continue through September 2023.
Remedial Actions for 3 AOCs – RVAAP-06 C Block Quarry, RVAAP-50 Atlas Scrap Yard, CC RVAAP-70 E Classification Yard	N. Peters / PIKA-Insight JV	PIKA-Insight continued developing responses to Army comments on the Work Plans/Remedial Designs for RVAAP-06 and RVAAP-50.
Investigation at 9 AOCs - RVAAP-34 Sand Creek, CC RVAAP-69 Building 1048 Fire Station, CC RVAAP-78 Quarry Pond Dump, CC RVAAP-79 DLA Ore Storage Yard, RVAAP-38 NACA Test Area, RVAAP-45 Wet Storage, RVAAP-42 Load Line 9, CC RVAAP-76 Depot Area, CC RVAAP-70 E Classification Yard	N. Peters / Leidos	On August 31, 2023, the Draft UFP-QAPP for RVAAP-34 Sand Creek Disposal Road Landfill was submitted to Ohio EPA. On August 31, 2023, the Draft Multi-AOC Delineation Sampling UFP-QAPP for RVAAP-38, RVAAP-42, RVAAP-45, and CC RVAAP-76 was submitted to the Ohio EPA. The Final version of the CC RVAAP-79 DLA Ore Storage Yard RI Addendum was submitted to Ohio EPA on August 9, 2023. The Preliminary Draft UFP-QAPP for the CC RVAAP-78 Quarry Pond Surface Dump RI is still under review by USACE. Leidos began preparing responses to Army comments on the Preliminary Draft UFP-QAPP for the VI Study at CC RVAAP-69 Former Fire Station. Leidos continued developing the Accident Prevention Plan and the Site Safety and Health Plan to address all planned field work.

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2022 Environmental Program Support Services	N. Peters / Chenega	Chenega submitted Draft April 2023, November 2022 and April 2022 RAB meeting minutes and September 2023 RAB site tour agenda to RAB members on August 23, 2023. A RAB tour was held on September 6, 2023. Chenega continued seasonal field work of Seibert Stake and warning sign maintenance and continued routine maintenance of the correspondence and Administrative Record files.
RVAAP-66 Facility Wide Ground Water Monitoring	J. Trumble / Leidos	Leidos continued working on the report for the spring FWGWMP sampling, and standard maintenance activities for the FWGWMP wells.

A. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties

B. Identify changes in key personnel

None

C. List target and actual completion dates for each element of activity, including project completion

The actual completion dates and target dates where applicable are provided with the status of activities in Section A.

D. Provide an explanation for any deviation from applicable schedules

None.

E. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities

Well installation and development in support of the FWGW FS resulted in thirty-two (32) 55-gallon drums of soil cuttings, and approximately 13,220 gallons of liquid IDW, including decontamination water. This waste is Nonhazardous. The soil was properly transported and disposed on August 8, 2023. The liquid IDW was land applied as coordinated and approved on August 22 and 23, 2023.

Approximately 1,482 gallons of soil cuttings and 5 gallons of decon water have been generated as part of the sampling activities at Open Demolition Area #2. The soil was sampled and found to be Nonhazardous and is being profiled for disposal. The waste is properly staged, labeled, and being inspected at Building 1036 while awaiting proper transport and disposal.

F. Describe activities planned for the following month (September 2023)

1. HGL will mobilize and begin field work on the Group 8 MRS remedial action on September 11, 2023.

2. Arcadis will continue field work operations at the Open Demolition Area 2 MRS.

3. PIKA-Insight JV plans to submit responses to Army comments on the Work Plans/Remedial Designs for RVAAP-06 and RVAAP-50. Pending resolution of Army comments, PIKA-Insight JV will submit the

Draft Remedial Designs for RVAAP-06 and RVAAP-50 for Ohio EPA review.

4. Leidos will begin the fall 2023 FWGWMP well sampling at the end of the month, including a 15-day field work notice before the beginning of the field effort.

5. Leidos plans to submit the Draft APP/SSHP for the Investigation of Nine AOCs for Army review.

6. Leidos plans to respond to Army comments on the Preliminary Draft RI Work Plan for CC RVAAP-78 and begin developing the Draft version.

7. Leidos plans to respond to Army comments and submit the Draft Work Plan for the Vapor Intrusion Study for CC RVAAP-69 for Ohio EPA review.

8. Leidos plans to submit the Final compiled RI Report for CC RVAAP-69 Former Fire Station to the Admin Record File.

G. Describe activities currently under Ohio EPA review and/or activities to be submitted for Ohio EPA review in the next 8 weeks.

Site Name/Activity Name	Current Status – In Progress/To Be Submitted	Start Date (Actual or Projected)	End Date (based on 45 day review timeframe)	Ohio EPA Reviewer Name (if known)
Final RI Addendum for CC RVAAP-79 - Leidos	In progress	August 9, 2023	September 23, 2023	Ed D'Amato
Draft QAPP for RVAAP-38, 42, 45, CC RVAAP-76 - Leidos	In progress	August 31, 2023	October 16, 2023	Ed D'Amato
Draft QAPP for RVAAP-34 - Leidos	In progress	August 31, 2023	October 16, 2023	Kevin Palombo
Draft VI Study Work Plan for CC RVAAP-69 - Leidos	To be submitted			Ed D'Amato
Draft Remedial Design Work Plan for RVAAP-50 Atlas Scrap Yard - Insight	To be submitted			Kevin Palombo

H. List of FY24 Milestones

Milestone Activity	Milestone Date	Actual Date Achieved
Block D Igloo MRS Draft Remedial Action Completion Report - HGL	August 30, 2024	
Group 8 MRS Draft Remedial Action Completion Report – HGL	August 30, 2024	
Draft 2023 LUC Inspection Report - Chenega	March 31, 2024	
FWGWMP Draft Annual Report - Leidos	February 15, 2024	
FWGWMP Draft Groundwater Addendum - Leidos	February 15, 2024	

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

August 7, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Ms. Natalie Oryshkewych
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report - July 2023

Dear Ms. Oryshkewych:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report – July 2023". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from July 1, 2023, through July 31, 2023. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37. Due to the small file size, this report is only being sent via email and not through the Ohio EPA LiquidFile system.

Please contact the undersigned at (614) 336-6000 Ext. 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.08.07 13:33:54 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Megan Oravec, Ohio EPA
Tom Schneider, Ohio EPA
Kevin Palombo, Ohio EPA
Katie Tait, OHARNG
Steve Kvaal, USACE – Louisville
James Trumble, USACE – Louisville

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
July 2023

Status of project activities for reporting period (July 2023)

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2021 RI/FS Completion Contract for IRP AOCs	N. Peters / Leidos	A meeting on the Draft Facility-wide Sewers RI Report was held, on January 17, 2023, to discuss the path forward with the Ohio EPA. Leidos has been working on the re-evaluation and provided preliminary results/suggestions to the Army on a teleconference on May 9, 2023. The Army is working on a modification to Leidos' contract to get additional support. The Army will schedule a Technical Project Planning meeting with the Ohio EPA after additional evaluation is completed.
Block D MRS and Group 8 MRS RD/RAs	Travis McCoun & Nicole Walworth / HGL	Field work at the Block D MRS is on hold and will recommence in the Fall 2023. The Group 8 MRS Draft QAPP was submitted to Ohio EPA on February 9, 2023, and comments were received on April 19, 2023. Response to comments were submitted to Ohio EPA on May 8, 2023, and acceptance of the Army responses was received on June 20, 2023, from the Ohio EPA. The final report was submitted on July 25, 2023.
RVAAP-004-R-01 ODA #2	Nicole Walworth & Travis McCoun / Arcadis	Ohio EPA approved the Final QAPP on April 3, 2023. Arcadis mobilized field staff to the site on March 14, 2023. Field work is ongoing and will continue through September 2023.
Remedial Actions for 3 AOCs – RVAAP-06 C Block Quarry, RVAAP-50 Atlas Scrap Yard, CC RVAAP-70 E Classification Yard	N. Peters / PIKA-Insight JV	PIKA-Insight continued developing the Work Plans/Remedial Designs for RVAAP-06, RVAAP-50 and CC RVAAP-70. The Preliminary Draft Remedial Design Work Plan for RVAAP-06 C Block Quarry was submitted to the Army on July 24, 2023, and is still under review. The Preliminary Draft Remedial Design Work Plan for RVAAP-50 Atlas Scrap Yard was submitted to the Army on May 2, 2023. Army review is complete, and Insight is working on comment responses.
Investigation at 9 AOCs - RVAAP-34 Sand Creek, CC RVAAP-69 Building 1048 Fire Station, CC RVAAP-78 Quarry Pond Dump, CC RVAAP-79 DLA Ore Storage Yard, RVAAP-38 NACA Test Area, RVAAP-45 Wet Storage, RVAAP-42 Load Line 9, CC RVAAP-76 Depot Area, CC RVAAP-70 E Classification Yard	N. Peters / Leidos	Leidos began developing responses to Army comments on the Preliminary Draft Delineation Sampling UFP-QAPP for RVAAP-34 Sand Creek Disposal Road Landfill. Leidos also began developing responses to Army comments on the Preliminary Draft Delineation Sampling UFP-QAPP for RVAAP-38, RVAAP-42, RVAAP-45, and CC RVAAP-76. On July 18, 2023, Leidos conducted a Project Planning session for all of the above sites with Ohio EPA, OHARNG, and USACE. Leidos began preparing the Final version of the CC RVAAP-79 DLA Ore Storage Yard RI Addendum for submission to Ohio EPA. Leidos submitted the Predraft UFP-QAPP for the CC RVAAP-78 Quarry Pond Surface Dump RI for Army review. On July 18, 2023, Leidos conducted a Project Planning session with Ohio EPA, OHARNG, and USACE. Leidos continued developing the Accident Prevention Plan and the Site Safety and Health Plan to address all planned field work.
2022 Environmental Program Support Services	N. Peters / Chenega	Chenega began preparing for the September 6, 2023 RAB Site Tour. Chenega continued seasonal field work of Seibert Stake and warning sign maintenance and continued routine maintenance of the correspondence and Administrative Record files.

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
RVAAP-66 Facility Wide Ground Water Monitoring	J. Trumble / Leidos	Leidos continued working on the report for the spring FWGWMP sampling, the chemistry from the FS well installs, and standard maintenance activities for the FWGWMP wells. On July 27, 2023, Leidos submitted the FS well related IDW Characterization and Disposal Plan to Ohio EPA for the liquid IDW recommending land application of the liquid IDW. An email response was received from the Ohio EPA on August 1, 2023.

A. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties

B. Identify changes in key personnel

None

C. List target and actual completion dates for each element of activity, including project completion

The actual completion dates and target dates where applicable are provided with the status of activities in Section A.

D. Provide an explanation for any deviation from applicable schedules

None.

E. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities

Well installation and development in support of the FWGW FS resulted in thirty-two (32) 55-gallon drums of soil cuttings, and approximately 13,220 gallons of liquid IDW, including decontamination water. This waste is Nonhazardous. The soil and liquid IDW are properly stored and labeled at Building 1036. Inspections are being conducted while awaiting transport and disposal or land application (for liquid).

Approximately 1,482 gallons of soil cuttings and 2.5 gallons of decon water has been generated as part of the sampling activities at Open Demolition Area #2. The waste is properly staged, labeled, and being inspected at Building 1036.

F. Describe activities planned for the following month (August 2023)

1. HGL will mobilize and begin field work on the Group 8 MRS remedial action.

2. Arcadis will continue field work operations at Open Demolition Area 2 MRS.

3. PIKA-Insight JV will continue developing the Preliminary Draft Work Plan/Remedial Design for CC RVAAP-70. Pending resolution of Army comments, PIKA-Insight JV will submit the Draft Remedial Designs for RVAAP-50 and RVAAP-06 for Ohio EPA review.

4. Leidos plans to submit the Draft APP/SSHP for the Investigation of Nine AOCs for Army review. Leidos plans to respond to Army comments on the Preliminary Draft RI Work Plan for CC RVAAP-78 and begin developing the Draft version. Leidos plans to respond to Army comments and submit Draft versions of the Work Plan for additional delineation sampling at RVAAP-34, 38, 42, 45 and CC RVAAP-76 and the Vapor Intrusion Study Work Plan for CC RVAAP-69 for Ohio EPA review. Leidos plans to submit the Final RI Addendum for CC RVAAP-79 to Ohio EPA.

G. Describe activities currently under Ohio EPA review and/or activities to be submitted for Ohio EPA review in the next 8 weeks.

Site Name/Activity Name	Current Status – In Progress/To Be Submitted	Start Date (Actual or Projected)	End Date (based on 45 day review timeframe)	Ohio EPA Reviewer Name (if known)
Final RI Addendum for CC RVAAP-79 - Leidos	To be submitted			Ed D'Amato
Draft Work Plan for RVAAP-38, 42, 45, CC RVAAP-76 - Leidos	To be submitted			Ed D'Amato
Draft Work Plan for RVAAP-34	To be submitted			Kevin Palombo
Draft VI Study Work Plan for CC RVAAP-69 - Leidos	To be submitted			Ed D'Amato
Draft Remedial Design Work Plan for RVAAP-50 Atlas Scrap Yard - Insight	To be submitted			Kevin Palombo
Final Group 8 MRS QAPP – HGL	In Progress	July 25, 2023	September 8, 2023	Nick Roope

H. List of FY24 Milestones

Milestone Activity	Milestone Date	Actual Date Achieved
Block D Igloo MRS Draft Remedial Action Completion Report - HGL	August 30, 2024	
Group 8 MRS Draft Remedial Action Completion Report – HGL	August 30, 2024	
Draft 2023 LUC Inspection Report - Chenega	March 31, 2024	
FWGWMP Draft Annual Report - Leidos	February 15, 2024	
FWGWMP Draft Groundwater Addendum - Leidos	February 15, 2024	

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

July 7, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Ms. Natalie Oryshkewych
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report - June 2023

Dear Ms. Oryshkewych:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report – June 2023". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from June 1, 2023, through June 30, 2023. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37. Due to the small file size, an electronic version is being submitted via email. This activity report will not be submitted via the Ohio EPA LiquidFile system.

Please contact the undersigned at (614) 336-6000 Ext. 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275
Digitally signed by TAIT.KATHRYN.SERENA.1289508275
Date: 2023.07.07 07:21:10 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Megan Oravec, Ohio EPA
Thomas Schneider, Ohio EPA
Kevin Palombo, Ohio EPA
Katie Tait, OHARNG
Steve Kvaal, USACE – Louisville
Jay Trumble, USACE – Louisville
Jennifer Tierney, Chenega, RVAAP Administrative Record

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
June 2023

Status of project activities for reporting period (June 2023)

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2021 RI/FS Completion Contract for IRP AOCs	N. Peters / Leidos	A meeting on the Draft Facility-wide Sewers RI Report was held, on January 17, 2023, to discuss the path forward with the Ohio EPA. Leidos has been working on the re-evaluation and provided preliminary results/suggestions to the Army on a teleconference on May 9, 2023. The Army is working on a modification to Leidos' contract to get additional support. The Army will schedule a Technical Project Planning meeting with the Ohio EPA after additional evaluation is completed.
Block D MRS and Group 8 MRS RD/RAs	Travis McCoun & Nicole Walworth / HGL	Field work at the Block D MRS is on hold and will recommence in the Fall 2023. The Group 8 MRS Draft QAPP was submitted to Ohio EPA on February 9, 2023, and comments were received on April 19, 2023. Response to comments were submitted to Ohio EPA on May 8, 2023, and acceptance of the Army responses was received on June 20, 2023, from the Ohio EPA. Final report production is in progress.
RVAAP-004-R-01 ODA #2	Nicole Walworth & Travis McCoun / Arcadis	Ohio EPA approved the Final QAPP on April 3, 2023. Arcadis mobilized field staff to the site on March 14, 2023. Field work is ongoing and will continue through September 2023.
Remedial Actions for 3 AOCs – RVAAP-06 C Block Quarry, RVAAP-50 Atlas Scrap Yard, CC RVAAP-70 E Classification Yard	N. Peters / PIKA-Insight JV	PIKA-Insight continued developing the Work Plans/Remedial Designs for RVAAP-06, RVAAP-50 and CC RVAAP-70. The Preliminary Draft Remedial Design Work Plan for RVAAP-50 Atlas Scrap Yard was submitted to the Army on May 2, 2023. ARNG and OHARNG reviews are completed.
Investigation at 9 AOCs - RVAAP-34 Sand Creek, CC RVAAP-69 Building 1048 Fire Station, CC RVAAP-78 Quarry Pond Dump, CC RVAAP-79 DLA Ore Storage Yard, RVAAP-38 NACA Test Area, RVAAP-45 Wet Storage, RVAAP-42 Load Line 9, CC RVAAP-76 Depot Area, CC RVAAP-70 E Classification Yard	N. Peters / Leidos	On May 9, 2023, Leidos submitted the Preliminary Draft Delineation Sampling UFP-QAPP for RVAAP-34 Sand Creek Disposal Road Landfill for Army review. ARNG and OHARNG reviews were completed in June. On May 25, 2023, Leidos submitted the Preliminary Draft version of the VI Study UFP-QAPP for CC RVAAP-69 Former Fire Station for Army review. ARNG and OHARNG reviews were completed in June. On May 3, 2023, Leidos submitted the redline Final version of the CC RVAAP-79 DLA Ore Storage Yard RI Addendum for Army review. The Army reviewed and approved the revisions. On May 2, 2023, Leidos submitted the Preliminary Draft version of the Delineation Sampling UFP-QAPP for RVAAP-38, RVAAP-42, RVAAP-45, and CC RVAAP-76 for Army review. ARNG and OHARNG reviews are completed. Leidos continued developing the RI Work Plan for CC RVAAP-78 Quarry Pond Surface Dump and the Accident Prevention Plan and the Site Safety and Health Plan to address all planned field work.

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2022 Environmental Program Support Services	N. Peters / Chenega	Chenega continued seasonal field work of Seibert Stake and warning sign maintenance and continued routine maintenance of the correspondence and Administrative Record files.
RVAAP-66 Facility Wide Ground Water Monitoring	J. Trumble / Leidos	Leidos submitted an IDW Plan to the Army which was approved on June 13, 2023.

A. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties

B. Identify changes in key personnel

None

C. List target and actual completion dates for each element of activity, including project completion

The actual completion dates and target dates where applicable are provided with the status of activities in Section A.

D. Provide an explanation for any deviation from applicable schedules

None.

E. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities

Well installation and development in support of the FWGW FS resulted in thirty-two (32) 55-gallon drums of soil cuttings, and approximately 13,220 gallons of liquid IDW, including decontamination water. This waste is Pending Analysis. The Spring 2023 FWGWMP field work/sampling generated five 55-gallon drums of purge and decontamination water which has been determined to be Nonhazardous. The soil and liquid IDW are properly staged and labeled at Building 1036. Inspections are being conducted while awaiting transport and disposal. The Nonhazardous IDW generated as part of the Spring FWGWMP event is scheduled to be transported and disposed on July 20, 2023.

Approximately 1,015 gallons of soil cuttings and 2.5 gallons of decon water has been generated as part of the sampling activities at Open Demolition Area #2. The waste is properly staged, labeled, and being inspected at Building 1036.

F. Describe activities planned for the following month (July 2023)

1. HGL will prepare the Group 8 MRS Final QAPP and transmit it to the Ohio EPA.

2. Arcadis will continue field work operations at Open Demolition Area 2.

3. PIKA-Insight JV will continue developing the Preliminary Draft Work Plan/Remedial Design for CC

RVAAP-70. PIKA-Insight JV will submit the Preliminary Draft Work Plan/Remedial Design for RVAAP-06 for Army review. Pending resolution of Army comments, PIKA-Insight JV will submit the Draft Remedial Design for RVAAP-50 for Ohio EPA review.

4. Leidos plans to submit the Draft APP/SSHP for the Investigation of Nine AOCs for Army review. Leidos plans to submit the Preliminary Draft RI Work Plan for CC RVAAP-78 for Army review. Leidos plans to respond to Army comments and submit Draft versions of the Work Plan for additional delineation sampling at RVAAP-34, 38, 42, 45 and CC RVAAP-76 and the Vapor Intrusion Study Work Plan for CC RVAAP-69 for Ohio EPA review. Leidos plans to submit the Final RI Addendum for CC RVAAP-79 to Ohio EPA.

G. Describe activities currently under Ohio EPA review and/or activities to be submitted for Ohio EPA review in the next 8 weeks.

Site Name/Activity Name	Current Status – In Progress/To Be Submitted	Start Date (Actual or Projected)	End Date (based on 45 day review timeframe)	Ohio EPA Reviewer Name (if known)
Final RI Addendum for CC RVAAP-79 - Leidos	To be submitted			
Draft Work Plan for RVAAP-34, 38, 42, 45, CC RVAAP-76 - Leidos	To be submitted			
Draft VI Study Work Plan for CC RVAAP-69 - Leidos	To be submitted			
Draft Remedial Design Work Plan for RVAAP-50 Atlas Scrap Yard - Insight	To be submitted			
Final Group 8 MRS QAPP – HGL	To be submitted			

H. List of FY24 Milestones

Milestone Activity	Milestone Date	Actual Date Achieved
Block D Igloo MRS Draft Remedial Action Completion Report - HGL	August 30, 2024	
Group 8 MRS Draft Remedial Action Completion Report – HGL	August 30, 2024	
Draft 2023 LUC Inspection Report - Chenega	March 31, 2024	
FWGWMP Draft Annual Report - Leidos	February 15, 2024	
FWGWMP Draft Groundwater Addendum - Leidos	February 15, 2024	

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

June 12, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Ms. Natalie Oryshkewych
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report - May 2023

Dear Ms. Oryshkewych:

Attached for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report – May 2023". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from May 1, 2023, through May 31, 2023. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37. This monthly report will only be submitted via email due to small file size and will not be submitted through the Ohio EPA LiquidFile system.

Please contact the undersigned at (614) 336-6000 Ext. 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.06.12 13:02:39 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Megan Oravec, Ohio EPA
Thomas Schneider, Ohio EPA
Kevin Palombo, Ohio EPA
Katie Tait, OHARNG
Steve Kvaal, USACE – Louisville
James Trumble, USACE – Louisville
Jennifer Tierney, Chenega, RVAAP Administrative Record

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
May 2023

Status of project activities for reporting period (May 2023)

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2021 RI/FS Completion Contract for IRP AOCs	N. Peters / Leidos	A meeting on the Draft Facility-wide Sewers RI Report was held, on January 17, 2023, to discuss the path forward with the Ohio EPA. Leidos has been working on the re-evaluation and provided preliminary results/suggestions to the Army on a teleconference on May 9, 2023. The Army is working on a modification to Leidos' contract to get additional support. The Army will schedule a Technical Project Planning meeting with the Ohio EPA after additional evaluation is completed.
Block D MRS and Group 8 MRS RD/RAs	Travis McCoun & Nicole Walworth / HGL	Field work at the Block D MRS is on hold and will recommence in the Fall 2023. The Group 8 MRS Draft QAPP was submitted to Ohio EPA on February 9, 2023, and comments were received on April 19, 2023. Response to comments were submitted to Ohio EPA on May 8, 2023 and is pending response.
RVAAP-004-R-01 ODA #2	Nicole Walworth & Travis McCoun / Arcadis	Ohio EPA approved the Final QAPP on April 3, 2023. Arcadis mobilized field staff to the site on March 14, 2023. Field work is ongoing and will continue through September 2023.
Remedial Actions for 3 AOCs – RVAAP-06 C Block Quarry, RVAAP-50 Atlas Scrap Yard, CC RVAAP-70 E Classification Yard	N. Peters / PIKA-Insight JV	PIKA-Insight continued developing the Work Plans/Remedial Designs for RVAAP-06, RVAAP-50 and CC RVAAP-70. The Preliminary Draft Remedial Design Work Plan for RVAAP-50 Atlas Scrap Yard was submitted to the Army on May 2, 2023. Responses to Army comments are pending.
Investigation at 9 AOCs - RVAAP-34 Sand Creek, CC RVAAP-69 Building 1048 Fire Station, CC RVAAP-78 Quarry Pond Dump, CC RVAAP-79 DLA Ore Storage Yard, RVAAP-38 NACA Test Area, RVAAP-45 Wet Storage, RVAAP-42 Load Line 9, CC RVAAP-76 Depot Area, CC RVAAP-70 E Classification Yard	N. Peters / Leidos	On May 9, 2023, Leidos submitted the Preliminary Draft Delineation Sampling UFP-QAPP for RVAAP-34 Sand Creek Disposal Road Landfill for Army review. On May 25, 2023, Leidos submitted the Preliminary Draft version of the VI Study UFP-QAPP for CC RVAAP-69 Former Fire Station for Army review. On May 3, 2023, Leidos submitted the redline Final version of the CC RVAAP-79 DLA Ore Storage Yard RI Addendum for Army review. On May 2, 2023, Leidos submitted the Preliminary Draft version of the Delineation Sampling UFP-QAPP for RVAAP-38, RVAAP-42, RVAAP-45, and CC RVAAP-76 for Army review.
2022 Environmental Program Support Services	N. Peters / Chenega	Chenega worked on the transcript from the April 19, 2023, RVAAP RAB meeting. Chenega began seasonal field work of Seibert Stake and warning sign maintenance

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
RVAAP-66 Facility Wide Ground Water Monitoring	J. Trumble / Leidos	Leidos completed the development and sampling of all the new FWGW FS wells and completed the Spring 2023 FWGWMP sampling. Leidos submitted the Final Spring 2022 Semi-Annual Report on May 16, 2023. Ohio EPA approval was received on May 31, 2023. Leidos submitted the Final 2022 Annual Report on May 4, 2023. Ohio EPA approval was received on May 31, 2023. Leidos submitted the Final 2023 Addendum Report on May 3, 2023. Ohio EPA approval was received on May 31, 2023.

A. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties

B. Identify changes in key personnel

None

C. List target and actual completion dates for each element of activity, including project completion

The actual completion dates and target dates where applicable are provided with the status of activities in Section A.

D. Provide an explanation for any deviation from applicable schedules

None.

E. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities

Well installation and development in support of the FWGW FS resulted in thirty-two (32) 55-gallon partially drums of soil cuttings, and approximately 13,220 gallons of liquid IDW, including decontamination water. The Spring 2023 FWGWMP field work/sampling created four full, and one partially full 55-gallon drum of purge and decontamination water. The soil and liquid IDW are properly staged and labeled at Building 1036. Inspections are being conducted while awaiting waste sample results and eventual transport and disposal.

Two drums (approximately 95 gallons) of decon water was generated during the tree cutting activities for Atlas Scrap Yard when decontaminating equipment mats. The waste was sampled and found to be Nonhazardous. The waste was properly transported and disposed offsite on June 8, 2023.

Approximately 500 gallons of soil cuttings and 4 gallons of decon water has been generated as part of the sampling activities at Open Demolition Area #2. The waste is properly staged, labeled, and being inspected at Building 1036.

F. Describe activities planned for the following month (June 2023)

1. Pending a response from the Ohio EPA, HGL will prepare the Group 8 MRS Final QAPP.

2. Arcadis will continue field work operations at Open Demolition Area 2.

3. PIKA-Insight JV will continue developing the Preliminary Draft Work Plans/Remedial Designs for RVAAP-06 and CC RVAAP-70. Pending resolution of Army comments, PIKA-Insight JV will submit the Draft Remedial Design for RVAAP-50.

4. Leidos plans to submit the Draft APP/SSHP for the Investigation of Nine AOCs for Army review. Leidos plans to continue developing and submit the Preliminary Draft RI Work Plan for CC RVAAP-78 and the Draft Work Plan for additional delineation sampling at RVAAP-34, 38, 42, 45 and CC RVAAP-76 for Ohio EPA review. Leidos plans to submit the Draft Vapor Intrusion Study Work Plan for CC RVAAP-69 for Ohio EPA review. Leidos plans to submit the Final RI Addendum for CC RVAAP-79 to Ohio EPA.

G. Describe activities currently under Ohio EPA review and/or activities to be submitted for Ohio EPA review in the next 8 weeks.

Site Name/Activity Name	Current Status – In Progress/To Be Submitted	Start Date (Actual or Projected)	End Date (based on 45 day review timeframe)	Ohio EPA Reviewer Name (if known)
RTCs for the Draft QAPP/WP for Group 8 MRS (RVAAP-063-R-01) – HGL	In Progress	May 8, 2023	June 22, 2023	Nick Roope
Final RI Addendum for CC RVAAP-79	To be submitted			
Draft Work Plan for RVAAP-34, 38, 42, 45, CC RVAAP-76	To be submitted			
Draft VI Study Work Plan for CC RVAAP-69	To be submitted			
Draft Remedial Design Work Plan for RVAAP-50 Atlas Scrap Yard	To be submitted			

H. List of FY24 Milestones

Milestone Activity	Milestone Date	Actual Date Achieved
Block D Igloo MRS Draft Remedial Action Completion Report - HGL	August 30, 2024	
Group 8 MRS Draft Remedial Action Completion Report – HGL	August 30, 2024	
Draft 2023 LUC Inspection Report - Chenega	March 31, 2024	
FWGWMP Draft Annual Report - Leidos	February 15, 2024	
FWGWMP Draft Groundwater Addendum - Leidos	February 15, 2024	

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

May 9, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Ms. Natalie Oryshkewych
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report - April 2023

Dear Ms. Oryshkewych:

Attached is the "RVAAP Restoration Program - DFFO Monthly Summary Report – April 2023". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from April 1, 2023, through April 30, 2023. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37. Due to small file size, this activity report will only be submitted via email.

Please contact the undersigned at (614) 336-6000 Ext. 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.05.05 08:08:13 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Megan Oravec, Ohio EPA, DERR
Thomas Schneider, Ohio EPA
Kevin Palombo, Ohio EPA, DERR
Katie Tait, OHARNG
Steve Kvaal, USACE – Louisville
James Trumble, USACE – Louisville
Jennifer Tierney, Chenega

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
April 2023

Status of project activities for reporting period (April 2023)

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2021 RI/FS Completion Contract for IRP AOCs	N. Peters / Leidos	A meeting on the Draft Facility-wide Sewers RI Report was held, on January 17, 2023, to discuss the path forward with the Ohio EPA. Additional evaluation and investigation are outside the scope of Leidos' current contract. The Army is working on a modification to Leidos' contract to get additional support. The Army will schedule a Technical Project Planning meeting with Ohio EPA after additional evaluation.
Block D MRS and Group 8 MRS RD/RAs	Travis McCoun & Nicole Walworth / HGL	HGL began cutting and clearing vegetation and brush at the MRS in preparation of the field work, however, the vegetation removal will not be completed before the March 31 deadline due to subcontractor issues. Therefore, the field work is on hold and recommence in the fall. The Group 8 MRS Draft QAPP was submitted to Ohio EPA on February 9, 2023, and comments were received on April 19, 2023. HGL submitted the draft response to comments on April 24, 2023, and are under Army review.
RVAAP-004-R-01 ODA #2	Nicole Walworth & Travis McCoun / Arcadis	Arcadis provided revised pages and a Final QAPP on March 21, 2023, and Ohio EPA approved the Final QAPP on April 3, 2023. Arcadis mobilized field staff to the site on March 14, 2023. Field work is ongoing.
Remedial Actions for 3 AOCs – RVAAP-06 C Block Quarry, RVAAP-50 Atlas Scrap Yard, CC RVAAP-70 E Classification Yard	N. Peters / PIKA-Insight JV	PIKA-Insight continued developing the Work Plans/Remedial Designs for RVAAP-06, RVAAP-50 and CC RVAAP-70. The ARNG/OHARNG/USACE had a meeting with the Ohio EPA and USACE Pittsburgh on April 25, 2023 to discuss wetlands impacts and mitigation at Atlas Scrap Yard.
Investigation at 9 AOCs - RVAAP-34 Sand Creek, CC RVAAP-69 Building 1048 Fire Station, CC RVAAP-78 Quarry Pond Dump, CC RVAAP-79 DLA Ore Storage Yard, RVAAP-38 NACA Test Area, RVAAP-45 Wet Storage, RVAAP-42 Load Line 9, CC RVAAP-76 Depot Area, CC RVAAP-70 E Classification Yard	N. Peters / Leidos	Leidos continued preparing the Accident Prevention Plan (APP) and Site Safety and Health Plan (SSHP) for all planned field activities. Leidos continued preparing the Vapor Intrusion (VI) Study Work Plan for CC RVAAP-69. Leidos continued developing the Work Plan for additional delineation sampling at RVAAP-34, 38, 42, 45 and CC RVAAP-76 and continued developing the RI Work Plan for CC RVAAP-78. Leidos continued developing the Final RI Addendum for CC RVAAP-79.

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2022 Environmental Program Support Services	N. Peters / Chenega	On April 4, 2023, Ohio EPA approved the Final 2022 Annual Land Use Control Monitoring Report for RVAAP-01 Ramsdell Quarry Landfill, RVAAP-04 Open Demolition Area #2, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 through 12 Load Lines 1, 2, 3,4 and 12, and RVAAP-51 Dump Along Paris-Windham Road. On April 19, 2023, Chenega provided facilitation and administration of the RVAAP RAB meeting.
RVAAP-66 Facility Wide Ground Water Monitoring	J. Trumble / Leidos	On April 10, 2023, the Army provided a 15-day notification letter to Ohio EPA regarding upcoming annual well gauging event and FWGWMP sampling. Leidos mobilized to CJAG on April 24, 2023, and began the Spring sampling by beginning the annual well gauging. As of April 27, 2023, all new FWGW FS wells have been installed, and will be developed and sampled throughout May. A response to Ohio EPA comments on the Spring 2022 Semi-Annual Report was sent on March 14, 2023. Responses to comments were approved by the Ohio EPA in a letter dated April 28, 2023. In a letter dated April 19, 2023 (received on April 20, 2023), Ohio EPA provided general comments on the Draft 2022 Annual Report. The Army and Ohio EPA agreed that the letter did not require revisions to the report. In a letter dated April 28, 2023 (received on May 1, 2023), Ohio EPA concurred with the Army responses for the 2023 Addendum Report.

A. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties

B. Identify changes in key personnel

None

C. List target and actual completion dates for each element of activity, including project completion

The actual completion dates and target dates where applicable are provided with the status of activities in Section A.

D. Provide an explanation for any deviation from applicable schedules

None.

E. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities

Well installation and development in support of the FWGW FS resulted in thirty-two (32) 55-gallon partially drums of soil cuttings, and a little more than 12,500 gallons of liquid IDW, including decontamination water in March and April 2023. The Spring 2023 FWGWMP field work/sampling created one partially full 55-gallon drum of decon water. The soil and liquid IDW are properly staged and labeled at Building 1036. Inspections are being conducted while awaiting waste sample results and eventual transport and disposal.

Two drums (approximately 95 gallons) of decon water was generated during the tree cutting activities for Atlas Scrap Yard when decontaminating equipment mats. The waste was sampled and found to be Nonhazardous. The waste is properly staged, labeled, and being inspected at Building 1036 while awaiting proper transport and disposal.

To date, approximately 405 gallons of soil cuttings and 2.5 gallons of decon water has been generated as part of the sampling activities at Open Demolition Area #2. The waste is properly staged, labeled, and being inspected at Building 1036.

F. Describe activities planned for the following month (May 2023)

1. Chenega plans to continue seasonal field work of Seibert Stake and warning sign maintenance.

2. HGL will submit responses to the comments on the Group 8 MRS Draft QAPP.

3. Arcadis will continue field work operations at Open Demolition Area 2.

4. PIKA-Insight JV will continue developing Work Plans/Remedial Designs for RVAAP-06 and CC RVAAP-70. PIKA-Insight JV will submit the Preliminary Draft Remedial Design for RVAAP-50 and the Draft APP/SSHP for Army review.

5. Leidos plans to submit the Draft APP/SSHP for the Investigation of Nine AOCs for Army review. Leidos plans to continue developing and submit the Preliminary Draft RI Work Plan for CC RVAAP-78 and the Preliminary Draft Work Plan for additional delineation sampling at RVAAP-34, 38, 42, 45 and CC RVAAP-76 for Army review. Leidos plans to submit the Preliminary Draft Vapor Intrusion Study Work Plan for CC RVAAP-69 for Army review. Leidos plans to submit the Final RI Addendum for CC RVAAP-79 to Ohio EPA.

6. Leidos plans on completing the development and sampling of the monitoring wells supporting the FWGW FS. Leidos will also continue the Spring FWGWMP sampling of the monitoring wells.

7. Leidos plans on submitting the Final 2022 Spring Semi-Annual FWGWMP Report, the Final 2022 Annual Report, and the 2023 Addendum Report.

G. Describe activities currently under Ohio EPA review and/or activities to be submitted for Ohio EPA review in the next 8 weeks.

Site Name/Activity Name	Current Status – In Progress/To Be Submitted	Start Date (Actual or Projected)	End Date (based on 45 day review timeframe)	Ohio EPA Reviewer Name (if known)
RTCs for the Draft QAPP/WP for Group 8 MRS (RVAAP-063-R-01) – HGL	To be submitted			Nick Roope
Final RI Addendum for CC RVAAP-79	To be submitted	May 12, 2023 (projected)		
Final 2023 Addendum for RVAAP-66 FWGWMP – Leidos	In Progress	May 3, 2023	June 19, 2023	Kevin Palombo
Final Semi-Annual Report – Spring 2022 – FWGWMP -	To be submitted	May12, 2023 (projected)		Kevin Palombo

Site Name/Activity Name	Current Status – In Progress/To Be Submitted	Start Date (Actual or Projected)	End Date (based on 45 day review timeframe)	Ohio EPA Reviewer Name (if known)
Leidos				
Final Annual Report for 2022 FWGWMP - Leidos	In Progress	May 4, 2023	June 20, 2023	Kevin Palombo

H. List of FY24 Milestones

Milestone Activity	Milestone Date	Actual Date Achieved
Block D Igloo MRS Draft Remedial Action Completion Report - HGL	August 30, 2024	
Group 8 MRS Draft Remedial Action Completion Report – HGL	August 30, 2024	
Draft 2023 LUC Inspection Report - Chenega	March 31, 2024	
FWGWMP Draft Annual Report - Leidos	February 15, 2024	
FWGWMP Draft Groundwater Addendum - Leidos	February 15, 2024	

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

April 7, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Ms. Natalie Oryshkewych
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report - March 2023

Dear Ms. Oryshkewych:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report – March 2023". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from March 1, 2023, through March 31, 2023. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37. Due to the small file size, this report will only be sent via email and will not be sent via the Ohio EPA LiquidFile system.

Please contact the undersigned at (614) 336-6000 Ext. 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.04.07 12:19:55 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Megan Oravec, Ohio EPA, DERR
Thomas Schneider, Ohio EPA, DERR
Kevin Palombo, Ohio EPA, DERR
Katie Tait, OHARNG
Steve Kvaal, USACE – Louisville
James Trumble, USACE – Louisville
Jennifer Tierney, Chenega

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
March 2023

Status of project activities for reporting period (March 2023)

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2021 RI/FS Completion Contract for IRP AOCs	N. Peters / Leidos	A meeting on the Draft Facility-wide Sewers RI Report was held, on January 17, 2023, to discuss the path forward with the Ohio EPA. Additional evaluation and investigation are outside the scope of Leidos' current contract, so Leidos is on hold while the Army evaluates the next steps needed to move the project forward. The Army is working on a modification to Leidos' contract to get additional support. The Army will schedule a Technical Project Planning meeting with Ohio EPA after additional evaluation.
Block D MRS and Group 8 MRS RD/RAs	Travis McCoun & Nicole Walworth / HGL	The Block D Igloo MRS Final QAPP was submitted to the Army and Ohio EPA on February 9, 2023 and was approved by the Ohio EPA on March 22, 2023. HGL began cutting and clearing vegetation and brush at the MRS in preparation of the field work, however, the vegetation removal will not be completed before the March 31 deadline due to subcontractor issues. Therefore, the field work will pause and recommence in the fall. The Group 8 MRS Draft QAPP was submitted to Ohio EPA on February 9, 2023. Ohio EPA comments are pending.
RVAAP-004-R-01 ODA #2	Nicole Walworth & Travis McCoun / Arcadis	Arcadis submitted the response to comments to the Ohio EPA on the Draft UFP-QAPP for ODA2 on September 14, 2022; the Ohio EPA requested an extension until December 9, 2022. Ohio EPA review of responses was provided to the Army on December 14, 2022. The Army had a comment clarification meeting with the Ohio EPA on January 6, 2023. Revised Response to Comments were submitted to Ohio EPA on January 24, 2023. Ohio EPA provided a response to the Army on January 31, 2023. Arcadis sent the Final QAPP to the Ohio EPA on March 1, 2023, and Ohio EPA provided additional comments. Arcadis provided revised pages and a Final QAPP on March 21, 2023, and Ohio EPA approved the Final QAPP on April 3, 2023. Arcadis completed vegetation removal on February 7, 2023. A Notification of Field Work was sent to the Ohio EPA on March 1, 2023. Arcadis mobilized field staff to the site on March 14, 2023.
Remedial Actions for 3 AOCs – RVAAP-06 C Block Quarry, RVAAP-50 Atlas Scrap Yard, CC RVAAP-70 E Classification Yard	N. Peters / PIKA-Insight JV	PIKA-Insight continued developing the Work Plans/Remedial Designs for RVAAP-06, RVAAP-50 and CC RVAAP-70. On March 6, 2023, the contractor conducted a site survey at all 3 AOCs. Tree and brush removal were performed at the Atlas Scrap Yard Former Storage Area (FSA) and CC RVAAP-70 East Classification Yard on March 20-24, 2023.

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
Investigation at 9 AOCs - RVAAP-34 Sand Creek, CC RVAAP-69 Building 1048 Fire Station, CC RVAAP-78 Quarry Pond Dump, CC RVAAP-79 DLA Ore Storage Yard, RVAAP-38 NACA Test Area, RVAAP-45 Wet Storage, RVAAP-42 Load Line 9, CC RVAAP-76 Depot Area, CC RVAAP-70 E Classification Yard	N. Peters / Leidos	Leidos continued preparing the Accident Prevention Plan (APP) and Site Safety and Health Plan (SSHP) for all planned field activities. Leidos continued preparing the Vapor Intrusion (VI) Study Work Plan for CC RVAAP-69. Leidos continued developing the Work Plan for additional delineation sampling at RVAAP-34, 38, 42, 45 and CC RVAAP-76 and continued developing the RI Work Plan for CC RVAAP-78. Leidos began developing the Final RI Addendum for CC RVAAP-79.
2022 Environmental Program Support Services	N. Peters / Chenega	Chenega submitted the Final 2022 Annual Land Use Control Monitoring Report for RVAAP-01 Ramsdell Quarry Landfill, RVAAP-04 Open Demolition Area #2, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 through 12 Load Lines 1, 2, 3,4 and 12, and RVAAP-51 Dump Along Paris-Windham Road to Ohio EPA on March 27, 2023 which was approved by the Ohio EPA on April 4, 2023
RVAAP-66 Facility Wide Ground Water Monitoring	J. Trumble / Leidos	Leidos mobilized to CJAG on March 13, 2023, and began well installation in support of the FWGW FS. On March 7, 2023, the Army received Ohio EPA comments on the Draft 2022 FWGWMP Spring Semi-Annual Report and on March 14, 2023, the Army provided responses to the comments. On February 13, 2023, the Army submitted the Draft 2022 Annual FWGWMP Report to the Ohio EPA. On March 7, 2023, the Army received Ohio EPA comments on the Draft 2023 FWGWMP Addendum Report. On March 14, 2023, the Army provided responses to the comments. Leidos has submitted plans to install culverts/driveways to access the monitoring wells located on the south side of State Route 5. OHARNG submitted comments to Leidos who is preparing responses and revising the plans.

A. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties

HGL encountered issues with their tree cutting subcontractor in that they would not be able to perform the cutting in time to meet the 31 March deadline. Therefore, HGL terminated the subcontractor and is looking to contract with another company to perform the cutting in the Fall, after 30 September.

B. Identify changes in key personnel

None

C. List target and actual completion dates for each element of activity, including project completion

The actual completion dates and target dates where applicable are provided with the status of activities in Section A.

D. Provide an explanation for any deviation from applicable schedules

None.

E. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities

Well installation and development in support of the FWGW FS resulted in eleven (11) 55-gallon drums of soil cuttings, and a little more than 1,700 gallons of liquid IDW, including decontamination water in March 2023. The soil and liquid IDW are properly staged and labeled at Building 1036. Inspections are being conducted while awaiting proper transport and disposal.

Two drums (approximately 95 gallons) of decon water was generated during the tree cutting activities for Atlas Scrap Yard when decontaminating equipment mats. The waste is properly staged, labeled, and being inspected while awaiting proper transport and disposal.

F. Describe activities planned for the following month (April 2023)

1. Chenega plans to begin seasonal field work of Seibert Stake and warning sign maintenance. Chenega will also ensure access to all monitoring wells has been achieved for the groundwater level sweep in April.

2. HGL will respond to comments on the Group 8 MRS Draft QAPP (if comments are received from Ohio EPA).

3. Arcadis will continue field work operations and begin soil sampling.

4. PIKA-Insight JV will continue developing Work Plans/Remedial Designs for RVAAP-06, RVAAP-50 and CC RVAAP-70 and will submit Draft APP/SSHP for Army review.

5. Leidos plans to submit the Draft APP/SSHP for the Investigation of Nine AOCs for Army review. Leidos plans to continue developing the RI Work Plan for CC RVAAP-78 and the Work Plan for additional delineation sampling at RVAAP-34, 38, 42, 45 and CC RVAAP-76. Leidos plans to submit the Pre-Draft Vapor Intrusion Study Work Plan for CC RVAAP-69 for Army review. Leidos plans to prepare the Final RI Addendum for CC RVAAP-79 for submittal to Ohio EPA in early May 2023.

6. Leidos plans on completing the installation and sampling of the monitoring wells supporting the FWGW FS.

7. Leidos plans on beginning the Spring FWGWMP sampling in April beginning with the facility wide water level sweep. This will be followed up with sampling of the monitoring wells.

G. Describe activities currently under Ohio EPA review and/or activities to be submitted for Ohio EPA review in the next 8 weeks.

Site Name/Activity Name	Current Status – In Progress/To Be Submitted	Start Date (Actual or Projected)	End Date (based on 45 day review timeframe)	Ohio EPA Reviewer Name (if known)
Draft QAPP/WP for Group 8 MRS (RVAAP-063-R-01) – HGL	In Progress	February 9, 2023	March 26, 2023	Nick Roope
RTC for Draft 2023 Addendum for RVAAP-66 FWGWMP – Leidos	In Progress	March 14, 2023	May 1, 2023	Kevin Palombo
Final Semi-Annual Report – Spring 2022 – FWGWMP - Leidos	In Progress	March 14, 2023	May 1, 2023	Kevin Palombo
Draft Annual Report for 2022 FWGWMP - Leidos	In Progress	February 13, 2023	March 30, 2023	Kevin Palombo
Final RI Addendum for CC RVAAP-79	To be submitted	May 4, 2023 (projected)		

H. List of FY23 Milestones

Milestone Activity	Milestone Date	Actual Date Achieved
FWGWMP Draft Annual Report	February 15, 2023	February 13, 2023
FWGWMP Draft Groundwater Addendum	February 15, 2023	January 23, 2023

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

March 8, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Ms. Natalie Oryshkewych
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report - February 2023

Dear Ms. Oryshkewych:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report – February 2023". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from February 1, 2023, through February 28, 2023. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37.

Please contact the undersigned at (614) 336-6000 Ext. 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Megan Oravec, Ohio EPA, DERR
Thomas Schneider, Ohio EPA, DERR
Kevin Palombo, Ohio EPA, DERR
Katie Tait, OHARNG
Steve Kvaal, USACE – Louisville
James Trumble, USACE - Louisville
Jennifer Tierney, Chenega

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
February 2023

Status of project activities for reporting period (February 2023)

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2021 RI/FS Completion Contract for IRP AOCs	N. Peters / Leidos	A meeting on the Draft Facility-wide Sewers RI Report was held, on January 17, 2023, to discuss the path forward with the Ohio EPA. Additional evaluation and investigation are outside the scope of Leidos' current contract, so Leidos is on hold while the Army evaluates the next steps needed to move the project forward. The Army is working on a modification to Leidos' contract to get additional support. The Army will schedule a Technical Project Planning meeting with Ohio EPA after additional evaluation.
Block D MRS and Group 8 MRS RD/RAs	Travis McCoun & Nicole Walworth / HGL	The Block D Igloo MRS Final QAPP was submitted to the Army and Ohio EPA on February 9, 2023. HGL began cutting and clearing vegetation and brush at the MRS in preparation of the field work. The Group 8 MRS Draft QAPP was submitted to Ohio EPA on February 9, 2023.
RVAAP-004-R-01 ODA #2	Nicole Walworth & Travis McCoun / Arcadis	Arcadis submitted the response to comments to the Ohio EPA on the Draft UFP-QAPP for ODA2 on September 14, 2022; the Ohio EPA requested an extension until December 9, 2022. Ohio EPA review of responses was provided to the Army on December 14, 2022. The Army had a comment clarification meeting with the Ohio EPA on January 6, 2023. Revised Response to Comments were submitted to Ohio EPA on January 24, 2023. Ohio EPA provided a response to the Army on January 31, 2023. Arcadis sent the Final QAPP to the Ohio EPA on March 1, 2023. Arcadis completed vegetation removal on February 7, 2023. QC Plan was submitted to the USACE on February 14, 2023.
Remedial Actions for 3 AOCs – RVAAP-06 C Block Quarry, RVAAP-50 Atlas Scrap Yard, CC RVAAP-70 E Classification Yard	N. Peters / PIKA-Insight JV	The contractor finalized and submitted the Project Management Plan and Quality Control Plan to the Army. The contractor submitted a Tree Removal Plan to the Army in preparation for tree clearing to be conducted in March, which was finalized on February 28, 2023. The contractor continued developing the Work Plans/Remedial Designs for RVAAP-06, RVAAP-50 and CC RVAAP-70.
Investigation at 9 AOCs - RVAAP-34 Sand Creek, CC RVAAP-69 Building 1048 Fire Station, CC RVAAP-78 Quarry Pond Dump, CC RVAAP-79 DLA Ore Storage Yard, RVAAP-38 NACA Test Area, RVAAP-45 Wet Storage, RVAAP-42 Load Line 9, CC RVAAP-76 Depot Area, CC RVAAP-70 E Classification Yard	N. Peters / Leidos	On February 14, 2023, Leidos issued the Final Draft RI Report for CC RVAAP-69 to Ohio EPA. Ohio EPA approved the Final RI in a letter dated February 27, 2023. Leidos continued preparing the Vapor Intrusion (VI) Study Work Plan for CC RVAAP-69. Leidos continued developing the Work Plan for additional delineation sampling at RVAAP-34, 38, 42, 45 and CC RVAAP-76 and continued developing the RI Work Plan for CC RVAAP-78.

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2022 Environmental Program Support Services	N. Peters / Chenega	Chenega submitted the Final Property Management Plan Appendices (2022 Update) to Ohio EPA on February 1, 2023. The document was approved by Ohio EPA in a letter dated February 13, 2023. Chenega submitted the Draft 2022 Annual Land Use Control Monitoring Report for RVAAP-01 Ramsdell Quarry Landfill, RVAAP-14 Open Demolition Area #2, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 through 12 Load Lines 1, 2, 3,4 and 12, and RVAAP-51 Dump Along Paris-Windham Road to Ohio EPA on January 19, 2023. That document is still in Ohio EPA review.
RVAAP-66 Facility Wide Ground Water Monitoring	J. Trumble / Leidos	Leidos issued a 15-day notification field notification to the Ohio EPA regarding the new well installation, on February 21, 2023. On February 7, 2023, the Army issued responses to Ohio EPA's comments on the Draft 2022 FWGWMP Spring Semi-Annual Report. On February 13, 2023, the Army submitted the Draft 2022 Annual FWGWMP Report to the Ohio EPA.

A. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties

None.

B. Identify changes in key personnel

None

C. List target and actual completion dates for each element of activity, including project completion

The actual completion dates and target dates where applicable are provided with the status of activities in Section A.

D. Provide an explanation for any deviation from applicable schedules

None.

E. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities

None.

F. Describe activities planned for the following month (March 2023)

1. Chenega plans to address comments from the Ohio EPA review of the Draft 2022 Annual LUC Monitoring Report upon receipt.

2. HGL will continue clearing brush and trees at the Block D Igloo MRS in support of upcoming field activities in 2023.

3. HGL will respond to comments on the Group 8 MRS Draft QAPP (if comments are received from Ohio EPA).

4. Arcadis will mobilize for QC seeding and geophysical survey field work in March 2023.

5. PIKA-Insight JV (PI-JV) plans to have the AOCs surveyed, and removal areas staked. PI-JV will also cut trees and brush in March ahead of the March 31 deadline. PI-JV will continue developing Work Plans/Remedial Designs for RVAAP-06, RVAAP-50 and CC RVAAP-70.

6. Leidos plans to continue developing the RI Work Plan for CC RVAAP-78 and the Work Plan for additional delineation sampling at RVAAP-34, 38, 42, 45 and CC RVAAP-76. Leidos plans to submit the compiled Final RI Report for CC RVAAP-69 to the Administrative Record and continue developing the Vapor Intrusion Study Work Plan for CC RVAAP-69. Leidos plans to begin developing the RI Addendum for CC RVAAP-79.

7. HGL will begin clearing brush and trees at the Block D MRS in support of upcoming field activities.

8. Leidos plans on initiating monitoring well installation to support the FWGW FS on March 13, 2023.

G. Describe activities currently under Ohio EPA review and/or activities to be submitted for Ohio EPA review in the next 8 weeks.

Site Name/Activity Name	Current Status – In Progress/To Be Submitted	Start Date (Actual or Projected)	End Date	Ohio EPA Reviewer Name (if known)
Final Block D Igloo QAPP/WP (RVAPP-060-R-01) – HGL	In Progress	February 9, 2023	March 26, 2023	Nick Roope
Draft QAPP/WP for Group 8 MRS (RVAAP-063-R-01) – HGL	In Progress	February 9, 2023	March 26, 2023	Nick Roope
Final QAPP/WP for Open Demolition Area 2 RI Addendum (RVAAP-004-R-01) – Arcadis	In Progress	March 1, 2023	April 1, 2023	Nick Roope
Draft Annual LUC Report for 2022 - Chenega	In Progress	January 19, 2023	March 6, 2023	Nick Roope
RTC for Draft 2023 Addendum for RVAAP-66 FWGWMP – Leidos	To be submitted			Kevin Palombo
Final Semi-Annual Report – Spring 2022 – FWGWMP - Leidos	To be submitted			Kevin Palombo
Draft Annual Report for 2022 FWGWMP - Leidos	In Progress	February 13, 2023	March 30, 2023	Kevin Palombo

H. List of FY23 Milestones

Milestone Activity	Milestone Date	Actual Date Achieved
FWGWMP Draft Annual Report	February 15, 2023	February 13, 2023
FWGWMP Draft Groundwater Addendum	February 15, 2023	January 23, 2023

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

February 9, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Ms. Natalie Oryshkewych
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report - January 2023

Dear Ms. Oryshkewych:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report – January 2023". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from January 1, 2023, through January 31, 2023. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37.

This letter and attachment are being submitted electronically via email only and due to small file size will not be submitted via the Ohio EPA LiquidFile site. Please contact the undersigned at (614) 336-6000 Ext. 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.02.08 14:28:17 -05'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Megan Oravec, Ohio EPA
Thomas Schneider, Ohio EPA
Kevin Palombo, Ohio EPA
Katie Tait, OHARNG
Steve Kvaal, USACE – Louisville
James Trumble, USACE – Louisville

Attachment – DFFO Report – January 2023

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
January 2023

Status of project activities for reporting period (January 2023)

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2021 RI/FS Completion Contract for IRP AOCs	N. Peters / Leidos	A meeting on the Draft Facility-wide Sewers RI Report was held, on January 17, 2023, to discuss the path forward with the Ohio EPA. Additional evaluation and investigation are outside the scope of Leidos' current contract, so Leidos is on hold while the Army evaluates the next steps needed to move the project forward. The Army will schedule a Technical Project Planning meeting with Ohio EPA after additional evaluation.
Block D MRS and Group 8 MRS RD/RAs	Travis McCoun & Nicole Walworth / HGL	The Block D MRS Draft QAPP was submitted to the Ohio EPA in August 2022; comments were received on November 2, 2022, and responses were sent to the Ohio EPA on November 29, 2022. Ohio EPA sent a letter of concurrence on January 25, 2023. The Final QAPP is being assembled for submission in February 2023. The Group 8 MRS Preliminary Draft QAPP was submitted to the Army on October 17, 2022. All reviewer comments were received on November 14, 2022. Responses to comments on the Preliminary Draft QAPP were submitted on December 29, 2022. Concurrence from the Army was received on all comments by January 26, 2023. The Draft QAPP is being prepared for Ohio EPA submission.
RVAAP-004-R-01 ODA #2	Nicole Walworth & Travis McCoun / Arcadis	Arcadis submitted the response to comments to the Ohio EPA on the Draft UFP-QAPP for ODA2 on September 14, 2022; the Ohio EPA requested an extension until December 9, 2022. Ohio EPA review of responses was provided to the Army on December 14, 2022. The Army had a comment clarification meeting with the Ohio EPA on January 6, 2023. Revised Response to Comments were submitted to Ohio EPA on January 24, 2023. Ohio EPA provided a response to the Army on January 31, 2023. Arcadis began cutting and clearing vegetation and brush at ODA#2 in preparation for upcoming field work.
Remedial Actions for 3 AOCs – RVAAP-06 C Block Quarry, RVAAP-50 Atlas Scrap Yard, CC RVAAP-70 E Classification Yard	N. Peters / PIKA-Insight JV	The contractor finalized and submitted the Project Management Plan and Quality Control Plan to the Army. The contractor continued developing Work Plans/Remedial Designs for RVAAP-06, RVAAP-50 and CC RVAAP-70.

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
Investigation at 9 AOCs - RVAAP-34 Sand Creek, CC RVAAP-69 Building 1048 Fire Station, CC RVAAP-78 Quarry Pond Dump, CC RVAAP-79 DLA Ore Storage Yard, RVAAP-38 NACA Test Area, RVAAP-45 Wet Storage, RVAAP-42 Load Line 9, CC RVAAP-76 Depot Area, CC RVAAP-70 E Classification Yard	N. Peters / Leidos	On January 4, 2023, Leidos submitted the Draft Project Management Plan and Quality Control Plan for USACE review. Leidos continued preparing the Site Safety and Health Plan. On January 6, 2023, Leidos provided a letter responding to Ohio EPA's comments on the Draft RI Report for CC RVAAP-69. In a letter dated January 19, 2023, the Ohio EPA concurred with those responses and Leidos began to update the report accordingly. Leidos also began preparing the Vapor Intrusion (VI) Study Work Plan for CC RVAAP-69. On January 19, 2023, Leidos conducted a site visit and site walk over for all AOCs on this contract. Leidos continued developing the Work Plan for additional delineation sampling at RVAAP-34, 38, 42, 45 and CC RVAAP-76 and continued developing the RI Work Plan for CC RVAAP-78.
2022 Environmental Program Support Services	N. Peters / Chenega	Chenega submitted the Draft 2022 Annual Land Use Control Monitoring Report for RVAAP-01 Ramsdell Quarry Landfill, RVAAP-04 Open Demolition Area #2, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 -12 Load Lines 1, 2, 3,4 and 12, and RVAAP-51 Dump Along Paris-Windham Road to Ohio EPA on January 19, 2023.
RVAAP-66 Facility Wide Ground Water Monitoring	J. Trumble / Leidos	The Ohio EPA concurred with the Final Monitoring Well Installation Plan in a letter dated January 11, 2023. On January 23, 2023, Leidos submitted the Draft 2023 FWGWMP Addendum to the Ohio EPA. On January 25, 2023, the Ohio EPA provided comments on the Draft Spring 2022 FWGWMP report.

A. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties

None.

B. Identify changes in key personnel

Rebecca Shreffler with Chenega has taken a new position with another company. Her last day is February 9, 2023. Chenega has requested that all correspondence be sent to Al Brillinger in the interim while a replacement is hired and onboarded.

C. List target and actual completion dates for each element of activity, including project completion

The actual completion dates and target dates where applicable are provided with the status of activities in Section A.

D. Provide an explanation for any deviation from applicable schedules

None.

E. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities

None.

F. Describe activities planned for the following month (February 2023)

1. Chenega plans to address comments from Ohio EPA review of the Draft 2022 Annual LUC Monitoring Report upon receipt.
2. HGL will finalize the Block D Igloo UFP-QAPP and submit it to the Army and Ohio EPA.
3. HGL will submit the Draft Remedial Action QAPP/Work Plan for the Group 8 MRS to Ohio EPA.
4. Arcadis will submit the Final QAPP/Work Plan with revised response incorporated to the Ohio EPA for the Open Demolition Area 2 MRS.
5. PIKA-Insight will continue developing Work Plans/Remedial Designs for RVAAP-06, RVAAP-50 and CC RVAAP-70.
6. Leidos plans to receive and respond to USACE comments on the Draft PMP and Draft QCP for the Nine AOCs project. Leidos plans to submit the Draft Site Safety and Health Plan for Army review. Leidos plans to continue developing the RI Work Plan for CC RVAAP-78 and the Work Plan for additional delineation sampling at RVAAP-34, 38, 42, 45 and CC RVAAP-76. Leidos plans to submit the Final RI Report for CC RVAAP-69 and continue developing the Vapor Intrusion Study Work Plan for CC RVAAP-69. Leidos plans to begin developing the RI Addendum for CC RVAAP-79.
7. Arcadis will finish the brush and tree clearing at ODA#2.
8. HGL will begin clearing brush and trees at the Block D MRS in support of upcoming field activities.
9. Leidos will begin clearing brush and trees in support of the upcoming well installation in support of the FS.

G. Describe activities currently under Ohio EPA review and/or activities to be submitted for Ohio EPA review in the next 8 weeks.

Site Name/Activity Name	Current Status – In Progress/To Be Submitted	Start Date (Actual or Projected)	End Date	Ohio EPA Reviewer Name (if known)
Final Block D Igloo QAPP/WP (RVAPP-060-R-01) – HGL	To be submitted	Mid-February 2023		Nick Roope
Draft QAPP/WP for Group 8 MRS (RVAAP-063-R-01) – HGL	To be submitted	Mid-February 2023		Nick Roope
Final QAPP/WP for Open Demolition Area 2 RI Addendum (RVAAP-004-R-01) – Arcadis	To be submitted	February 14, 2023		Nick Roope
Final RI Report for CC RVAAP-69 Building 1048 Fire Station – Leidos	To be submitted	February 13, 2023		Ed D'Amato
Draft Annual LUC Report for 2022 - Chenega	In Progress	January 19, 2023	March 6, 2023	Nick Roope

Site Name/Activity Name	Current Status – In Progress/To Be Submitted	Start Date (Actual or Projected)	End Date	Ohio EPA Reviewer Name (if known)
Final Property Management Plan – Chenega	In Progress	January 27, 2023	March 13, 2023	Kevin Palombo
Draft 2023 Addendum for RVAAP-66 FWGWMP – Leidos	In Progress	January 23, 2023	March 9, 2023	Kevin Palombo
RTC on the Draft Semi-Annual Report – Spring 2022 – FWGWMP - Leidos	In Progress	February 7, 2023	March 23, 2023	Kevin Palombo
Draft Annual Report for 2022 FWGWMP - Leidos	In Progress	October 2022	February 15, 2023	Kevin Palombo

H. List of FY23 Milestones

Milestone Activity	Milestone Date	Actual Date Achieved
FWGWMP Draft Annual Report	February 15, 2023	
FWGWMP Draft Groundwater Addendum	February 15, 2023	January 23, 2023

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

January 9, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Ms. Natalie Oryshkewych
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Ohio, Monthly Activity Report - December 2022

Dear Ms. Oryshkewych:

Enclosed for your review is the "RVAAP Restoration Program - DFFO Monthly Summary Report - December 2022". The report summarizes the Restoration Program activities conducted at the former RVAAP for the period from December 1, 2022, through December 31, 2022. This report is being submitted to the Ohio EPA to comply with the Ohio EPA Director's Final Findings and Orders, Section XVI, paragraphs 36 and 37. Due to small file, this submittal will only be submitted via email and not through the Ohio EPA LiquidFile system.

Please contact the undersigned at (614)336-6000 Ext. 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.01.09 10:48:06 -05'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

Attachment

cc: Megan Oravec, Ohio EPA, DERR
Thomas Schneider, Ohio EPA, DERR
Kevin Palombo, Ohio EPA, DERR
Katie Tait, OHARNG
Steve Kvaal, USACE – Louisville
James Trumble, USACE – Louisville
Rebecca Shreffler, Chenega, Administrative Record

RVAAP RESTORATION PROGRAM - DFFO MONTHLY SUMMARY REPORT
December 2022

Status of project activities for reporting period (December 2022)

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
2021 RI/FS Completion Contract for IRP AOCs	N. Peters / Leidos	On November 17, 2022, Ohio EPA provided feedback on the responses provided by the Army on August 24, 2022 on the Draft Facility-wide Sewers RI Report. While considering Ohio EPA's feedback, the Army determined that a written response would not be effective, and a meeting is needed with the Ohio EPA to discuss the path forward. The meeting has been scheduled for January 17, 2023.
Block D MRS and Group 8 MRS RD/RAs	Travis McCoun & Nicole Walworth / HGL	The Block D MRS Draft QAPP was submitted to the Ohio EPA in August 2022; comments were received on November 2, 2022, and responses were sent to the Ohio EPA on November 29, 2022. The Army provided comments on the Preliminary Draft Group 8 UFP-QAPP/WP to HGL on November 14, 2022. Responses to Army comments were issued on December 29, 2022.
RVAAP-004-R-01 ODA #2	Nicole Walworth & Travis McCoun / Arcadis	Arcadis submitted the response to comments to the Ohio EPA on the Draft UFP-QAPP for ODA2 on September 14, 2022; The Ohio EPA requested an extension until December 9, 2022. Ohio EPA review of responses was provided to the Army on December 14, 2022. The Army scheduled a comment clarification meeting with the Ohio EPA for January 6, 2023
Remedial Actions for 3 AOCs – RVAAP-06 C Block Quarry, RVAAP-50 Atlas Scrap Yard, CC RVAAP-70 E Classification Yard	N. Peters / PIKA-Insight JV	On December 19, 2022, the contractor submitted the Draft Project Management Plan and Quality Control Plan for Army review.
Investigation at 9 AOCs - RVAAP-34 Sand Creek, CC RVAAP-69 Building 1048 Fire Station, CC RVAAP-78 Quarry Pond Dump, CC RVAAP-79 DLA Ore Storage Yard, RVAAP-38 NACA Test Area, RVAAP-45 Wet Storage, RVAAP-42 Load Line 9, CC RVAAP-76 Depot Area, CC RVAAP-70 E Classification Yard	N. Peters / Leidos	A new contract was awarded to Leidos to continue the work at 9 AOCs. The contract was awarded on November 4, 2022. The contract kickoff meeting was held on December 19, 2022. The contractor continued working on the Project Management Plan and the schedule. The contractor began preparing the Site Safety and Health Plan and Work Plan for additional delineation sampling at RVAAP-34, 38, 42, 45 and CC RVAAP-76. The contractor also began preparing the RI Work Plan for CC RVAAP-78.
2022 Environmental Program Support Services	N. Peters / Chenega	Chenega finalized and submitted the Contractor Quality Control Plan and the Site Safety and Health Plan to the Army on December 20, 2022. Chenega prepared the Preliminary Draft Annual Land Use Control (LUC) Monitoring Report for Ramsdell Quarry Landfill, Winklepeck Burning Grounds, ODA2, Load Lines 1-4 and 12, and Dump Along Paris-Windham Road. The report was submitted for Army review on December 30, 2022.

PROJECT NAME	USACE TECH MGR /Contractor	PROJECT STATUS
RVAAP-66 Facility Wide Ground Water Monitoring	J. Trumble / Leidos	Leidos submitted the Final Monitoring Well Installation Plan for Ohio EPA approval on November 23, 2022. On November 21, 2022, Leidos submitted the Draft Spring 2022 FWGWMP report to the Ohio EPA. The Annual Well Inspection Report noting condition of the wells was issued on December 22, 2022.

A. Describe difficulties encountered during the reporting period and actions taken to rectify any difficulties

None.

B. Identify changes in key personnel

None.

C. List target and actual completion dates for each element of activity, including project completion

The actual completion dates and target dates where applicable are provided with the status of activities in Section A.

D. Provide an explanation for any deviation from applicable schedules

None.

E. Indicate how much soil and groundwater was generated and/or transported and disposed as part of RVAAP restoration activities

Five (5) 55-gallon drums of liquid IDW were staged at Building 1036 on secondary containment from the Spring 2022 FWGWMP sampling event (three drums) and the Fall FWGWMP sampling event (two drums). The waste was Nonhazardous and was properly transported and disposed on December 15, 2022.

F. Describe activities planned for the following month (January 2023)

1. The Property Management Plan Appendices (PMP) will be finalized and issued pending approval of responses to Ohio EPA comments.

2. Chenega plans to address comments from Army review of the Preliminary Draft 2022 Annual LUC Monitoring Report.

3. HGL will finalize the Block D Igloo UFP-QAPP pending Ohio EPA approval of the responses to comments.

4. HGL will submit the Draft Remedial Action QAPP/Work Plan for the Group 8 MRS

5. Arcadis will submit the responses to Ohio EPA comments for the Open Demolition Area 2 MRS.

6. PIKA-Insight plans to respond to Army comments on the Project Management Plan and Quality Control Plan and begin developing Work Plans/Remedial Designs for RVAAP-06, RVAAP-50 and CC RVAAP-70.

7. A meeting will be held with Ohio EPA on January 17, 2023, to discuss the path forward on the Facility-wide Sewers RI. Leidos will provide technical support to the Army for that meeting.

8. Leidos plans to submit the Draft Project Management Plan and schedule for the Nine AOCs project and the Draft Site Safety and Health Plan for Army review. Leidos plans to continue developing the RI Work Plan for CC RVAAP-78 and the Work Plan for additional delineation sampling at RVAAP-34, 38, 42, 45. And CC RVAAP-76.

December 5, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin M. Sedlak
Army National Guard
Installations & Environment- Cleanup Branch IPA Designation
1438 State Route 534 SW
Newton Falls, OH 44444

Sent via email to: Kevin.m.sedlak.ctr@army.mil

RE: US Army Ravenna Ammunition Plt RVAAP
Remediation Response
Project records
Remedial Response
Portage County
267000859243, 267000859137, 267000859098, 267000859264 and 267000859127

Subject: Uniform Federal Policy-Quality Assurance Project Plan for Additional Remedial Design Sampling at Multiple Areas of Concern

Dear Mr. Sedlak:

On November 23, 2023, the Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) received the Uniform Federal Policy-Quality Assurance Project Plan for Additional Remedial Design Sampling at Multiple Areas of Concern[1]. It was prepared by Leidos.

Ohio EPA has the following comment:

1. Please add clarifying language stating that the results of the sampling will not change the selected remedy for the Areas of Concern or the required additional soil removal on side walls and/or floors of previous excavations that did not meet remedial clean up goals.

If you have any questions concerning this letter, please contact me at (330) 963-1170 or by email at ed.damato@epa.ohio.gov.

Sincerely,

Edward J D'Amato

Edward D'Amato, Site Coordinator
Division of Environmental Response and Revitalization

ec: Nicole Walworth, USACE Baltimore
Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Jennifer M. Tierney, Chenega
Angela Cobbs, Chenega
Megan Oravec, Ohio EPA, DERR, NEDO
Natalie Oryshkewych, Ohio EPA, DERR, NEDO
Brian Tucker, Ohio EPA, DERR, CO
Thomas Schneider, Ohio EPA, DERR, SWDO

[1] https://edocpub.epa.ohio.gov/publicportal/ViewDocument.aspx?docid=2641597

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

August 31, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Edward D'Amato, Site Coordinator
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Draft Uniform Federal Policy-Quality Assurance Project Plan (UFP-QAPP), Multiple Areas of Concern (Work Activity No. 267000859243, 267000859098, 267000859264, and 267000859127)

Dear Mr. D'Amato:

For your review, an electronic version of the *Draft Uniform Federal Policy-Quality Assurance Project Plan for Additional Remedial Design Sampling at Multiple Areas of Concern* has been sent using the Ohio EPA LiquidFile system. The areas of concern addressed in this plan include RVAAP-38 National Advisory Committee on Aeronautics (NACA) Test Area, RVAAP-42 Load Line 9, RVAAP-45 Wet Storage Area, and CC RVAAP-76 Depot Area. A hard copy and CD can be sent upon request by Ohio EPA.

This plan was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at 614-336-6000, ext 2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.08.31 11:52:07 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Megan Oravec, Ohio EPA, NEDO
Tom Schneider, Ohio EPA, SWDO
Katie Tait, OHARNG
Steve Kvaal, USACE Louisville
Nathaniel Peters, II, USACE Louisville
Jed Thomas, Leidos
Ryan Laurich, Leidos
Jennifer Tierney, Chenega

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

December 13, 2023

Ohio Environmental Protection Agency
Attn: Mr. Nicholas Roope
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Draft 2023 Annual Land Use Control Monitoring Report, Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Camp James A. Garfield, Portage/Trumbull Counties, Ohio, (Ohio EPA ID 267000859029)

Dear Mr. Roope:

Attached for your review is an electronic version of the Draft 2023 Annual Land Use Control Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP-04 Open Demolition Area #2, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08-12 Load Lines 1 through 4 and 12, and RVAAP-51 Dump Along Paris Windham Road. Due to small file size, this report is being submitted via email only and not through the Ohio EPA LiquidFile system.

This report was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at (330)235-2153 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.12.13 09:03:23 -05'00'

FOR Kevin M. Sedlak
RVAAP Restoration Project Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA (cover letter via email only)
Megan Oravec, Ohio EPA (cover letter via email only)
Katie Tait, OHARNG (one [1] electronic copy)
Nathaniel Peters, USACE – Louisville (one [1] electronic copy)
Steve Kvaal, USACE – Louisville (cover letter via email only)
Jennifer Tierney, AR Records Manager (one [1] electronic copy)

November 15, 2023

U.S. Army Corps of Engineers (USACE)
Attn: Dr. Nathaniel Peters II
600 Martin Luther King Jr. PL
Louisville, KY 40202

Subject: Camp James A. Garfield/former RVAAP Preliminary Draft 2023 Annual Land Use Control Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP-14 Open Demolition Area #2, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 through 12 Load Lines 1, 2, 3,4 and 12, and RVAAP-51 Dump Along Paris-Windham Road Contract No. W912QR-22-C-0031

Dear Dr. Peters,

The Preliminary Draft *2023 Annual Land Use Control (LUC) Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP_04 Open Demolition Area #2, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 through 12 Load Lines 1, 2, 3, 4 and 12, and RVAAP-51 Dump Along Paris-Windham Road* at Camp James A. Garfield/former Ravenna Army Ammunition Plant (RVAAP) is being sent to you electronically. This report was prepared by Chenega Reliable Services, LLC and is submitted for the Camp Ravenna Environmental Program Support Services Contract # W912QR-22-C-0031 in support of the former RVAAP Restoration Program located at Camp James A. Garfield Joint Military Training Center in Portage/Trumbull Counties, Ohio.

Only electronic copies of the preliminary draft inspection form will be submitted to you and the Camp James A. Garfield Environmental office for review.

Please feel free to contact me at 330-980-1289 or at Allan.Brillinger@chenegars.com via e-mail if there are issues or concerns with this report.

Sincerely,

Allan B. Brillinger
Program Manager, Chenega Reliable Services, LLC

Cc: Katie Tait, OHARNG (1 electronic copy)
Kevin Sedlak, NGB (1 electronic copy)
Steve Kvaal, USACE (transmittal letter only)
Jennifer Tierney, Chenega AR Manager (1 electronic copy)

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

April 4, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin M. Sedlak
RVAAP Restoration Program Manager
ARNG-Directorate
Camp James A. Garfield JTC
1438 State Route 534
Newton Falls, OH 44444

Sent via email to: kevin.m.sedlak.ctr@army.mil

RE: US Army Ravenna Ammunition Plt
RVAAP
Remediation Response
Project records
O&M
Federal Facilities
Portage County
267000859029

Subject: **Final - 2022 Annual Land Use Control Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP-04 Open Demolition Area #2, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 - 12 Load Lines 1 through 4 and 12, RVAAP-51 Dump Along Paris Windham Road, Camp James A. Garfield, Portage/Trumbull Counties, Ohio - Dated March 27, 2023 – Ohio EPA Concurrence**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) received and has reviewed the "Final 2022 Annual Land Use Control Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP-04 Open Demolition Area #2, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 - 12 Load Lines 1 through 4 and 12, RVAAP-51 Dump Along Paris Windham Road, Camp James A. Garfield, Portage/Trumbull Counties, Ohio", March 27, 2023.

Ohio EPA has reviewed this documentation and has found no significant deficiencies. As a result, Ohio EPA concurs with the final findings of the report.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235 or by via email at Nicholas.roope@epa.ohio.gov.

Sincerely,

Nicholas Roope
Environmental Specialist
Division of Environmental Response and Revitalization

NCR/cm

ec: Allan Brillinger, Chenega
Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Megan Oravec, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR

Received 04 APR 2023

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

March 27, 2023

Ohio Environmental Protection Agency
Attn: Mr. Nicholas Roope
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, FINAL 2022 Annual Land Use Control (LUC) Monitoring Report for RVAAP-01 Ramsdell Quarry Landfill, RVAAP-04 Open Demolition Area #2, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 - 12 Load Lines 1 through 4 and 12, RVAAP-51 Dump Along Paris Windham Road, Camp James A. Garfield, Portage/Trumbull Counties, Ohio, (Ohio EPA ID No. 267000859029)

Dear Mr. Roope:

Attached is an electronic version of the Final 2022 Annual Land Use Control Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP-04 Open Demolition Area #2, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 through 12 Load Lines 1 through 4 and 12, and RVAAP-51 Dump Along Paris Windham Road for your review and approval. Due to the small file size, this document will only be submitted via email and not through the Ohio EPA LiquidFile system.

This report was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at (614) 336-2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.03.27 09:05:26 -04'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA (cover letter via email only)
Natalie Oryshkewych, Ohio EPA (cover letter via email only)
Megan Oravec, Ohio EPA (cover letter via email only)
Katie Tait, OHARNG (one [1] electronic copy)
Nathaniel Peters, USACE – Louisville (one [1] electronic copy)
Steve Kvaal, USACE – Louisville (cover letter via email only)
Jennifer Tierney, Administrative Records Manager (one [1] electronic copy)

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

March 8, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin M. Sedlak
RVAAP Restoration Program Manager
ARNG-Directorate
Camp James A. Garfield JTC
1438 State Route 534
Newton Falls, OH 44444

Sent via email to: kevin.m.sedlak.ctr@army.mil

RE: US Army Ravenna Ammunition Plt
RVAAP
Remediation Response
Project records
O&M
Federal Facilities
Portage County
267000859029

Subject: **DRAFT - 2022 Annual Land Use Control Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP-04 Open Demolition Area #2, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 - 12 Load Lines 1 through 4 and 12, RVAAP-51 Dump Along Paris Windham Road, Camp James A. Garfield, Portage/Trumbull Counties, Ohio - Dated January 19, 2023 – Ohio EPA Request for Final**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA), Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) has received and reviewed the document entitled "Draft 2022 Annual Land Use Control Monitoring Report, RVAAP-01 Ramsdell Quarry Landfill, RVAAP-04 Open Demolition Area #2, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 - 12 Load Lines 1 through 4 and 12, RVAAP-51 Dump Along Paris Windham Road, Camp James A. Garfield, Portage/Trumbull Counties, Ohio", dated January 31, 2022.

Ohio EPA has reviewed this documentation and noted Appendix A (the 2022 RVAAP-01 RQL Access Logs) was missing from the report. Ohio EPA is requesting the submittal of the final document, with the missing Appendix A, for concurrence.

If you have any questions or concerns, please do not hesitate to contact me at (330) 963-1235 or via email: Nicholas.roope@epa.ohio.gov.

Sincerely,

Nicholas Roope, Environmental Specialist
Division of Environmental Response and Revitalization

Received 08 MAR 2023

NCR/cm

ec: Al Brillinger, Chenega Reliable Services, LLC
Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Megan Oravec, Ohio EPA, DERR, NEDO
Natalie Oryshkewych, Ohio EPA, DERR, NEDO
Thomas Schneider, Ohio EPA, DERR, SWDO

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

January 18, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Nicholas Roope
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: DRAFT 2022 Annual Land Use Control Monitoring Report, RVAAP Restoration Program, Camp James A. Garfield/Former RVAAP, Portage and Trumbull Counties, Ohio (Ohio EPA ID No. 267-000859-029)

Dear Mr. Roope:

Attached for your review is the Draft 2022 Annual Land Use Control Monitoring Report for RVAAP-01 Ramsdell Quarry Landfill, RVAAP-04 Open Demolition Area #2, RVAAP-05 Winklepeck Burning Grounds, RVAAP-08 - 12 Load Lines 1 through 4 and 12, and RVAAP-51 Dump Along Paris Windham Road. Due to small file size this report will only be submitted via email and not through the Ohio EPA LiquidFile system.

This report was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at (614) 336-2053 or kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.01.18 14:24:33 -05'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA (cover letter via email only)
Natalie Oryshkewych, Ohio EPA (cover letter via email only)
Megan Oravec, Ohio EPA (cover letter via email only)
Katie Tait, OHARNG (one [1] electronic copy)
Nathaniel Peters, USACE – Louisville (one [1] electronic copy)
Steve Kvaal, USACE – Louisville (cover letter via email only)
Jennifer Tierney, AR Records Manager (one [1] electronic copy)

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

February 13, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin M. Sedlak
Restoration Program Manager
ARNG-ILE Clean-up
Camp James A. Garfield JTC
1438 State Route 534
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Project Records
Remedial Response
Portage County
ID#267000859029

Sent via email to: Kevin.m.sedlak.civ@mail.mil

Subject: **Approval of the "Final Revised Property Management Plan for the Designated Areas of Concern and Munitions Response Sites, Version 4.0," Former Ravenna Army Ammunition Plant, Camp James A. Garfield Joint Military Training Center, Portage and Trumbull Counties, Ohio, dated January 27,2023**

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the "Final Revised Property Management Plan for the Designated Areas of Concern and Munitions Response Sites, Version 4.1," Former Ravenna Army Ammunition Plant, Camp James A. Garfield Joint Military Training Center, Portage and Trumbull Counties, Ohio, dated January 27, 2023. This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) via email February 1, 2023. The document was prepared for the United States Army Corps of Engineers on behalf of the National Guard Bureau by Chenega Reliable Services, LLC under Contract Number W912QR-22-C-00313.

The final document was reviewed by personnel from Ohio EPA, DERR. Pursuant to the Director's Findings and Orders paragraph 39 (b), Ohio EPA considers the document final and approved.

If you have any questions, please contact me at kevin.palombo@epa.ohio.gov or call me at (330) 963-1292.

Sincerely,

Received 14 FEB 23

Kevin M. Palombo, Environmental Specialist
Division of Environmental Response and Revitalization

ec: Kevin Sedlak, ARNG
Rebecca Shreffler, Chenega
Katie Tait, OHARNG RTLS, CJAG
Steve Kvaal, USACE Louisville
Nathaniel Peters, USACE Louisville
Megan Oravec, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Nicholas Roope, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR

KP/cm

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

January 27, 2023

Ohio Environmental Protection Agency
DERR-NEDO
Attn: Mr. Kevin Palombo
2110 East Aurora Road
Twinsburg, OH 44087-1924

Subject: Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Final Property Management Plan, Version 4.1, Former RVAAP, Portage/Trumbull unties, Ohio (Ohio EPA ID No. 267-000859-029)

Dear Mr. Palombo:

The *Final Revised Property Management Plan for the Designated Areas of Concern and Munitions Response Sites, Version 4.1, Former Ravenna Army Ammunition Plant, Camp James A. Garfield Joint Military Training Center, Portage and Trumbull Counties, Ohio* (PMP) is being submitted to you electronically via the Ohio EPA LiquidFile site. Version 4.1 differs from Version 4.0 as follows:

- Cover Page – the date has been changed from "June 2021" to "February 2023". The version number has been changed from "4.0" to "4.1". Version 4.1 includes no main text changes and only updates to appendices.
- Footers – The date has been removed from the footers throughout the document.
- Appendix A1 – Sites with LUCs:
  - Table A1 has been updated and revised.
  - A section on RVAAP-04 Open Demolition Area #2 has been added.
  - The sections on RVAAP-08, 09, 10 and 11 (Load Lines 1 through 4), and RVAAP-12 (Load Line 12) have been revised and combined.
- Appendix A2 – AOCs with NFAs:
  - Table A2 has been updated and revised.
  - Sections on RVAAP-03 Open Demolition Area #1, RVAAP-74 Building 1034 Motor Pool Hydraulic Lift, and RVAAP-75 George Road Sewer Treatment Plant have been added to Appendix A2.

This PMP was prepared for the Army National Guard in support of the RVAAP Restoration Program. Please contact the undersigned at (614) 336-6000 ext 2053 or Kevin.m.sedlak.ctr@army.mil if there are issues or concerns with this submission.

Sincerely,

TAIT.KATHRYN.SERENA.1289508275 Digitally signed by TAIT.KATHRYN.SERENA.1289508275 Date: 2023.01.27 14:36:06 -05'00'

FOR Kevin M. Sedlak
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Tom Schneider, Ohio EPA (cover letter via email only)
Natalie Oryshkewych, Ohio EPA (cover letter via email only)
Megan Oravec, Ohio EPA (cover letter via email only)
Katie Tait, OHARNG (one [1] electronic copy)
Nathaniel Peters, USACE – Louisville (one [1] electronic copy)
Steve Kvaal, USACE – Louisville (cover letter via email only)
Jennifer Tierney, Chenega Reliable Services (one [1] electronic copy, one [1] hard copy)

Ohio Environmental Protection Agency

Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

January 19, 2023

TRANSMITTED ELECTRONICALLY

Mr. Kevin Sedlak
Restoration Program Manager
ARNG-ILE Clean Up
Camp James A Garfield JTC
1438 State Route 534 SW
Newton Falls, OH 44444

RE: US Army Ammunition Plt RVAAP
Remediation Response
Remedial Investigation
Plans
Remedial Response
Portage County
267000859029

Sent via email: kevin.m.sedlak.ctr@army.mil

Subject: Response to Ohio EPA Comments on the "Draft 2022 Property Management Plan Appendices" dated November 17, 2022

Dear Mr. Sedlak:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the Response to Ohio EPA Comments on the "Draft 2022 Property Management Plan Appendices" at the Former Ravenna Army Ammunition Plant, Portage and Trumbull Counties, Ohio (Camp James A. Garfield). This document was received at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR) via email on November 17, 2022. The response was prepared for the United States Army Corps of Engineers (USACE) on behalf of the National Guard Bureau by Chenega Reliable Services, LLC.

Based on our review of the Army National Guard's Response to Ohio EPA comments provided in your letter dated November 17, 2022, we find the responses generally acceptable, and the document can be finalized. Please be sure that all agreed-upon changes, additions, and clarifications are provided in the final document.

If you have questions, you can reach me at kevin.palombo@epa.ohio.gov or at (330) 963-1292.

Sincerely,

Kevin M. Palombo
Environmental Specialist
Division of Environmental Response and Revitalization

KP/cm

ec: Rebecca Shreffler, Chenega Reliable Services
Katie Tait, OHARNG RTLS
Steven Kvaal, USACE Louisville
Nat Peters, USACE Louisville
Megan Oravec, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Liam McEvoy, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR

Received
19 JAN 2023