**Final**

# Facility-wide Groundwater Monitoring Program Plan
# RVAAP-66 Facility-wide Groundwater
# Semi-Annual Report for Spring 2019 Sampling Event

**Former Ravenna Army Ammunition Plant**
**Portage and Trumbull Counties, Ohio**

**Contract No. W912QR-16-D-0003**
**Delivery Order No. W912QR-18-F-0337**

**Prepared for:**



**United States Army Corps of Engineers**
**Louisville District**

**Prepared by:**




**Leidos**
**8866 Commons Boulevard, Suite 201**
**Twinsburg, Ohio 44087**

**January 24, 2020**

**Final**

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# RVAAP-66 Facility-wide Groundwater
# Semi-Annual Report for Spring 2019 Sampling Event

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Leidos
8866 Commons Boulevard, Suite 201
Twinsburg, Ohio 44087

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This Semi-annual Report summarizes activities conducted in spring 2019 as part of the Facility-wide Groundwater Monitoring Program (FWGWMP) in support of the Ravenna Army Ammunition Plant Restoration Program. This report provides a description of field activities performed, presents field and analytical results, and analyzes chemical data collected per the sampling scheme specified in the Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Addendum for 2019.

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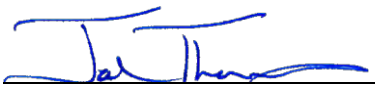
**CONTRACTOR STATEMENT OF INDEPENDENT TECHNICAL REVIEW**

Leidos has completed the Facility-wide Groundwater Monitoring Program Plan, RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2019 Sampling Event for the Ravenna Army Ammunition Plant Restoration Program. Notice is hereby given that an independent technical review has been conducted that is appropriate to the level of risk and complexity inherent in the project. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of data quality objectives; technical assumptions; methods, procedures, and materials to be used; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the customer's needs consistent with law and existing United States Army Corps of Engineers (USACE) policy. In addition, an independent verification was performed to ensure all applicable changes were made per regulatory and Army comments.



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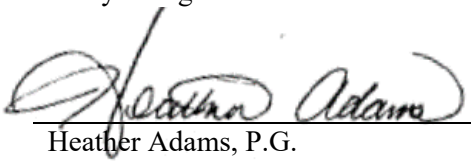

January 24, 2020

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Independent Technical Review Team Leader

Date

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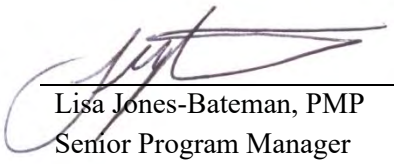

January 24, 2020

Lisa Jones-Bateman, PMP
Senior Program Manager

Date

**Final**

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600 Martin Luther King, Jr. Place
Louisville, Kentucky 40202

**Prepared by:**
Leidos
8866 Commons Boulevard, Suite 201
Twinsburg, Ohio 44087

**January 24, 2020**

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ARNG = Army National Guard.
I&E = Installations and Environment.
NEDO = Northeast District Office.
OHARNG = Ohio Army National Guard.
Ohio EPA = Ohio Environmental Protection Agency.
REIMS = Ravenna Environmental Information Management System.
SWDO = Southwest District Office.
USACE = U.S. Army Corps of Engineers.

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# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AOC | Area of Concern |
| Army | U.S. Department of the Army |
| ARNG | Army National Guard |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CJAG | Camp James A. Garfield |
| COPC | Chemical of Potential Concern |
| DFFO | Director's Final Findings and Orders |
| DoD | U.S. Department of Defense |
| FCR | Field Change Request |
| FS | Feasibility Study |
| FWCUG | Facility-wide Cleanup Goal |
| FWGW | Facility-wide Groundwater |
| FWGWMP | Facility-wide Groundwater Monitoring Program |
| IDW | Investigation-derived Waste |
| IRP | Installation Restoration Program |
| MCL | Maximum Contaminant Level |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| Ohio EPA | Ohio Environmental Protection Agency |
| P.E. | Professional Engineer |
| P.G. | Professional Geologist |
| PCB | Polychlorinated Biphenyl |
| PMP | Project Management Professional |
| PP | Proposed Plan |
| PWS | Performance Work Statement |
| QA | Quality Assurance |
| QAPP | Quality Assurance Project Plan |
| QC | Quality Control |
| RCRA | Resource Conservation and Recovery Act |
| RI | Remedial Investigation |
| RIWP | Remedial Investigation Work Plan |
| ROD | Record of Decision |
| RSL | Regional Screening Level |
| RVAAP | Ravenna Army Ammunition Plant |
| SAP | Sampling and Analysis Plan |
| SVOC | Semi-volatile Organic Compound |
| USACE | U.S. Army Corps of Engineers |
| USEPA | U.S. Environmental Protection Agency |
| VOC | Volatile Organic Compound |

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# 1.0 INTRODUCTION

Leidos has been contracted by the U.S. Army Corps of Engineers (USACE), Louisville District to execute the performance work statement (PWS) titled "Groundwater Investigation and Reporting Services, Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Camp James A. Garfield (CJAG) Joint Military Training Center, Portage and Trumbull Counties, Ohio." This work is being performed under a firm-fixed price basis in accordance with USACE, Louisville District Contract No. W912QR-16-D-0003, Delivery Order No. W912QR-18-F-0337. The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) investigation and cleanup are occurring under the U.S. Department of Defense (DoD) Installation Restoration Program (IRP). Activities include monitoring an extensive network of groundwater monitoring wells to determine nature and extent of groundwater impacts, providing additional information in support of hydrogeologic and fate-and-transport models, evaluating potential exit pathways, and evaluating vertical contaminant distribution and/or particle inflow/outflow through the facility. The former RVAAP/CJAG is located in Portage and Trumbull counties, Ohio (Figure 1-1).

## 1.1 PURPOSE

The Director's Final Findings and Orders (DFFO) was issued to the U.S. Department of the Army (Army) on June 10, 2004. The purpose of the DFFO is for the Army to develop and implement:

- A Remedial Investigation/Feasibility Study (RI/FS), Proposed Plan (PP), Record of Decision (ROD), or other appropriate document and remedy for each area of concern (AOC) or appropriate group of AOCs at the former RVAAP; and
- A Facility-wide Groundwater (FWGW) investigation, monitoring, and remediation program at the former RVAAP.

Section 15 of the DFFO outlines the requirements of the Facility-wide Groundwater Monitoring Program (FWGWMP). The purpose of the *RVAAP-66 Facility-wide Groundwater Addendum for 2019* (Leidos 2019a) (herein referred to as the 2019 Addendum) is to satisfy the requirements of Section 15d, which specifies the FWGWMP Plan will "utilize an iterative process, with an annual review and revision cycle to accommodate the addition or deletion of wells from the groundwater monitoring network." This semi-annual report provides results of the spring 2019 sampling performed in accordance with the 2019 Addendum.

## 1.2 OBJECTIVES

The primary objectives of the 2019 Addendum and subsequent sampling in spring and fall 2019 are to use the facility-wide monitoring well network to assess potential exit pathways, assess nature and extent data gaps, and monitor contaminant concentrations related to historical RVAAP activities (e.g., explosives/propellants, volatile organic compounds [VOCs], semi-volatile organic compounds [SVOCs], pesticides, polychlorinated biphenyls [PCBs]) at selected source area wells for trend analysis.

The 2019 Addendum supplements the FWGWMP Plan and discusses the subset of wells at the former RVAAP that will be monitored on a semi-annual basis (spring and fall 2019) and the chemicals of potential concern (COPCs) that will be evaluated at each selected well.

## 1.3 REPORT ORGANIZATION

The remaining sections of this semi-annual report are organized as follows:

- Section 2.0. Background
- Section 3.0. Spring 2019 Monitoring Event
- Section 4.0. Results
- Section 5.0 Data Quality Assessment
- Section 6.0 Well Abandonment
- Section 7.0. References.

# 2.0 BACKGROUND

In 2004, the Army and Ohio Environmental Protection Agency (Ohio EPA) finalized the *Facility-wide Groundwater Monitoring Program Plan for the Ravenna Army Ammunition Plant, Ravenna, Ohio* (Portage Environmental 2004) for the former RVAAP, now known as CJAG Joint Military Training Center. The FWGWMP was initiated in April 2005 with quarterly sampling of 36 FWGWMP monitoring wells. Fourteen of these wells were identified as "background wells," and the remaining wells were located at various AOCs at CJAG. Five Resource Conservation and Recovery Act (RCRA) wells (RQLmw-007, RQLmw-008, RQLmw-009, DETmw-003, DETmw-004) were incorporated into the FWGWMP after May 2005 and are sampled semi-annually. Beginning in fiscal year 2008, the FWGWMP was expanded to include the characterization of groundwater from 243 existing monitoring wells at the facility.

Since 2005, annual addendums have been developed to specify the sampling scheme for each year. The annual sampling approach has been summarized in an annual report. In 2016, the *Remedial Investigation Work Plan for Groundwater and Environmental Services for RVAAP-66 Facility-Wide Groundwater* (herein referred to as the RIWP; TEC-Weston 2016) was developed. This RIWP serves as a supplement to the FWGWMP Plan and specifies aspects of the RI with the goal of adequately characterizing pertinent physical and chemical groundwater conditions in the multi-aquifer hydrostratigraphic units variably present across CJAG, so that potential current and future risks to potential human and environmental receptors can be ascertained, effectively managed, and mitigated as needed.

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# 3.0 SPRING 2019 MONITORING EVENT

The 2019 Addendum further addressed AOC-specific nature and extent data gaps in the historical sampling dataset, as indicated by an analysis of results through 2018. To this end, 72 wells (including 5 RCRA wells) were selected for sampling during the semi-annual events in 2019. These wells are depicted in Figure 3-1.

Monitoring well sampling and analytical testing are conducted in accordance with the Sampling and Analysis Plan (SAP) and Quality Assurance Project Plan (QAPP) updates provided with the RIWP (TEC-Weston 2016). The following subsections summarize the activities completed in spring 2019 as they relate to the FWGWMP. The primary activity was groundwater sampling.

## 3.1 GROUNDWATER ELEVATION MONITORING

A comprehensive facility-wide gauging event was conducted between April 23and 29, 2019. The depth to water in each monitoring well was measured from the top of the inner casing-level indicator. Depth to water measurements at wells RQLmw-017, DETmw-004, SCLmw-001, and SCLmw-002 could not be measured during the comprehensive gauging event because water levels were below the top of permanently installed sampling pumps. Depth to water measurements at wells DA2mw-105 and WBGmw-013 could not be measured due to health and safety concerns regarding bees' nests within the well casing.

Measured depths to water during this gauging event are presented in Appendix A. The calculated groundwater elevations and potentiometric surface maps generated from this comprehensive facility-wide event will be presented in the 2019 Annual Report.

## 3.2 MONITORING WELL INSPECTION AND REPAIRS

Each monitoring well was inspected during the April 2019 comprehensive water level measurement event. Maintenance was not performed at any monitoring well during the well gauging and inspection activities. However, the Army is currently conducting well repair activities, such as painting the wells and bollards and re-stenciling the wells.

A tabulated summary of well inspection notes from April 2017 is included in Appendix B. Detailed well inspection forms and photographs were provided to the Army in the *2019 Annual Monitoring Well Inspection Report* (Leidos 2019b).

## 3.3 SPRING 2019 MONITORING WELL SAMPLING EVENT

From April 29 to May 13, 2019, all 72 wells specified in the 2019 Addendum were sampled. These wells are depicted in Figure 3-1. This sampling event included the third quarter of sampling at the three permanent monitoring wells installed at the Sand Creek Disposal Road Landfill in October 2018. Monitoring wells SCLmw-001, SCLmw-002, and SCLmw-003 were sampled and analyzed for the RVAAP full-suite.

Monitoring wells were purged and sampled using low-flow methods. Purging and sampling were completed using dedicated bladder pumps and tubing. The sampling was performed in accordance with field change request (FCR) FCR_LEIDOS_FWGW_006 Micro-Purge Procedure. This FCR is presented in Appendix C.

Sampling of each monitoring well began immediately after purging. Samples were placed into iced coolers once collected and maintained under chain-of-custody until shipped to the TestAmerica Laboratory in North Canton, Ohio, via courier.

Table 3-1 summarizes the analyses completed for each monitoring well. The quality assurance/quality control (QA/QC) samples consisted of field duplicate and matrix spike/matrix spike duplicate (MS/MSD) samples. Rinsate QA/QC samples were not required because of the use of dedicated and disposable equipment. In addition, USACE split samples were collected from wells DETmw-003, FBQmw-172, LL10mw-003, LL1mw-089, SCLmw-002, and RQLmw-011 and shipped to CT Laboratories in Baraboo, Wisconsin.

Appendix D includes the Task Team Activity Log Sheets, Well Purge Forms, Chains of Custody, and Calibration Logs.

## 3.4 FIELD CHANGE REQUESTS

In October 2018, three FCRs were approved that are applicable to the spring 2019 sampling event. These FCRs are summarized below and presented in Appendix C:

- FCR_LEIDOS_FWGW_001 – Specifies that, due to the permanent bladder pumps, total depths of wells will not be collected during the facility-wide comprehensive water level measurements.
- FCR_LEIDOS_FWGW_004 – Specifies the field QC sampling frequency.
- FCR_LEIDOS_FWGW_006 – Documents the micro-purge procedure to be implemented during groundwater sampling collected by micro-purging with dedicated bladder pumps.

## 3.5 INVESTIGATION-DERIVED WASTE

Investigation-derived waste (IDW) was generated during the field activities. Four 55-gallon drums were used to containerize the estimated 164 gallons of liquid IDW generated. On June 11, 2019, Leidos submitted an IDW Report containing a characterization and disposal plan. The plan recommended that the liquid IDW be characterized as non-hazardous, non-contaminated under Clean Harbors Profile No. CH1784679 and be removed offsite and disposed of at a permitted water treatment or waste facility. This plan was approved by the Army.

On June 13, 2019, the four drums containing the IDW were picked up and transported for disposal. Appendix E contains the IDW Report and final bill of lading (manifest) used for transport of the waste.

**Table 3-1. FWGWMP Wells with Analytical Testing Suite**

| Well ID | VOCs | SVOCs | PCBs | Explosives | Pesticides | Cyanide | Other | Metals[7] |
|---|---|---|---|---|---|---|---|---|
| CBPmw-008 | | | | | | X | | |
| CBPmw-009 | | | | | | X | | |
| DA2mw-115 | | | | | | | | X |
| DET-003 | X | X[2,3,4,5] | X | X | X | X | | X |
| DET-004 | X | X[2,3,4,5] | X | X | X | X | | X |
| EBGmw-125 | | | | | | X | | |
| EBGmw-131 | | | | | | X | | |
| FBQmw-171 | | | | | | X | Sulfate/sulfide, nitrate/nitrite, alkalinity | |
| FBQmw-172 | | | | | | X | | |
| FBQmw-174 | | | | X | | | Sulfate/sulfide, nitrate/nitrite, alkalinity | |
| FBQmw-175 | | | | | | | Sulfate/sulfide, nitrate/nitrite, alkalinity | Cr[VI] |
| FBQmw-176 | | | | | | X | | |
| FWGmw-004 | | | | X | | | | X |
| FWGmw-007 | | | | X | | | | X |
| FWGmw-011 | | | | X | | | | X |
| FWGmw-012 | | | | X | | | | X |
| FWGmw-015 | | | | X | | | | X |
| FWGmw-016 | | | | X | | | | X |
| FWGmw-018 | X | | | | | X | | X |
| FWGmw-019 | | | | | | | Nitroguanidine[1], nitrocellulose[1] | |
| FWGmw-020 | X | | | | | X | | X |
| FWGmw-021 | | | | X | | | | X |
| FWGmw-022 | | | | | | | Nitroguanidine[1], nitrocellulose[1] | |
| FWGmw-023 | | | | | | | Nitroguanidine[1], nitrocellulose[1] | |
| FWGmw-024 | | | | X | | | | X |
| LL1mw-064 | | | | | | | | X |
| LL1mw-065 | | | | X | | | | X |
| LL1mw-080 | | | | X | | | | |
| LL1mw-081 | | | | X | | X | | |
| LL1mw-083 | | | | X | | | Sulfate/sulfide, nitrate/nitrite, alkalinity | |
| LL1mw-084 | | | | X | | | Sulfate/sulfide, nitrate/nitrite, alkalinity | X |
| LL1mw-086 | | | | | | X | Alkalinity | X |
| LL1mw-087 | | | | X | | | | X |

**Table 3-1. FWGWMP Wells with Analytical Testing Suite (continued)**

| Well ID | VOCs | SVOCs | PCBs | Explosives | Pesticides | Cyanide | Other | Metals[6] |
|---|---|---|---|---|---|---|---|---|
| LL1mw-088 | | | | X | | | Alkalinity | X |
| LL1mw-089 | | | | X | | | Nitroguanidine[1], nitrocellulose[1] | |
| LL2mw-059 | | | | X | | | | X |
| LL2mw-264 | | | | | | X | | |
| LL2mw-267 | | | | X | | | | X |
| LL2mw-272 | | | | | | X | | |
| LL3mw-234 | | | | | | X | | |
| LL3mw-237 | | | | X | | | | |
| LL3mw-244 | | | | X | | | | X |
| LL3mw-246 | | | | X | | | Perchlorate | X |
| LL4mw-200 | | | | | | X | | |
| LL7mw-001 | | | | | | X | | X |
| LL7mw-006 | | | | X | | | | |
| LL10mw-003 | X | | | | | | | |
| LL10mw-005 | | | | | | | | X |
| LL11mw-005 | | | | | | X | | |
| LL12mw-183 | | | | | | X | | |
| LL12mw-185 | | | | | | | Nitrate | |
| LL12mw-187 | | | | | | | Nitrate | X |
| LL12mw-242 | | | | | | | Nitrate | X |
| LL12mw-245 | | | | X | | | Nitrate | X |
| LL12mw-247 | | | | | | | Nitrate | X |
| NTAmw-119 | | X[4] | | X | | | | X |
| NTAmw-120 | | X[1,6] | | | | | | |
| RQLmw-007 | X | X[2,4,5] | X | X | X | X | Phosphorus | X |
| RQLmw-008 | X | X[2,4,5] | X | X | X | X | | X |
| RQLmw-009 | X | X[2,4,5] | X | X | X | X | | X |
| RQLmw-011 | | | | | | | Sulfate/sulfide, nitrate/nitrite, alkalinity | |
| RQLmw-012 | | | | | | X | Sulfate/sulfide, nitrate/nitrite, alkalinity | |
| RQLmw-013 | | | | | | | Sulfate/sulfide, nitrate/nitrite, alkalinity | |
| RQLmw-016 | | | | | | X | | |
| SCFmw-004 | | | | | | | | X |
| WBGmw-006 | | | | X | | | | X |

**Table 3-1. FWGWMP Wells with Analytical Testing Suite (continued)**

| Well ID | VOCs | SVOCs | PCBs | Explosives | Pesticides | Cyanide | Other | Metals[6] |
|---|---|---|---|---|---|---|---|---|
| WBGmw-009 | | | | X | | | | X |
| WBGmw-020 | | | | X | | | | X |
| WBGmw-021 | | | | X | | | | X |
| SCLmw-001 | X | X | X | X | X | X | Sulfate/sulfide, nitrate/nitrite, alkalinity, perchlorate, phosphorus, nitroguanidine, nitrocellulose | X |
| SCLmw-002 | X | X | X | X | X | X | Sulfate/sulfide, nitrate/nitrite, alkalinity, perchlorate, phosphorus, nitroguanidine, nitrocellulose | X |
| SCLmw-003 | X | X | X | X | X | X | Sulfate/sulfide, nitrate/nitrite, alkalinity, perchlorate, phosphorus, nitroguanidine, nitrocellulose | X |

**Notes:**

X = Indicates well or constituent to be sampled as part of the 2019 FWGWMP. Wells and constituents will be sampled semi-annually unless indicated by the footnotes below.
[1] Indicates monitoring well or constituents to be sampled in spring 2019 due to missed tests or rejected results in 2018. Additional sampling during 2019 for these wells and constituents will be based on review of the spring 2019 results.
[2] SVOCs: phthalates
[3] SVOCs: nitroaromatics
[4] SVOCs: polycyclic aromatic hydrocarbons
[5] SVOCs: phenols
[6] SVOCs: hexachlorocyclopentadiene
[7] Metals sampling in all 2019 will only include wells with one or more metals exceeding screening criteria including a screen against approved background criteria.

Cr[VI] = Hexavalent Chromium.
FWGWMP = Facility-wide Groundwater Monitoring Program.
ID = Identification.
PCB = Polychlorinated Biphenyl.
SVOC = Semi-volatile Organic Compound.
VOC = Volatile Organic Compound.

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# 4.0 RESULTS

Table 4-1 presents the 2019 FWGWMP sampling recommendations for sampling each individual well, as presented in the 2019 Addendum. In addition, this table provides a discussion of the results for each well. The concentrations are compared to the applicable screening criteria for each chemical. The screening criteria are the highest concentration amongst the aquifer-specific background concentration for metals, maximum contaminant level (MCL), Resident facility-wide cleanup goal (FWCUG), or U.S. Environmental Protection Agency (USEPA) Residential tap water regional screening level (RSL).

Appendix F.1 contains a table with all analytical results from the wells sampled in spring 2019, Appendix F.2 contains the chemical-specific screening criteria, and Appendix F.3 contains a summary of results that exceeded the applicable screening criteria. The laboratory data packages are presented in Appendix G.

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**Table 4-1. Recommended FWGWMP Wells for 2019**

| No | RVAAP-66 Area | Well Name | Aquifer | 2019 FWGWMP Sampling Recommendations | Spring 2019 Sampling Results |
|---|---|---|---|---|---|
| 1 | RVAAP-01 Ramsdell Quarry | RQLmw-007 | Upper Sharon | • In accordance with the DFFO, analytical parameters for this RCRA well include the same parameters as 2018: VOCs, phthalates, PAHs, phenols, PCBs, explosives, pesticides, cyanide, phosphorus, and metals. | • VOCs, phthalates, PAHs, phenols, PCBs, explosives, pesticides, cyanide, and phosphorus were not detected.<br>• Manganese was the only metal that exceeded the screening criteria and background concentration. Manganese was detected at a concentration of 0.49 mg/L, which exceeds the background concentration of 0.198 mg/L. |
| 2 | RVAAP-01 Ramsdell Quarry | RQLmw-008 | Upper Sharon | • In accordance with the DFFO, analytical parameters for this RCRA well include the same parameters as 2018: VOCs, phthalates, PAHs, phenols, PCBs, explosives, pesticides, cyanide, and metals. | • VOCs, phthalates, PAHs, phenols, PCBs, explosives, and pesticides were not detected.<br>• Cyanide was detected at an estimated concentration of 0.0053J mg/L, which is below the MCL of 0.2 mg/L.<br>• Arsenic, iron, magnesium, and manganese were the only metals that exceeded the screening criteria and background concentration. |
| 3 | RVAAP-01 Ramsdell Quarry | RQLmw-009 | Upper Sharon | • In accordance with the DFFO, analytical parameters for this RCRA well include the same parameters as 2018: VOCs, phthalates, PAHs, phenols, PCBs, explosives, pesticides, cyanide, and metals. | • VOCs, phthalates, PAHs, phenols, PCBs, explosives, and pesticides were not detected.<br>• Cyanide was detected at an estimated concentration of 0.013J mg/L, which is below the MCL of 0.2 mg/L.<br>• Manganese was the only metal that exceeded the screening criteria and background concentration. Manganese was detected at a concentration of 0.3 mg/L, which exceeded the background concentration of 0.198 mg/L. |
| 4 | RVAAP-01 Ramsdell Quarry | RQLmw-011 | Upper Sharon | • In consideration of the pH anomalies, continue to monitor anions, pH, and alkalinity. | • Nitrate, nitrite, sulfide, and alkalinity were not detected.<br>• Sulfate does not have screening criteria and was detected at an estimated concentration of 130J mg/L.<br>• pH was 4.07 S.U. at the time of sample collection. |
| 5 | RVAAP-01 Ramsdell Quarry | RQLmw-012 | Upper Sharon | • In consideration of the pH anomalies, continue to monitor anions, pH, alkalinity, and cyanide. | • Nitrate, nitrite, and sulfide were either not detected or detected at concentrations below screening criteria.<br>• Sulfate does not have screening criteria and was detected at an estimated concentration of 110J mg/L.<br>• Alkalinity does not have screening criteria and was detected at an estimated concentration of 9.9J mg/L.<br>• Cyanide was detected at an estimated concentration of .04J mg/L, which is below the MCL of 0.2 mg/L.<br>• pH was 5.14 S.U. at the time of sample collection. |
| 6 | RVAAP-01 Ramsdell Quarry | RQLmw-013 | Upper Sharon | • In consideration of the pH anomalies, continue to monitor anions, pH, and alkalinity. | • Alkalinity, nitrate, and sulfide were not detected.<br>• Sulfate does not have screening criteria and was detected at an estimated concentration of 160J mg/L.<br>• pH was 3.98 S.U. at the time of sample collection. |
| 7 | RVAAP-01 Ramsdell Quarry | RQLmw-016 | Upper Sharon | • Continue to monitor cyanide. | • Cyanide was not detected. |
| 8 | RVAAP-02 Erie Burning Grounds | EBGmw-125 | Unconsolidated | • Continue to monitor cyanide. | • Cyanide was detected at a concentration of 0.011 mg/L, which is below the MCL of 0.2 mg/L. |
| 9 | RVAAP-02 Erie Burning Grounds | EBGmw-131 | Upper Sharon | • Continue to monitor cyanide. | • Cyanide was not detected. |
| 10 | RVAAP-04 Demolition Area 2 | DA2mw-115 | Upper Sharon | • Continue to monitor metals. | • All metal concentrations were below the screening criteria or background concentration. |
| 11 | RVAAP-04 Demolition Area 2 | DETmw-003 | Unconsolidated | • In accordance with the DFFO, analytical parameters for this RCRA well include the same parameters as 2018: VOCs, phthalates, nitroaromatics, PAHs, phenols, PCBs, explosives, pesticides, cyanide, and metals. | • Cyanide, phthalates, nitroaromatics, SVOCs, phenols, PCBs, explosives, or pesticides were not detected.<br>• Acetone was the only VOC detected. Acetone was detected at an estimated concentration of 0.0028J mg/L, which is below the Tapwater RSL.<br>• Manganese was the only metal that exceeded the screening criteria and background concentration. Manganese was detected at a concentration of 0.24 mg/L, which exceeded the background concentration of 0.075 mg/L. |

**Table 4-1. Recommended FWGWMP Wells for 2019 (continued)**

| No | RVAAP-66 Area | Well Name | Aquifer | 2019 FWGWMP Sampling Recommendations | Spring 2019 Sampling Results |
|---|---|---|---|---|---|
| 12 | RVAAP-04 Demolition Area 2 | DETmw-004 | Unconsolidated | • In accordance with the DFFO, analytical parameters for this RCRA well include the same parameters as 2018: VOCs, phthalates, nitroaromatics, PAHs, phenols, PCBs, explosives, pesticides, cyanide, and metals. | • SVOCs, pesticides, phthalates, nitroaromatics, PAHs, phenols, cyanide, and PCBs were not detected.<br>• Acetone was the only VOC detected. Acetone was detected at an estimated concentration of 0.0051 mg/L, which is below the Tapwater RSL.<br>• All metal concentrations were below the screening criteria or background concentration, with the exception of calcium. Calcium does not have screening criteria and was detected at a concentration of 120 mg/L, which exceeded the background concentration of 107 mg/L.<br>• No explosives were detected with the exception of HMX and RDX. The HMX concentration was below the screening criteria. The RDX concentration of 0.0014 mg/L exceeded the screening criteria. |
| 13 | RVAAP-05 Winklepeck Burning Grounds | WBGmw-006 | Unconsolidated | • Continue to monitor explosives and metals. | • No explosives were detected with the exception of HMX and RDX. The HMX concentration was below the screening criteria. The RDX concentration of 0.011 mg/L exceeded the screening criteria.<br>• All metal concentrations were below the screening criteria or background concentration with the exception of manganese. The manganese concentration of 0.099 mg/L exceeded the background concentration of 0.075 mg/L. |
| 14 | RVAAP-05 Winklepeck Burning Grounds | WBGmw-009 | Unconsolidated | • Continue to monitor explosives and metals. | • No explosives were detected with the exception of HMX and RDX. The HMX concentration was below the screening criteria. The RDX concentration of 0.0016 mg/L exceeded the screening criteria.<br>• All metal concentrations were below the screening criteria or background concentration with the exception of manganese. The manganese concentration of 0.18 mg/L exceeded the background concentration of 0.075 mg/L. |
| 15 | RVAAP-05 Winklepeck Burning Grounds | WBGmw-020 | Upper Sharon | • Continue to monitor explosives and metals. | • Explosives were not detected.<br>• All metal concentrations were below the screening criteria or background concentration with the exception of iron and manganese. The iron concentration of 3.4 mg/L exceeded the background concentration of 2.08 mg/L. The manganese concentration of 0.22 mg/L exceeded the background concentration of 0.198 mg/L. |
| 16 | RVAAP-05 Winklepeck Burning Grounds | WBGmw-021 | Upper Sharon | • Continue to monitor explosives and metals. | • Explosives were not detected.<br>• All metal concentrations were below the screening criteria or background concentration with the exception of manganese. The manganese concentration of 0.37 mg/L exceeded the background concentration of 0.198 mg/L. |
| 17 | RVAAP-08 Load Line 1 (east of Load Line 1 fence) | LL1mw-064 | Unconsolidated | • Continue to monitor metals in this sentinel well. | • All metal concentrations were below the screening criteria or background concentration with the exception of manganese. The manganese concentration of 0.12 mg/L exceeded the background concentration of 0.075 mg/L. |
| 18 | RVAAP-08 Load Line 1 (southeast of Load Line 1 fence) | LL1mw-065 | Unconsolidated | • Although explosives were not detected, this exit pathway well will continue to monitor migration potential.<br>• Continue to monitor explosives and metals. | • Explosives were not detected.<br>• All metal concentrations were below the screening criteria or background concentration. |
| 19 | RVAAP-08 Load Line 1 | LL1mw-080 | Upper Sharon | • Continue to monitor explosives. | • The explosives 2-amino-4, 6-DNT; 4-amino-2,6-DNT; HMX; and RDX were detected; however, only RDX exceeded the screening criteria at a concentration of 0.013 mg/L. |
| 20 | RVAAP-08 Load Line 1 | LL1mw-081 | Upper Sharon | • Continue to monitor explosives and cyanide. | • All explosive concentrations were not detected or were below the screening criteria.<br>• Cyanide was not detected. |
| 21 | RVAAP-08 Load Line 1 | LL1mw-083 | Upper Sharon | • Continue to monitor explosives, anions, and alkalinity. | • Nitrite and sulfide were not detected, and nitrate is below the screening criteria.<br>• Nitrate was detected but at a concentration below the screening level.<br>• Sulfate does not have screening criteria and was detected at an estimated concentration of 120J mg/L.<br>• Alkalinity does not have screening criteria and was detected at a concentration of 44 mg/L.<br>• TNT; 1,3-DNB; 2,4-DNT; 2-amino-4,6-DNT; and 4-amino-2,6-DNT exceeded the screening criteria. All other explosives were below the screening criteria. |

**Table 4-1. Recommended FWGWMP Wells for 2019 (continued)**

| No | RVAAP-66 Area | Well Name | Aquifer | 2019 FWGWMP Sampling Recommendations | Spring 2019 Sampling Results |
|---|---|---|---|---|---|
| 22 | RVAAP-08 Load Line 1 | LL1mw-084 | Upper Sharon | • Continue to monitor explosives, anions, alkalinity, and metals. | • Nitrite and alkalinity were not detected.<br>• Nitrate was detected at a concentration of 0.33J mg/L, which is below the MCL of 10 mg/L.<br>• Sulfate does not have screening criteria and was detected at an estimated concentration of 140J mg/L.<br>• Sulfide does not have screening criteria and was detected at an estimated concentration of 0.8J mg/L.<br>• 1,3-DNB; TNT; 2,4-DNT; 2-amino-4,6-DNT; 4-amino-2,6-DNT; and RDX exceeded the screening criteria. All other explosives were below the screening criteria.<br>• All metal concentrations were below the screening criteria or background concentration. |
| 23 | RVAAP-08 Load Line 1 (southeast of Load Line 1 fence) | LL1mw-086 | Unconsolidated | • Continue to monitor metals, cyanide, and alkalinity in this sentinel well. | • Cyanide was not detected.<br>• Alkalinity does not have screening criteria but was detected at a concentration of 110 mg/L.<br>• Aluminum, iron, manganese, and potassium were the only metals that exceeded screening criteria. |
| 24 | RVAAP-08 Load Line 1 (southeast of Load Line 1 fence) | LL1mw-087 | Unconsolidated | • Although explosives were not detected, this exit pathway well will continue to monitor migration potential.<br>• Continue to monitor explosives and metals. | • Explosives were not detected.<br>• All metal concentrations were below the screening criteria or background concentration. |
| 25 | RVAAP-08 Load Line 1 | LL1mw-088 | Unconsolidated | • Continue to monitor explosives, alkalinity, and metals in this sentinel well. | • Alkalinity does not have a screening criteria but was detected at a concentration of 290 mg/L.<br>• Explosives were not detected.<br>• Arsenic and sodium were the only metals that exceeded the screening criteria. Arsenic was detected at a concentration of 0.028 mg/L, exceeding the MCL of 0.01 mg/L. Sodium was detected at an estimated concentration of 23J mg/L, exceeding the background concentration of 18.2 mg/L. |
| 26 | RVAAP-08 Load Line 1 | LL1mw-089 | Unconsolidated | • Continue to monitor explosives and recollect rejected propellant results from 2018. | • All explosive and propellant concentrations were below screening criteria. This includes the nitroguanidine and nitrocellulose that had rejected results in spring 2018. |
| 27 | RVAAP-09 Load Line 2 South | LL2mw-059 | Upper Sharon | • Continue to monitor explosives and metals. | • The explosives 1,3-DNB and 2,4-DNT exceeded screening criteria. All other explosive concentrations were below screening criteria.<br>• All metal concentrations were below the screening criteria or background concentration. |
| 28 | RVAAP-09 Load Line 2 | LL2mw-264 | Upper Sharon | • Continue to monitor cyanide. | • Cyanide was detected at an estimated concentration of 0.006J mg/L, which is below the MCL of 0.2 mg/L. |
| 29 | RVAAP-09 Load Line 2 | LL2mw-267 | Upper Sharon | • Continue to monitor explosives and metals. | • All explosive concentrations were below screening criteria.<br>• All metal concentrations were below the screening criteria or background concentration with the exception of iron. Iron was detected at a concentration of 2.5 mg/L, which exceeded the background concentration of 2.08 mg/L. |
| 30 | RVAAP-09 Load Line 2 | LL2mw-272 | Upper Sharon | • Continue to monitor cyanide. | • Cyanide was not detected. |
| 31 | RVAAP-10 Load Line 3 | LL3mw-234 | Upper Sharon | • Continue to monitor cyanide. | • Cyanide was detected at an estimated concentration of 0.0087J mg/L, which is below the MCL of 0.2 mg/L. |
| 32 | RVAAP-10 Load Line 3 | LL3mw-237 | Upper Sharon | • Continue to monitor explosives. | • All explosive concentrations were less than screening criteria with the exception of 4-amino-2,6-DNT.<br>• 4-Amino-2,6-DNT was detected at a concentration of 0.004 mg/L, which slightly exceeded the Tapwater RSL of 0.0039 mg/L. |
| 33 | RVAAP-10 Load Line 3 | LL3mw-244 | Upper Sharon | • Continue to monitor explosives and metals. | • All explosive concentrations were below screening criteria.<br>• All metal concentrations were below the screening criteria or background concentration. |
| 34 | RVAAP-10 Load Line 3 | LL3mw-246 | Upper Sharon | • Continue to monitor explosives, perchlorate, and metals. | • All explosive concentrations were below screening criteria.<br>• All metal concentrations were below the screening criteria or background concentration.<br>• Perchlorate was detected, but concentrations were below screening criteria. |

**Table 4-1. Recommended FWGWMP Wells for 2019 (continued)**

| No | RVAAP-66 Area | Well Name | Aquifer | 2019 FWGWMP Sampling Recommendations | Spring 2019 Sampling Results |
|---|---|---|---|---|---|
| 35 | RVAAP-11 Load Line 4 | LL4mw-200 | Unconsolidated | • Continue to monitor cyanide. | • Cyanide was not detected. |
| 36 | RVAAP-12 Load Line 12 | LL12mw-183 | Unconsolidated | • Continue to monitor cyanide | • Cyanide was not detected. |
| 37 | RVAAP-12 Load Line 12 | LL12mw-185 | Unconsolidated | • Continue to monitor nitrate. | • Nitrate was detected at a concentration of 92 mg/L, which exceeded the MCL of 10 mg/L. |
| 38 | RVAAP-12 Load Line 12 | LL12mw-187 | Unconsolidated | • Continue to monitor nitrate and metals. | • Nitrate had a concentration of 1,600 mg/L, which exceeded the MCL of 10 mg/L.<br>• All metal concentrations were below the screening criteria or background concentration with the exception of calcium, magnesium, potassium, sodium, and manganese. |
| 39 | RVAAP-12 Load Line 12 | LL12mw-242 | Unconsolidated | • Continue to monitor nitrate and metals. | • Nitrate was not detected.<br>• All metal concentrations were below the screening criteria or background concentration with the exception of arsenic, iron, and sodium.<br>• Arsenic was detected at a concentration of 0.022 mg/L, which exceeded the MCL of 0.01 mg/L.<br>• Iron was detected at a concentration of 3.8mg/L, which exceeded the background concentration of 1.91 mg/L.<br>• Sodium exceeded the background criteria at an estimated concentration of 29J mg/L, exceeding the background concentration of 18.2 mg/L. |
| 40 | RVAAP-12 Load Line 12 | LL12mw-245 | Unconsolidated | • Although nitrate was not detected, a history of nitrate detections in recent years and nearby wells warrant further monitoring.<br>• Continue to monitor explosives, nitrate, and metals. | • Nitrate was detected at an estimated concentration of 0.12J mg/L, which is less than the MCL of 10 mg/L.<br>• All explosive concentrations were below the screening criteria.<br>• All metal concentrations were below the screening criteria or background concentration, with the exception of arsenic. Arsenic was detected at a concentration of 0.012 mg/L, which exceeded the MCL of 0.01 mg/L. Calcium, magnesium, and sodium exceeded the background criteria and have no risk-based criteria. |
| 41 | RVAAP-12 Load Line 12 (south of Load Line 12 fence) | LL12mw-247 | Unconsolidated | • Although nitrate was not detected, a history of nitrate detections in recent years and nearby wells warrants further monitoring at this exit pathway well.<br>• Continue to monitor metals and nitrate. | • Nitrate was not detected.<br>• All metal concentrations were below the screening criteria or background concentration with the exception of manganese. Manganese was detected at a concentration of 0.16 mg/L, which exceeded the background concentration of 0.075 mg/L. Sodium exceeded the background criteria and has no risk-based criteria. |
| 42 | RVAAP-16 Fuze and Booster Quarry Landfill/Ponds | FBQmw-171 | Homewood | • Continue to monitor cyanide, anions, and alkalinity. | • Nitrite and sulfide were not detected.<br>• Nitrate was detected at an estimated concentration of 0.33 mg/L, which is below the MCL of 10 mg/L.<br>• Sulfate does not have screening criteria and was detected at a concentration of 24 mg/L.<br>• Alkalinity does not have screening criteria and was detected at a concentration of 41 mg/L.<br>• Cyanide was not detected. |
| 43 | RVAAP-16 Fuze and Booster Quarry Landfill/Ponds | FBQmw-172 | Homewood | • Continue to monitor cyanide. | • Cyanide was not detected. |
| 44 | RVAAP-16 Fuze and Booster Quarry Landfill/Ponds | FBQmw-174 | Homewood | • Continue to monitor explosives, anions, and alkalinity. | • Nitrite and sulfide were not detected.<br>• Nitrate was detected at a concentration of 1.2 mg/L, which is below the MCL of 10 mg/L.<br>• Sulfate does not have screening criteria and was detected at a concentration of 15 mg/L.<br>• Alkalinity does not have screening criteria and was detected at an estimated concentration of 4.8J mg/L.<br>• The explosives TNT; 2,4-DNT; 2-amino-4,6-DNT; 4-amino-2,6-DNT; and RDX exceeded the screening criteria. |

**Table 4-1. Recommended FWGWMP Wells for 2019 (continued)**

| No | RVAAP-66 Area | Well Name | Aquifer | 2019 FWGWMP Sampling Recommendations | Spring 2019 Sampling Results |
|---|---|---|---|---|---|
| 45 | RVAAP-16 Fuze and Booster Quarry Landfill/Ponds | FBQmw-175 | Homewood | • Continue to monitor anions, alkalinity, and hexavalent chromium. | • Nitrite and sulfide were not detected.<br>• Nitrate was detected at a concentration of 1.6 mg/L, which is below the MCL of 10 mg/L.<br>• Sulfate does not have screening criteria and was detected at a concentration of 20 mg/L.<br>• Alkalinity does not have screening criteria and was detected at a concentration of 13 mg/L.<br>• Hexavalent chromium was not detected. |
| 46 | RVAAP-16 Fuze and Booster Quarry Landfill/Ponds | FBQmw-176 | Unconsolidated | • Continue to monitor cyanide. | • Cyanide was not detected. |
| 47 | RVAAP-34 Sand Creek Disposal Road Landfill | SCLmw-001 | Unconsolidated | • Continue quarterly monitoring. | • Explosives, PCBs, pesticides, SVOCs, VOCs, perchlorate, nitrate, nitrite, and sulfide were not detected.<br>• All metal concentrations were below the screening criteria or background concentration with the exception of manganese. Manganese was detected at a concentration of 0.31 mg/L, which exceed the background concentration of 0.075 mg/L. Calcium and sodium exceeded the background criteria and have no risk-based criteria.<br>• Sulfate and alkalinity were detected, but these chemicals do not have screening criteria.<br>• Phosphorus was detected at a concentration of 0.018 mg/L, which exceeded the Tapwater RSL of 0.00004 mg/L.<br>• Cyanide was detected at an estimated concentration of 0.015J mg/L, which is below the MCL of 0.2 mg/L. |
| 48 | RVAAP-34 Sand Creek Disposal Road Landfill | SCLmw-002 | Unconsolidated | • Continue quarterly monitoring. | • Explosives, PCBs, pesticides, SVOCs, perchlorate, nitrate, nitrite, and sulfide were not detected.<br>• All metal concentrations were below the screening criteria or background concentration with the exception of iron and manganese. Calcium exceeded the background criteria and has no risk-based criteria.<br>• Sulfate and alkalinity were detected, but these chemicals do not have screening criteria.<br>• Phosphorus was detected at an estimated concentration of 0.011J mg/L, which exceeded the Tapwater RSL of 0.00004 mg/L.<br>• Cyanide was detected at an estimated concentration of 0.0052J mg/L, which is below the MCL of 0.2 mg/L.<br>• Acetone was the only VOC detected. Acetone was detected at an estimated concentration of 0.0021J mg/L, which is below the Tapwater RSL of 1.4 mg/L. |
| 49 | RVAAP-34 Sand Creek Disposal Road Landfill | SCLmw-003 | Unconsolidated | • Continue quarterly monitoring. | • Explosives, PCBs, pesticides, SVOCs, perchlorate, phosphorus, cyanide, nitrate, nitrite, and sulfide were not detected.<br>• All metal concentrations were below screening criteria or background concentration with the exception of manganese. Calcium, magnesium, potassium, and sodium exceeded the background criteria and have no risk-based criteria.<br>• Sulfate and alkalinity were detected, but these chemicals do not have screening criteria.<br>• Acetone was the only VOC detected. Acetone was detected at an estimated concentration of 0.0021J mg/L, which is below the Tapwater RSL of 1.4 mg/L. |
| 50 | RVAAP-38 NACA Test Area | NTAmw-119 | Unconsolidated | • Continue to monitor PAHs, explosives, and metals. | • Explosives and SVOCs were not detected.<br>• All metal concentrations were below the screening criteria or background concentration with the exception of manganese. Manganese was detected at a concentration of 0.33 mg/L, which exceeded the background concentration of 0.075 mg/L. |
| 51 | RVAAP-38 NACA Test Area | NTAmw-120 | Upper Sharon | • Rejected hexachlorocyclopentadiene results from 2018 require additional monitoring. | • Hexachlorocyclopentadiene was not detected. |
| 52 | RVAAP-40 Load Line 7 | LL7mw-001 | Homewood | • Continue to sample for metals and cyanide. | • All metal concentrations were below the screening criteria or background concentration.<br>• Cyanide was not detected. |
| 53 | RVAAP-40 Load Line 7 | LL7mw-006 | Homewood | • Continue to monitor explosives. | • All explosives were below the screening criteria. |
| 54 | RVAAP-43 Load Line 10 | LL10mw-003 | Homewood | • Continue to monitor VOCs. | • All VOCs were below the screening criteria. |

**Table 4-1. Recommended FWGWMP Wells for 2019 (continued)**

| No | RVAAP-66 Area | Well Name | Aquifer | 2019 FWGWMP Sampling Recommendations | Spring 2019 Sampling Results |
|---|---|---|---|---|---|
| 55 | RVAAP-43 Load Line 10 | LL10mw-005 | Homewood | • Continue to monitor metals. | • All metals were below the screening criteria or background concentration. |
| 56 | RVAAP-44 Load Line 11 | LL11mw-005 | Unconsolidated | • Continue to monitor cyanide | • Cyanide was not detected. |
| 57 | RVAAP-49 Central Burn Pits | CBPmw-008 | Unconsolidated | • Continue to monitor cyanide. | • Cyanide was not detected. |
| 58 | RVAAP-49 Central Burn Pits | CBPmw-009 | Upper Sharon | • Continue to monitor cyanide. | • Cyanide was not detected. |
| 59 | RVAAP-66 Facility-wide Groundwater (southern portion of Admin area) | FWGmw-004 | Unconsolidated | • Although explosives were not detected, this exit pathway well will continue to monitor migration potential.<br>• Continue to monitor explosives and metals. | • Explosives were not detected.<br>• All metals were below the screening criteria or background concentration. |
| 60 | RVAAP-66 Facility-wide Groundwater (southwestern portion of facility, south of NACA Test Area) | FWGmw-007 | Unconsolidated | • Although explosives were not detected, this exit pathway well will continue to monitor migration potential.<br>• Continue to monitor explosives and metals. | • Explosives were not detected.<br>• All metal concentrations were below screening criteria or background concentration with the exception of calcium, magnesium, and manganese. Calcium was detected at a concentration of 130 mg/L, exceeding the background concentration of 107 mg/L. Magnesium was detected at a concentration of 66 mg/L, exceeding the background concentration of 55.3 mg/L. Manganese was detected at a concentration of 0.13 mg/L, which exceeded the background concentration of 0.075 mg/L. |
| 61 | RVAAP-66 Facility-wide Groundwater (near East Classification Yard) | FWGmw-011 | Unconsolidated | • Although explosives were not detected, this exit pathway well will continue to monitor migration.<br>• Continue to monitor explosives and metals. | • Explosives were not detected.<br>• All metal concentrations were below the screening criteria or background concentration with the exception of iron and manganese.<br>• Iron was detected at a concentration of 8.2 mg/L, which exceeded the background concentration of 1.91 mg/L.<br>• Manganese was detected at a concentration of 0.29 mg/L, which exceed the background concentration of 0.075 mg/L. |
| 62 | RVAAP-66 Facility-wide Groundwater (near East Classification Yard) | FWGmw-012 | Upper Sharon | • Although explosives were not detected, this exit pathway well will continue to monitor migration potential.<br>• Continue to monitor explosives and metals. | • Explosives were not detected.<br>• All metal concentrations were below the screening criteria or background concentration with the exception of iron. Iron was detected at a concentration of 2.4 mg/L, which exceeded the background concentration of 2.08 mg/L. Potassium exceeded the background criteria and has no risk-based criteria. |
| 63 | RVAAP-66 Facility-wide Groundwater (southeast of Administration Area) | FWGmw-015 | Unconsolidated | • Although explosives were not detected, this exit pathway well will continue to monitor migration potential.<br>• Continue to monitor explosives and metals. | • Explosives were not detected.<br>• All metal concentrations were below screening criteria or background concentration except calcium, magnesium, and potassium. Calcium was detected at a concentration of 280 mg/L, exceeding the background concentration of 107 mg/L. Magnesium was detected at a concentration of 290 mg/L, exceeding the background concentration of 55.3 mg/L. Potassium was detected at a concentration of 44J mg/L, which is equal to the background concentration of 18.2 mg/L. |
| 64 | RVAAP-66 Facility-wide Groundwater (southeast of Administration Area) | FWGmw-016 | Upper Sharon | • Although explosives were not detected, this exit pathway well will continue to monitor migration potential.<br>• Continue to monitor explosives and metals. | • Explosives were not detected.<br>• All metal concentrations were below the screening criteria or background concentration with the exception of manganese. Manganese was detected at a concentration of 0.22 mg/L, which exceeded the background concentration of 0.198 mg/L. |
| 65 | RVAAP-66 Facility-wide Groundwater (off-facility, south of State Route 5, south of Load Line 12) | FWGmw-018 | Basal Sharon Conglomerate | • Although VOCs were not detected, a history of low VOC concentrations warrants monitoring in this exit pathway well.<br>• Continue to monitor VOCs, metals, and cyanide. | • VOCs were not detected.<br>• All metal concentrations were below the screening criteria or background concentration.<br>• Cyanide was detected at an estimated concentration of 0.0065J mg/L, which is below the MCL of 0.2 mg/L. |
| 66 | RVAAP-66 Facility-wide Groundwater (located between Load Line 10 and Load Line 9) | FWGmw-019 | Basal Sharon Conglomerate | • VOC detections were limited to acetone and methylene chloride, more than an order of magnitude lower than screening criteria; therefore, no additional sampling is warranted at this well with the exception of rejected propellant results from 2018, which require additional monitoring. | • The propellants nitrocellulose and nitroguanidine were not detected. |

**Table 4-1. Recommended FWGWMP Wells for 2019 (continued)**

| No | RVAAP-66 Area | Well Name | Aquifer | 2019 FWGWMP Sampling Recommendations | Spring 2019 Sampling Results |
|---|---|---|---|---|---|
| 67 | RVAAP-66 Facility-wide Groundwater (off-facility, south of State Route 5, south of Load Line 12) | FWGmw-020 | Upper Sharon | • Although VOCs do not exceed criteria, a history of low VOC concentrations warrants monitoring to monitor vertical and lateral migration in this exit pathway well.<br>• Continue to monitor VOCs, metals, and cyanide. | • VOCs were not detected.<br>• All metal concentrations were below the screening criteria or background concentration with the exception of arsenic and potassium. Arsenic was detected at a concentration of 0.023 mg/L, which exceeded the MCL of 0.01 mg/L. Potassium was detected at a concentration of 4.6 mg/L, which exceeded the background concentration of 3.38 mg/L.<br>• Cyanide was detected at a concentration of 0.011 mg/L, which is below the MCL of 0.2 mg/L. |
| 68 | RVAAP-66 Facility-wide Groundwater (off-facility, south of State Route 5, south of Load Line 3) | FWGmw-021 | Upper Sharon | • Continue to monitor explosives and metals. | • All explosive concentrations were below screening criteria.<br>• All metal concentrations were below the screening criteria or background concentration. |
| 69 | RVAAP-66 Facility-wide Groundwater (located between Load Line 10 and Load Line 9) | FWGmw-022 | Upper Sharon | • Rejected propellant results from 2018 require additional monitoring. | • The propellants nitrocellulose and nitroguanidine were not detected. |
| 70 | RVAAP-66 Facility-wide Groundwater (located between Load Line 7 and Fuze and Booster Quarry Landfill/Ponds) | FWGmw-023 | Upper Sharon | • Rejected propellant results from 2018 require additional monitoring. | • The propellants nitrocellulose and nitroguanidine were not detected. |
| 71 | RVAAP-66 Facility-wide Groundwater (off-facility, south of State Route 5, south of Load Line 2) | FWGmw-024 | Upper Sharon | • Continue to monitor explosives and metals. | • Explosives were not detected.<br>• All metal concentrations were below the screening criteria or background concentration with the exception of manganese. Manganese was detected at a concentration of 0.33 mg/L, which exceeded the background concentration of 0.198 mg/L. |
| 72 | RVAAP-66 Facility-wide Groundwater (southeast portion of facility) | SCFmw-004 | Basal Sharon Conglomerate | • Continue to monitor metals. | • All metal concentrations were below the screening criteria or background concentration except calcium, magnesium, and potassium. Calcium was detected at a concentration of 150 mg/L, exceeding the background concentration of 93 mg/L. Magnesium was detected at a concentration of 58 mg/L, exceeding the background concentration of 30 mg/L. Potassium was detected at a concentration of 2.9J mg/L, which is equal to the background concentration of 2.9 mg/L. |

Note: Background concentrations for metals vary by aquifer.

DFFO = Director's Final Findings and Orders.
DNB = Dinitrobenzene.
DNT = Dinitrotoluene.
FWGWMP = Facility-wide Groundwater Monitoring Plan.
HMX = Octahydro-1,3,5,7- tetranitro-1,3,5,7-tetrazocine.
MCL = Maximum Contaminant Level.
mg/L = Milligrams per Liter.
NACA = National Advisory Committee on Aeronautics.
PAH = Polycyclic Aromatic Hydrocarbon.
PCB = Polychlorinated Biphenyl.
RCRA = Resource Conservation and Recovery Act.
RDX = Hexahydro-1,3,5-trinitro-1,3,5-triazine.
RSL = Regional Screening Level.
RVAAP = Ravenna Army Ammunition Plant.
S.U. = Standard Unit.
SVOC = Semi-volatile Organic Compound.
TNT = 2,4,6-Trinitrotoluene.
VOC = Volatile Organic Compound.

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# 5.0 DATA QUALITY ASSESSMENT

A data quality assessment was performed to support the results of the spring 2019 sampling event. The purpose of this DQA report is to document the following:

- The QC procedures followed to ensure data generated by Leidos, during the implementation of the April 2019 sampling event to support the FWGWMP at the former RVAAP, meet project requirements;
- The quality of the data collected; and
- Any problems encountered during the course of the study and their solutions.

The entire data quality assessment report is presented in Appendix H.

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# 6.0 WELL ABANDONMENT

In a letter dated May 30, 2019, the Army National Guard (ARNG) notified Ohio EPA of the field activities to abandon the one temporary well at Open Demolition Area #1 (DA1tw-001) and three temporary wells at Electric Substation No. 3 (ES3tw-001, ES3tw-002, and ES3tw-003). This notification letter is provided in Appendix I.1.

On June 12, 2019, all four temporary wells were abandoned. The entire casing was removed from wells ES3tw-001, ES3tw-002, and ES3tw-003 by manual methods. The entire casing at DA1tw-001 could not be removed; therefore, the casing was cut to a depth below ground surface. Bentonite pellets were used to seal the existing borehole. The well abandonment logs are provided in Appendix I.2, and the Water Well Sealing Reports submitted to the Ohio Department of Natural Resources are provided in Appendix I.3.

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# 7.0 REFERENCES


Leidos 2019a. *Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Addendum for 2019.* May 2019.

Leidos 2019b. *2019 Annual Monitoring Well Inspection Report for the Groundwater Investigation and Reporting Services*. May 2019.

Portage Environmental 2004. *Facility-wide Groundwater Monitoring Program Plan for the Ravenna Army Ammunition Plant, Ravenna, Ohio*. September 2004.

TEC-Weston 2016. *Remedial Investigation Work Plan for Groundwater and Environmental Investigation Services for RVAAP-66 Facility-Wide Groundwater*. December 2016.

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# FIGURES

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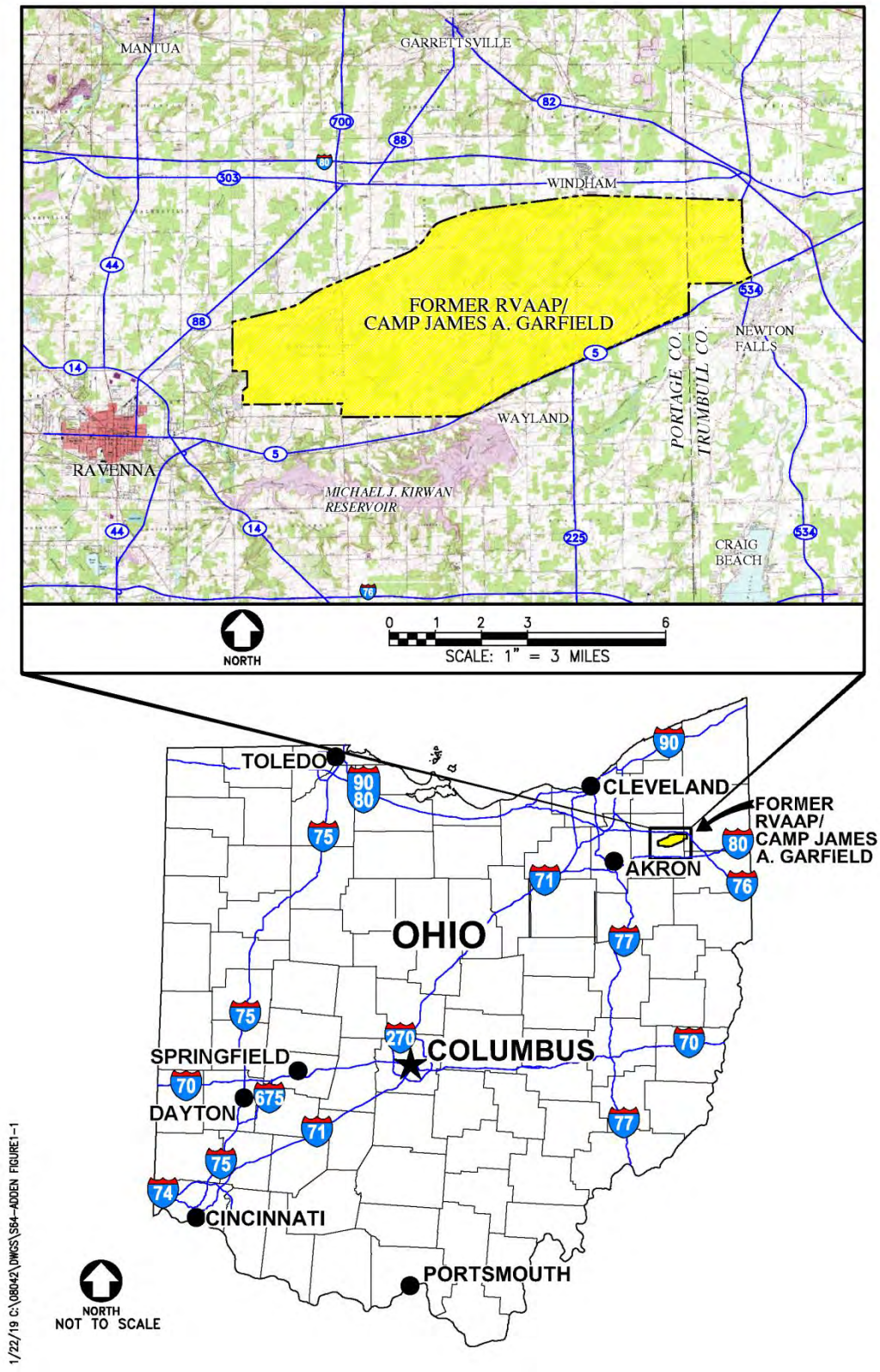


**Figure 1-1. General Location and Orientation of the Former RVAAP/CJAG**

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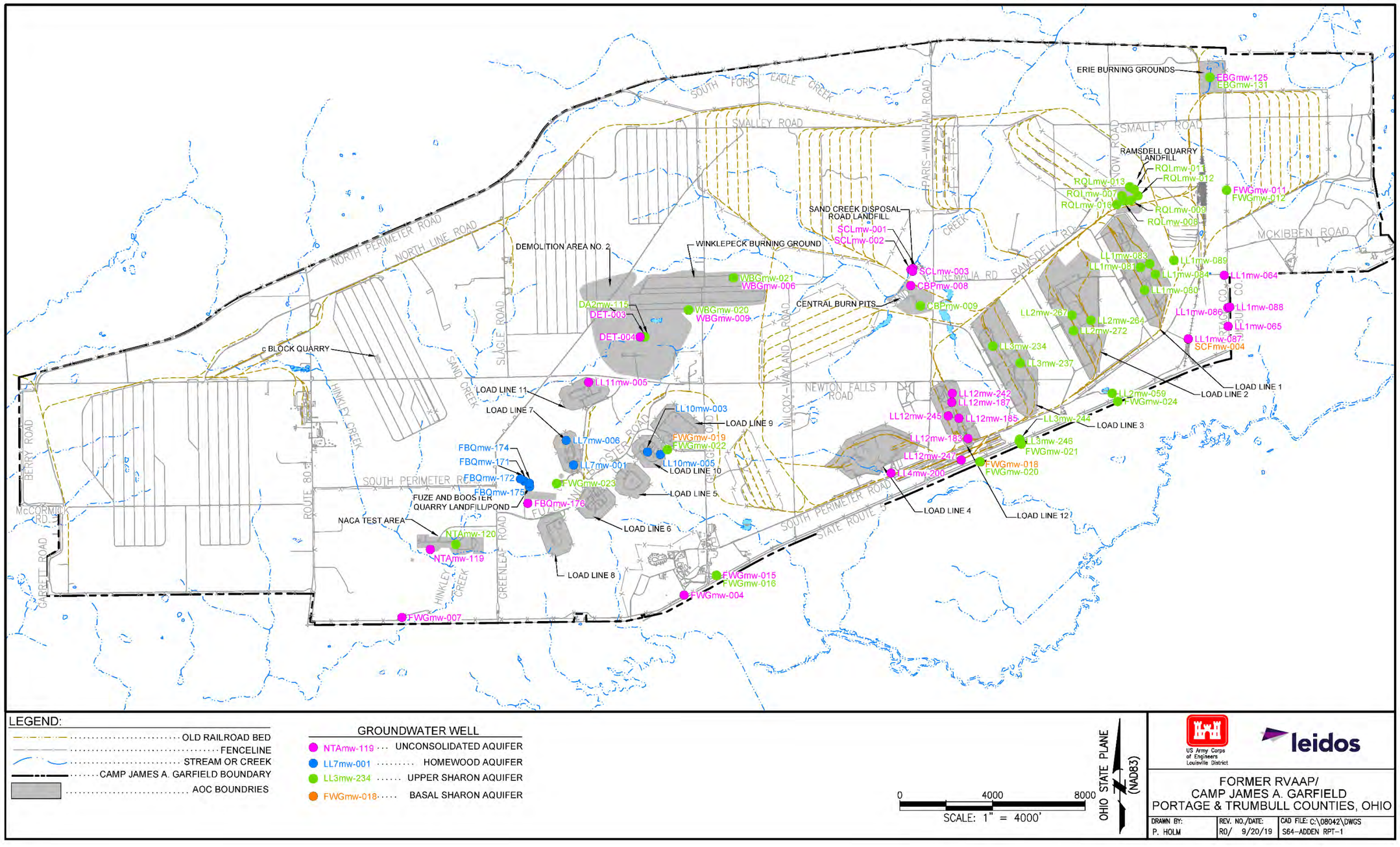


**Figure 3-1. 2019 FWGWMP Wells**

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# APPENDIX A

# Well Gauging Results

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| RVAAP Facility Wide Monitoring Well Gauging Results | | | |
|---|---|---|---|
| April 2019 | | | |
| RVAAP Area | Well ID | Date Gauged | Depth to Water (below TOC) |
| RVAAP-01 Ramsdell Quarry Landfill | RQLmw-006 | 4/29/2019 | 35.38 |
| RVAAP-01 Ramsdell Quarry Landfill | RQLmw-007 | 4/29/2019 | 5.28 |
| RVAAP-01 Ramsdell Quarry Landfill | RQLmw-008 | 4/29/2019 | 5.76 |
| RVAAP-01 Ramsdell Quarry Landfill | RQLmw-009 | 4/29/2019 | 4.00 |
| RVAAP-01 Ramsdell Quarry Landfill | RQLmw-010 | 4/29/2019 | 24.70 |
| RVAAP-01 Ramsdell Quarry Landfill | RQLmw-011 | 4/29/2019 | 21.00 |
| RVAAP-01 Ramsdell Quarry Landfill | RQLmw-012 | 4/29/2019 | 20.92 |
| RVAAP-01 Ramsdell Quarry Landfill | RQLmw-013 | 4/29/2019 | 24.31 |
| RVAAP-01 Ramsdell Quarry Landfill | RQLmw-014 | 4/29/2019 | 18.76 |
| RVAAP-01 Ramsdell Quarry Landfill | RQLmw-015 | 4/29/2019 | 31.93 |
| RVAAP-01 Ramsdell Quarry Landfill | RQLmw-016 | 4/29/2019 | 36.52 |
| RVAAP-01 Ramsdell Quarry Landfill | RQLmw-017 | 4/29/2019 | NM |
| RVAAP-02 Erie Burning Grounds | EBGmw-123 | 4/25/2019 | 9.98 |
| RVAAP-02 Erie Burning Grounds | EBGmw-124 | 4/25/2019 | 3.82 |
| RVAAP-02 Erie Burning Grounds | EBGmw-125 | 4/25/2019 | 12.54 |
| RVAAP-02 Erie Burning Grounds | EBGmw-126 | 4/25/2019 | 1.91 |
| RVAAP-02 Erie Burning Grounds | EBGmw-127 | 4/25/2019 | 5.25 |
| RVAAP-02 Erie Burning Grounds | EBGmw-128 | 4/25/2019 | 6.87 |
| RVAAP-02 Erie Burning Grounds | EBGmw-129 | 4/25/2019 | 5.17 |
| RVAAP-02 Erie Burning Grounds | EBGmw-130 | 4/25/2019 | 6.42 |
| RVAAP-02 Erie Burning Grounds | EBGmw-131 | 4/25/2019 | 8.93 |
| RVAAP-04 Open Demolition Area #2 | DA2mw-104 | 4/23/2019 | 21.49 |
| RVAAP-04 Open Demolition Area #2 | DA2mw-105 | 4/23/2019 | NM |
| RVAAP-04 Open Demolition Area #2 | DA2mw-106 | 4/23/2019 | 3.92 |
| RVAAP-04 Open Demolition Area #2 | DA2mw-107 | 4/23/2019 | 7.05 |
| RVAAP-04 Open Demolition Area #2 | DA2mw-108 | 4/23/2019 | 5.88 |
| RVAAP-04 Open Demolition Area #2 | DA2mw-109 | 4/23/2019 | 11.47 |
| RVAAP-04 Open Demolition Area #2 | DA2mw-110 | 4/23/2019 | 6.01 |
| RVAAP-04 Open Demolition Area #2 | DA2mw-111 | 4/23/2019 | 7.53 |
| RVAAP-04 Open Demolition Area #2 | DA2mw-112 | 4/23/2019 | 6.73 |
| RVAAP-04 Open Demolition Area #2 | DA2mw-113 | 4/23/2019 | 7.20 |
| RVAAP-04 Open Demolition Area #2 | DA2mw-114 | 4/23/2019 | 4.83 |
| RVAAP-04 Open Demolition Area #2 | DA2mw-115 | 4/23/2019 | 6.03 |
| RVAAP-04 Open Demolition Area #2 | DETmw-001B | 4/23/2019 | 22.31 |
| RVAAP-04 Open Demolition Area #2 | DETmw-002 | 4/23/2019 | 32.25 |
| RVAAP-04 Open Demolition Area #2 | DETmw-003 | 4/23/2019 | 9.25 |
| RVAAP-04 Open Demolition Area #2 | DETmw-004 | 4/23/2019 | NM |
| RVAAP-05 Winklepeck Burning Grounds | WBGmw-005 | 4/23/2019 | 4.49 |
| RVAAP-05 Winklepeck Burning Grounds | WBGmw-006 | 4/23/2019 | 5.88 |
| RVAAP-05 Winklepeck Burning Grounds | WBGmw-007 | 4/23/2019 | 16.35 |
| RVAAP-05 Winklepeck Burning Grounds | WBGmw-008 | 4/23/2019 | 13.95 |
| RVAAP-05 Winklepeck Burning Grounds | WBGmw-009 | 4/23/2019 | 12.08 |
| RVAAP-05 Winklepeck Burning Grounds | WBGmw-010 | 4/23/2019 | 7.05 |
| RVAAP-05 Winklepeck Burning Grounds | WBGmw-011 | 4/23/2019 | 9.79 |
| RVAAP-05 Winklepeck Burning Grounds | WBGmw-012 | 4/23/2019 | 24.45 |

| RVAAP Facility Wide Monitoring Well Gauging Results (continued) | | | |
|---|---|---|---|
| April 2019 | | | |
| RVAAP Area | Well ID | Date Gauged | Depth to Water (below TOC) |
| RVAAP-05 Winklepeck Burning Grounds | WBGmw-013 | 4/23/2019 | NM |
| RVAAP-05 Winklepeck Burning Grounds | WBGmw-014 | 4/23/2019 | 15.22 |
| RVAAP-05 Winklepeck Burning Grounds | WBGmw-015 | 4/23/2019 | 11.26 |
| RVAAP-05 Winklepeck Burning Grounds | WBGmw-016 | 4/23/2019 | 15.94 |
| RVAAP-05 Winklepeck Burning Grounds | WBGmw-017 | 4/23/2019 | 7.70 |
| RVAAP-05 Winklepeck Burning Grounds | WBGmw-018 | 4/23/2019 | 13.62 |
| RVAAP-05 Winklepeck Burning Grounds | WBGmw-019 | 4/23/2019 | 16.59 |
| RVAAP-05 Winklepeck Burning Grounds | WBGmw-020 | 4/23/2019 | 11.68 |
| RVAAP-05 Winklepeck Burning Grounds | WBGmw-021 | 4/23/2019 | 8.36 |
| RVAAP-06 C Block Quarry | CBLmw-001 | 4/24/2019 | 41.30 |
| RVAAP-06 C Block Quarry | CBLmw-002 | 4/24/2019 | 35.97 |
| RVAAP-06 C Block Quarry | CBLmw-003 | 4/24/2019 | 32.85 |
| RVAAP-06 C Block Quarry | CBLmw-004 | 4/24/2019 | 33.85 |
| RVAAP-06 C Block Quarry | CBLmw-005 | 4/24/2019 | 25.52 |
| RVAAP-08 Load Line 1 | LL1mw-063 | 4/25/2019 | 24.61 |
| RVAAP-08 Load Line 1 | LL1mw-064 | 4/25/2019 | 0.25 |
| RVAAP-08 Load Line 1 | LL1mw-065 | 4/25/2019 | 10.70 |
| RVAAP-08 Load Line 1 | LL1mw-067 | 4/25/2019 | 20.30 |
| RVAAP-08 Load Line 1 | LL1mw-078 | 4/25/2019 | 34.19 |
| RVAAP-08 Load Line 1 | LL1mw-079 | 4/25/2019 | 33.68 |
| RVAAP-08 Load Line 1 | LL1mw-080 | 4/25/2019 | 10.96 |
| RVAAP-08 Load Line 1 | LL1mw-081 | 4/25/2019 | 29.90 |
| RVAAP-08 Load Line 1 | LL1mw-082 | 4/25/2019 | 27.60 |
| RVAAP-08 Load Line 1 | LL1mw-083 | 4/25/2019 | 34.79 |
| RVAAP-08 Load Line 1 | LL1mw-084 | 4/25/2019 | 27.91 |
| RVAAP-08 Load Line 1 | LL1mw-085 | 4/25/2019 | 36.74 |
| RVAAP-08 Load Line 1 | LL1mw-086 | 4/25/2019 | 7.12 |
| RVAAP-08 Load Line 1 | LL1mw-087 | 4/25/2019 | 4.95 |
| RVAAP-08 Load Line 1 | LL1mw-088 | 4/25/2019 | 4.90 |
| RVAAP-08 Load Line 1 | LL1mw-089 | 4/25/2019 | 26.04 |
| RVAAP-09 Load Line 2 | LL2mw-059 | 4/25/2019 | 14.44 |
| RVAAP-09 Load Line 2 | LL2mw-060 | 4/25/2019 | 10.49 |
| RVAAP-09 Load Line 2 | LL2mw-261 | 4/29/2019 | 5.45 |
| RVAAP-09 Load Line 2 | LL2mw-262 | 4/29/2019 | 5.83 |
| RVAAP-09 Load Line 2 | LL2mw-263 | 4/29/2019 | 6.26 |
| RVAAP-09 Load Line 2 | LL2mw-264 | 4/29/2019 | 5.05 |
| RVAAP-09 Load Line 2 | LL2mw-265 | 4/29/2019 | 10.48 |
| RVAAP-09 Load Line 2 | LL2mw-266 | 4/29/2019 | 9.25 |
| RVAAP-09 Load Line 2 | LL2mw-267 | 4/29/2019 | 7.91 |
| RVAAP-09 Load Line 2 | LL2mw-268 | 4/29/2019 | 13.30 |
| RVAAP-09 Load Line 2 | LL2mw-269 | 4/29/2019 | 15.45 |
| RVAAP-09 Load Line 2 | LL2mw-270 | 4/29/2019 | 5.63 |
| RVAAP-09 Load Line 2 | LL2mw-271 | 4/29/2019 | 11.38 |
| RVAAP-09 Load Line 2 | LL2mw-272 | 4/29/2019 | 7.02 |
| RVAAP-10 Load Line 3 | LL3mw-232 | 4/25/2019 | 17.12 |

| RVAAP Facility Wide Monitoring Well Gauging Results (continued) | | | |
|---|---|---|---|
| April 2019 | | | |
| RVAAP Area | Well ID | Date Gauged | Depth to Water (below TOC) |
| RVAAP-10 Load Line 3 | LL3mw-233 | 4/25/2019 | 25.68 |
| RVAAP-10 Load Line 3 | LL3mw-234 | 4/25/2019 | 9.30 |
| RVAAP-10 Load Line 3 | LL3mw-235 | 4/25/2019 | 16.43 |
| RVAAP-10 Load Line 3 | LL3mw-236 | 4/25/2019 | 15.81 |
| RVAAP-10 Load Line 3 | LL3mw-237 | 4/25/2019 | 13.81 |
| RVAAP-10 Load Line 3 | LL3mw-238 | 4/25/2019 | 15.42 |
| RVAAP-10 Load Line 3 | LL3mw-239 | 4/25/2019 | 23.63 |
| RVAAP-10 Load Line 3 | LL3mw-240 | 4/25/2019 | 26.74 |
| RVAAP-10 Load Line 3 | LL3mw-241 | 4/25/2019 | 8.54 |
| RVAAP-10 Load Line 3 | LL3mw-242 | 4/25/2019 | 13.58 |
| RVAAP-10 Load Line 3 | LL3mw-243 | 4/25/2019 | 10.69 |
| RVAAP-10 Load Line 3 | LL3mw-244 | 4/25/2019 | 8.70 |
| RVAAP-10 Load Line 3 | LL3mw-245 | 4/25/2019 | 13.22 |
| RVAAP-10 Load Line 3 | LL3mw-246 | 4/24/2019 | 19.22 |
| RVAAP-11 Load Line 4 | LL4mw-193 | 4/25/2019 | 5.85 |
| RVAAP-11 Load Line 4 | LL4mw-194 | 4/25/2019 | 6.80 |
| RVAAP-11 Load Line 4 | LL4mw-195 | 4/25/2019 | 12.58 |
| RVAAP-11 Load Line 4 | LL4mw-196 | 4/25/2019 | 9.93 |
| RVAAP-11 Load Line 4 | LL4mw-197 | 4/25/2019 | 13.97 |
| RVAAP-11 Load Line 4 | LL4mw-198 | 4/25/2019 | 5.93 |
| RVAAP-11 Load Line 4 | LL4mw-199 | 4/25/2019 | 7.20 |
| RVAAP-11 Load Line 4 | LL4mw-200 | 4/25/2019 | 18.17 |
| RVAAP-11 Load Line 4 | LL4mw-201 | 4/25/2019 | 10.01 |
| RVAAP-12 Load Line 12 | LL12mw-088 | 4/25/2019 | 6.63 |
| RVAAP-12 Load Line 12 | LL12mw-107 | 4/25/2019 | 9.31 |
| RVAAP-12 Load Line 12 | LL12mw-113 | 4/25/2019 | 5.45 |
| RVAAP-12 Load Line 12 | LL12mw-128 | 4/25/2019 | 9.28 |
| RVAAP-12 Load Line 12 | LL12mw-153 | 4/25/2019 | 6.02 |
| RVAAP-12 Load Line 12 | LL12mw-154 | 4/25/2019 | 8.62 |
| RVAAP-12 Load Line 12 | LL12mw-182 | 4/25/2019 | 8.90 |
| RVAAP-12 Load Line 12 | LL12mw-182ss | 4/25/2019 | 8.42 |
| RVAAP-12 Load Line 12 | LL12mw-183 | 4/25/2019 | 11.99 |
| RVAAP-12 Load Line 12 | LL12mw-184 | 4/25/2019 | 12.38 |
| RVAAP-12 Load Line 12 | LL12mw-185 | 4/25/2019 | 7.05 |
| RVAAP-12 Load Line 12 | LL12mw-186 | 4/25/2019 | 5.74 |
| RVAAP-12 Load Line 12 | LL12mw-187 | 4/25/2019 | 9.31 |
| RVAAP-12 Load Line 12 | LL12mw-188 | 4/25/2019 | 4.34 |
| RVAAP-12 Load Line 12 | LL12mw-189 | 4/25/2019 | 3.42 |
| RVAAP-12 Load Line 12 | LL12mw-242 | 4/25/2019 | 8.55 |
| RVAAP-12 Load Line 12 | LL12mw-243 | 4/25/2019 | 9.28 |
| RVAAP-12 Load Line 12 | LL12mw-244 | 4/25/2019 | 9.52 |
| RVAAP-12 Load Line 12 | LL12mw-245 | 4/25/2019 | 8.22 |
| RVAAP-12 Load Line 12 | LL12mw-246 | 4/25/2019 | 16.65 |
| RVAAP-12 Load Line 12 | LL12mw-247 | 4/25/2019 | 4.73 |
| RVAAP-13 Building 1200 | B12mw-010 | 4/25/2019 | 17.08 |

| RVAAP Facility Wide Monitoring Well Gauging Results (continued) | | | |
|---|---|---|---|
| April 2019 | | | |
| RVAAP Area | Well ID | Date Gauged | Depth to Water (below TOC) |
| RVAAP-13 Building 1200 | B12mw-011 | 4/25/2019 | 19.32 |
| RVAAP-13 Building 1200 | B12mw-012 | 4/25/2019 | 20.75 |
| RVAAP-13 Building 1200 | B12mw-013 | 4/25/2019 | 21.21 |
| RVAAP-16 Fuze and Booster Quarry Landfill/Ponds | FBQmw-166 | 4/24/2019 | 5.03 |
| RVAAP-16 Fuze and Booster Quarry Landfill/Ponds | FBQmw-167 | 4/24/2019 | 3.81 |
| RVAAP-16 Fuze and Booster Quarry Landfill/Ponds | FBQmw-168 | 4/24/2019 | 10.06 |
| RVAAP-16 Fuze and Booster Quarry Landfill/Ponds | FBQmw-169 | 4/24/2019 | 5.42 |
| RVAAP-16 Fuze and Booster Quarry Landfill/Ponds | FBQmw-170 | 4/24/2019 | 16.95 |
| RVAAP-16 Fuze and Booster Quarry Landfill/Ponds | FBQmw-171 | 4/24/2019 | 16.09 |
| RVAAP-16 Fuze and Booster Quarry Landfill/Ponds | FBQmw-172 | 4/24/2019 | 23.20 |
| RVAAP-16 Fuze and Booster Quarry Landfill/Ponds | FBQmw-173 | 4/24/2019 | 42.95 |
| RVAAP-16 Fuze and Booster Quarry Landfill/Ponds | FBQmw-174 | 4/24/2019 | 14.69 |
| RVAAP-16 Fuze and Booster Quarry Landfill/Ponds | FBQmw-175 | 4/24/2019 | 16.24 |
| RVAAP-16 Fuze and Booster Quarry Landfill/Ponds | FBQmw-176 | 4/24/2019 | 7.34 |
| RVAAP-16 Fuze and Booster Quarry Landfill/Ponds | FBQmw-177 | 4/24/2019 | 10.65 |
| RVAAP-19 Landfill North of Winklepeck Burning Grounds | LNWmw-024 | 4/23/2019 | 10.73 |
| RVAAP-19 Landfill North of Winklepeck Burning Grounds | LNWmw-025 | 4/23/2019 | 4.33 |
| RVAAP-19 Landfill North of Winklepeck Burning Grounds | LNWmw-026 | 4/23/2019 | 3.52 |
| RVAAP-19 Landfill North of Winklepeck Burning Grounds | LNWmw-027 | 4/23/2019 | 5.60 |
| RVAAP-28 Suspected Mustard Agent Burial Site | MBSmw-001 | 4/24/2019 | 17.31 |
| RVAAP-28 Suspected Mustard Agent Burial Site | MBSmw-002 | 4/24/2019 | 17.95 |
| RVAAP-28 Suspected Mustard Agent Burial Site | MBSmw-003 | 4/24/2019 | 18.35 |
| RVAAP-28 Suspected Mustard Agent Burial Site | MBSmw-004 | 4/24/2019 | 16.78 |
| RVAAP-28 Suspected Mustard Agent Burial Site | MBSmw-005 | 4/24/2019 | 17.56 |
| RVAAP-28 Suspected Mustard Agent Burial Site | MBSmw-006 | 4/24/2019 | 17.02 |
| RVAAP-29 Upper and Lower Cobbs Ponds | CPmw-001 | 4/25/2019 | 1.57 |
| RVAAP-29 Upper and Lower Cobbs Ponds | CPmw-002 | 4/29/2019 | 0.01 |
| RVAAP-29 Upper and Lower Cobbs Ponds | CPmw-003 | 4/25/2019 | 1.28 |
| RVAAP-29 Upper and Lower Cobbs Ponds | CPmw-004 | 4/25/2019 | 9.81 |
| RVAAP-29 Upper and Lower Cobbs Ponds | CPmw-005 | 4/25/2019 | 11.20 |
| RVAAP-29 Upper and Lower Cobbs Ponds | CPmw-006 | 4/25/2019 | 8.53 |
| RVAAP-33 Load Line 6 | LL6mw-001 | 4/24/2019 | 11.25 |
| RVAAP-33 Load Line 6 | LL6mw-002 | 4/24/2019 | 19.35 |
| RVAAP-33 Load Line 6 | LL6mw-003 | 4/24/2019 | 15.25 |
| RVAAP-33 Load Line 6 | LL6mw-004 | 4/24/2019 | 16.16 |
| RVAAP-33 Load Line 6 | LL6mw-005 | 4/24/2019 | 11.41 |
| RVAAP-33 Load Line 6 | LL6mw-006 | 4/24/2019 | 13.20 |
| RVAAP-33 Load Line 6 | LL6mw-007 | 4/24/2019 | 3.55 |
| RVAAP-33 Load Line 6 | LL6mw-008 | 4/24/2019 | 13.84 |
| RVAAP-33 Load Line 6 | LL6mw-009 | 4/24/2019 | 13.50 |
| RVAAP-34 Sand Creek Disposal Road Landfill | SCLmw-001 | 4/23/2019 | NM |
| RVAAP-34 Sand Creek Disposal Road Landfill | SCLmw-002 | 4/23/2019 | NM |
| RVAAP-34 Sand Creek Disposal Road Landfill | SCLmw-003 | 4/23/2019 | 16.88 |
| RVAAP-38 NACA Test Area | NTAmw-107 | 4/24/2019 | 12.17 |
| RVAAP-38 NACA Test Area | NTAmw-108 | 4/24/2019 | 17.25 |

| RVAAP Facility Wide Monitoring Well Gauging Results (continued) | | | |
|---|---|---|---|
| April 2019 | | | |
| RVAAP Area | Well ID | Date Gauged | Depth to Water (below TOC) |
| RVAAP-38 NACA Test Area | NTAmw-109 | 4/24/2019 | 11.43 |
| RVAAP-38 NACA Test Area | NTAmw-110 | 4/24/2019 | 13.54 |
| RVAAP-38 NACA Test Area | NTAmw-111 | 4/24/2019 | 3.52 |
| RVAAP-38 NACA Test Area | NTAmw-112 | 4/24/2019 | 8.33 |
| RVAAP-38 NACA Test Area | NTAmw-113 | 4/24/2019 | 6.46 |
| RVAAP-38 NACA Test Area | NTAmw-114 | 4/24/2019 | 5.65 |
| RVAAP-38 NACA Test Area | NTAmw-115 | 4/24/2019 | 10.99 |
| RVAAP-38 NACA Test Area | NTAmw-116 | 4/24/2019 | 4.94 |
| RVAAP-38 NACA Test Area | NTAmw-117 | 4/24/2019 | 12.81 |
| RVAAP-38 NACA Test Area | NTAmw-118 | 4/24/2019 | 8.28 |
| RVAAP-38 NACA Test Area | NTAmw-119 | 4/24/2019 | 12.18 |
| RVAAP-38 NACA Test Area | NTAmw-120 | 4/24/2019 | 33.09 |
| RVAAP-39 Load Line 5 | LL5mw-001 | 4/24/2019 | 18.96 |
| RVAAP-39 Load Line 5 | LL5mw-002 | 4/24/2019 | 19.50 |
| RVAAP-39 Load Line 5 | LL5mw-003 | 4/24/2019 | 17.36 |
| RVAAP-39 Load Line 5 | LL5mw-004 | 4/24/2019 | 16.75 |
| RVAAP-39 Load Line 5 | LL5mw-005 | 4/24/2019 | 20.45 |
| RVAAP-39 Load Line 5 | LL5mw-006 | 4/24/2019 | 19.00 |
| RVAAP-40 Load Line 7 | LL7mw-001 | 4/23/2019 | 20.13 |
| RVAAP-40 Load Line 7 | LL7mw-002 | 4/23/2019 | 14.98 |
| RVAAP-40 Load Line 7 | LL7mw-003 | 4/23/2019 | 11.24 |
| RVAAP-40 Load Line 7 | LL7mw-004 | 4/23/2019 | 14.56 |
| RVAAP-40 Load Line 7 | LL7mw-005 | 4/23/2019 | 21.17 |
| RVAAP-40 Load Line 7 | LL7mw-006 | 4/23/2019 | 9.81 |
| RVAAP-41 Load Line 8 | LL8mw-001 | 4/23/2019 | 9.85 |
| RVAAP-41 Load Line 8 | LL8mw-002 | 4/24/2019 | 16.12 |
| RVAAP-41 Load Line 8 | LL8mw-003 | 4/24/2019 | 10.84 |
| RVAAP-41 Load Line 8 | LL8mw-004 | 4/24/2019 | 9.09 |
| RVAAP-41 Load Line 8 | LL8mw-005 | 4/24/2019 | 10.24 |
| RVAAP-41 Load Line 8 | LL8mw-006 | 4/24/2019 | 18.47 |
| RVAAP-42 Load Line 9 | LL9mw-001 | 4/24/2019 | 13.57 |
| RVAAP-42 Load Line 9 | LL9mw-002 | 4/24/2019 | 11.10 |
| RVAAP-42 Load Line 9 | LL9mw-003 | 4/24/2019 | 7.58 |
| RVAAP-42 Load Line 9 | LL9mw-004 | 4/24/2019 | 18.65 |
| RVAAP-42 Load Line 9 | LL9mw-005 | 4/24/2019 | 14.16 |
| RVAAP-42 Load Line 9 | LL9mw-006 | 4/24/2019 | 16.79 |
| RVAAP-42 Load Line 9 | LL9mw-007 | 4/24/2019 | 7.50 |
| RVAAP-43 Load Line 10 | LL10mw-001 | 4/24/2019 | 23.89 |
| RVAAP-43 Load Line 10 | LL10mw-002 | 4/24/2019 | 15.75 |
| RVAAP-43 Load Line 10 | LL10mw-003 | 4/24/2019 | 18.81 |
| RVAAP-43 Load Line 10 | LL10mw-004 | 4/24/2019 | 11.67 |
| RVAAP-43 Load Line 10 | LL10mw-005 | 4/24/2019 | 13.59 |
| RVAAP-43 Load Line 10 | LL10mw-006 | 4/24/2019 | 9.84 |
| RVAAP-44 Load Line 11 | LL11mw-001 | 4/23/2019 | 8.28 |
| RVAAP-44 Load Line 11 | LL11mw-002 | 4/23/2019 | 0.95 |

| RVAAP Facility Wide Monitoring Well Gauging Results (continued) | | | |
|---|---|---|---|
| April 2019 | | | |
| RVAAP Area | Well ID | Date Gauged | Depth to Water (below TOC) |
| RVAAP-44 Load Line 11 | LL11mw-003 | 4/23/2019 | 0.71 |
| RVAAP-44 Load Line 11 | LL11mw-004 | 4/23/2019 | 0.11 |
| RVAAP-44 Load Line 11 | LL11mw-005 | 4/23/2019 | 5.49 |
| RVAAP-44 Load Line 11 | LL11mw-006 | 4/23/2019 | 2.05 |
| RVAAP-44 Load Line 11 | LL11mw-007 | 4/23/2019 | 13.48 |
| RVAAP-44 Load Line 11 | LL11mw-008 | 4/23/2019 | 0.81 |
| RVAAP-44 Load Line 11 | LL11mw-009 | 4/23/2019 | 1.80 |
| RVAAP-44 Load Line 11 | LL11mw-010 | 4/23/2019 | 3.34 |
| RVAAP-44 Load Line 11 | LL11mw-011 | 4/23/2019 | 7.76 |
| RVAAP-44 Load Line 11 | LL11mw-012 | 4/23/2019 | 18.81 |
| RVAAP-49 Central Burn Pits | CBPmw-001 | 4/23/2019 | 13.31 |
| RVAAP-49 Central Burn Pits | CBPmw-002 | 4/23/2019 | 8.95 |
| RVAAP-49 Central Burn Pits | CBPmw-003 | 4/23/2019 | 12.00 |
| RVAAP-49 Central Burn Pits | CBPmw-004 | 4/23/2019 | 10.86 |
| RVAAP-49 Central Burn Pits | CBPmw-005 | 4/23/2019 | 12.16 |
| RVAAP-49 Central Burn Pits | CBPmw-006 | 4/23/2019 | 7.94 |
| RVAAP-49 Central Burn Pits | CBPmw-007 | 4/23/2019 | 15.40 |
| RVAAP-49 Central Burn Pits | CBPmw-008 | 4/23/2019 | 16.15 |
| RVAAP-49 Central Burn Pits | CBPmw-009 | 4/23/2019 | 10.31 |
| RVAAP-50 Atlas Scrap Yard | ASYmw-001 | 4/24/2019 | 11.24 |
| RVAAP-50 Atlas Scrap Yard | ASYmw-002 | 4/24/2019 | 14.64 |
| RVAAP-50 Atlas Scrap Yard | ASYmw-003 | 4/24/2019 | 12.24 |
| RVAAP-50 Atlas Scrap Yard | ASYmw-004 | 4/24/2019 | 9.39 |
| RVAAP-50 Atlas Scrap Yard | ASYmw-005 | 4/24/2019 | 7.98 |
| RVAAP-50 Atlas Scrap Yard | ASYmw-006 | 4/24/2019 | 14.05 |
| RVAAP-50 Atlas Scrap Yard | ASYmw-007 | 4/24/2019 | 15.46 |
| RVAAP-50 Atlas Scrap Yard | ASYmw-008 | 4/24/2019 | 5.13 |
| RVAAP-50 Atlas Scrap Yard | ASYmw-009 | 4/24/2019 | 11.54 |
| RVAAP-50 Atlas Scrap Yard | ASYmw-010 | 4/24/2019 | 12.39 |
| RVAAP-66 Facility-wide Groundwater | FWGmw-001 | 4/29/2019 | 7.10 |
| RVAAP-66 Facility-wide Groundwater | FWGmw-002 | 4/29/2019 | 21.71 |
| RVAAP-66 Facility-wide Groundwater | FWGmw-003 | 4/24/2019 | 5.03 |
| RVAAP-66 Facility-wide Groundwater | FWGmw-004 | 4/29/2019 | 9.96 |
| RVAAP-66 Facility-wide Groundwater | FWGmw-005 | 4/24/2019 | 21.15 |
| RVAAP-66 Facility-wide Groundwater | FWGmw-006 | 4/24/2019 | 3.85 |
| RVAAP-66 Facility-wide Groundwater | FWGmw-007 | 4/24/2019 | 24.35 |
| RVAAP-66 Facility-wide Groundwater | FWGmw-008 | 4/24/2019 | 5.26 |
| RVAAP-66 Facility-wide Groundwater | FWGmw-009 | 4/24/2019 | 1.93 |
| RVAAP-66 Facility-wide Groundwater | FWGmw-010 | 4/25/2019 | 11.40 |
| RVAAP-66 Facility-wide Groundwater | FWGmw-011 | 4/25/2019 | 1.75 |
| RVAAP-66 Facility-wide Groundwater | FWGmw-012 | 4/25/2019 | 0.25 |
| RVAAP-66 Facility-wide Groundwater | FWGmw-013 | 4/23/2019 | 18.50 |
| RVAAP-66 Facility-wide Groundwater | FWGmw-014 | 4/24/2019 | 3.35 |
| RVAAP-66 Facility-wide Groundwater | FWGmw-015 | 4/29/2019 | 2.81 |
| RVAAP-66 Facility-wide Groundwater | FWGmw-016 | 4/29/2019 | 15.87 |

| RVAAP Facility Wide Monitoring Well Gauging Results (continued) | | | |
|---|---|---|---|
| April 2019 | | | |
| RVAAP Area | Well ID | Date Gauged | Depth to Water (below TOC) |
| RVAAP-66 Facility-wide Groundwater | FWGmw-018 | 4/24/2019 | 21.12 |
| RVAAP-66 Facility-wide Groundwater | FWGmw-019 | 4/24/2019 | 114.57 |
| RVAAP-66 Facility-wide Groundwater | FWGmw-020 | 4/24/2019 | 21.95 |
| RVAAP-66 Facility-wide Groundwater | FWGmw-021 | 4/24/2019 | 19.60 |
| RVAAP-66 Facility-wide Groundwater | FWGmw-022 | 4/24/2019 | 113.68 |
| RVAAP-66 Facility-wide Groundwater | FWGmw-023 | 4/23/2019 | 116.48 |
| RVAAP-66 Facility-wide Groundwater | FWGmw-024 | 4/24/2019 | 14.36 |
| RVAAP-66 Facility-wide Groundwater | SCFmw-001 | 4/25/2019 | 88.68 |
| RVAAP-66 Facility-wide Groundwater | SCFmw-002 | 4/25/2019 | 19.27 |
| RVAAP-66 Facility-wide Groundwater | SCFmw-003 | 4/25/2019 | 8.67 |
| RVAAP-66 Facility-wide Groundwater | SCFmw-004 | 4/25/2019 | -0.03 |
| RVAAP-66 Facility-wide Groundwater | SCFmw-005 | 4/29/2019 | 9.20 |
| RVAAP-66 Facility-wide Groundwater | SCFmw-006 | 4/29/2019 | 16.35 |
| RVAAP-66 Facility-wide Groundwater | BKGmw-004 | 4/29/2019 | 11.80 |
| RVAAP-66 Facility-wide Groundwater | BKGmw-005 | 4/24/2019 | 10.73 |
| RVAAP-66 Facility-wide Groundwater | BKGmw-006 | 4/24/2019 | 23.72 |
| RVAAP-66 Facility-wide Groundwater | BKGmw-008 | 4/25/2019 | 16.58 |
| RVAAP-66 Facility-wide Groundwater | BKGmw-010 | 4/25/2019 | 14.54 |
| RVAAP-66 Facility-wide Groundwater | BKGmw-012 | 4/29/2019 | 7.40 |
| RVAAP-66 Facility-wide Groundwater | BKGmw-013 | 4/24/2019 | 11.76 |
| RVAAP-66 Facility-wide Groundwater | BKGmw-015 | 4/24/2019 | 48.78 |
| RVAAP-66 Facility-wide Groundwater | BKGmw-016 | 4/24/2019 | 5.82 |
| RVAAP-66 Facility-wide Groundwater | BKGmw-017 | 4/24/2019 | 17.24 |
| RVAAP-66 Facility-wide Groundwater | BKGmw-018 | 4/24/2019 | 15.70 |
| RVAAP-66 Facility-wide Groundwater | BKGmw-019 | 4/24/2019 | 20.83 |
| RVAAP-66 Facility-wide Groundwater | BKGmw-020 | 4/23/2019 | 7.46 |
| RVAAP-66 Facility-wide Groundwater | BKGmw-021 | 4/29/2019 | 11.52 |
| RVAAP-66 Facility-wide Groundwater | BKGmw-022 | 4/24/2019 | 14.23 |
| RVAAP-66 Facility-wide Groundwater | BKGmw-023 | 4/24/2019 | 4.80 |
| RVAAP-66 Facility-wide Groundwater | BKGmw-024 | 4/24/2019 | 10.59 |
| RVAAP-66 Facility-wide Groundwater | BKGmw-025 | 4/24/2019 | 41.70 |

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# APPENDIX B

## Summary of Groundwater Monitoring Well Conditions and Repair Recommendations

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**RVAAP Facility-Wide Monitoring Well Conditions**
**April 2019**

| Well ID | Date Gauged | Repairs Needed |
|---|---|---|
| ASYmw-001 | 04/24/19 | The guard posts are heavily rusted. The well paint and ID are in good condition. |
| ASYmw-002 | 04/24/19 | The guard posts have minor rust. The well paint and ID are in good condition. |
| ASYmw-003 | 04/24/19 | The guard posts are heavily rusted. The well paint is in good condition, but the ID is fading. |
| ASYmw-004 | 04/24/19 | The guard posts are heavily rusted. The well paint is in good condition, but the ID is fading. |
| ASYmw-005 | 04/24/19 | The guard posts are heavily rusted. The well paint is in good condition, but the ID is not visible. The well pad is loose from freeze/thaw. |
| ASYmw-006 | 04/24/19 | The guard posts are heavily rusted. The well paint is in good condition, but the ID is starting to fade. |
| ASYmw-007 | 04/24/19 | The guard posts are heavily rusted. The well paint and ID are in good condition. |
| ASYmw-008 | 04/24/19 | The guard posts are heavily rusted. The well paint is in good condition, but the ID is faded and barely visible. |
| ASYmw-009 | 04/24/19 | The guard posts are heavily rusted. The well paint is in good condition, but the ID is faded and hard to read. |
| ASYmw-010 | 04/24/19 | The guard posts are heavily rusted. The well paint is in good condition, but the ID is starting to fade. |
| B12mw-010 | 04/25/19 | The guard posts are heavily rusted and leaning. The well paint is in good condition, but the ID is faded and hard to read. |
| B12mw-011 | 04/25/19 | The guard posts are heavily rusted. The well paint is in good condition, but the ID is very slightly faded. |
| B12mw-012 | 04/25/19 | The guard posts have moderate rust. The well paint is in good condition, but the full ID is not visible. The AOC ID looks to have been repainted, but the well number has not been repainted. |
| B12mw-013 | 04/25/19 | The well is in good condition; no issues. |
| BKGmw-004 | 04/29/19 | The guard posts and well paint show minor rust. The ID is not visible. |
| BKGmw-005 | 04/24/19 | The guard posts and well paint show minor rust. The ID is very slightly faded. |
| BKGmw-006 | 04/24/19 | The guard posts and well paint show minor rust. The ID is in good condition. |
| BKGmw-008 | 04/25/19 | The guard posts and well paint show minor rust. The ID is beginning to fade. |
| BKGmw-010 | 04/25/19 | The guard posts and well paint show moderate rust. The ID is faded. The hinge on the well lid is broken and cannot be secured. |
| BKGmw-012 | 04/29/19 | The guard posts and well paint show very minor rusting. The ID is in good condition. |
| BKGmw-013 | 04/24/19 | The guard posts and well paint show very minor rusting. The ID is in good condition. The hinge on the well lid is broken and cannot be secured. The compression cap was installed on 4/25/19. |
| BKGmw-015 | 04/24/19 | The guard posts and well paint show moderate rust. The ID is faded. |
| BKGmw-016 | 04/24/19 | The guard posts and well paint show minor rusting. The ID is beginning to fade. The hinge on the well lid is broken and cannot be secured. |

**RVAAP Facility-Wide Monitoring Well Conditions**
**April 2019**

| Well ID | Date Gauged | Repairs Needed |
|---|---|---|
| BKGmw-017 | 04/24/19 | The guard posts and well paint show minor rusting. The ID is faded and hard to read. |
| BKGmw-018 | 04/24/19 | The guard posts and well paint show minor rusting. The ID is in good condition. |
| BKGmw-019 | 04/24/19 | The guard posts and well paint show very minor rusting. The ID is in good condition. The hinge on the well lid is broken and cannot be secured. |
| BKGmw-020 | 04/23/19 | The guard posts and well paint show very minor rusting. The ID is in good condition. |
| BKGmw-021 | 04/29/19 | The guard posts and well paint show minor rusting. The ID is faded and hard to read. |
| BKGmw-022 | 04/24/19 | The well is in good condition; the ID needs to be painted on. |
| BKGmw-023 | 04/24/19 | The well is in good condition; the ID needs to be painted on. |
| BKGmw-024 | 04/24/19 | The well is in good condition; the ID needs to be painted on. |
| BKGmw-025 | 04/24/19 | The well is in good condition; the ID needs to be painted on. |
| CBLmw-001 | 04/24/19 | The guard posts show moderate to heavy rusting. The well paint and ID are in good condition. |
| CBLmw-002 | 04/24/19 | The guard posts show heavy rusting. The well paint and ID are in good condition. |
| CBLmw-003 | 04/24/19 | The guard posts show heavy rusting. The well paint and ID are in good condition. |
| CBLmw-004 | 04/24/19 | The guard posts show moderate rusting. The well paint and ID are in good condition. |
| CBLmw-005 | 04/24/19 | The well is in good condition; no issues. |
| CBPmw-001 | 04/23/19 | The guard posts and well paint show minor rusting. The ID is faded and hard to read. |
| CBPmw-002 | 04/23/19 | The guard posts and well paint show minor rusting. The ID is faded and hard to read. |
| CBPmw-003 | 04/23/19 | The guard posts and well paint show minor rusting. The ID is faded and hard to read. |
| CBPmw-004 | 04/23/19 | The guard posts and well paint show minor rusting. The ID is faded and hard to read. |
| CBPmw-005 | 04/23/19 | The guard posts and well paint show minor rusting. The ID is faded and hard to read. |
| CBPmw-006 | 04/23/19 | The guard posts and well paint show minor rusting. The ID is showing minor fading. |
| CBPmw-007 | 04/23/19 | The guard posts and well paint show minor rusting. The ID is faded and hard to read. |
| CBPmw-008 | 04/23/19 | The guard posts and well paint show minor rusting. The ID is faded and hard to read. |
| CBPmw-009 | 04/23/19 | The well is in good condition. The paint is white (incorrect color). |
| CPmw-001 | 04/25/19 | The well is in good condition; no issues. |
| CPmw-002 | 04/29/19 | The guard posts show minor rusting. The ID is in good condition. |
| CPmw-003 | 04/25/19 | The guard posts show moderate rusting. The ID is in fair condition. Flush mount well; the bolt holders are stripped and the lid cannot be secured. |
| CPmw-004 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is faded and hard to read. |
| CPmw-005 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is faded and not visible. |

**RVAAP Facility-Wide Monitoring Well Conditions**
**April 2019**

| Well ID | Date Gauged | Repairs Needed |
|---|---|---|
| CPmw-006 | 04/25/19 | The guard posts and well paint show moderate rusting. The ID is faded and not visible. |
| DA1tw-001 | 04/24/19 | N/A – The temporary well was installed in October 2018. |
| DA2mw-104 | 04/23/19 | The guard posts and well paint show minor rust. The ID is faded. |
| DA2mw-105 | 04/23/19 | The guard posts and well paint show minor rusting. The ID is in good condition. |
| DA2mw-106 | 04/23/19 | The guard posts and well paint show minor rusting. The ID is in good condition. |
| DA2mw-107 | 04/23/19 | The guard posts and well paint show minor rusting. The ID is in good condition. |
| DA2mw-108 | 04/23/19 | The guard posts and well paint show minor rusting. The ID is hard to read due to paint chipping. |
| DA2mw-109 | 04/23/19 | The guard posts and well paint show minor rust. The ID is in good condition. The well pad is elevated off of the ground due to frost heave. |
| DA2mw-110 | 04/23/19 | The paint and ID are in good condition. The well pad is raised off of the ground due to frost heave. |
| DA2mw-111 | 04/23/19 | The guard posts and well paint show minor rusting. The ID is hard to read due to paint chipping. The well pad is elevated due to frost heave. |
| DA2mw-112 | 04/23/19 | The guard post and well paint are in good condition. There is slight paint chipping around the ID. |
| DA2mw-113 | 04/23/19 | The guard post and well paint are in good condition. There is paint chipping around the ID. |
| DA2mw-114 | 04/23/19 | The well is in good condition. The paint is white (incorrect color). |
| DA2mw-115 | 04/23/19 | The well is in good condition. The paint is white (incorrect color). |
| DET-001B | 04/23/19 | The guard posts and well paint show minor rusting. The ID is in good condition. The well pad is elevated due to frost heave. |
| DET-002 | 04/23/19 | The guard posts and well paint show moderate rusting. The ID is in good condition. One guard post is leaning. |
| DET-003 | 04/23/19 | The guard posts and well paint show moderate rusting. The ID is faded and not visible. |
| DET-004 | 04/23/19 | The guard posts and well paint show moderate rusting. The ID is in good condition. |
| EBGmw-123 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is beginning to fade. |
| EBGmw-124 | 04/25/19 | The well is in good condition; no issues. |
| EBGmw-125 | 04/25/19 | The well is in good condition; the ID is beginning to fade. |
| EBGmw-126 | 04/25/19 | The guard posts and well paint show very minor rusting. The ID is faded and hard to read. Some posts are leaning. |
| EBGmw-127 | 04/25/19 | The well is in good condition; no issues. |
| EBGmw-128 | 04/25/19 | The ID is slightly faded; no other issues. |
| EBGmw-129 | 04/25/19 | The guard posts show minor rusting. The ID is in good condition. |
| EBGmw-130 | 04/25/19 | The well is in good condition; the ID is beginning to fade. |
| EBGmw-131 | 04/25/19 | The paint is in good condition; there is a crack in the well pad. |
| FBQmw-166 | 04/24/19 | The guard posts and well paint are in good condition. The ID is faded and not visible. |
| FBQmw-167 | 04/24/19 | The guard posts and well paint are in good condition. The ID is faded and not visible. |

**RVAAP Facility-Wide Monitoring Well Conditions**
**April 2019**

| Well ID | Date Gauged | Repairs Needed |
|---|---|---|
| FBQmw-168 | 04/24/19 | The well is in good condition; no issues. |
| FBQmw-169 | 04/24/19 | The paint is in good condition. The well pad is elevated due to frost heave. |
| FBQmw-170 | 04/24/19 | The guard posts and well paint are in good condition. The ID is faded and not visible. |
| FBQmw-171 | 04/24/19 | The guard posts and well paint are in good condition. The ID is faded. |
| FBQmw-172 | 04/24/19 | The guard posts and well paint are in good condition. The ID is faded and not visible. |
| FBQmw-173 | 04/24/19 | The guard posts and well paint are in good condition. The ID is faded. |
| FBQmw-174 | 04/24/19 | The guard posts and well paint are in good condition. The ID is faded. |
| FBQmw-175 | 04/24/19 | The paint is in good condition. The well cap does not sit flush with the top of the PVC (can't be pushed down). |
| FBQmw-176 | 04/24/19 | The well is in good condition; no issues. |
| FBQmw-177 | 04/24/19 | The guard posts and well paint are in good condition. The ID is faded and not visible. |
| FWGmw-001 | 04/29/19 | The well is in good condition. The paint is white (incorrect color). |
| FWGmw-002 | 04/29/19 | The well is in good condition. The paint is white (incorrect color). |
| FWGmw-003 | 04/24/19 | The guard posts and well paint show moderate rusting. The ID is in good condition. |
| FWGmw-004 | 04/29/19 | The guard post paint is in good condition. Minor chipping on the well paint around the ID has occurred. |
| FWGmw-005 | 04/24/19 | The well is in good condition; no issues. |
| FWGmw-006 | 04/24/19 | The guard posts and well paint show minor rusting/chipping. Chipping near the ID makes it hard to read. |
| FWGmw-007 | 04/24/19 | The guard post paint is in in good condition. Chipping near the well ID makes it hard to read. The well pad has a hairline crack. |
| FWGmw-008 | 04/24/19 | The guard posts and well paint show minor chipping/rusting. The ID is in good condition, but may be affected by surrounding chipping. |
| FWGmw-009 | 04/24/19 | The guard posts show minor rusting, and moderate rusting/chipping on the well paint has occurred. The ID is visible but affected by surrounding paint chipping. |
| FWGmw-010 | 04/25/19 | The guard posts are in good condition. The well paint is heavily rusted/chipped. The ID is not visible. |
| FWGmw-011 | 04/25/19 | The guard posts and well show minor rust/chipping. The paint is white (incorrect color). |
| FWGmw-012 | 04/25/19 | The well is in good condition. The paint is white (incorrect color). |
| FWGmw-013 | 04/23/19 | The paint is in good condition; the well pad is cracked. |
| FWGmw-014 | 04/24/19 | The well is in good condition. The paint is white (incorrect color). |
| FWGmw-015 | 04/29/19 | The well is in good condition; minor rust/chipping on the well has occurred. |
| FWGmw-016 | 04/29/19 | The well is in good condition; minor fading on the ID has occurred. |
| FWGmw-018 | 04/24/19 | The well is in good condition; the ID needs to be painted on. |
| FWGmw-019 | 04/24/19 | The well is in good condition; the ID needs to be painted on. |
| FWGmw-020 | 04/24/19 | The well is in good condition; the ID needs to be painted on. |
| FWGmw-021 | 04/24/19 | The well is in good condition; the ID needs to be painted on. |

**RVAAP Facility-Wide Monitoring Well Conditions**
**April 2019**

| Well ID | Date Gauged | Repairs Needed |
|---|---|---|
| FWGmw-022 | 04/24/19 | The well is in good condition; the ID needs to be painted on. |
| FWGmw-023 | 04/23/19 | The well is in good condition; the ID needs to be painted on. |
| FWGmw-024 | 04/24/19 | The well is in good condition; the ID needs to be painted on. |
| LL1mw-063 | 04/25/19 | The guard posts show moderate rusting; the well paint is in good condition. The ID is faded and hard to read. |
| LL1mw-064 | 04/25/19 | The guard posts show moderate rusting. The well paint and ID are in good condition. |
| LL1mw-065 | 04/25/19 | The guard posts show moderate rusting. The well paint is in good condition, but the ID is faded. |
| LL1mw-067 | 04/25/19 | The guard posts show moderate rusting. The well paint is in good condition, but the ID is faded. |
| LL1mw-078 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is faded. |
| LL1mw-079 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is in good condition. |
| LL1mw-080 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is faded. |
| LL1mw-081 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is faded. |
| LL1mw-082 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is faded. |
| LL1mw-083 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is faded. |
| LL1mw-084 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is faded. |
| LL1mw-085 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is faded. |
| LL1mw-086 | 04/25/19 | The well is in good condition; no issues. |
| LL1mw-087 | 04/25/19 | The guard posts are in good condition. Rust/chipping on the well paint makes the ID hard to read. |
| LL1mw-088 | 04/25/19 | The guard posts are in good condition. The well is not painted and no ID is present. |
| LL1mw-089 | 04/25/19 | The well is in good condition, but the ID needs to be painted on. |
| LL2mw-059 | 04/25/19 | The guard posts show minor to moderate rusting. The well paint and ID are in good condition. |
| LL2mw-060 | 04/25/19 | The well is in good condition; no issues. |
| LL2mw-261 | 04/29/19 | The guard posts and well paint show minor rusting. The ID is slightly faded. |
| LL2mw-262 | 04/29/19 | The guard posts and well paint show minor rusting. The ID is slightly faded. |
| LL2mw-263 | 04/29/19 | The guard posts and well paint show minor rusting. The ID is slightly faded. |
| LL2mw-264 | 04/29/19 | The guard posts show minor rusting. The well paint is moderately to heavily rusting/chipping, and the ID is not visible. |
| LL2mw-265 | 04/29/19 | The guard posts and well paint show minor rusting. The ID is faded. |
| LL2mw-266 | 04/29/19 | The guard posts and well paint show minor rusting. The ID is faded. |
| LL2mw-267 | 04/29/19 | The guard posts and well paint show minor rusting. The ID is faded. One guard post is leaning. |

**RVAAP Facility-Wide Monitoring Well Conditions**
**April 2019**

| Well ID | Date Gauged | Repairs Needed |
|---|---|---|
| LL2mw-268 | 04/29/19 | The guard posts and well paint show minor rusting. The ID is slightly faded. |
| LL2mw-269 | 04/29/19 | The guard posts and well paint show minor rusting. The ID is slightly faded. |
| LL2mw-270 | 04/29/19 | The guard posts and well paint show minor rusting. The ID is faded and not visible. |
| LL2mw-271 | 04/29/19 | The guard posts are in good condition. The well casing is not painted and there is no ID. |
| LL2mw-272 | 04/29/19 | The well is in good condition, but the ID needs to be painted on. |
| LL3mw-232 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is slightly faded. |
| LL3mw-233 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is slightly faded. |
| LL3mw-234 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is faded and hard to read. The well lid is cracked but can be closed and secured. |
| LL3mw-235 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is starting to fade. |
| LL3mw-236 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is faded and hard to read. |
| LL3mw-237 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is faded and hard to read. One post is leaning over. |
| LL3mw-238 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is faded and hard to read. |
| LL3mw-239 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is faded. |
| LL3mw-240 | 04/25/19 | The well is in good condition; no issues. |
| LL3mw-241 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is faded and hard to read. |
| LL3mw-242 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is faded and hard to read. |
| LL3mw-243 | 04/25/19 | The well is in good condition; no issues. |
| LL3mw-244 | 04/25/19 | The well is in good condition; white paint (incorrect color). |
| LL3mw-245 | 04/25/19 | The well is in good condition; no issues. |
| LL3mw-246 | 04/24/19 | The guard posts show minor rusting. The well casing is not painted, and there is no ID. |
| LL4mw-193 | 04/25/19 | The guard posts and well show minor rusting. The ID is beginning to fade. |
| LL4mw-194 | 04/25/19 | The guard posts and well show minor rusting. The ID is beginning to fade. |
| LL4mw-195 | 04/25/19 | The well was repainted during the April 2019 event; good condition. |
| LL4mw-196 | 04/25/19 | The guard posts and well show minor rusting. The ID is beginning to fade. |
| LL4mw-197 | 04/25/19 | The guard posts and well show minor rusting. The ID is beginning to fade. |
| LL4mw-198 | 04/25/19 | The guard posts and well show moderate rusting. The ID is beginning to fade. |
| LL4mw-199 | 04/25/19 | The guard posts and well show minor rusting. The ID is beginning to fade. |

**RVAAP Facility-Wide Monitoring Well Conditions**
**April 2019**

| Well ID | Date Gauged | Repairs Needed |
|---|---|---|
| LL4mw-200 | 04/25/19 | The well was repainted during the April 2019 event; the well is in good condition. |
| LL4mw-201 | 04/25/19 | The guard posts and well show minor rusting. The ID is beginning to fade. |
| LL5mw-001 | 04/24/19 | The guard posts show heavy rusting. The well paint is in good condition, but the ID is faded. |
| LL5mw-002 | 04/24/19 | The guard posts show moderate rusting. The well paint is in good condition, but the ID is faded. |
| LL5mw-003 | 04/24/19 | The guard posts show heavy rusting. The well paint is in good condition, but the ID is faded. |
| LL5mw-004 | 04/24/19 | The guard posts show heavy rusting. The well paint is in good condition, but the ID is faded. |
| LL5mw-005 | 04/24/19 | The guard posts show heavy rusting. The well paint is in good condition, but the ID is faded. |
| LL5mw-006 | 04/24/19 | The guard posts show moderate rusting. The well paint is in good condition, but the ID is faded. |
| LL6mw-001 | 04/24/19 | The guard posts show heavy rusting, but the ID is still visible on one post. Flush mount well; one bolt holder is missing, but the well can still be secured. |
| LL6mw-002 | 04/24/19 | The guard posts and well show heavy rusting. The ID has been rusted over and is not visible. |
| LL6mw-003 | 04/24/19 | The guard posts and well show moderate rusting. The ID has been rusted over. |
| LL6mw-004 | 04/24/19 | The guard posts and well show moderate rusting. The ID is in good condition. |
| LL6mw-005 | 04/24/19 | The guard posts and well show moderate rusting. The ID has been rusted over. |
| LL6mw-006 | 04/24/19 | The guard posts show heavy rusting, but the ID is still visible on one post. Flush mount well. |
| LL6mw-007 | 04/24/19 | The guard posts show heavy rusting, but the ID is still visible on one post. Flush mount well; one bolt holder is stripped and the other is missing. The well cannot be secured. |
| LL6mw-008 | 04/24/19 | The well is in good condition; no issues. |
| LL6mw-009 | 04/24/19 | The well is in good condition; no issues. |
| LL7mw-001 | 04/23/19 | The guard posts show heavy to moderate rusting, but the well paint is in good condition. The ID is faded and not visible. |
| LL7mw-002 | 04/23/19 | The guard posts show heavy rusting, but the well paint is in good condition. The ID is faded and not visible. |
| LL7mw-003 | 04/23/19 | The guard posts show moderate rusting, but the well paint is in good condition. The ID is faded and not visible. |
| LL7mw-004 | 04/23/19 | The guard posts show moderate rusting, but the well paint is in good condition. The ID is faded and not visible. |
| LL7mw-005 | 04/23/19 | The guard posts show heavy to moderate rusting, but the well paint is in good condition. The ID is faded and hard to read. |
| LL7mw-006 | 04/23/19 | The guard posts show heavy to moderate rusting, but the well paint is in good condition. The ID is faded and hard to read. |
| LL8mw-001 | 04/23/19 | The guard posts show heavy to moderate rusting, but the well paint is in good condition. The ID is in good condition. |
| LL8mw-002 | 04/24/19 | The guard posts show heavy to moderate rusting, but the well paint is in good condition. The ID is faded and not visible. |

**RVAAP Facility-Wide Monitoring Well Conditions**
**April 2019**

| Well ID | Date Gauged | Repairs Needed |
|---|---|---|
| LL8mw-003 | 04/24/19 | The guard posts show moderate rusting, but the well paint is in good condition. The ID is starting to fade. The well pad is cracked. The well casing has two dent marks. |
| LL8mw-004 | 04/24/19 | The guard posts show moderate rusting, but the well paint is in good condition. The ID is starting to fade. |
| LL8mw-005 | 04/24/19 | The guard posts show heavy rusting, but the well paint is in good condition. The ID is faded and not visible. One post is leaning over. The well pad is cracked. |
| LL8mw-006 | 04/24/19 | The guard posts show moderate rusting, but the well paint is in good condition. Half of the ID is faded and not visible. The well pad is cracked. |
| LL9mw-001 | 04/24/19 | The guard posts and well paint show moderate rusting. The ID is visible on one post but rusted over on the casing. One post is leaning over. |
| LL9mw-002 | 04/24/19 | The guard posts show minor to moderate rusting. The ID is rusted over. One post is leaning over. |
| LL9mw-003 | 04/24/19 | The guard posts and well paint show minor rusting. The ID is faded and not visible. |
| LL9mw-004 | 04/24/19 | The guard posts and well paint show moderate rusting. The ID is rusted over. |
| LL9mw-005 | 04/24/19 | The guard posts and well paint show moderate rusting. The ID is rusted over. |
| LL9mw-006 | 04/24/19 | The guard posts and well paint show moderate rusting. The ID is rusted over. |
| LL9mw-007 | 04/24/19 | The guard posts show minor rusting. The ID on the post is faded and not visible. Flush mount well. |
| LL10mw-001 | 04/24/19 | The guard posts show severe rusting, but the well paint is in good condition. The ID is faded and not visible. |
| LL10mw-002 | 04/24/19 | The guard posts show moderate rusting, but the well paint is in good condition. The ID is faded and not visible. |
| LL10mw-003 | 04/24/19 | The guard posts show severe rusting, but the well paint is in good condition. The ID is faded and not visible. |
| LL10mw-004 | 04/24/19 | The guard posts show moderate rusting, but the well paint is in good condition. The ID is faded and not visible. |
| LL10mw-005 | 04/24/19 | The guard posts show severe rusting, but the well paint is in good condition. The ID is faded and not visible. |
| LL10mw-006 | 04/24/19 | The guard posts show severe rusting, but the well paint and ID are in good condition. The well pad is cracked. |
| LL11mw-001 | 04/23/19 | The guard posts and well paint show minor rusting. The ID is faded. |
| LL11mw-002 | 04/23/19 | The guard posts show moderate rusting. The ID is faded and not visible. Flush mount well; both bolt holders are stripped and the lid cannot be secured. |
| LL11mw-003 | 04/23/19 | The guard posts show minor rusting. The ID is faded and not visible. |

**RVAAP Facility-Wide Monitoring Well Conditions**
**April 2019**

| Well ID | Date Gauged | Repairs Needed |
|---|---|---|
| LL11mw-004 | 04/23/19 | The guard posts show minor to moderate rusting, but the ID is in good condition. Flush mount well; the bolt holders are broken off and the lid cannot be secured. |
| LL11mw-005 | 04/23/19 | The guard posts show moderate rusting, but the ID is in okay condition. Flush mount well; one of the bolts is too small, but the lid can be secured. |
| LL11mw-006 | 04/23/19 | The guard posts show minor to moderate rusting, and the ID is faded and hard to read. |
| LL11mw-007 | 04/23/19 | The guard posts and well paint show minor rusting/chipping. The ID is in good condition. The well pad is cracked. |
| LL11mw-008 | 04/23/19 | The guard posts show minor to moderate rusting, and the ID is faded and hard to read. Flush mount well; both bolt holders are stripped and the lid cannot be secured. |
| LL11mw-009 | 04/23/19 | The guard posts show moderate rusting, and the ID is painted on the post and is fading. The well casing is not painted. |
| LL11mw-010 | 04/23/19 | The guard posts and well paint show minor rusting. The ID is faded and hard to read. |
| LL11mw-011 | 04/23/19 | The well is in good condition; no issues. |
| LL11mw-012 | 04/23/19 | All paint is in good condition. The well pad is cracked. |
| LL12mw-088 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is in good condition. |
| LL12mw-107 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is fading. |
| LL12mw-113 | 04/25/19 | The guard posts and well paint are in good condition. The ID is fading. |
| LL12mw-128 | 04/25/19 | The guard posts show minor rusting. The well paint and ID are in good condition. |
| LL12mw-153 | 04/25/19 | The guard posts show minor rusting. The well paint and ID are in good condition. |
| LL12mw-154 | 04/25/19 | The guard posts show minor rusting. The well paint and ID are in good condition. |
| LL12mw-182 | 04/25/19 | The well appears to have been recently repainted and is in good condition. |
| LL12mw-182ss | 04/25/19 | The well appears to have been recently repainted and is in good condition. |
| LL12mw-183 | 04/25/19 | The guard posts show minor rusting. The well paint and ID are in good condition. |
| LL12mw-184 | 04/25/19 | The well is in good condition; no issues. |
| LL12mw-185 | 04/25/19 | The guard posts show minor rusting. The well paint and ID are in good condition. |
| LL12mw-186 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is in good condition. |
| LL12mw-187 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is in good condition. |
| LL12mw-188 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is in good condition. |
| LL12mw-189 | 04/25/19 | The guard posts and well paint show minor rusting. The ID is in good condition. |
| LL12mw-242 | 04/25/19 | The guard posts show moderate rusting, but the well paint is in good condition. The ID is fading. |

**RVAAP Facility-Wide Monitoring Well Conditions**
**April 2019**

| Well ID | Date Gauged | Repairs Needed |
|---|---|---|
| LL12mw-243 | 04/25/19 | The guard posts show moderate rusting. The well paint and ID are in good condition. |
| LL12mw-244 | 04/25/19 | The guard posts show moderate rusting. The well paint is in good condition, but the ID is faded. |
| LL12mw-245 | 04/25/19 | The guard posts show moderate rusting. The well paint and ID are in good condition. |
| LL12mw-246 | 04/25/19 | The guard posts show moderate rusting. The well paint is in good condition, but the ID is fading. |
| LL12mw-247 | 04/25/19 | The guard posts are in good condition. The well paint is showing moderate rust, and the ID is not visible. |
| LNWmw-024 | 04/23/19 | The guard posts show moderate rusting, but the well paint is in good condition. The ID is beginning to fade. |
| LNWmw-025 | 04/23/19 | The guard posts show moderate rusting, but the well paint is in good condition. The ID is beginning to fade. |
| LNWmw-026 | 04/23/19 | The guard posts show moderate rusting, but the well paint is in good condition. The ID is beginning to fade. |
| LNWmw-027 | 04/23/19 | The guard posts show moderate rusting, but the well paint is in good condition. The ID is beginning to fade. |
| MBS-001 | 04/24/19 | The guard posts and well paint are in good condition. The ID is faded. |
| MBS-002 | 04/24/19 | The guard posts and well paint are in good condition. The ID is faded. |
| MBS-003 | 04/24/19 | The guard posts and well paint are in good condition. The ID is faded. |
| MBS-004 | 04/24/19 | The guard posts and well paint are in good condition. The ID is faded. The well pad is raised due to frost heaving. |
| MBS-005 | 04/24/19 | The guard posts and well paint show moderate rusting. The ID is faded and not visible. |
| MBS-006 | 04/24/19 | The guard posts and well paint show moderate rusting. The ID is faded and not visible. |
| NTAmw-107 | 04/24/19 | The guard posts show moderate rusting. The well paint is in good condition, but the ID is fading. |
| NTAmw-108 | 04/24/19 | The guard posts show moderate rusting. The well paint is in good condition, but the ID is fading. |
| NTAmw-109 | 04/24/19 | The guard posts show moderate rusting. The well paint is in good condition, but the ID is fading. |
| NTAmw-110 | 04/24/19 | The guard posts show moderate rusting. The well paint is in good condition, but the ID is fading. |
| NTAmw-111 | 04/24/19 | The guard posts show moderate rusting. The well paint is in good condition, but the ID is fading. |
| NTAmw-112 | 04/24/19 | The guard posts show moderate rusting. The well paint is in good condition, but the ID is fading. One post is leaning over. |
| NTAmw-113 | 04/24/19 | The guard posts show moderate rusting. The well paint is in good condition, but the ID is fading. |
| NTAmw-114 | 04/24/19 | The guard posts show moderate rusting. The well paint is in good condition, but the ID is fading. |
| NTAmw-115 | 04/24/19 | The guard posts show moderate rusting. The well paint and ID are in good condition. |
| NTAmw-116 | 04/24/19 | The guard posts show moderate rusting. The well paint and ID are in good condition. |

**RVAAP Facility-Wide Monitoring Well Conditions**
**April 2019**

| Well ID | Date Gauged | Repairs Needed |
|---|---|---|
| NTAmw-117 | 04/24/19 | The guard posts show moderate rusting. The well paint is in good condition, but the ID is faded. |
| NTAmw-118 | 04/24/19 | The guard posts show moderate rusting. The well paint is in good condition, but the ID is fading. |
| NTAmw-119 | 04/24/19 | The guard posts are in good condition. The well paint is moderately rusted/chipped, and the ID is not visible. The well pad is cracked. |
| NTAmw-120 | 04/24/19 | The well is in good condition; the ID needs to be painted on. |
| RQLmw-006 | 04/29/19 | The guard posts are in good condition. The well paint is showing minor rust, and the ID is faded. |
| RQLmw-007 | 04/29/19 | No guard posts. The well paint is showing minor rust, and the ID is fading. |
| RQLmw-008 | 04/29/19 | No guard posts. The well paint is showing minor rust, and the ID is fading. |
| RQLmw-009 | 04/29/19 | No guard posts. The well paint is showing minor rust, and the ID is fading. |
| RQLmw-010 | 04/29/19 | The guard posts and well paint show minor rusting. The ID is in good condition. |
| RQLmw-011 | 04/29/19 | The guard posts and well paint show minor rusting. The ID is fading. The well pad is cracked. |
| RQLmw-012 | 04/29/19 | The guard posts and well paint show minor rusting. The ID is fading. |
| RQLmw-013 | 04/29/19 | The well is in good condition; no issues. |
| RQLmw-014 | 04/29/19 | The guard posts and well paint show very minor rusting. The ID is fading. |
| RQLmw-015 | 04/29/19 | The guard posts show minor rusting. The well paint and ID are in good condition. |
| RQLmw-016 | 04/29/19 | The guard posts show minor rusting. The well paint and ID are in good condition. |
| RQLmw-017 | 04/29/19 | The well is in good condition; no issues. |
| SCFmw-001 | 04/25/19 | The well is in good condition; no issues. |
| SCFmw-002 | 04/25/19 | The guard posts show minor rusting. The well paint and ID are in good condition. |
| SCFmw-003 | 04/25/19 | The well is in good condition; the ID needs to be painted on. |
| SCFmw-004 | 04/25/19 | The guard posts and well paint show moderate to heavy rusting. The ID is no longer visible. |
| SCFmw-005 | 04/29/19 | The guard posts show moderate rusting. The well paint is in good condition, but the ID is fading. |
| SCFmw-006 | 04/29/19 | The guard posts show minor rusting. The well paint and ID are in good condition. |
| SCLmw-001 | 04/23/19 | The well is in good condition; the ID needs to be painted on. |
| SCLmw-002 | 04/23/19 | The well is in good condition; the ID needs to be painted on. |
| SCLmw-003 | 04/23/19 | The well is in good condition; the ID needs to be painted on. |
| WBGmw-005 | 04/23/19 | The guard posts and well paint show minor rusting. The ID is fading. The hinge on the well lid is broken and cannot be secured. |
| WBGmw-006 | 04/23/19 | The guard posts and well paint show minor rusting. The ID is fading. |
| WBGmw-007 | 04/23/19 | The guard posts and well paint are in good condition. The ID is faded and not visible. |
| WBGmw-008 | 04/23/19 | The guard posts and well paint are in good condition. The ID is faded and not visible. |

**RVAAP Facility-Wide Monitoring Well Conditions**
**April 2019**

| Well ID | Date Gauged | Repairs Needed |
|---|---|---|
| WBGmw-009 | 04/23/19 | The guard posts and well paint are in good condition. The ID is fading. The hinge on the well lid is broken and cannot be secured. |
| WBGmw-010 | 04/23/19 | The guard posts and well paint show moderate rusting. The ID is still in good condition. The well pad is raised from frost heave. |
| WBGmw-011 | 04/23/19 | The guard posts and well paint are in good condition. The ID is faded and hard to read. The well pad is raised from frost heave. |
| WBGmw-012 | 04/23/19 | The guard posts and well paint show minor to moderate rusting. The ID is not visible. One post is leaning over. |
| WBGmw-013 | 04/23/19 | The guard posts and well paint show moderate rusting. The ID is not visible. |
| WBGmw-014 | 04/23/19 | The guard posts show moderate rusting. The ballistic steel casing is in good condition, but the ID is faded and not visible. The well pad is raised due to frost heave. |
| WBGmw-015 | 04/23/19 | The guard posts show moderate rusting. The ballistic steel casing is in good condition, but the ID is faded and not visible. The well pad is raised due to frost heave. |
| WBGmw-016 | 04/23/19 | The guard posts and well paint show moderate to heavy rusting. The ID is no longer visible. |
| WBGmw-017 | 04/23/19 | The guard posts and well paint show moderate to heavy rusting. The ID is no longer visible. The well pad is raised due to frost heave. |
| WBGmw-018 | 04/23/19 | The well casing is painted white (incorrect color). The ID is not readable. The well pad is cracked. |
| WBGmw-019 | 04/23/19 | The well casing is painted white (incorrect color). The ID is not present on the well pad. The well pad is cracked. |
| WBGmw-020 | 04/23/19 | The well casing is painted white (incorrect color). |
| WBGmw-021 | 04/23/19 | The well casing is painted white (incorrect color). |

# APPENDIX C

# Field Change Requests

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# FIELD CHANGE REQUEST

FIELD CHANGE REQUEST NO.: LEIDOS_FWGW_001
PROJECT: Groundwater Investigation and Reporting Services, RVAAP Restoration Program
CONTRACT NUMBER: W912QR-16-D-0003, Delivery Order W912QR-18-F-0337
BRIEF DESCRIPTION: Monitoring Well Total Depth Collection

REQUESTOR IDENTIFICATION
NAME/TITLE: Jed Thomas, Deputy Project Manager ORGANIZATION: Leidos
PHONE: 330-405-5802

SIGNATURE 10/4/18 DATE

BASELINE IDENTIFICATION
BASELINE(S) AFFECTED ☐ Cost ☐ Scope ☐ Milestone ☒ Method of Accomplishment

AFFECTED DOCUMENT (TITLE, NUMBER AND SECTION):
Final Remedial Investigation Work Plan for Groundwater and Environmental Investigation Services for RVAAP-66 Facility-wide Groundwater (RI Work Plan)
Section 3.8 Monitoring Well Network Review

DESCRIPTION OF CHANGE:
Section 3.8 of the RI Work Plan specifies that total well depths will be measured during the annual, comprehensive water level measurements at each monitoring well within Camp Ravenna. However, permanent bladder pumps have been placed in monitoring wells. Therefore, total depths of the wells will not be collected during the comprehensive water level measurements for each well within the network.

JUSTIFICATION:
Removal of the permanent bladder pumps during the comprehensive annual water level measurement activity may disturb the groundwater within the monitoring well prior to sampling.

IMPACT OF NOT IMPLEMENTING REQUEST:
See justification.

PARTICIPANTS AFFECTED BY IMPLEMENTING REQUEST:
Leidos field teams.

COST ESTIMATE: $0 (No cost impact to USACE)

Estimator Signature: Not applicable DATE

PREVIOUS FCR AFFECTED ☐ YES ☒ NO; IF YES, FCR NO.

APPROVAL SIGNATURES:

USACE Representative TRUMBLE.JAMES.NAPOLEON.III.1207239727 Digitally signed by TRUMBLE.JAMES.NAPOLEON.III.1207239727 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=TRUMBLE.JAMES.NAPOLEON.III.1207239727 Date: 2018.10.10 09:26:27 -04'00' 10 Oct 2018 DATE

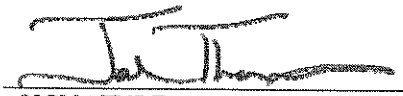
Ohio EPA Project Coordinator [signature] 11-7-18 DATE

Leidos H&S Manager (if applicable) Not applicable DATE

# FIELD CHANGE REQUEST

FIELD CHANGE REQUEST NO.: LEIDOS_FWGW_004
PROJECT: Groundwater Investigation and Reporting Services, RVAAP Restoration Program
CONTRACT NUMBER: W912QR-16-D-0003, Delivery Order W912QR-18-F-0337
BRIEF DESCRIPTION: Groundwater Quality Control (QC) Sampling Frequency

REQUESTOR IDENTIFICATION
NAME/TITLE: Jed Thomas, Deputy Project Manager ORGANIZATION: Leidos
PHONE: 330-405-5802



SIGNATURE 10/4/18
DATE

BASELINE IDENTIFICATION
BASELINE(S) AFFECTED ☐ Cost ☐ Scope ☐ Milestone ☒ Method of Accomplishment

AFFECTED DOCUMENT (TITLE, NUMBER AND SECTION):
Final Remedial Investigation Work Plan for Groundwater and Environmental Investigation Services for RVAAP-66 Facility-wide Groundwater (RI Work Plan)

DESCRIPTION OF CHANGE:
Worksheet 20 of the RI Work Plan QAPP discusses the Field Quality Control Sample Summary. This section indicates that "The frequency and location of field quality control samples (e.g. field duplicates, MS/MSD samples, etc.) are specified in Section 3.0 of the WP."

However, Section 3.0 of the RI Work Plan does not discuss field quality control samples. For documentation purposes, below is what will be collected with respect to field quality control samples. This is consistent with the specifications provided in the Facility-wide Sampling and Analysis Plan.

- Field duplicate – collected at 10% frequency
- Split samples – collected at 10% frequency
- MS/MSD samples – collected at 5% frequency
- Equipment rinsate – not required due to use of dedicated equipment (e.g., in place bladder pumps).

JUSTIFICATION:
The justification for this field change request is to document and obtain concurrence of the frequency at which groundwater quality control samples will be collected and analyzed.

IMPACT OF NOT IMPLEMENTING REQUEST:
The impact of not implementing the request is potential disagreement regarding the quality control sample collection requirements.

PARTICIPANTS AFFECTED BY IMPLEMENTING REQUEST:
Leidos field teams and laboratory.

# FIELD CHANGE REQUEST

FIELD CHANGE REQUEST NO.: LEIDOS_FWGW_004
PROJECT: Groundwater Investigation and Reporting Services, RVAAP Restoration Program
CONTRACT NUMBER: W912QR-16-D-0003, Delivery Order W912QR-18-F-0337
BRIEF DESCRIPTION: Groundwater Quality Control (QC) Sampling Frequency

COST ESTIMATE: $0 (No cost impact to USACE)

| | | |
|---|---|---|
| Estimator Signature: | Not applicable | DATE |

PREVIOUS FCR AFFECTED ☐ YES ☒ NO; IF YES, FCR NO.

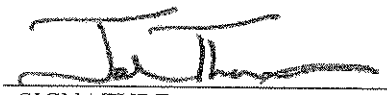
APPROVAL SIGNATURES:

| | | |
|---|---|---|
| USACE Representative | TRUMBLE.JAMES.NAPOLEON.III.1207239727 Digitally signed by TRUMBLE.JAMES.NAPOLEON.III.1207239727 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=TRUMBLE.JAMES.NAPOLEON.III.1207239727 Date: 2018.10.10 09:20:11 -04'00' | 10 Oct 2018 DATE |
| Ohio EPA Project Coordinator | [signature] | 11-7-18 DATE |
| Leidos H&S Manager (if applicable) | Not applicable | DATE |

# FIELD CHANGE REQUEST

FIELD CHANGE REQUEST NO.: LEIDOS_FWGW_006
PROJECT: Groundwater Investigation and Reporting Services, RVAAP Restoration Program
CONTRACT NUMBER: W912QR-16-D-0003, Delivery Order W912QR-18-F-0337
BRIEF DESCRIPTION: Micro-Purge Procedure

REQUESTOR IDENTIFICATION
NAME/TITLE: Jed Thomas, Deputy Project Manager ORGANIZATION: Leidos
PHONE: 330-405-5802



SIGNATURE 10/26/18
DATE

BASELINE IDENTIFICATION
BASELINE(S) AFFECTED ☐ Cost ☐ Scope ☐ Milestone ☒ Method of Accomplishment

AFFECTED DOCUMENT (TITLE, NUMBER AND SECTION):
Final Remedial Investigation Work Plan for Groundwater and Environmental Investigation Services for RVAAP-66 Facility-wide Groundwater (RI Work Plan)
Main Text: Section 3.7 2016 FWGW Monitoring Program and RI Groundwater Sampling
Appendix A: Sampling and Analysis Plan, Section 4.9.1 Micro-Purge Procedure

DESCRIPTION OF CHANGE:
Section 3.7 of the Main Text and Section 4.9.1 of Appendix A have some variances regarding the micro-purge procedure and stabilization parameters. This request is to document the micro-purge procedure to be implemented during groundwater sampling collected by micro-purging with dedicated bladder pumps.

Micro-purge Procedure
Step 1. Connect all applicable hoses at the surface.

Step 2. Turn the pump on and begin purging two times the amount of any stagnant water in the pump and tubing. (This purging does not represent a parameter for sampling.) For micro-purging, the pumping rate will not exceed 100 milliliters per minute (mL/min), unless it can be shown that higher purge rates (maximum of 500 mL/min) will not result in a drawdown greater than 0.3 ft. The pump rate is established once drawdown has been stabilized.

Step 3. After two times the amount of stagnant water has been purged from the pump and tubing and water level drawdown has been stabilized, begin recording water quality parameters every 3 to 5 minutes on tbe Groundwater Sample Form.

Step 4. Continue purging until water quality parameters have stabilized. Stabilization of water quality parameters is defined as three consecutive readings shown in Table 1.

Step 5. Collect sample immediately after micro-purging.

Additional Guidance
Minimum purging – A minimum of two times the volume of the pump and tubing quantity containing stagnant water must be purged.

Turbidity - If the turbidity cannot be reduced to less than or equal to 10 NTUs after 2 hours of purging and if all other parameters are stable, the well will be sampled.

Sample Collection for Metals - If turbidity is below 50 NTUs at the time of sampling, the sample collected for metals will not require filtering. If the turbidity cannot be brought below 50 NTUs, then both an unfiltered and a filtered sample will be collected for metals analysis, each in their own separate pre-preserved container. The unfiltered sample will be collected first. The filtered sample will be collected through a 5-micron filter.

# FIELD CHANGE REQUEST

FIELD CHANGE REQUEST NO.: LEIDOS_FWGW_006
PROJECT: Groundwater Investigation and Reporting Services, RVAAP Restoration Program
CONTRACT NUMBER: W912QR-16-D-0003, Delivery Order W912QR-18-F-0337
BRIEF DESCRIPTION: Micro-Purge Procedure

**Table 1. Water Quality Stabilization Requirements for Micro-purging**

| Water Quality Parameter | Stabilization Requirement |
|---|---|
| pH | ± 0.1 SU |
| Conductivity | ± 3% |
| ORP | ± 20mV |
| Turbidity | ≤ 10 NTU |
| DO | ± 10% or 0.2 mg/L (whichever is greater) |
| Temperature | ± 0.5 degC |

JUSTIFICATION:
Section 3.7 of the Main Text and Section 4.9.1 of Appendix A have some variances regarding the micro-purge procedure and stabilization parameters.

IMPACT OF NOT IMPLEMENTING REQUEST:
The field teams implementing micro-purge groundwater sampling may use different stabilization requirements for guidance regarding when a groundwater sample can be collected.

PARTICIPANTS AFFECTED BY IMPLEMENTING REQUEST:
Groundwater sampling staff.

COST ESTIMATE: $0 (No cost impact to USACE)

Estimator Signature: Not applicable _____ DATE _____

PREVIOUS FCR AFFECTED ☐ YES ☒ NO; IF YES, FCR NO.

APPROVAL SIGNATURES:

USACE Representative _____ 7 Nov 2018 DATE

Ohio EPA Project Coordinator _____ 11-7-18 DATE

Leidos H&S Manager (if applicable) Not applicable _____ DATE

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# APPENDIX D

# Field Forms

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# D.1 Task Team Activity Log Sheets

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## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 4/23/19 Page 1 of 1

Task Team Members:

Charles Spurr CS

Jed Thomas 4/23/19

Narrative (include time and location):

0910 Jed & Charles on site at Central Burn Pits area (CBP) for gauging activities.

1050 Stop work for thunder / lightning. Return to 1036

1120 Jed offsite. Team up with Rich Sprinzl for remainder of the day.

CS 4/23/19

Daily Weather Condition: A.M. Sunny; some clouds; scattered rain; 63°F

P.M. CS 4/23/19

Recorded By: Charles Spurr 4/23/19 (Signature) QC Checked by: RSprinzl 4/23/19 (Signature)

# TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 04/23/19 Page 1 of 1

Task Team Members:

RYAN LAUNICH

LINDSEY MOYER

JS 8/1/2019

Narrative (include time and location):

0907 - ARRIVE AT DEMOLITION AREA 2 START GAUGING

1040 - SWA LIGHTNING + THUNDER, LIGHT RAIN

1035 - ASSOC 4/23/19 SWA AT DA2MW-105 HORNET NEST IN WELL CASING.

1125 - RETURN TO WORK, RAIN, LIGHTNING STOPPED.

1227 - DA2 GAUGING COMPLETE COULD NOT GAUGE DA2MW-105 DUE TO WASP NEST IN WELL. LOCK GATE AT DA2.

1235 - START GAUGING AT LL11

1400 - EXIT LL11, LOCK GATE.

1408 - GAUGING COMPLETE AT LL11.

1427 - START GAUGING LL7

1515 - GAUGING COMPLETE AT LL7, LOCK GATE.

1516 - GAUGE FAULKTH WIDE FWGMW-022.

1537 - START GAUGING LL8.

1545. DEPART LL8, LOCK GATE.

1600 - RETURN TO 1036 + DEMOBILIZE.

TW

4/23/19

Daily Weather Condition: A.M. 64°F P. CLOUDS

P.M. 71°F MOSTLY CLOUDY

Recorded By: RE (Signature) QC Checked by: Q.MGM (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 04/23/19 Page 1 of 2

Task Team Members:

Rich Sprinz
Jasmine Stefansky
Charles Spurr

CS 4/23/19

Narrative (include time and location):

0845 Depart B1036 for LNW.
0855 Winkepeck Gate @ George Rd Locked. Inform FM - will call Range Control.
0910 Range Control unlocked gate. Enter toward WBG/LNW.
0918 Arrived @ LNW. Appears mowing has occurred recently.
0920 Arrived @ LNWmw-024 (Wasp exited cap). Water Level not functioning properly. Inform FM. (Heloron 100' #2178 Pine
0935 Met FM @ WBG. Troubleshoot WL meter and test 2nd meter.
-Tested ok in potable water
0950 Return to LNW. Recontinue MW Inspection and Gauging (4 MWs)
1030 Gauging @ LNW completed. Thunder heard in distance (dark clouds imminent).
1035 Arrived @ WBG and wait for storm/thunder to clear (Lightning seen). Inform FM
1045 Arrived B1036. Heavy Rain/Lightning
1053 Rain stopped/No Lightning
1102 Thunder @ B1036 (and Rain)
1132 Depart B1036 (Rich + Charles) for WBG (No thunder/lightning for 30 min)
1138 Arrived @ WBG. Begin MW Gauging (15)
1200 WBGmw-013 - active Bee Nest under Lid. Inform FM.
1305 Lunch Break
1320 Continue gauging @ WBG.
1445 Completed mw gauging @ WBG. Depart WBG, close gate - Inform FM/Range Control.
1455 Gauge BKGmw-026
1502 Gauge FWGmw-013 (Enter WSA)

Daily Weather Condition: A.M. 60s cloudy, brief rain ⇒ on/off t-storm

P.M. 70° overcast

Recorded By: KS 04/23/19 (Signature) QC Checked by: [signature] 4/23/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 4/23/19 Page 2 of 2

Task Team Members:

Rich Sprnz

Charles Spurr CS 4/23/19

Narrative (include time and location):

1510 Depart WSA. Inform FM. Head to CBP + SCL (1 MW left @ CBP)
1520 Arrive @ CBP. Gauge last MW CBPmw-0008
1525 Depart CBP.
1530 Arrive @ SCL. Gauge MWs (3) + Inspections.
1600 Gauging completed. Site Restoration photos taken for Ted (PM).
1602 Depart SCL.
1613 Return to B1036.
1630 Depart B1036/offsite.

CS 4/23/19

Daily Weather Condition: A.M. 60s cloudy, on/off t-storm

P.M. 70 overcast

Recorded By: RS 4/23/19 (Signature) QC Checked by: CS 4/23/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 04/24/19 Page 1 of 1

Task Team Members:

Rich Sprinzl
Jed Thomas (AM)
Heather Adams (OM)

JS 8/1/2019

Narrative (include time and location):

0800 Depart B1036 for Western Background Wells.
0815 Arrive @ BKGmw-016. Gauge/Inspect ~~them~~ 4/24/19. WASP NEST!
0825 Continue to Next MWs in Depot Area
0905 Enter Drop Zone to gauge 3 MWs
0955 Depart Drop Zone. Inform FM
1010 Gauge 4 Northern BKG MWs.
1112 Arrived @ CBlock. Gauge 5 MWs.
1200 Gauging completed @ CBlock. Head back to B1036.
1210 Return to B1036.
1255 Heather + Rich depart for Western BKG MWs (No Deer Hunters signed in)
1310 ARRIVE @ 1st MW west of Depot Area. Begin gauging EWG/BKG MWs.
1405 COMPLETED GAUGING IN WESTERN AREAS.
1420 EXIT MAIN GATE & BEGIN GAUGING RT. 5/OFFSITE MWS.
1600 COMPLETED OFFSITE MW GAUGING.
1610 REENTER MAIN GATE. UNLOAD AT B1036.
1630 OFFSITE.

RS 4/24/19

Daily Weather Condition: A.M. 40s Sunny

P.M. 60s Sunny

Recorded By: RS 4/24/19 (Signature) QC Checked by: 4/24/19 (Signature)

# TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 4/24/19 Page 1 of 1

Task Team Members:

Ryan Lawrence

Lindsey Moyer RL/4/24/19

N/4/24/19

Narrative (include time and location):

0750 - DEPART 1036.

0800 - ARRIVE AT LL8 TO FINISH GAUGING

0845 - GAUGING COMPLETE AT LL8, LOCK GATE.

0850 - START GAUGING LL6. NO CHAIN OR LOCK ON GATE. NOTIFIED H. ADAMS.

0948 - EXIT LL6 ~~+ LOCK GA~~ N 4/24/19 CAN'T LOCK GATE - NO CHAIN OR LOCK.

0950 - GAUGING COMPLETE AT LL6.

1000 - START GAUGING AT LL5

1044 - GAUGING COMPLETE AT LL5, LOCK GATE.

1055 - START GAUGING AT LL10

1142 - GAUGING COMPLETE AT LL10, LOCK GATE

1158 - START GAUGING AT LL9, PICKED UP LL9MW-001, FWGMW-019 + FWGMW-022 PRIOR TO ENTERING LL9.

1300 - GAUGING COMPLETE AT LL9, LOCKED GATE.

1307 - RETURN TO 1036 FOR ADDITIONAL GAUGING LOCATIONS.

1327 - START GAUGING AT ATLAS SCRAP YARD.

1438 - GAUGING COMPLETE AT ATLAS SCRAP YARD.

1451 - GAUGE BKGMW-013. CAP IS STUCK WILL HAVE TO RETURN TO REMOVE + WILL NEED A WRENCH.

1513 - START GAUGING ~~LL4~~ RL 4/24/19 LL3.

1555 - DEPART LL3, LOCK GATE.

1601 - RETURN TO 1036 DEMOBILIZE.

Daily Weather Condition: A.M. 55°F CLEAR

P.M. 61°F MOSTLY SUNNY

Recorded By: [signature] 4/24/19 (Signature) QC Checked by: [signature] 4/24/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 4/24/19 Page 1 of 1

Task Team Members:

Charles Spurr

Jasmine Stefanicky

CS 4/24/19

Narrative (include time and location):

0800 Charles & Jasmine arrive at Mustard Burial Site (MBS) for gauging activities. Also gauge FWGmw-007

1010 Finished gauging MBS & depart for NACA Test Area (NTA).

1015 Arrive at NTA for gauging

1055 Gauge DA1tw-001 DTW: 12.91' BTOC

1315 Finish gauging NTA. Return to 1036 to resupply & have HES break.

1350 Arrive at Fuze & Booster Quarry (FBQ) for gauging

1655 Finish gauging at FBQ. Return to 1036

CS 4/24/19

Daily Weather Condition: A.M. 40°F; Partly Cloudy; calm

P.M. 62°F; Sunny; breezy to calm

Recorded By: Charles Spurr 4/24/19 (Signature) QC Checked by: [illegible] 4/24/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 4/25/19 Page 1 of 1

Task Team Members:

Charles Spurr

Jasmine Stefansky CS 4/25/19

Narrative (include time and location):

0820 Charles & Jasmine arrive at Load Line 1 area for gauging activities.

1000 Access road to LL1mw-067 has orange barricade at entrance. Walk on foot to well & discover several downed trees along the way.

1035 LL1mw-067 gauged & team returns to truck to continue. Load Line 1 Area.

1225 Finish gauging Load Line 1 & move to gauge FWG wells to the NE then travel to Erie Burning Grounds (EBG)

1310 Finish gauging FWGmw-010, 011, & 012.

1315 Arrive at EBG for gauging.

1505 Finish gauging at EBG & travel to Building 1200 (B12) for gauging. Also grab BKGmw-008

1555 Finish gauging at B12 & return to 1036

CS 4/25/19

Daily Weather Condition: A.M. 54°F; Cloudy; calm

P.M. 68°F; Partly Cloudy; breezy

Recorded By: [signature] 4/25/19 (Signature) QC Checked by: [signature] 04/25/19 (Signature)

# TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 4/25/19 Page 1 of 1

Task Team Members:

RYAN LAURICH

LINDSEY MOYER RL/4/25/19

RL/4/25/19

Narrative (include time and location):

0808 - DEPART 1036.

0826 - GAUGE SCFMW-001.

0840 - RETURN TO RKGMW-013 REMOVE PVC CAP + REPLACE w/ COMPRESSION CAP + GAUGE

DTW = 11.76

0853 - RETURN TO LL3 TO COMPLETE GAUGING.

1022 - GAUGING COMPLETE AT LL3, GATE LOCKED

1035 - START GAUGING LL4

1133 - GAUGING COMPLETE AT LL4, LOCK GATE.

1150 - START GAUGING LL12. OFFSITE WELLS.

1159 - SIGN IN AT LL12 GATE BOX.

1422 - SIGN OUT OF LL12. GAUGING AT LL12 COMPLETE

1443 - START GAUGING COBBS POND.

1521 - GAUGING COMPLETE AT COBBS POND, COULD NOT LOCATE CPMW-002.

1530 - START GAUGING LL2

1556 - RETURN TO 1036 + DEMOBILIZE.

RL 4/25/19

Daily Weather Condition: A.M. 52°F CLOUDY

P.M. 61°F LIGHT RAIN

Recorded By: RL 4/25/19 (Signature) QC Checked by: [signature] 4/25/19 (Signature)

# TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 4/29/19 Page 1 of 1

Task Team Members:
Charles Spurr
Jed Thomas

CS 4/29/19

Narrative (include time and location):

0750 Arrive at Load Line 2 gate (LL-2) for gauging activities.

0940 Finish gauging at LL-2 & move to Ramsdell Quarry Landfill to continue gauging (RQL)

0955 Arrive at RQL & sign-in.

1120 Sign out of RQL. Finished inside fence area.

1200 Truck stuck next to RQLmw-006.

1230 Able to get unstuck & drive back to Ramsdell Rd. Finish gauging RQLmw-015 & 016.

1300 Finish gauging all of RQL wells. Begin gauging remaining BKG, FWG, & CP wells.

1530 Finish gauging/inspecting remaining wells. Return to 1036 to process paperwork & repair pump for LL12mw-187.

CS 4/29/19

Daily Weather Condition: A.M. 34°F; Partly Cloudy; calm

P.M. 60°F; mostly Cloudy; calm to breezy

Recorded By: Charles Spurr 4/29/19 QC Checked by: Jed Thomas 4/29/19
(Signature) (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 04/29/19 Page 1 of 1

Task Team Members:

Jackie Mitchell 04/29/19

04/29/19

Narrative (include time and location):

0855 Depart field office for GWS event.
0905 Arrive at DA2 and begin setup on DET-004.
0917 Begin low flow purge of DET-004
0953 DET-004 stable, send confirmation of stability text to A. Sprinzl. Recieve Stability Confimation.
1004 Collect sample DET-004-190401-GW for Pesticides/PCBs, SVOCs, VOCs, Cyanide, TAL Metals, LL PAHs
1503 Sampling complete. Hook back to YSI for post sampling parameter readings. Use well Cap Freeze Protection and begin packing supplies
1528 Return to field office and unload supplies and samples

04/29/19

Daily Weather Condition: A.M. 38°F, light wind & rain

P.M. 55°F, light wind, cloudy

Recorded By: (Signature) QC Checked by: Amanda Sprinzl 04/29/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

ate: (mm/dd/yy): 4/29/19 Page 1 of 1

Task Team Members:

Lindsey Mayer on 4/29/19

on 4/29/19

Narrative (include time and location):

0840 Depart field office
0850 R. Lavich helps L. Mayer set up on DA2MW-115
0928 Begin purge
1024 End purge, Text A. Sprinzel log.
1030 Collect samples DA2MW-115-190401-GW, DA2MW-115-190401-GWMSD, DA2MW-115-190402-GW, DA2MW-115-190403-GW
1055 Secure well, decon equipment
1120 Help R. Lavich with batteries for 4/29/19
1400 Arrive back at 1036
1410 Arrive at FWGMW-016
1426 Begin purge.
1519 End purge. A. Sprinzel gives approval to sample.
1520 Collect sample FWGMW-016-190401-GW
1540 Secure well, decon equipment.
1550 Arrive back at 1036 unload

on 4/29/19

Daily Weather Condition: A.M. 43°F cloudy

P.M. 61°F cloudy

ecorded By: on 4/29/19 (Signature) QC Checked by: Amanda Spring on 04/29/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 4/29/19 Page 1 of 1

Task Team Members:

RYAN LAUNAY

RL 4/29/19

RL 4/29/19

Narrative (include time and location):

0840 - DEPART 1036.

0850 - ARRIVE AT DAZ W/ JACKIE MITCHELL + LINDSEY MOSER. ALL SET UP ON SEPARATE WELLS. 0900 - COLLECT FWGTB-191001-TB + FWGTB-191009-TB FOR VOCS.

0958 - START PURGE AT DET-003.

1046 - DET-003 STABLE, SEND TEXT W/ PHOTO OF LOG TO A. SPANZL TO VERIFY STABILITY.

1052 - RECEIVED CONFIRMATION OF STABILITY.

1053 - COLLECT SAMPLES DET-003-190401-GW FOR VOCS, PHTHALATES, NITROAROMATICS, PHENOLS, LL PAHS, PCBS, PESTICIDES, EXPLOSIVES, CYANIDE, TAL METALS. DET-003-190401-GWMSD AND DET-003-190402-GW FOR VOCS, PCBS, PESTICIDES, EXPLOSIVES, CYANIDE, + TAL METALS. DET-003-190403-GW FOR VOCS, PCBS, PESTICIDES, EXPLOSIVES, CYANIDE, + TAL METALS.

1400 - LINDSEY DEPARTS FOR 1036.

1520 - JACKIE DEPARTS FOR 1036.

1526 - POST SAMPLE READING.

1540 - DEPART DAZ, LOCK GATE.

1545 - ARRIVE AT 1036, DEMOBILIZE.

RL 4/29/19

Daily Weather Condition: A.M. 50°F P. Cloudy

P.M. 57°F P. Cloudy

Recorded By: RL 4/29/19 (Signature) QC Checked by: [signature] 04/29/19 (Signature)

# TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 4/30/19 Page 1 of 2

Task Team Members:

Ryan Laurich

TL / 4/30/19 RL / 4/30/19

Narrative (include time and location):

0750 - DEPART 1036.

0800 - ARRIVE AT WINKLEPECK BURNING GROUNDS. w/ LINDSEY MOYER - WILL SET UP ON SEPERATE WELLS.

0825 - START PURGE ON WBGmw-021.

0941 - WBGmw-021 STABLE, SENT LOG VIA TEXT TO A. SPRINZL.

0944 - RECEIVED CONFIRMATION OF STABILITY

0945 - COLLECT WBGmw-021-190401-GW FOR EXPLOSIVES + TAL METALS.

1000 - COLLECT POST SAMPLE YSI DATA.

1028 - START PURGE AT WBGmw-020.

1045 - KEVIN + OHIO EPA REPS (2) ONSITE TO OBSERVE GWS ACTIVITIES.

1120 - KEVIN + OHIO EPA REPS OFFSITE.

1143 - WBGmw-020 STABLE, TEXT LOG TO A. SPRINZL TO CONFIRM.

1147 - STABILITY CONFIRMED.

1150 - SAMPLE WBGmw-020-190401-GW FOR EXPLOSIVES + TAL METALS.

1205 - TAKE YSI POST SAMPLE DATA.

1218 - DEPART WINKLEPECK BURN GROUNDS - LOCK GATE.

1230 - ARRIVE AT FUZE + BOOSTER QUARRY.

1335 - START LOW FLOW AT FBQmw-171

1418 - FBQmw-171 STABLE, TEXT LOG TO A. SPRINZL TO VERIFY

1419 - STABILITY VERIFIED.

1420 - SAMPLE FBQmw-171-190401-GW FOR CYANIDE, SULFATE, NITRATE, NITRITE, ALKALINITY AND SULFIDE.

Daily Weather Condition: A.M. 47°F CLOUDY

P.M. 52°F LIGHT RAIN

Recorded By: [signature] 4/30/19 (Signature) QC Checked by: [signature] 04/30/19 (Signature)

# TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 4/30/19 Page 2 of 2

Task Team Members:

R. Laurich

[illegible] 4/30/19 [illegible] 4/30/19

Narrative (include time and location):

1459 - COLLECT POST SAMPLE YSI DATA.

1545 - DEPART FUZE + BOOSTER QUARRY.

1600 - ARRIVE AT 1036 - DEMOBILIZE

[illegible] 4/30/19

Daily Weather Condition: A.M. 47°F CLOUDY

P.M. 52°F LIGHT RAIN

Recorded By: [illegible] 4/30/19 (Signature) QC Checked by: [illegible] 04/30/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 04/30/19 Page 1 of 1

Task Team Members:

Jackie Mitchell 04/30/19

04/30/19

Narrative (include time and location):

0903 Depart Building 1036 field office for GWS event.
0913 Arrive at NACA test Area to sample NTA-mw-120.
0937 Begin low flow purge of NTAmw-120.
1004 Stagnant water purged from well, begin recording stability parameters.
1042 Parameters stable. Send confirmation text to A. Spinzl
1045 Recieve confirmation of stability.
1048 Sample NTAmw-120-190401-GW for SVOC: Hexachlorocyclopentadine
1111 Take post sample parameter readings and begin demob. from NACA Test Area.
1140 Depart NACA Test Area.
1155 Arrive at FWGmw-007 and begin setting up sampling equipment.
1210 Begin low flow purge of FWGmw-007.
Stagnant water purged from well, begin recording stability parameters.
1331 Parameters stable. Send confirmation text to A. Spinzl.
1332 Recieve confirmation of stability.
1335 sample FWGmw-007-190401-GW for Explosives and TAL Metals.
1430 Sampling complete. Take post sampling parameter readings
1448 Depart FWGmw-007.
1510 Return to 1036 field office and begin demob. activities.

Daily Weather Condition: A.M. 50°F, light wind, cloudy

P.M. 56°F, light wind, cloudy

Recorded By: (Signature) QC Checked by: 4/30/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 4/30/19 Page 1 of 1

Task Team Members:

Lindsey Mayer 4/30/19

4/30/19

Narrative (include time and location):

0750 Depart 1036
0800 Arrive at WBGmw-006. Set up on well.
0818 Begin purge
0910 Collect sample WBGmw-006-190401-Gw, after parameters stabilized.
0945 Secure well, decon equipment.
0955 Set up on WBGMw-009
1003 Begin purge
1045 Kevin, along with Ohio EPA drive onsite.
1053 Collect sample. WBGmw-009-190401-Gw, after stabilization.
1120 Secure well, decon equipment.
1210 Arrive back at 1036, got more bottleware, drop off samples
1235 Arrive at FBQ-172
1300 Begin purge
1351 Collect sample FBQmw-172-190401-Gw, FBQmw-172-190402-Gw, FBQmw-172-190403-Gw.
1422 Secure well, decon equipment
1425 Set up on FBQmw-174
1432 Begin purge
1507 Collect sample FBQmw-174-190401-Gw
1531 Secure well decon equipment
1600 Arrive back 1036.

Daily Weather Condition: A.M. 48°F, cloudy

P.M. 52°F, cloudy/rain

Recorded By: [signature] 4/30/19 (Signature) QC Checked by: [signature] 4/30/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 4/30/19 Page 1 of 2

Task Team Members:

Charles Spurr

Jackie Mitchell CS 4/30/19

Narrative (include time and location):

0800 Depart 1036 to correct lock at Ramsdell Quarry Landfill & deploy repaired pump into LL12mw-187.

0820 Well lock (6000) removed from RQL gate. Gate is now only locked with RQL specific lock. Depart & travel to Load line 12.

0835 Deploy pump into LL12mw-187. Return to 1036 to prepare for GWS activities.

0900 Depart for NACA Test Area (NTA)

0915 Arrive at NTA & setup on wells. C. Spurr at NTA mw-119 & J. Mitchell at NTA mw-120.

0955 Begin low flow purge of NTAmw-119

1045 Sample NTAmw-119 (DUP, MSD, & Split) - for explosives

1130 EPA onsite Kevin & Liam along with Kevin Sedlak

1150 EPA offsite, Jackie M. travels to FWGmw-007

1155 Return to 1036 with samples from NTAmw-119 & 120

1225 Depart for FBQ

1235 Arrive at FBQ & setup at FBQmw-175

1250 Stop to help co-worker get unstuck

1315 Return to FBQmw-175 & begin low flow

1325 Notice that turbidity is very high (water is brown/cloudy) Notify Amanda Sprinzl. Also pump is set on bottom of well.

1350 Decision made to pull pump and adjust tubing length.

Daily Weather Condition: A.M. 53°F; Cloudy; calm

P.M. 57°F; Partly Cloudy; rain

Recorded By: Charles Spurr 4/30/19 (Signature) QC Checked by: Amanda Sprinzl 04/30/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 4/30/19 Page 2 of 2

Task Team Members:

Charles Spurr

CS 4/30/19

Narrative (include time and location):

1400 Return to 1036 to clean & rebuild pump for FBQmw-175

1445 Return to FBQ

1505 Pump is reset in FBQmw-175. TD of well: 23.06'
Pump intake at 22' BTOC

1530 Return to 1036 with samples from FBQmw-172 & FBQmw-171. Help unload trucks & clean up.

CS 4/30/19

Daily Weather Condition: A.M. CS 4/30/19

P.M. 55°F ; Sun & Clouds ; calm

Recorded By: [signature] 4/30/19 (Signature) QC Checked by: Amanda Spurgeon 04/30/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 05/01/19 Page 1 of 2

Task Team Members:

Jackie Mitchell on 05/01/19

05/101/19

Narrative (include time and location):

0815 Depart building 1036 field office for GWS event.
0820 Arrive at LL7 to show charles the wells.
0835 Arrive at FWGmw-023 and begin setup on well
0910 Begin low flow purge of FWGmw-023
0955 Stagnant water purged. Begin recording stability parameters.
1005 Parameters stable, send confirmation text to A. Sprinzl
1008 A. Sprinzl confirms stability
1009 Collect sample FWGmw-023-190401-GW for Nitroguanidine (6)(A) & Nitrocellulose (12)(A)
1041 Sampleng complete, take final parameter readings. Begin demob. from FWGmw-023.
1105 Depart FWGmw-023.
1110 Arrive at LL10mw-003 and begin setup on well.
1029 Begin low flow purge of LL10mw-003
1208 Stagnant water pured. Begin recording stability parameters.
1223 Parameters stable, send confirmation text to A. Sprinzl
1228 A. Sprinzl confirms stability
1230 Collect samples LL10-003-190403-GW, LL10mw-003-190401-GW, LL10mw-003-190402-GW for VOCs
1253 Sampling complete, take final parameter readings. Begin demob from LL10mw-003.
1320 Meet Jed at main entrance of LL10 to relinquish samples.

Daily Weather Condition: A.M. 64°F, light wind, partly cloudy

P.M. 80°F, moderate wind, partly cloudy

Recorded By: 05/01/19 (Signature) QC Checked by: 5/1/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 05/01/19 Page 2 of 2

Task Team Members:

Jackie Mitchell

05/01/19

05/01/19

Narrative (include time and location):

1330 Arrive at LL10mw-005 and begin setup on well.
1355 Begin low flow purge of LL10mw-005.
1429 Stagnant water purged. Begin taking stability parameters.
1454 Parameters stable. Send confirmation text to A. Sprinkel.
1459 Recieve confirmation from A. Sprinkel.
1505 Collect sample LL10mw-005-190401-GW for TAL Metals.
1516 Sampling complete. Record final parameter readings.
1517 Begin demob. from LL10.
1538 Depart LL10. Gate locked.
1547 Arrive at 1036 field office and begin final demobalization activities.

05/02/19

Daily Weather Condition: A.M. 64°F, light wind, partly cloudy

P.M. 80°F, moderate wind, sunny

Recorded By: 05/01/19 (Signature) QC Checked by: 5/1/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 5/01/19 Page 1 of 1

Task Team Members:

Lindsey Mayer 5/1/19

5/1/19

Narrative (include time and location):

0810 Depart 1036
0815 Arrive at LL12 and sign in at gate
0820 R. Lavrich helps L. Mayer carry equipment to LL12mw-183
0843 Begin purge on LL12mw-183
1017 Collect sample LL12mw-183-190401-GW.
1040 Secure well decon equipment
1115 Set up on LL12mw-242
1130 Begin purge
1405 Collect sample. LL2mw-242-190401-GW. After sampling, post readings. > 50NTU. Call A. Sprinzel, collect filtered.
1450 Secure well, decon equipment
1515 Sign R. Lavrich + L. Mayer out on gate 5/1/19 board
1535 Arrive back at 1036, unload vehicle

5/1/19

Daily Weather Condition: A.M. 60°F partly cloudy
P.M. 85°F Sunny

Recorded By: (Signature) 5/1/19 QC Checked by: (Signature) 05/01/19

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 5/1/19 Page 1 of 1

Task Team Members:

RYAN LAIRICH

RL 5/1/19

RL 5/1/19

Narrative (include time and location):

0812 - DEPART 1036.

0820 - ARRIVE AT LL12 + SIGN IN AT SOUTH GATE. CLOSED MOWER AND W/ME AT LL12, WILL SAMPLE SEPARATELY

0850 - START LOW FLOW AT ~~MW-24~~ LL12MW-247.

1009 - LL12MW-247 STABLE, TEXT LOG TO A. SPRUNZL TO CONFIRM

1013 - RECEIVE CONFIRMATION OF STABILITY. ALSO CHECKED W/ H. ADAMS - IF TURBIDITY > 10 NTU AFTER 1 HOUR OF PURGING SAMPLE, FILTER FOR METALS IF > 50NTU + COLLECTING METALS AT WELL.

1015 - COLLECT LL12MW-247-190401-GW FOR NITRATE + TAL METALS.

1055 - POST SAMPLE YSI DATA

1130 - START LOW FLOW AT LL12MW-185

1234 - LL12MW-185 STABLE, TEXT A. SPRUNZL LOG TO CONFIRM.

1236 - RECEIVE STABILITY CONFIRMATION.

1240 - SAMPLE ~~LL12MW-185-190401 FOR~~ still LL12MW-185 LL12MW-185-190401-GW FOR NITRATE

1325 - POST SAMPLE YSI DATA.

1550 - JED THOMAS PICKS UP SAMPLES.

1422 - START LOW FLOW AT LL12MW-245.

1455 - END PURGE DUE TO TIME CONSTRAINTS. TURBIDITY WAS NOT DECREASING, THE WATER LEVEL WAS DROPPING TOO FAST + THERE WOULD NOT BE ENOUGH TIME TO STABILIZE THE WELL + COLLECT SAMPLE VOLUME BY 1630.

1515 - STOP AT FWGMW-022 TO HELP CHARLES SPURR.

- RETURN TO 1036 - DEMOBILIZE.

Daily Weather Condition: A.M. 51°F SUNNY

P.M. 81°F SUNNY

Recorded By: RL 5/1/19 (Signature) QC Checked by: [signature] 05/01/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 5/1/19 Page 1 of 2

Task Team Members:

Charles Spurr cc 5/1/19

Narrative (include time and location):

0825 Arrive at Load Line 7 & walk wells to be sampled to assess access. Setup at LL7mw-001

0840 J. Mitchell calls to notify me that her water level is not long enough for FWGmw-023. Meet & trade WL's.

0905 Begin low flow purge of LL7mw-001. Note water is orange in color. Turbidity >1000.

1020] Sample LL7mw-001 for TAL metals & Cyanide

1025 Finish activities at LL7mw-001. Load & depart for LL7mw-006

1050 Arrive & setup at LL7mw-006

1100 Begin low flow purge of LL7mw-006

1205] Sample LL7mw-006 for explosives

1230 Finish activities at LL7mw-006. Depart for Load line 11

1240 Arrive and setup at LL11mw-005

1250 Begin low flow purge of LL11mw-005

1400] Sample LL11mw-005 for Cyanide

1430 Finish activities at LL1. Load & return to 1036 with samples.

1505 Arrive at FWGmw-019 & 022. Gauge and discover that water is >100' BTOC (max of WL). Call Jeff Thomas. Ryan Laurich will bring out 300' WL.

Daily Weather Condition: A.M. 62°F; Cloudy; calm

P.M. 78°F; Sunny; breezy to windy

Recorded By: Charles Spurr 5/1/19 (Signature) QC Checked by: [signature] 05/01/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 5/1/19 Page 2 of 2

Task Team Members:

Charles Spurr

Ryan Laurich CS 5/1/19

Narrative (include time and location):

1520 Ryan arrives w/ 300' WL. Gauge FWGmw-022

1525 Begin low flow purge of FWGmw-022

1535 With correct pump pressure, water is not coming through tubing. Call Amanda Sprinzl to discuss possible remedy.

1545 Figure out that deep pumps need more discharge time (ie. 20:40 CPM 1). Water begins to flow to surface but team determines that we will not have enough time to sample & decides to pack up + leave for the day.

1600 Team packed up + returns to 1036

CS 5/1/19

Daily Weather Condition: A.M. CS 5/1/19

P.M. 82° F; Sunny; windy

Recorded By: Charles Spurr 5/1/19 (Signature) QC Checked by: [signature] 05/1/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 05/02/19 Page 1 of 2

Task Team Members:

Jaelie Mitchell

05/02/19

05/02/19

Narrative (include time and location):

0820 Depart building 1036 field office for GWS event.
0845 Arrive at LL2mw-264 and begin setup on well
0854 Begin low flow purge of LL2mw-0164.
0913 Stagnant water purged, begin recording stability parameters
0958 Parameters Stable. Send confirmation text to A. Sprinzl.
1001 Recieve confirmation
1005 Collect sample LL2mw-264-~~04~~ 190401-GW for Cyanide. 05/02/19
1008 Sampling complete. Take final parameter readings and begin demob. from LL2mw-264.
1027 Arrive at LL2mw-267 and begin set up on well.
1042 Begin low flow purge of LL2mw-267.
1305 Parameters stable except turbidity. Purging for 2 hrs.
~~1305~~ call H. Adams to confirm sampling.
1320 Collect sample LL2mw-~~0~~267 190401-GW for TAL Metals and Explosives. 05/02/19
1333 Collect post sample parameter readings and begin demob. from LL2.
1430 Return to building 1036 to drop of samples and recieve more bottle ware
1435 Arrive at FWGmw-015 and begin setup on well.
1441 Begin low flow purge of FWGmw-015
1500 Call Heather. Decision to end purging made due to high

05/02/19

Daily Weather Condition: A.M. 59°F, light wind, overcast

P.M. 70°F, light wind, partly sunny

Recorded By: 05/02/19 (Signature) QC Checked by: 5/2/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 05/02/19 Page 2 of 2

Task Team Members:

Jackie Mitchell

05/02/19

05/02/19

Narrative (include time and location):

Turbidity. Begin demob. from FWGMW-015
1320 Return to 1036 field office for demobilization activities. Event complete for the week.

05/02/19

Daily Weather Condition: A.M. 05/02/19

P.M. 71°F, ND wind, sunny

Recorded By: 05/02/19 (Signature) QC Checked by: 5/2/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 5/2/19 Page 1 of 1

Task Team Members:

Charles Spurr

CS 5/2/19

Narrative (include time and location):

0825 Arrive at FWGmw-022 & 019. Setup on 022

0835 Begin low flow purge of FWGmw-022

0915] Sample FWGmw-022

0935 Finish activities at mw-022, pack & move to mw-019

0955 Begin low flow purge of FWGmw-019

1035] Sample FWGmw-019

1100 Complete activities at mw-019, load up, & depart to return to 1036

1120 Arrive at 1036 to drop samples & purge water. Receive new assignment

1135 Depart 1036 for SCFmw-004 & LL1mw-087

1150 Arrive & setup on LL1mw-087

1205 Begin low flow purge of LL1mw-087. Start at CPM2 29:1 16 PSI but drawdown too great. Decrease to CPM1 59:1 ~25 mL/min.

1320] Sample LL1mw-087

1350 Open SCFmw-004 packer to allow Artesian flow ~3/100' ATOC

1400 Take one shot parameters w/ YSI for SCFmw-004

1405] Sample SCFmw-004 & close well. Reseat packer

1425 Finish all activities at LL1mw-087. Load truck & return to 1036

CS 5/2/19

Daily Weather Condition: A.M. 60°F; Cloudy; calm

P.M. 72°F; partly cloudy; calm

Recorded By: [signature] 5/2/19 (Signature) QC Checked by: [signature] 05/02/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 05/02/19 Page 1 of 1

Task Team Members:

Lindsey Mayor 5/2/19

5/2/19

Narrative (include time and location):

0815 Depart 1036
0820 Sign in at LL12
0830 Arrive at well LL12mw-245
0846 Begin purge
0943 Send picture of well log to A.Sprinzel, water level is dropping. A.Sprinzel calls, she states to dry to lower to 10mL/min, well is still dropping, will purge well dry.
1020 End purge, well is dry.
1023 Decon equipment.
1037 Set up on LL12mw-187
1046 Begin purge
1148 Collect sample LL12mw-187-190401-GW (nitrate/TAL metals). After approval from A. Sprinzel.
1215 Secure well, decon equipment
1230 Collect sample LL12mw-245-190401-GW (TAL metals/nitrate/explosives)
1256 Secure well, decon equipment
1316 Sign out at gate/lock gate
1315 Arrive back at 1036 to get water/drop off samples.
1340 Set up on LL4mw-200
1349 Begin purge
1450 Collect sample LL4mw-200-190401-GW, after Approval from A. Sprinzel
1512 Secure well, decon equipment

Daily Weather Condition: A.M. 62°F overcast

P.M. 72°F partly cloudy

Recorded By: [signature] 5/2/19 (Signature) QC Checked by: [signature] 05/02/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 5/6/19 Page 1 of 1

Task Team Members:

Charles Spurr

CS 5/6/19

Narrative (include time and location):

0820 Arrive at Load Line 1. Travel to & setup at LL1mw-084

0835 Begin low flow purge of LL1mw-084

0925 ] Sample LL1mw-084

1020 Finish activities at LL1mw-084. Pack up + move to LL1mw-083

1100 Begin low flow purge of LL1mw-083

* well has poison ivy present around it. Precautions were taken to avoid any contact with myself or equipment.

1135 ] Sample LL1mw-083

1205 Finish activities at LL1mw-083. Pack up and prepare to move to LL1mw-081

1255 Begin low flow purge of LL1mw-081, Water is dark orange in color & has very high turbidity. Will not run water through flow cell of YSI until turbidity comes down.

1331 first reading taken through flow cell.

1505 Sample LL1mw-081 turb. not below 10 but 3 readings within 10% & purge has taken > 2 hours. Verify with Amanda Sprinzl.

1525 Finish activities at LL1mw-081. Pack up & return to 1036

Daily Weather Condition: A.M. 53°F; Sunny; calm to breezy

P.M. 76°F; Sunny; calm

Recorded By: [signature] 5/6/19 (Signature) QC Checked by: [signature] 5/6/19 (Signature)

# TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 5-6-19 Page 1 of 1

Task Team Members:

G. Gromofsky

L. Moyer

H. Adams SS 5-6-19

Narrative (include time and location):

0824 Arrive at LL2-MW59.

0840 Begin low flow purge.

0904 Well stable. A Sprinzl confirms @ 1426

0905 Sample LL2-MW059 for explosives + TAL metals.

0921 Collect post sample reading, break down equipment.

0942 Depart well.

0956 Arrive at LL3-MW244

1010 Begin low flow purge.

1039 Parameters stable. A Sprinzl confirms at 1426.

1040 Sample LL3mw-244 for explosives and TAL metals

1044 Collect post sample reading and break down equipment.

1107 Depart well for ~~Bottling 1030~~ SS 5-6-19 Line 2 to get ~~Bottles~~ from L. Moyer.

1139 L. Moyer and G. Gromofsky arrive at Line 3.

1145 G. Gromofsky arrives at LL3mw-237

1200 Begin low flow purge.

1250 H. Adams arrives to drop off bottle for next well and collect samples from earlier today.

1353 Send purge form via text to verify stability with A. Sprinzl Need to show that turbidity reading (<10) is ligitimate. Clean out/empty flow cell and collect 4 more readings.

1415 Sample LL3mw-237 for explosives.

1439 Collect post sample reading and gather gear to return to 10306

Daily Weather Condition: A.M. 52°F, partly cloudy, calm

P.M. 65°F, sunny, calm

Recorded By: [signature] 5-6-19 (Signature) QC Checked by: [signature] 5/6/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 05/06/19 Page 1 of 1

Task Team Members:

Lindsey Mayer 5/6/19

5/6/19

Narrative (include time and location):

0801 Depart 1036
0817 Arrive at LL2mw-272
0836 Begin low flow purge.
1109 A. Spinzel gives permission to sample, well has reached stabilization.
1110 Collect sample LL2mw-272-190401-GW (cyanide).
1123 Secure well, decon equipment.
1130 meet up with Gabby, she takes bottle set for 113mw-237. , locks 112.
1135 enter 113.
1145 Set up on LL3mw-234.
1157 Begin purge. Due to elevated turbidity, purged an extra 750mL during stagnant water purge. ~~After sta~~ 5/6/19
1454 A. Spinzel gives approval to sample
1455 Collect sample LL3mw-234-190401-GW (cyanide).
1510 Secure well decon equipment.
1520 Lock LL3 gate
1525 Arrive back at 1036, unload

5/6/19

Daily Weather Condition: A.M. 60's Sunny

P.M. 70's Sunny

Recorded By: 5/6/19 (Signature) QC Checked by: 5-6-19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 05-07-19 Page 1 of 1

Task Team Members:

Gabby Gromofsky

Charles Spurr SS 5-7-19

DS 5-7-19

Narrative (include time and location):

0819 Arrive at LL1mw-089

0837 Begin low flow purge.

0906 Well stable and verify with A. Sprinzl via text.

0920 Sample LL1mw-089. Primary sample ID: LL1mw-089-190401-GW | Duplicate sample ID: LL1mw-089-190402-GW (SS 5-7-19) | Split sample ID: LL1mw-089-190403-GW | MS/MSD ID: LL1mw-089-190401-GWMSD

1130 Collect post sample reading and break down equipment / purge water line.

1200 Arrive at Load Line 1 and leave samples at gate for H. Adams to pick up.

1215 Arrive at LL1mw-080

1222 Begin low flow purge.

1258 Stable. Verify with A. Sprinzl via text.

1315 Collect post sample reading and break down equipment.

1330 Depart Load Line 1 for LL1mw-064.

1342 Receive call from H. Adams to change plans. Proceed to FWGmw-012.

1415 Arrive at FWGmw-012. Charles Spurr is on FWGmw-011.

1433 Begin low flow purge.

1503 Well stable. Confirm with A. Sprinzl via text.

1515 Sample FWGmw-012 for explosives and TAL metals.

1520 Collect post sample reading and pack equipment.

1600 Charles and Gabby offsite for Building 1036.

Daily Weather Condition: A.M. 50°F cloudy calm

P.M. 56°F cloudy

Recorded By: [signature] 5-7-19 (Signature) QC Checked by: [signature] 5/8/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 5/7/19 Page 1 of 2

Task Team Members:

Charles Spurr

Jed Thomas CS 5/7/19

Narrative (include time and location):

0810 Arrive at area along George Rd. adjacent to suspected potable well.

0815 Jed dons a bee keeper suit and gathers equipment

0825 Jed approaches suspected area of well while charles remains in vehicle and keeps watch.

0830 Well is located & bees/hornets are not present. Well is staked & relative measurements are taken
- From south wooded area next to field walk 49 ft. North along white edge line of George Rd. Turn right (east) and walk 79 ft. into field
- Hole ~ 1.5 ft. deep x 1.5 ft. in diameter. Marked w/ a stake & pin flags (orange)

0845 Jed walks field around well to search for any signs of bees/hornets in the vicinity. Photo documentation.

0900 Return to 1036.

0920 Jed offsite. Charles mobs to Erie Burning Grounds (EBG) for well sampling activities.

0945 Arrive at EBG & Setup at EBGmw-125

1005 Begin low flow purge of EBGmw-125

1055 Sample EBGmw-125

1110 Finish all activities at EBGmw-125. Move and setup on EBGmw-131

Daily Weather Condition: A.M. 53°F ; Cloudy ; calm

P.M. CS 5/7/19

Recorded By: [signature] 5/7/19 (Signature) QC Checked by: [signature] 5/8/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 5/7/19 Page 2 of 2

Task Team Members:

Charles Spurr CS 5/7/19

Narrative (include time and location):

1130 Begin low flow purge of EBGmw-131
1205 Sample EBGmw-131
1215 Finish activities at EBGmw-131
1230 Meet H. Adams to transfer samples & then mob to FWGmw-011 & 012
1250 Arrive & setup at FWGmw-011
1315 Begin low flow purge of FWGmw-011
1520 Purging for > 2 hours. Turbidity ~15 NTU. Receive approval from A. Sprinzl to collect sample. Turbidity is >10 but 3 readings are within 10% & all other parameters are stable
1535 Finish activities for FWGmw-011. Pack equipment
1550 Depart for 1036

CS 5/7/19

Daily Weather Condition: A.M. CS 5/7/19

P.M. 63°F; mostly cloudy; breezy

Recorded By: Charles Spurr 5/7/19 (Signature) QC Checked by: [signature] 5/8/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 5/7/19 Page 1 of 1

Task Team Members:

RYAN LAURICH

RL/5/7/19 RL/5/7/19

Narrative (include time and location):

0812 - DEPART 1036 FOR FUZE + BOOSTER @ QUARRY.

0820 - ARRIVE AT FBQ.

1844 0839 - START LOW FLOW AT FBQmw-175.

1108 - FBQmw-175 STABLE, PURGED 2 HOURS POST REMOVAL OF STAGNANT WATER. TURBIDITY STABLE BUT >10 NTU. SENT LOG TO A. SPRINZL TO VERIFY

1112 - STABILITY VERIFIED.

1115 - SAMPLE FBQmw-175-190401-GW + FBQmw-175-190402-GW FOR SULFIDE, NITRATE, NITRITE, SULFATE, ALKALINITY, + HEX CHROME. FBQmw-175-190401-GWMSD FOR HEX CHROME. FBQmw-175-190403-GW FOR SULFIDE, NITRATE, NITRITE, SULFATE, ALKALINITY, + HEX CHROME.

1240 - POST SAMPLE YSI DATA.

1303 - START LOW FLOW ON FBQmw-176.

1430 - HEATHER ADAMS PICKS UP SAMPLES FROM FBQmw-175.

1521 - FBQmw-176 STABLE, TEXTED LOG TO A. SPRINZL TO CONFIRM.

1531 - STABILITY CONFIRMED EXCEPT FOR TURBIDITY

1532 - SAMPLE FBQmw-176-190401-GW FOR CSANIDE.

1537 - TAKE POST SAMPLE YSI DATA. * TURBIDITY WOULD NOT STABILIZE AFTER TWO HOURS OF PURGING BUT WAS <50 NTU.

- RETURN TO 1036 TO DEMOBILIZE.

RL 5/7/19

Daily Weather Condition: A.M. 55°F P. CLOUDY

P.M. 63°F P. CLOUDY

Recorded By: RL 5/7/19 (Signature) QC Checked by: [signature] 5/8/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 05/07/19 Page 1 of 1

Task Team Members:

Lindsey Mayer 5/7/19

5/8/19

Narrative (include time and location):

0808 Depart 1036, for groundwater sampling
0823 Arrive at LL1mw-086, set up.
0837 Begin low flow purge.
1152 End purge. A. Sprinzel gives permission to sample.
1153 Collect sample LL1mw-086-190401-GW, (Alkalinity, TAL metals, cyanide, filtered using 0.45 micron filter).
1209 Secure well, decon equipment.
1220 Set up on LL1mw-065 for low flow purge
1230 Begin purge.
1313 A. Sprinzel gives approval to sample, after parameters have reached stability
1314 Collect sample LL1mw-065-0190401-GW, (TAL metals, explosives)
1330 Secure well, decon equipment
1340 Arrive at LL2mw-064
1343 Begin purge, Call A. Sprinzel water keeps flowing after compressor turns off, she states to disconnect air line, water keeps flowing. She states it maybe partially artesian. L. Mayer tells her there are orange particulates, she suggests pumping at a higher rate than what it is flowing to remove particulates
1428 A Sprinzel gives approval to sample
1429 Collect sample LL2mw-064-190401-GW (TAL metals).
1437 Secure well, decon equipment
1450 Arrive at 1036, unload

Daily Weather Condition: A.M. 50's cloudy

P.M. 60's cloudy

Recorded By: L. Mayer 5/7/19 (Signature) QC Checked by: [signature] 5/8/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 5-8-19 Page 1 of 2

Task Team Members:

Gabby Gronefsky
Charles Spurr
Lindsey Moyer
Jackie Mitchell
JM 5-8-19

Narrative (include time and location):

0815 Jackie, Gabby, Lindsey, and Charles arrive at sand creek for groundwater sampling. Set up on SCLmw-001 through SCLmw-003.

0851 Charles and Gabby begin low flow purge on SCLmw-002 and prep bottleware for sampling.

0919 well stable. Send sample log to A. Sprinzl to verify.

0926 A. Sprinzl verified stability.

0925 Sample SCLmw-002 for VOCs, SVOCs, explosives, LL PAHs, PCBs, pesticides, cyanide, sulfide, Nitrate, nitrite, sulfate, Alkalinity, nitroguanidine, nitrocellulose, perchlorate, TAL metals.

* Duplicate ID: SCLmw002-190402-GW
* Split ID: SCLmw-002-190403-GW
* Primary ID: SCLmw-002-190401-GW
* MS/MSD ID: SCLmw-002-190401-GWMSD

1045 collect post sample reading and pack up equipment.

1203 Gabby departs SCL for 1036.

1210 Arrive at 1036 and collect equipment for GWS at LLmw-088

1235 Arrive at LLmw-088.

1302 Begin low flow purge.

1358 Notify H. Adams of elevated turbidity (~40 JM 5-8-19 NTU).

1503 All parameters stable, but turbidity is >10 NTU and <50 NTU. ~Two hr purge complete

Daily Weather Condition: A.M. 58°F, cloudy, breezy

P.M. 60°F, partly cloudy, breezy

Recorded By: [signature] 5-8-19 (Signature) QC Checked by: [signature] 5-9-19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

ate: (mm/dd/yy): 5-8-19 Page 2 of 2

Task Team Members:

Gabby Gromafsky

5-8-19

5-8-19

Narrative (include time and location):

1505 Sample LH1mw-088-19010-GW. Attempted to verify vol 4. Sprint and did not receive verification (no responce).

1545 Depart well.

1550 Arrive at 036. for demobilization.

Daily Weather Condition: A.M.

P.M. 5-8-19

ecorded By: 5-9-19 QC Checked by: 5-9-19

(Signature) (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 5/8/19 Page 1 of 1

Task Team Members:

RYAN LAURILLA

JL 5/8/19

JL 5/8/19

Narrative (include time and location):

0800 - DEPART FROM 1036.
0826 - START LOW FLOW AT FWGmw-004.
0906 - FWGmw-004 STABLE, TEXT LOG TO H. ADAMS TO CONFIRM.
0911 - STABILITY CONFIRMED.
0912 - SAMPLE FWGmw-004 FOR TAL METALS + EXPLOSIVES.
0935 - POST SAMPLE YSI DATA.
0959 - START LOW FLOW ON FWGmw-015.
1040 - FWGmw-015 STABLE, TEXT LOG TO H. ADAMS TO CONFIRM.
1054 - STABILITY CONFIRMED TEXT TO H. ADAMS NOT RECEIVED.
1055 - SAMPLE FWGmw-015 FOR EXPLOSIVES + TAL METALS.
1202 - POST SAMPLE YSI DATA.
1230 - RETURN TO BLDG. 1036 DECON SAMPLES.
1314 - START LOW FLOW AT CBPmw-008.
1401 - CBPmw-008 STABLE, TEXT LOG TO H. ADAMS TO CONFIRM.
1410 - STABILITY CONFIRMED.
1411 - SAMPLE CBPmw-008-190401-GW FOR CYANIDE.
1433 - ~~POST SAMPLE YSI DATA.~~ CHARLES SPANN PICKS UP CBPmw-008 SAMPLE TO GET IT IN SHIPMENT W/ COURIER.
1436 - POST SAMPLE YSI DATA
1600 - GOT STUCK AT CBPmw-008, GARY FROM VISTA PULLED THE VEHICLE OUT AFTER H. ADAMS WAS NOTIFIED.
1610 - RETURN TO 1036 - DEMOBILIZE

Daily Weather Condition: A.M. 48°F CLOUDY

P.M. 71°F SUNNY

Recorded By: JL 5/8/19 (Signature) QC Checked by: 05/08/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 05/08/19 Page 1 of 1

Task Team Members:

Jackie Mitchell 05/08/19

Charles Spurr 05/08/19

Narrative (include time and location):

0808 Depart building 1036 for GWS event.
0815 Arrive at Sand creek AOC and begin setup on wells.
0850 Begin low flow purge of SCLmw-0001.
0945 Stagnant water purged. Begin collecting parameter readings.
1012 Parameters stable. Readings QC'd by C. Spurr.
1015 Collect sample SCLmw-0001-190401-GW for VOCs, SVOCs, LL PAHs, PCBs, Pesticides, Explosives, Cyanide, Sulfide, Nitrate/Nitrite/Sulfate, Alkalinity, Nitroguanidine, Nitrocellulose, Perchlorate, TAL Metals & Phosphorus
1448 Sampling complete, collect final post sample parameter readings. Begin demob. from Sand Creek.
1510 Jackie and Lyndsey return to building 1036. Charles heads to help Ryan with truck.

05/08/19

Daily Weather Condition: A.M. 49°F, light wind, overcast

P.M. 63°F, light wind, partly cloudy

Recorded By: 05/08/19 (Signature) QC Checked by: 5/8/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 05/08/19 Page 1 of 1

Task Team Members:

Lindsey Mayer 5/8/19

5/8/19

Narrative (include time and location):

0800 Depart 1036, for Sand Creek groundwater sampling.
0820 Set up on well SCLmw-003
0838 Begin low flow purge. During stagnant water purge, water level dropped below the top of the pump.
1009 Charles confirms well is stable.
1010 Collect sample SCLmw-003-190401-GW (VOCs, SVOCs, LLPAH's PCBs, Pesticides, Explosives, Cyanide, Sulfide, Nitrate/Nitrite/Sulfate, Alkalinity, Nitroguanidine, Nitrocellulose, Perchlorate, TAL metals + Phosphorus).
1435 Secure well, decon equipment, move equipment back to trucks
1500 Arrive back at 1036, unload

5/8/19

Daily Weather Condition: A.M. 50's cloudy/overcast/light wind

P.M. 70's Sunny

Recorded By: 05/08/19 QC Checked by: 5/8/19

(Signature) (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 5-9-19 Page 1 of 2

Task Team Members:

Gabby Gromofsky
Ryan Lavrich
Jed Thomas
Lindsey Moyer
Charles Sporr 5-9-19

Narrative (include time and location):

0817 Arrive (Gabby + Ryan) at Ramsdell Quarry Landfill for groundwater sampling. Sign in at west gate.
0830 Jed Thomas arrives at RQL with gate key. Jed offsite.
~ Ryan + Gabby assess access issues with RQLmw-007.
0845 Gabby arrives at RQLmw-007 and Ryan proceeds to RQLmw-011.
0857 Begin low flow purge of RQLmw-007.
0922 Parameters stable. Verify with A. Sprinzl via text.
0937 Receive verification of stability from A. Sprinzl.
0940 Sample RQLmw-007-190401-GW for VOCs, phthalates, phenols, LL PAHs, PCBs, Pesticides, explosives and cyanide.
1025 Collect post sample reading and break down equipment.
~ Purge water line w/ QED freeze protection.
1042 Arrive at RQLmw-008.
1049 Begin low flow purge
1151 Parameters stable. Verify with A. Sprinzl via text.
1200 Receive confirmation of stabilization and sample RQLmw-008-190401-GW for VOCs, phthalates, phenols, LL PAHs, PCBs, pesticides, explosives and cyanide.
1233 Collect post sample reading, purge water line with QED freeze protection wrap up gear and equipment. Add Ryan's VOCs to cooler with trip blank.
1255 Lindsey onsite. Depart RQLmw-008 for RQLmw-013 - collect bottleware from Lindsey for RQLmw-012.

Daily Weather Condition: A.M. 63°F cloudy, windy

P.M. 76° F partly cloudy, windy

Recorded By: (Signature) 5-9-19 QC Checked by: (Signature) 5-9-19

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 5-9-19 Page 2 of 2

Task Team Members:

Gabby Gromoffsky

Charles Spurr AS 5-9-19

AS 5-9-19

Narrative (include time and location):

1302 Arrive at RQLmw-012.

1318 Begin low flow purge.

1323 Charles Spurr onsite to pick up samples.

1328 Charles AS 5-9-19 departs RQL.

1405 Parameters stable. Verify with Amanda Sprinzl via text.

1416 Receive verification of stability from A.S.

1420 Sample RQLmw-012-190401-GW for cyanide, alkalinity, sulfate, nitrate, nitrite, and sulfide.

1431 Collect post sample reading, purge water line with QED freeze protection and break down equipment.

1449 Depart RQL for sample management and demobilization activities at Building 1036.

AS 5-9-19

Daily Weather Condition: A.M. 63°F cloudy windy

P.M. 76°F, partly cloudy, windy

Recorded By: [signature] 5-9-19 (Signature) QC Checked by: [signature] 5-9-19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 05/09/19 Page 1 of 2

Task Team Members:

Lindsey Mayer 5/9/19

5/9/19

Narrative (include time and location):

0801 Depart 1036

0810 Drive with Heather to make sure it is ok to set up to LL3mw-246, and she shows L.Mayer where to pull off into grass 5/9/19

0816 Arrive at LL3mw-246 to set up.

0827 Begin low flow purge.

0904 Stabilization parameters, granted from C. Spurr.

0905 Collect samples. LL3mw-246-190401-GW (Explosives, Perchlorate, TAL metals). LL3mw-246-190401-GWMSD (perchlorate) LL3mw-246-190402-GW (Explosives, perchlorate, TAL metals) and split LL3mw-246-190403-GW (Explosives, perchlorate, TAL metals).

0945 Secure well, decon equipment.

1003 Arrive at FWGmw-021, set up

1012 Begin low flow purge, waited longer during stagnant water purge, due to water was turbid.

1119 R.Laurich confirms parameters are stable.

1120 Collect samples FWGmw-021-190401-GW 5/9/19, FWGmw-021-190401-MSD, FWGmw-021-190402-GW, FWGmw-021-190403-GW (Explosives / TAL Metals).

1205 Secure well, decon equipment.

1215 Arrive back at 1036, drop off samples, pickup new bottleware

1240 Sign in at gate at Ramsdell Quarry

1250 Set up on RQLmw-013

1303 Begin purge.

1352 End purge. R.Laurich confirms stable.

Daily Weather Condition: A.M. 70's Sunny

P.M. 70's cloudy / windy

Recorded By: [signature] 5/9/19 (Signature) QC Checked by: [signature] 05/09/19 (Signature)

gn 05/09/19

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 05/09/19 Page 2 of 2

Task Team Members:

Lindsey Mayer 5/9/19

5/9/19

Narrative (include time and location):

1353 Collect sample RQLmw-013-190401-GW, (Sulfate, Alkalinity, Nitrate, Nitrite, Sulfide).
1405 Secure well, decon equipment
1415 Set up on CBP-009.
1425 Begin purge, Jed picks up bottleware.
1458 1500 Jed arrives at CBP-009 with bottleware.
1503 End purge, Jed approves stabilization.
1505 Collect sample CBPmw-009-190401-GW (cyanide).
1512 Secure well, decon equipment.
1535 Arrive back at 1036, unload.

5/9/19

Daily Weather Condition: A.M. 70's Sunny

P.M. 70's cloudy/windy

Recorded By: 5/9/19 (Signature) QC Checked by: 05/09/19 (Signature)

# TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 5/9/19 Page 1 of 1

Task Team Members:

Ryan Lanrich

Gabby Gromofsky re/5/9/19.

re/5/9/19

Narrative (include time and location):

0804 - DEPART 1036

0815 - ARRIVE AT RQL + SIGN IN AT GREEN BOX. GABBY + RYAN SPLIT UP TO SAMPLE WELLS.

0902 - START LOW FLOW AT RQLmw-011.

0940 - RQLmw-011 STABLE, TEXT LOG TO A. SPRINZL TO VERIFY.

0952 - STABILITY VERIFIED.

0953 - SAMPLE RQLmw-011-190401-GW, RQLmw-011-190401-GW MSD, RQLmw-011-190402-GW + RQLmw-011-190403-GW FOR SULFIDE, NITRITE NITRATE, SULFATE, + ALKALINITY.

1032 - POST SAMPLE ~~YSI~~ 5/9/19 YSI DATA.

1059 - START LOW FLOW AT RQLmw-009.

1234 - RQLmw-009 STABLE, TEXT LOG TO A. SPRINZL TO VERIFY.

1239 - STABILITY VERIFIED.

1240 - SAMPLE RQLmw-009-190401-GW FOR VOCs, PHTHALATES/PHENOLS, LL PAHs, PCBs, PESTICIDES, EXPLOSIVES, CYANIDE, + TAL METALS.

*1337 - POST SAMPLE YSI DATA. CHARLES PICKS UP SAMPLES FROM

~~1330 - CH~~ re 5/9/19 RQLmw-011 + RQLmw-009.

1355 - SIGN OUT OF RQL + LOCK GATE.

1447 - START LOW FLOW AT RQLmw-016.

1528 - RQLmw-016 STABLE, CHARLES SPURR IN FIELD VERIFIES LOG.

1530 - ~~POST SAMPLE YSI DATA.~~ SAMPLE RQLmw-016-190401-GW FOR CYANIDE.

1544 - POST SAMPLE YSI DATA.

1615 - RETURN TO 1036 + DEMOBILIZE.

Daily Weather Condition: A.M. 66°F SUNNY

P.M. 79°F CLOUDY

Recorded By: [signature] 5/9/19 (Signature) QC Checked by: [signature] 05/09/19 (Signature)

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 05/09/19 Page 1 of 2

Task Team Members:

Jackie Mitchell

JM 05/09/19

JM 05/09/19

Narrative (include time and location):

0800 Depart building 1036 for GWS event.
0820 Arrive at FWGmw-018 and begin setup on well.
0830 Begin low flow purge of FWGmw-018.
0912 Well stable. Send confirmation of stability text to A. Sprinzl.
0923 Stability confirmed.
0925 Collect sample FWGmw-018-190401-GW for VOCs, Cyanide & TAL Metals.
0948 Begin setup of FWGmw-020
1003 Begin low flow purge of FWGmw-020.
1035 ~1200 mls water purged. Pump stops producing water. Check equipment. Problem not identified. Call C. Spurr to recieve help.
1045 C Spurr onsite. Troubleshoot for repair. Remove pump to check for malfunction. Problem not identified. C. Spurr takes pump back to 1036 to repair or replace.
1214 Arrive at FWGmw-024 and setup on well.
1231 Begin low flow purge of FWGmw-024.
1333 Well stable. Send confirmation of stability text to A. Sprinzl.
1336 Stability confirmed.

Daily Weather Condition: A.M. 64°F, light wind, partly sunny

P.M. 76°F, light wind, cloudy

Recorded By: (Signature) 05/09/19 QC Checked by: (Signature) 5-9-19

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 05/09/19 Page 2 of 2

Task Team Members:

Jackie Mitchell jm 05/09/19

Charles Spurr jm 05/09/19

Narrative (include time and location):

1340 Collect sample FWGmw-024-190401-GW for Explosives and TAL Metals.

1347 Sampling complete, take post sample parameter readings and begin demob. from site.

1430 Charles Spurr sets Stainless bladder pump into FWGmw-020.

1450 Depart FWGmw-024.

1455 Arrive at building 1034 and begin demobilization activities.

jm 05/09/19

Daily Weather Condition: A.M. N/A

P.M. 76°F, light wind, cloudy

Recorded By: (Signature) 05/09/19 QC Checked by: (Signature) 5-9-19

## TASK TEAM ACTIVITY LOG SHEET

**PROJECT NAME:** Facility-wide Groundwater RVAAP-66 **PROJECT NO:** April 2019 Sampling Event

Date: (mm/dd/yy): 5/13/19 Page 1 of 1

Task Team Members:

Charles Spurr
Ryan Laurich

Narrative (include time and location):

0820 Arrive at FWGmw-020 & setup. Ground path to well is muddy. will have to move equipment to well by hand.

0900 Air fitting for controller/tubing interface incorrect unavailable. Notify Ryan Laurich to bring spare QED parts to connect air line.

0915 Ryan on site to deliver parts. Return & finish setup.

0935 Begin low flow purge of FWGmw-020

1015 Sample FWGmw-020.

1030 Finish activities at well. Begin packing equipment in truck & remove pump from well.

1100 All equipment is packed & well is secure. Return to 1036.

Daily Weather Condition: A.M. 48°F; Cloudy; calm

P.M.

Recorded By: [signature] 5/13/19 (Signature) QC Checked by: [signature] 5/20/19 (Signature)

# D.2 Well Purge Forms

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# RVAAP-01 RAMSDELL QUARRY LANDFILL

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** RQLmw-007

**Date and Time:** Start: 5-9-19 | 0857 Complete: 5-9-19 | 1027

**Personnel:** Gabby Gromofsky

**Purge Method(s):** Bailer Bladder Pump Other: N/A

**Depth To Water:** 6.16 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 15.9 ft. **PSI=** 15.9 /2 + 10 = 17.9

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 15.9 - DTW 6.16 = 9.74

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 9.74 x Tf 9.46 = 92.1

**3.) Total Volume of stagnant water**

Total volume = 622 + ~~714.1~~ DS 5-9-19 92.1 = 714.1

**2x Total volume =** 1,428 ml

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA02140 | 5-9-19 |
| Water Level Tape: SOLONIST (Heron) | 07-0573 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 43635 | N/A |

**Total Volume of Water Removed (Liters):** 6.15 L Sample Method: Bladder Pump

**Sample ID / Date / Time:** RQLmw-007-19040I-GW | 5-9-19 | **QC Sample ID** N/A

**Analysis** VOCs, phthalates/phenols, LL PAHs, PCBs, Pesticides, explosives, cyanide

Field Observations/Site Conditions During Purging: water is slightly turbid and light brown while purging stagnant water; Became clear, colorless, odorless after stagnant water was purged.

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary:

DS 5-9-19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: 5-9-19 (Signature and Date)

QA Checked By: 5-9-19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** RQLmw-007

Initial DTW: 6.16

| | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|---|
| | 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5-9-19 | 0858 | 11.0 | 0.899 | 6.63 | 26.83 | 3.44 | 244.2 | 275 ml | ~~250~~ ~~125~~ 125 | 6.28 | Initial reading through flow cell (1/20/40) water is slightly turbid, light brown, odorless |
| | 0910 | -- | -- | -- | -- | -- | -- | 1,500 ml | 125 | 6.30 | Purged 2x's volume of stagnant water in pump and tubing - stability parameters not recorded |
| | 0913 | 10.9 | 0.599 | 6.18 | 5.14 | 0.78 | 261.0 | 375 ml | 125 | 6.30 | Start recording stability parameters water is clear, colorless, odorless |
| | 0916 | 11.0 | 0.597 | 6.17 | 3.22 | 0.58 | 261.9 | 450 ml | 150 | 6.30 | |
| | 0919 | 10.9 | 0.595 | 6.17 | 5.33 | 0.56 | 261.8 | 450 ml | 150 | 6.30 | JLY 5-9-19 |
| ↓ | 0922 | 11.1 | 0.593 | 6.18 | 3.72 | 0.72 | 261.4 | 450 ml | 150 | 6.30 | Stable- Confirm w/ A. Sprinzl @0937 (2300 ml purged) |
| | | | | | | | | | | | |
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|---|---|---|---|---|---|---|---|---|---|---|---|
| 5-9-19 | 1025 | 12.1 | 0.775 | 6.71 | 6.79 | 1.26 | 235.0 | 350 | ~~35~~ 150 | 6.80 | POST SAMPLE READINGS |

**Recorded By:** 5-9-19 **QA Checked By:** 5-9-19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID Number:** RQLmw-008

**Date and Time:** Start: 5-9-19 / 1049 Complete: 5-9-19 / 1240

**Personnel:** Gabby Gromofsky

**Purge Method(s):** Bailer Bladder Pump Other: N/A

**Depth To Water:** 6.51 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 15.3 ft. **PSI=** 15.3 /2 + 10 = 17.6

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 15.3 - DTW 6.51 = 8.79

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 8.79 x Tf 21.576 = 189.6

**3.) Total Volume of stagnant water**

Total volume = 622 + 189.6 = 811.6

**2x Total volume =** 1,623 ml

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: YSI PRO DSS or Horiba U-52 | FA02140 | 5-9-19 |
| Water Level Tape: SOLONIST Heron | 07-0573 | N/A |
| Other: MP-10 with QED Well Wizzard or MP-50 | 43635 | N/A |

**Total Volume of Water Removed (Liters):** 12.86 L Sample Method: Bladder Pump

**Sample ID / Date / Time:** RQLmw-008-190401-GW / 5-9-19 / 1200 **QC Sample ID** N/A

**Analysis** VOCs, phthalates, phenols, LL PAHs, PCBs, Pesticides, explosives, cyanide

Field Observations/Site Conditions During Purging: water is initially dark reddish orange, extremely turbid with biological growth, and odorless; Became clear, colorless, odorless;

Sampling Procedure Followed: YES / NO If no, why was deviation necessary: 5-9-19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected YES / NO**

Recorded By: [signature] 5-9-19 (Signature and Date)

QA Checked By: [signature] 5-9-19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** RQLmw-008

| | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|---|
| | 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 6.51

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5-9-19 | 1050 | 13.0 | 0.843 | 6.95 | 682.5 | 8.57 | 25.1 | 300 ml | 300 ml | 6.71 | Initial reading through flow cell (1/20/40) water is extremely turbid, dark reddish orange, has biological growth |
| | 1056 | -- | -- | -- | -- | -- | -- | 1,650 ml | 275 | 7.02 | Purged 2x's volume of stagnant water in pump and tubing - stability parameters not recorded |
| | 1101 | 11.5 | 0.949 | 6.67 | 46.61 | 0.30 | -60.1 | 850 ml | 170 | 6.85 | Start recording stability parameters (1/5/55) water is reddish orange, slightly turbid |
| | 1106 | 11.4 | 0.944 | 6.67 | 43.68 | 0.27 | -62.1 | 850 ml | 170 | 6.80 | water is odorless |
| | 1111 | 11.6 | 0.942 | 6.67 | 33.26 | 0.26 | -63.3 | 850 ml | 170 | 6.80 | |
| | 1116 | 11.9 | 0.933 | 6.68 | 18.56 | 0.23 | -64.1 | 875 ml | 175 | 6.80 | MB 5-9-19 |
| | 1121 | 11.3 | 0.924 | 6.67 | 14.06 | 0.20 | -64.1 | 850 ml | 170 | 6.80 | water has an orange tint, slightly cloudy |
| | 1126 | 11.4 | 0.925 | 6.67 | 19.45 | 0.19 | -63.9 | 875 ml | 175 | 6.80 | 5-9-19 |
| | 1131 | 11.4 | 0.921 | 6.67 | 10.49 | 0.18 | -65.3 | 850 ml | 170 | 6.80 | empty flow cell and refill (turbidity fluctuating around 15 NTU) |
| | 1136 | 11.3 | 0.930 | 6.68 | 6.07 | 1.63 | -59.8 | 850 ml | 170 | 6.80 | |
| | 1141 | 11.2 | 0.933 | 6.67 | 8.37 | 0.24 | -63.0 | 850 ml | 170 | 6.80 | 5-9-19 |
| | 1146 | 11.1 | 0.943 | 6.71 | 4.99 | 0.18 | -67.2 | 850 ml | 170 | 6.80 | MB |
| ↓ | 1151 | 11.1 | 0.946 | 6.68 | 4.13 | 0.17 | -68.8 | 850 ml | 170 | 6.80 | Stable - verify with A. Sprinzl via text @ 1200 (1L purged) |
| | | | | | MB | 5-9-19 | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5-9-19 | 1233 | 11.1 | 1.000 | 6.76 | 2.82 | 1.12 | -65.5 | 510 ml | 170 | 6.80 | POST SAMPLE READINGS |

**Recorded By:** 5-9-19 **QA Checked By:** 5-9-19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** RQLmw-009

**Date and Time:** 5/9/19 Start: 1059 Complete: 1234

**Personnel:** R. Lavoie

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 4.94 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 15 ft. **PSI=** 15 /2 + 10 = 17.5

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 15 - DTW 4.94 = 10.06

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 10.06 x Tf 21.576 = 217

**3.) Total Volume of stagnant water**

Total volume = 622 + 217 = 839

**2x Total volume =** 1678

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: YSI PRODSS or Horiba U-52 | FA05179 | 5/9/19 |
| Water Level Tape: SOLONIST HERON | 2178-7 | N/A |
| Other: MP-10 with QED Well Wizzard or MP-50 | 1052 18836 | N/A |

**Total Volume of Water Removed (Liters):** 9.675 Sample Method: Bladder Pump

**Sample ID / Date / Time:** RQLmw-009-190461-GW 5/9/19 1240 **QC Sample ID** N/A

**Analysis** VOCs, PHTHALATES / PHENOLS, LL PAHs, PCBs, PESTICIDES, EXPLOSIVES, CYANIDE, TAL METALS.

Field Observations/Site Conditions During Purging: ORANGE, TURBID, NO ODOR, ~~FLOATING SKIN~~ - CLEARED UP END OF PURGE

Sampling Procedure Followed: YES / NO If no, why was deviation necessary: N/A TLL 5/9/19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected YES / NO**

Recorded By: 5/9/19 (Signature and Date)

QA Checked By: 05/09/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** RQLmw-009

| | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|---|
| | 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 4.94

| Date | Time (1103) | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/9/19 | 1102 | ~~17.8~~ | ~~0.197~~ | ~~6.23~~ | ~~4.1~~ | ~~8.24~~ | 342.8 | 375 | 75 | ~~5.12~~ | Initial reading through flow cell CPM 1 57/3 |
| | 1123 | 14.3 | 0.311 | 6.47 | 58.1 | 6.02 | -- | 1325 | ~65 | ~~6.77~~ 5.77 | Purged 2x's volume of stagnant water in pump and tubing - stability parameters not recorded |
| | 1124 | 13.6 | 0.235 | 6.32 | 555.8 | 1.07 | 347.5 | 75 | 75 | ~~6.72~~ 5.73 | Start recording stability parameters |
| | 1129 | 13.5 | 0.228 | 6.30 | 481.1 | 1.01 | 341.6 | 500 | 100 | 5.78 | ORANGE/TURBID/NO ODOR. |
| | 1134 | 13.4 | 0.227 | 6.31 | 418.3 | 1.02 | 335.2 | 500 | 100 | 5.76 | |
| | 1139 | 13.2 | 0.227 | 6.32 | 376.0 | 1.00 | 291.8 | 500 | 100 | 5.78 | |
| | 1144 | 12.9 | 0.228 | 6.33 | 203.2 | 0.99 | 273.8 | 500 | 100 | 5.70 | |
| | 1149 | 13.0 | 0.230 | 6.33 | 156.0 | 0.96 | 242.0 | 500 | 100 | 5.70 | |
| | 1154 | 12.9 | 0.232 | 6.34 | 58.3 | 0.94 | 208.9 | 500 | 100 | 5.70 | |
| | 1159 | 13.1 | 0.234 | 6.34 | 38.1 | 0.91 | 181.6 | 500 | 100 | 5.70 | |
| | 1204 | 12.8 | 0.236 | 6.34 | 31.7 | 0.88 | 163.3 | 500 | 100 | 5.70 | TURBIDITY + COLOR CLEARING UP |
| | 1209 | 13.0 | 0.236 | 6.35 | 19.7 | 0.87 | 165.9 | 500 | 100 | 5.70 | |
| | 1214 | 13.0 | 0.237 | 6.35 | 11.7 | 0.85 | 154.3 | 500 | 100 | 5.70 | |
| | 1219 | 12.7 | 0.237 | 6.35 | 13.8 | 0.85 | 114.6 | 500 | 100 | 5.70 | |
| | | | | | | | 133.4 | | | | |
| 5/9/19 | 1357 | 14.4 | 0.239 | 6.36 | 3.3 | 1.41 | ~~135.4~~ stable | 400 | 100 | 5.70 | POST SAMPLE READINGS |

**Recorded By:** 5/9/19 **QA Checked By:** 05/09/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** RQ MW-009

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/9/19 | 1224 | 12.7 | 0.237 | 6.35 | 9.3 | 0.85 | 96.8 | 500 | 100 | 5.70 | |
| ↓ | 1229 | 12.8 | 0.237 | 6.35 | 8.8 | 0.83 | 85.5 | 500 | 100 | 5.70 | |
| | 1234 | 12.8 | 0.237 | 6.35 | 8.3 | 0.83 | 82.7 | 500 | 100 | 5.70 | STABLE |
| ↓ | 1239 | — | — | — | — | — | — | 500 | 100 | 5.70 | STABILITY CONFIRMED |

RL 5/9/19

**Recorded By:** RL 5/9/19

**QA Checked By:** 05/09/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** RQLmw-011

**Date and Time:** 5/9/19 Start: 0902 Complete: 0940

**Personnel:** R. Lavelly

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 21.25 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 31 ft. **PSI=** 31 /2 + 10 = 25.5

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

1.) **Length of Tubing w/ stagnant water**

Intake Depth (ID) 31 - DTW 21.25 = 9.75

2.) **Volume of stagnant water in tubing**

Difference of ID-DTW 9.75 x Tf 21.576 = 210.37

3.) **Total Volume of stagnant water**

Total volume = 622 + 210.37 = 823.37

**2x Total volume =** 1664.73

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: YSI PRO DSS or Horiba U-52 | FA03179 | 5/9/19 |
| Water Level Tape: SOLONIST LEROY | 2178-T | N/A |
| Other: MP-10 with QED Well Wizzard or MP-50 | 1032 18836 | N/A |

**Total Volume of Water Removed (Liters):** 5.35 Sample Method: Bladder Pump

**Sample ID / Date / Time:** RQLmw-011-190401 5/9/19 0953 **QC Sample ID** RQLmw-011-190402-GW RQLmw-011-190403-GW RQLmw-011-190407-GW MSD

**Analysis** SULFIDE, NITRATE, NITRITE, SULFATE ALKALINITY

Field Observations/Site Conditions During Purging: CLEAR / COLORLESS / ODORLESS. 5/9/19

Sampling Procedure Followed: YES / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected YES / NO**

Recorded By: 5/9/19 (Signature and Date)

QA Checked By: 05/09/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** RQLmw-011

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements | Initial DTW: 21.25 |
|---|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample | |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/9/19 | 0908 | 12.5 | 0.398 | 5.60 | 6.1 | 5.67 | 268.4 | 400 | 100 | 21.40 | Initial reading through flow cell CPM ; 57/3 |
| | 0919 | -- | -- | -- | -- | -- | -- | 1250 | ~115 | 21.40 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 0920 | 12.1 | 0.242 | 4.34 | 2.5 | 4.71 | 344.6 | 100 | 100 | 21.40 | Start recording stability parameters CLEAR/COLORLESS/ODORLESS |
| | 0925 | 12.1 | 0.238 | 4.22 | 2.9 | 4.63 | 362.9 | 500 | 100 | 21.40 | |
| | 0930 | 12.2 | 0.237 | 4.14 | 3.5 | 4.53 | 375.9 | 500 | 100 | 21.40 | |
| | 0935 | 12.2 | 0.240 | 4.09 | 3.6 | 4.48 | 382.0 | 500 | 100 | 21.40 | |
| | 0940 | 12.2 | 0.244 | 4.07 | ~~3.0~~ within 3.0 | 4.36 | 387.1 | 500 | 100 | 21.40 | STABLE |
| | 0952 | — | — | — | — | — | — | 1200 | 100 | 21.40 | STABILITY CONFIRMED |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| 5/9/19 | 1052 | 14.80 | 0.344 | 4.42 | 2.4 | 4.48 | 402.0 | 400 | 100 | 21.40 | POST SAMPLE READINGS |

RQ 5/9/19

**Recorded By:** RQ 5/9/19 **QA Checked By:** 05/09/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** RQLmw - 012

**Date and Time:** Start: 5-9-19 / 1318 Complete: 5-9-19 / 1435

**Personnel:** Gabby Gromoffsky

**Purge Method(s):** Bailer Bladder Pump Other: N/A

**Depth To Water:** 21.08 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 29.5 ft. **PSI=** 29.5 /2 + 10 = 24.7

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 29.5 - DTW 21.08 = 8.42

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 8.42 x Tf 21.576 = 181

**3.) Total Volume of stagnant water**

Total volume = 622 + 181 = 803

**2x Total volume =** 1,607 ml

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA02140 | 5-9-19 |
| Water Level Tape: SOLONIST (Heron) | 07-0573 | N/A |
| Other: (MP-10 with QED Well Wizzard) or MP-50 | 43035 | N/A |

**Total Volume of Water Removed (Liters):** 12.025 L Sample Method: Bladder Pump

**Sample ID / Date / Time:** RQLmw-012-190401-GW/5-9-19/1420 **QC Sample ID** N/A

**Analysis** Cyanide, Sulfide, nitrate, nitrite, sulfate, alkalinity

Field Observations/Site Conditions During Purging: water is clear, colorless, odorless; poison ivy grows on and around well;

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary:

DD 5-9-19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: 5-9-19 (Signature and Date)

QA Checked By: 5-9-19 (Signature and Date)

leidos

# WELL PURGE FORM

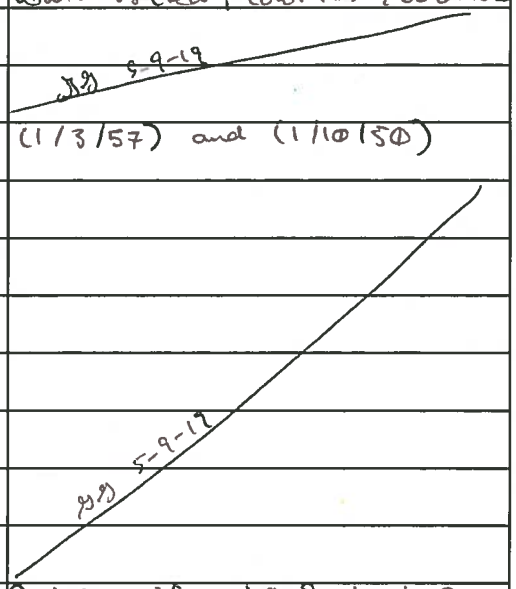


**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** RQLmw-012

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 21.08

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5-9-19 | 1319 | 11.8 | 0.320 | 6.81 | 2.39 | 10.69 | 123.4 | 275 ml | 300 | 21.08 | Initial reading through flow cell (1/120/40) water is clear, colorless, odorless |
| | 1329 | -- | -- | -- | -- | -- | -- | 1,850 ml | ~~185~~ 375 | 21.11 | Purged 2x's volume of stagnant water in pump and tubing - stability parameters not recorded 5 min pump discovered from battery for app |
| | 1332 | 9.9 | 0.428 | 5.25 | 0.81 | 5.61 | 215.5 | 1,125 ml | 375 | 21.11 | Start recording stability parameters (1/10/50) water is clear, colorless, odorless |
| | 1335 | 10.1 | 0.443 | ~~5.25~~ 5.29 | 0.80 | 5.35 | 219.1 | 1,100 ml | 370 | 21.11 | |
| | 1338 | 10.3 | 0.439 | 5.29 | 0.89 | 5.30 | 221.0 | 1,125 ml | 375 | 21.11 | |
| | 1341 | 10.8 | 0.441 | 5.30 | 0.66 | 5.37 | 207.3 | 650 ml | ~220 | 21.11 | (1/3/57) and (1/10/50) |
| | 1344 | 11.4 | 0.439 | 5.29 | 0.72 | 5.82 | 212.0 | 450 ml | ~~90~~ 150 | 21.11 | |
| | 1347 | 11.8 | 0.426 | 5.29 | 0.76 | 5.94 | 213.5 | 450 ml | ~~90~~ 150 | 21.11 | |
| | 1350 | 12.0 | 0.369 | 5.22 | 0.76 | 6.50 | 219.2 | 450 ml | ~~90~~ 150 | 21.11 | |
| | 1353 | 11.9 | 0.351 | 5.20 | 0.80 | 6.66 | 222.1 | 450 ml | 150 | 21.11 | |
| | 1356 | 11.7 | 0.337 | 5.17 | 0.62 | 6.87 | 226.1 | 450 ml | 150 | 21.11 | |
| | 1359 | 11.8 | 0.329 | 5.15 | 0.65 | 6.91 | 230.2 | 450 ml | 150 | 21.11 | |
| | 1402 | 11.8 | 0.324 | 5.14 | 0.66 | 6.93 | 233.1 | 450 ml | 150 | 21.11 | |
| ↓ | 1405 | 11.8 | 0.321 | 5.14 | 0.65 | 6.96 | 236.2 | 450 ml | 150 | 21.11 | Stable-verify w/ A Sprinzl @ 1416 (2 L purged) |
| 5-9-19 | 1431 | 12.6 | 0.335 | 5.49 | 0.28 | 7.68 | 230.8 | 300 ml | 150 | 21.11 | POST SAMPLE READINGS |




**Recorded By:** 5-9-19 **QA Checked By:** 5-9-19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** RQLmw-013

**Date and Time:** 5/9/19 Start: 1303 Complete: 1352

**Personnel:** Lindsey Mayer

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 23.59 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 33.5 ft. **PSI=** 33.5 /2 + 10 = 26.75

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 33.5 - DTW 23.59 = 9.91

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 9.91 x Tf 21.576 = 213.82

**3.) Total Volume of stagnant water**

Total volume = 622 + 213.82 = 835.82

**2x Total volume =** 1671.64

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03313 | 5/9/19 |
| Water Level Tape: ~~SOLONIST~~ Heron (Qu 5/9/19) | 07-0572 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 42406 | N/A |

**Total Volume of Water Removed (Liters):** 5.2 Sample Method: Bladder Pump

**Sample ID / Date / Time:** RQLmw-013-190401-GW/5-9-19/1353 **QC Sample ID** N/A

**Analysis** Sulfide, Alkalinity, Sulfate, Nitrate, Nitrite

Field Observations/Site Conditions During Purging: 70's cloudy/windy, water is clear, colorless, odorless

Sampling Procedure Followed: (YES) NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) NO**

Recorded By: [signature] 5/9/19 (Signature and Date)

QA Checked By: [signature] 05/09/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** RQLmw-013

| | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV |
|---|---|---|---|---|---|---|
| Stabilization Requirements | 3 | 3 | 3 | 1 | 3 | 3 |
| Consecutive Readings to Sample | | | | | | |

Initial DTW: 23.59

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/9/19 | 1307 | 13.4 | 0.431 | 3.57 | 3.39 | 7.62 | 331.5 | 300 | 75 | 23.89 | Initial reading through flow cell CPM-1 D=2.0 R=58.0 |
| | 1324 | -- | -- | -- 3.95 | -- | -- | -- | 1700 | 100 | 23.91 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded CPM-1 R=3.0 D=5 |
| | 1325 | 12.4 | 0.409 | ~~8.74~~ dm 5/9/19 | 8.74 | 1.33 | 334.4 | 100 | 100 | 23.91 | Start recording stability parameters |
| | 1330 | 12.4 | 0.408 | 3.98 | 5.28 | 1.11 | 331.1 | 500 | 100 | 23.91 | |
| | 1335 | 12.5 | 0.405 | 3.98 | 1.99 | 0.91 | 329.3 | 500 | 100 | 23.91 | |
| | 1340 | 12.6 | 0.404 | 3.98 | 1.62 | 0.90 | 329.6 | 500 | 100 | 23.91 | |
| | 1345 | 12.7 | 0.403 | 3.98 | 2.00 | 0.83 | 332.3 | 500 | 100 | 23.91 | |
| | 1352 | — | — | — | — | — | — | 700 | 100 | 23.91 | R. Lavich Approves stability |
| | | | | | | | | | | | 5/9/19 |
| 5/9/19 | 1404 | 13.1 | 0.409 | 3.98 | 1.80 | 1.53 | 323.9 | 400 | 100 | 23.91 | POST SAMPLE READINGS |

**Recorded By:** 5/9/19

**QA Checked By:** 05/09/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** RQLmw-016

**Date and Time:** 5/9/19 Start: 1447 Complete: 1528

**Personnel:** R. LAURICH

**Purge Method(s):** Bailer ☐ Bladder Pump ☑ Other: ☐

**Depth To Water:** 36.93 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 40.7 ft. **PSI=** 40.7 /2 + 10 = 30.35

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 40.7 - DTW 36.93 = 3.77

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 3.77 x Tf 9.46 = 35.66

**3.) Total Volume of stagnant water**

Total volume = 622 + 35.66 = 657.66

**2x Total volume =** 1315

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: YSI PRO DSS or Horiba U-52 | FAO 3179 | 5/9/19 |
| Water Level Tape: SOLONIST w/ 1/4 in. HERON | 2178-T | N/A |
| Other: MP-10 with QED Well Wizzard or MP-50 | 1032 18836 | N/A |

**Total Volume of Water Removed (Liters):** 2.525 Sample Method: Bladder Pump

**Sample ID / Date / Time:** RQLmw-016-190401-GW 5/9/19 **QC Sample ID** N/A

**Analysis** CYANIDE.

Field Observations/Site Conditions During Purging: CLEAR | COLORLESS | ODORLESS

RL 5/9/19

Sampling Procedure Followed: YES / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected YES / NO**

Recorded By: [signature] 5/9/19 (Signature and Date)

QA Checked By: [signature] 05/09/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** RQL mw-016

Initial DTW: 36.93

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/9/19 | 1455 | 17.2 | 2.507 | 5.99 | 5.5 | 1.99 | 130.8 | 375 | 75 | 37.05 | Initial reading through flow cell CPM \| 5/13 |
| | 1512 | -- | -- | -- | -- | -- | -- | 950 | ~56 | 37.30 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded CPM \| 5/14 |
| | 1513 | 13.6 | 2.401 | 6.11 | 2.1 | 0.80 | -25.2 | 50 | 50 | 37.28 | Start recording stability parameters CPM \| 5/13 CLEAR / COLORLESS / ODORLESS |
| | 1518 | 14.0 | 2.397 | 6.11 | 2.0 | 0.77 | -25.6 | 250 | 50 | 37.30 | |
| | 1523 | 14.2 | 2.402 | 6.11 | 1.9 | 0.76 | -31.7 | 250 | 50 | 37.30 | |
| | 1528 | 14.2 | 2.407 | 6.11 | 2.1 | 0.75 | -35.0 | 250 | 50 | 37.30 | STABLE |
| | 1529 | — | — | — | — | — | — | 50 | 50 | 37.30 | STABILITY CONFIRMED |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | Re | | | | | |
| | | | | | | | 5/9/19 | | | | |
| | | | | | | | 5/9/19 | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| 5/9/19 | 1544 | 14.2 | 2.426 | 6.12 | 1.2 | 1.25 | 9.4 | 350 | 50 | 37.31 | POST SAMPLE READINGS |

**Recorded By:** 5/9/19

**QA Checked By:** 05/09/19

# RVAAP-02 ERIE BURNING GROUNDS

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** EBGmw-125

**Date and Time:** Start: 5/7/19 1005 Complete: 5/7/19 1110

**Personnel:** Charles Spurr

**Purge Method(s):** Bailer ☑ Bladder Pump Other: ____

**Depth To Water:** 12.40 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 19 ft. **PSI=** 19 /2 + 10 = 19.5

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 19 - DTW 12.40 = 6.60

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 6.60 x Tf 9.46 = 62.4

**3.) Total Volume of stagnant water**

Total volume = 622 + 62.4 = 684.4

**2x Total volume =** 1369 mL

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03966 | 5/7/19 |
| Water Level Tape: SOLONIST | 212380 | N/A |
| Other: (MP-10 with QED Well Wizzard) or MP-50 | 3308 | N/A |

**Total Volume of Water Removed (Liters):** 7.05 Sample Method: Bladder Pump

**Sample ID / Date / Time:** EBGMW-125-190401-GW 5/7/19 1055 **QC Sample ID** N/A

**Analysis** Cyanide

Field Observations/Site Conditions During Purging: 54°F; cloudy; calm

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: [signature] 5/7/19 (Signature and Date)

QA Checked By: [signature] 5/8/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** EBGmw-125

| | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV |
|---|---|---|---|---|---|---|
| Stabilization Requirements | | | | | | |
| Consecutive Readings to Sample | 3 | 3 | 3 | 1 | 3 | 3 |

Initial DTW: 12.40

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/7/19 | 1009 | 10.3 | 0.444 | 7.04 | 15.8 | 1.49 | 219 | 600mL | 150 | 12.40 | Initial reading through flow cell CPM 2/4/26 ~20 PSI |
| - | - | -- | -- | -- | -- | -- | -- | - | - | - | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| 5/7/19 | 1015 | 9.7 | 0.415 | 6.75 | 13.2 | 0.42 | 215 | 1.5(L) | 150 | 12.40 | Start recording stability parameters CPM 2/4/26 20 PSI |
| | 1020 | 9.5 | 0.412 | 6.74 | 8.4 | 0.12 | 125 | 0.75 | 150 | 12.40 | |
| | 1025 | 9.4 | 0.413 | 6.76 | 8.2 | 0.04 | 65 | 0.75 | 150 | 12.40 | |
| | 1030 | 9.5 | 0.414 | 6.79 | 4.2 | 0.00 | 35 | 0.75 | 150 | 12.40 | |
| | 1035 | 9.5 | 0.414 | 6.80 | 3.5 | 0.00 | 17 | 0.75 | 150 | 12.40 | |
| | 1040 | 9.5 | 0.415 | 6.82 | 3.1 | 0.00 | 3.1 | 0.75 | 150 | 12.40 | |
| | 1045 | 9.5 | 0.417 | 6.84 | 2.8 | 0.00 | -4.2 | 0.75 | 150 | 12.40 | |
| | 1050 | 9.5 | 0.417 | 6.84 | 2.7 | 0.00 | -9.6 | 0.75 | 150 | 12.40 | |
| | | | | | | | | CS 5/7/19 | | | |
| 5/7/19 | 1057 | 9.8 | 0.420 | 6.87 | 4.1 | 0.05 | -17 | 300mL | 150 | 12.40 | POST SAMPLE READINGS |

**Recorded By:** [signature] 5/7/19 **QA Checked By:** [signature] 5/8/19

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# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** EBGmw-131

**Date and Time:** Start: 5/7/19 1130 Complete: 5/7/19 1215

**Personnel:** Charles Spurr

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 8.65 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 65.5 ft. **PSI=** 65.5 /2 + 10 = 43

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 65.5 - DTW 8.65 = 56.85

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 56.85 x Tf 21.576 = 1227

**3.) Total Volume of stagnant water**

Total volume = 622 + 1227 = 1849

**2x Total volume =** 3698 mL

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03966 | 5/7/19 |
| Water Level Tape: SOLONIST | 212380 | N/A |
| Other: (MP-10 with QED Well Wizzard) or MP-50 | 3308 | N/A |

**Total Volume of Water Removed (Liters):** 6.2 Sample Method: Bladder Pump

**Sample ID / Date / Time:** EBGMW-131-190401-GW 5/7/19 1205 **QC Sample ID** N/A

**Analysis** Cyanide

Field Observations/Site Conditions During Purging: 57° F; Cloudy; breezy

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: 5/7/19 (Signature and Date)

QA Checked By: 5/8/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** EBGmw-131

Initial DTW: 8.65'

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/7/19 | 1134 | 10.7 | 0.615 | 7.24 | 14.8 | 3.18 | 77 | 800 mL | 200 | 8.68 | Initial reading through flow cell CPM2/4/26 ~43 PSI |
| – | – | -- | -- | -- | -- | -- | -- | – | – | – | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| 5/7/19 | 1149 | 10.3 | 0.593 | 7.24 | 3.7 | 0.10 | -31 | 3.8(L) | 200 | 8.68 | Start recording stability parameters CPM2/4/26 ~43 PSI |
| ↓ | 1154 | 10.3 | 0.593 | 7.24 | 3.2 | 0.08 | -34 | 1.0(L) | 200 | 8.68 | ↓ ↓ |
| ↓ | 1159 | 10.3 | 0.594 | 7.24 | 2.8 | 0.03 | -36 | 1.0 | 200 | 8.68 | ↓ ↓ |
| | | | | | | | CS | 5/7/19 | | | |
| 5/7/19 | 1207 | 10.4 | 0.594 | 7.25 | 3.6 | 0.13 | -37 | 400 mL | 200 | 8.68 | POST SAMPLE READINGS |

**Recorded By:** [signature] 5/7/19 **QA Checked By:** [signature] 5/8/19

# RVAAP-03 OPEN DEMOLITION AREA #2

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** DA2 MW - 115

**Date and Time:** Start: 4/29/19 0928 Complete: 1029

**Personnel:** Lindsey Mayer

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 5.93 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 41.5 ft. **PSI=** 41.5 /2 + 10 = 30.75

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 41.5 - DTW 5.93 = 35.57

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 35.57 x Tf 21.576 = 767.46

**3.) Total Volume of stagnant water**

Total volume = 622 + 767.46 = 1389.46

**2x Total volume =** 2778.91

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA02140 | 4/29/19 |
| Water Level Tape: ~~SOLONIST~~ 2m 4/29/19 Heron | 07-0573 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 42406 | N/A |

**Total Volume of Water Removed (Liters):** ~~4.805~~ 2m 4/29/19 4.925 Sample Method: Bladder Pump

**Sample ID / Date / Time:** DA2mw-115-190401-GW/4/29/19/1030 **QC Sample ID** DA2MW-115-190401-GWMSD/DA2mw-115-190402-GW DA2mw-15-190403-GW

**Analysis** TAL metals

Field Observations/Site Conditions During Purging: 43.1°, cloudy, water is clear, colorless, odorless.

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary:

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: L. Mayer 4/29/19 (Signature and Date)

QA Checked By: Amanda Springl @4/29/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** DA2MW-115

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 5.93

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/29/19 | 0934 | 7.8 | 1.350 | 7.44 | 2.99 | 7.71 | 199.0 | 200 ~~80~~ mL | 40 | 6.00 | Initial reading through flow cell 52.0 CPM-1 / D-30 / R-~~56~~ Ramped up to CPM-1 D-40 R-56 |
| | 1008 | -- | -- | -- | -- | -- | -- | 2850 | 75 | 6.00 | Purged 2x's volume of stagnant water in pump and tubing - stability parameters not recorded |
| | 1009 | 8.9 | 1.289 | 7.20 | 0.79 | 2.06 | -28.9 | 75 | 75 | 6.00 | Start recording stability parameters |
| | 1014 | 9.0 | 1.290 | 7.20 | 0.55 | 1.81 | -33.6 | 375 | 75 | 6.00 | |
| | 1019 | 9.1 | 1.290 | 7.20 | 0.51 | 1.76 | -37.5 | 375 | 75 | 6.00 | |
| | 1024 | 9.1 | 1.291 | 7.21 | 0.44 | 1.83 | -40.9 | 375 | 75 | 6.00 | Send picture |
| | 1029 | — | — | — | — | — | — | 375 | 75 | 6.00 | ~~1024~~ Approval from A. Sprinzl to sample |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
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| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | 4/29/19 |
| 4/29/19 | 1052 | 93 | 1.293 | 7.25 | 0.46 | 1.39 | -26.9 | 300 | 75 | 6.00 | POST SAMPLE READINGS |

**Recorded By:** [signature] 4/29/19 **QA Checked By:** Amanda Sprinzl 04/29/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** DET-003

**Date and Time:** Start: 4/29/19 0958 Complete: 4/29/19 1526

**Personnel:** RYAN LAUNCH

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** ~~9.96~~ 8.96 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 12.4 ft. **PSI=** 12.4 /2 + 10 = 16.2

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

1.) **Length of Tubing w/ stagnant water**

Intake Depth (ID) 12.4 - DTW 8.96 = ~~3.44~~ 3.44 in stagnant

2.) **Volume of stagnant water in tubing**

Difference of ID-DTW ~~3.44~~ 3.44 in stagnant x Tf 9.46 = ~~33.08~~ 32.54 ml

3.) **Total Volume of stagnant water**

Total volume = 622 + ~~33.08~~ 32.54 = ~~645.08~~ 654.54 ml

2x Total volume = ~~1290.16~~ 1309.08 ml

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: YSI PRO DSS or Horiba U-52 | FA0J179 | 4/29/19 |
| Water Level Tape: ~~SOLONIST~~ 4/29/19 SOLONIST 212580 ~~ft~~ stagnant | 212580 | N/A |
| Other: MP-10 with QED Well Wizard or MP-50 | 1052 | N/A |

**Total Volume of Water Removed (Liters):** 3.090 Sample Method: Bladder Pump

**Sample ID / Date / Time:** DET-003-190401-GW 4/29/19 1053 **QC Sample ID** DET-003-190401-GWMSD + DET-003-190402-GW

**Analysis** VOCs, PHTHALATES, NITROAROMATICS, PHENOLS, LL PAHS, PCBS, PESTICIDES, EXPLOSIVES, DET-003-190403-GW CYANIDE, TAL METALS

Field Observations/Site Conditions During Purging: WATER STARTED ORANGE, CLOUDY, NO ODOR - WATER CLEARED UP DURING PURGE

Sampling Procedure Followed: YES / NO If no, why was deviation necessary: ~~N/A~~ stagnant

NA

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected** (YES) / NO

Recorded By: 4/29/19 (Signature and Date)

QA Checked By: 04/29/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** DET-003

| | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|---|
| | 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 8.96

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/29/19 | 1006 | 7.9 | 0.766 | 7.27 | 192.6 | 5.14 | 53.01 | 50 mL | 50 | 9.00 | Initial reading through flow cell ORANGE, NO ODOR CPM: 57/5 |
| | 1031 | -- | -- | -- | -- | -- | -- | 1300 | ~52 | 8.96 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded WATER CLEARING UP |
| | 1036 | 8.1 | 0.723 | 7.21 | 6.3 | 1.01 | -15.6 | 350 | 70 | 8.98 | Start recording stability parameters |
| | 1041 | 8.2 | 0.723 | 7.21 | 4.9 | 0.97 | -18.9 | 350 | 70 | 9.00 | |
| | 1046 | 8.2 | 0.723 | 7.21 | 2.6 | 0.94 | -26.1 | 350 | 70 | 9.00 | STABLE |
| | 1052 | — | — | — | — | — | — | 420 | 70 | 9.00 | ~~Sample~~ RECORDED FOR CONFIRMATION ON STABILIZATION Re 4/29/19 |
| | | | | | | | | | | | |
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| 4/29/19 | 1526 | 9.4 | 0.737 | 7.42 | 1.8 | 1.85 | -41.1 | 270 | ~70 | 9.05 | POST SAMPLE READINGS |

CPM: 55/4 UP

Re 4/29/19

**Recorded By:** 4/29/19 **QA Checked By:** 04/29/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** DET-004

**Date and Time** 04/29/19 Start: 0917 Complete: 1502

**Personnel:** Jackie Mitchell

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 9.84 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** ~~+2~~ 11.9 ft. **PSI=** 11.9 /2 + 10 = ~16

gm 04/29/19

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 11.9 - DTW 9.84 = 2.06

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 2.06 x 9.46 Tf = 19.49

**3.) Total Volume of stagnant water**

Total volume = 622 + 19.49 = 641.49

**2x Total volume =**

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03966 | 04/29/19 |
| Water Level Tape: SOLONIST | Pine 2178-T | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | Pine 43635 | N/A |

**Total Volume of Water Removed (Liters):** 1.875 L Sample Method: Bladder Pump

**Sample ID / Date / Time:** DET-004-190401-GW/04/29/19/1004 **QC Sample ID** —

**Analysis** Pesticides/PCBs, SVOCs, VOCs, Explosives, ULPAHs, Cyanide, TAL Metals

Field Observations/Site Conditions During Purging: 40°F, light wind, cloudy. Well pad surrounded by med. length grass, pad covered, paint flaking off baffists and stickup

Sampling Procedure Followed (YES) / NO If no, why was deviation necessary:

gm 04/29/19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: 04/29/19 (Signature and Date)

QA Checked By: Amanda Spring 04/29/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** DET-004

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 9.84

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/29/19 | 0924 | 7.5 | 0.988 | 6.61 | 2.54 | 5.12 | 228.2 | 300 | 25 | 9.98 | Initial reading through flow cell 1/2.0/58.0 |
| | 0937 | -- | -- | -- | -- | -- | -- | 650 | 20 | Top of Pump | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 0938 | 7.5 | 0.792 | 6.51 | 1.95 | 3.20 | 223.9 | 50 | 20 | | Start recording stability parameters 1/1.0/59.0 |
| | 0943 | 7.4 | 0.786 | 6.52 | 2.15 | 3.00 | 224.9 | 100 | 20 | | |
| | 0948 | 7.4 | 0.784 | 6.52 | 1.76 | 2.94 | 224.9 | 100 | 20 | | |
| | 0953 | 7.3 | 0.784 | 6.52 | 1.74 | 2.87 | 225.7 | 100 | 20 | | 225 ml purged while awaiting Stability Confirmation |
| 04/29/19 | 1502 | 11.5 | 0.781 | 5.59 | 1.08 | 2.91 | 201.8 | 350 | 20 | Top of Pump | POST SAMPLE READINGS |

JMR 04/29/19

**Recorded By:** JMR 04/29/19 **QA Checked By:** Amanda Springl 04/29/19

# RVAAP-05 WINKLEPECK BURNING GROUNDS

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** WBGMW-006

**Date and Time:** Start: 4/30/19 0818 Complete: 0969

**Personnel:** Lindsey Moser

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 5.69 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 16 ft. **PSI=** 16 /2 + 10 = 18

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 16 - DTW 5.69 = 10.31

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 10.31 x Tf 21.576 = 222.45

**3.) Total Volume of stagnant water**

Total volume = 622 + 222.45 = 844.45

**2x Total volume =** 1688.9

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA02140 | 4/30/19 |
| Water Level Tape: ~~SOLONIST~~ Heron (DM 4/30/19) | 07-0573 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 42406 | N/A |

**Total Volume of Water Removed (Liters):** 2.85 Sample Method: Bladder Pump

**Sample ID / Date / Time:** WBGMW-006-190401-GW/4-30-19/0910 **QC Sample ID** N/A

**Analysis** Explosives, TAL Metals

Field Observations/Site Conditions During Purging: 48°F, cloudy, water is clear, colorless, odorless

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: DM 4/30/19 4/30/19 (Signature and Date)

QA Checked By: 4/30/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** WBGmw-006

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements | Initial DTW: 5.69 |
|---|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample | |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/30/19 | 0824 | 9.0 | 1.421 | 7.31 | 0.81 | 3.19 | 199.4 | 300mL | 50 | 5.74 | Initial reading through flow cell CPM-1 D-3.0 R-57.0 |
| | 0852 | -- | -- | -- | -- | -- | -- | 1400 | 50 | 5.76 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 0853 | 8.9 | 1.419 | 7.27 | 5.27 | 0.74 | 218.3 | 50 | 50 | 5.76 | Start recording stability parameters |
| | 0858 | 9.0 | 1.421 | 7.28 | 5.28 | 0.74 | 218.4 | 250 | 50 | 5.78 | |
| | 0903 | 9.0 | 1.419 | 7.28 | 7.79 | 0.67 | 218.5 | 250 | 50 | 5.81 | |
| | 0909 | - | - | - | - | - | - | 300 | 50 | 5.81 | A. Sprinzel gives Approval to sample |
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|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/30/19 | 0940 | 9.0 | 1.427 | 7.31 | 0.79 | 0.77 | 218.9 | 300 | 50 | 5.84 | POST SAMPLE READINGS |

**Recorded By:** 4/30/19 **QA Checked By:** 4/30/19

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# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** WBGmw-009

**Date and Time:** Start: 4/30/19 1003 Complete: 1052

**Personnel:** Lindsey Mayer

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 11.89 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 20.05 ft. **PSI=** 20.05 /2 + 10 = 20.025

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 20.05 - DTW 11.89 = 8.16

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 8.16 x Tf 21.576 = 176.06

**3.) Total Volume of stagnant water**

Total volume = 622 + 176.06 = 798.06

**2x Total volume =** 1596.12

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA02140 | 4/30/19 |
| Water Level Tape: SOLINST Heron (2nd 4/30/19) | 07-0573 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 42406 | N/A |

**Total Volume of Water Removed (Liters):** 2.95 Sample Method: Bladder Pump

**Sample ID / Date / Time:** WBGmw-009-190401-GW/4-30-19/1053 **QC Sample ID** N/A

**Analysis** Explosives / Tal metals

Field Observations/Site Conditions During Purging: 48°F, cloudy water is clear, colorless, odorless.

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: 4/30/19 (Signature and Date)

QA Checked By: 4/30/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** WBGMW-009

| | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|---|
| | 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 11.89

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/30/19 | 1008 | 9.4 | 0.909 | 6.43 | 1.12 | 3.59 | 212.1 | 250mL | QM 4/30/19 20 50 | 12.48 | Initial reading through flow cell CPM-1 D-2 R-58 |
| | 1035 | -- | -- | -- | -- | -- | -- | 1350 | 50 | 12.89 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 1036 | 9.8 | 0.851 | 6.29 | 1.01 | 0.87 | 194.9 | 50 | 50 | 12.90 | Start recording stability parameters |
| | 1041 | 9.8 | 0.851 | 6.28 | 0.91 | 0.85 | 199.1 | 250 | 50 | 12.90 | |
| | 1046 | 10.1 | 0.851 | 6.28 | 1.21 | 0.78 | 201.4 | 250 | 50 | 12.92 | |
| | 1052 | — | — | — | — | — | — | 300 | 50 | 12.92 | A. Spinzal gives approval to sample |
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|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/30/19 | 1114 | 10.2 | 0.863 | 6.35 | 0.41 | 1.20 | 198.2 | 250 | 50 | 13.05 | POST SAMPLE READINGS |

**Recorded By:** [signature] 4/30/19 **QA Checked By:** [signature] 4/30/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** WBGmw-020

**Date and Time:** Start: 4/30/19 1028 Complete: 4/30/19 1145

**Personnel:** R. Lavigne

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 11.60 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 34 ft. **PSI=** 34 /2 + 10 = 27

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 34 - DTW 11.60 = 22.40

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 22.40 x Tf 21.576 = 483.30

**3.) Total Volume of stagnant water**

Total volume = 622 + 483.30 = 1105.30

**2x Total volume =** 2210.60

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: YSI PRO DSS or Horiba U-52 | FA03179 | 4/30/19 |
| Water Level Tape: SOLONIST | 212380 | N/A |
| Other: MP-10 with QED Well Wizzard or MP-50 | 1032 | N/A |

**Total Volume of Water Removed (Liters):** 5.745 Sample Method: Bladder Pump

**Sample ID / Date / Time:** WBGmw-020-190401-GW 4/30/19 1150 **QC Sample ID** N/A

**Analysis** EXPLOSIVES + TAL METALS.

Field Observations/Site Conditions During Purging: ORANGE TINT, CLOUDY, NO ODOR - CLEARED UP DURING PURGE.

Sampling Procedure Followed: YES / NO If no, why was deviation necessary: N/A

PL/4/30/19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected** YES / NO

Recorded By: 4/30/19 (Signature and Date)

QA Checked By: 04/30/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** WBGmw-020

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 11.60

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/30/18 | 1033 | 10.2 | ~~2.73~~ 0.273 RL 4/30/19 | 7.48 | 7.4 | 2.16 | 234.2 | 375 | ~75 | 11.68 | Initial reading through flow cell CPM, 57/3 |
| | 1102 | -- | -- | -- | -- | -- | -- | 1850 | ~65 | 11.71 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded CPM, 58/2 |
| | 1103 | 10.4 | 0.271 | 7.18 | 282.9 | 0.89 | -25.2 | 50 | 50 | 11.70 | Start recording stability parameters CPM, 57/3 ORANGE TINT CLOUDY, NO ODOR |
| | 1108 | 10.5 | 0.270 | 7.18 | 128.5 | 0.87 | -27.9 | 300 | 60 | 11.71 | |
| | 1113 | 10.5 | 0.271 | 7.18 | 46.6 | 0.88 | -32.4 | 400 | 80 | 11.71 | |
| | 1118 | 10.4 | 0.271 | 7.19 | 19.8 | 0.87 | -37.0 | 400 | 80 | 11.71 | CLOUDINESS + TINT CLEARING UP. |
| | 1123 | 10.4 | 0.270 | 7.19 | 15.9 | 0.89 | -37.1 | 400 | 80 | 11.73 | |
| | 1128 | 10.5 | 0.270 | 7.19 | 14.0 | 0.89 | -36.4 | 350 | ~~60~~ 70 RL 4/30/19 | 11.72 | MARINE BATTERY LOOSING POWER ALTERING FLOW RATE W/O CHANGING PUMP SETTINGS. |
| | 1133 | 10.5 | 0.270 | 7.19 | 12.0 | 0.89 | -36.1 | 300 | 60 | 11.72 | |
| | 1138 | 10.6 | 0.270 | 7.19 | 8.0 | 0.89 | -36.7 | 350 | ~~60~~ 70 RL 4/30/19 | 11.72 | |
| | 1143 | 10.6 | 0.270 | 7.19 | 6.0 | 0.90 | -37.1 | 350 | ~~60~~ 70 | 11.72 | STABLE |
| | 1147 | — | — | — | — | — | — | 300 | ~75 | 11.72 | STABILITY CONFIRMED |
| | | | | | | RL 4/30/19 | | | | | |
| | | | | | | | | | | | |
| 4/30/19 | 1205 | 10.7 | 0.273 | 7.30 | 5.1 | 2.01 | ~~102.~~ 93.6 RL 4/30/19 | ~~3.4~~ 420 RL 4/30/19 | ~60 | 11.72 | POST SAMPLE READINGS |

**Recorded By:** [signature] 4/30/19

**QA Checked By:** [signature] 04/30/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** WBGmw-021

**Date and Time:** Start: 4/30/19 0825 Complete: 4/30/19 0941

**Personnel:** R. LAURICH

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 8.21 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 38 ft. **PSI=** 38 /2 + 10 = 29

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 38 - DTW 8.21 = 29.79

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 29.79 x Tf 3/8 21.576 = 642.75

**3.) Total Volume of stagnant water**

Total volume = 622 + 642.75 = 1264.75

**2x Total volume =** 2529.50

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: YSI PRO DSS or Horiba U-52 | FN03179 | 4/30/19 |
| Water Level Tape: SOLONIST | 212380 | N/A |
| Other: MP-10 with QED Well Wizzard or MP-50 | 1032 | N/A |

**Total Volume of Water Removed (Liters):** 10.80 Sample Method: Bladder Pump

**Sample ID / Date / Time:** WBGmw-021-190401-GW 4/30/19 0945 **QC Sample ID** N/A

**Analysis** TAL METALS + EXPLOSIVES.

Field Observations/Site Conditions During Purging: ~~CLEAR, COLORLESS, ODORLESS~~ SLIGHT ORANGE TINT, CLOUDY, ODORLESS COLOR + CLOUDINESS CLEANED THROUGH PURGE. TL 4/30/19

Sampling Procedure Followed: YES / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected YES / NO**

Recorded By: 4/30/19 (Signature and Date)

QA Checked By: 04/30/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** WBGMW-021

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements | Initial DTW: 8.21 |
|---|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample | |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/30/19 | 0850 | 9.2 | 0.583 | 7.46 | 2.4 | 2.57 | 215.2 | 375 mL | 75 | 8.26 | Initial reading through flow cell CPM 1 5/3 |
| | 0850 | -- | -- | -- | -- | -- | -- | 2600 | ~130 | 8.25 | Purged 2x's volume of stagnant water in pump and tubing - stability parameters not recorded CPM 1 55/5 |
| | 0851 | 9.7 | 0.516 | 7.34 | 67.3 | 0.89 | 143.6 | 130 | ~130 | 8.25 | Start recording stability parameters ORANGE TINT, CLOUDY, ODORLESS. |
| | 0856 | 9.7 | 0.516 | 7.34 | 38.3 | 0.87 | 141.8 | 650 | 130 | 8.25 | |
| | 0901 | 9.7 | 0.516 | 7.34 | 24.9 | 0.85 | 128.6 | 700 | 140 | 8.25 | |
| | 0906 | 9.7 | 0.516 | 7.34 | 19.5 | 0.84 | 118.5 | 700 | 140 | 8.25 | COLOR + CLOUDINESS CLEARING UP |
| | 0911 | 9.8 | 0.517 | 7.35 | 17.3 | 0.84 | 116.3 | 700 | 140 | 8.25 | |
| | 0916 | 9.8 | 0.518 | 7.35 | 14.8 | 0.82 | 112.4 | 700 | 140 | 8.25 | |
| | 0921 | 9.8 | 0.519 | 7.35 | 14.7 | 0.82 | 111.6 | 700 | 140 | 8.25 | |
| | 0926 | 9.8 | 0.521 | 7.35 | 11.8 | 0.82 | 105.6 | 700 | 140 | 8.25 | |
| | 0931 | 9.8 | 0.522 | 7.35 | 10.5 | 0.81 | 103.2 | 700 | 140 | 8.25 | |
| | 0936 | 9.8 | 0.522 | 7.36 | ~~8~~ 8.5 | 0.81 | 101.3 | 700 | 140 | 8.25 | |
| | 0941 | 9.9 | 0.522 | 7.36 | 8.5 | 0.80 | 100.1 | 700 | 140 | 8.25 | STABLE |
| | 0944 | — | — | — | — | — | — | 420 | 140 | — | STABILITY CONFIRMED |
| | 1000 | 10.0 | 0.525 | 7.41 | 6.7 | 1.47 | 202.7 | 420 | 140 | 8.25 | POST SAMPLE READINGS |

**Recorded By:** 4/30/19 **QA Checked By:** 5/1/30/19

# RVAAP-08 LOAD LINE 1

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** LL1mw-064

**Date and Time:** 5/7/19 Start: 1343 Complete: 1428

**Personnel:** Lindsey Mayer

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 0.37 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 13 ft. **PSI=** 13 /2 + 10 = 16.5

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 13 - DTW 0.37 = 12.63

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 12.63 x Tf 21.576 = 272.50

**3.) Total Volume of stagnant water**

Total volume = 622 + 272.50 = 894.50

**2x Total volume =** 1789.00

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA02140 | 5/7/19 |
| Water Level Tape: ~~SOLONIST~~ Heron (AM 5/7/19) | 07-0572 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 43635 | N/A |

**Total Volume of Water Removed (Liters):** 21.1 Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL1mw-064-190401-GW/5-7-19/ 1429 **QC Sample ID** N/A

**Analysis** TAL metals

Field Observations/Site Conditions During Purging: 60s overcast / during (AM 5/7/19) starting purge water kept flowing even when compressor would turn off, call A. Sprinzel, she stated well maybe partially artesian, turn off compressor and see if it flows, keeps flowing. She stated could turn pump on to get orange particulates out of water

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: [signature] 5/7/19 (Signature and Date)

QA Checked By: [signature] 5/8/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LL1mw-064

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 0.37

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/7/19 | 1348 | 11.1 | 0.444 | 7.76 | 124.43 | 0.70 | -61.2 | 1,750mL | 350 | ~~0.61~~ 0.51 | Initial reading through flow cell |
| | 1412 | -- | -- | -- | -- | -- | -- | 1,000 | 500 | 0.63 | Purged 2x's volume of stagnant water in pump and tubing - stability parameters not recorded |
| | 1413 | 11.0 | 0.445 | 7.65 | 13.12 | 0.04 | -130.8 | 1750 | 350 | 0.51 | Start recording stability parameters |
| | 1418 | 11.2 | 0.446 | 7.65 | 1.89 | 0.05 | -133.2 | 1750 | 350 | 0.47 | |
| | 1423 | 11.2 | 0.446 | 7.65 | 0.92 | 0.05 | -134.4 | 1750 | 350 | 0.47 | water is clear, colorless, odorless. |
| | 1428 | — | — | — | — | — | — | 1750 | 350 | 0.45 | A. Sprinzel gives approval to sample |

5/7/19 1348 — 5-7-19 At sea front pace, water kept flowing when pump shut off

CPM-14, R-10, D-5, to set camera, particulates out

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/7/19 | 1435 | 10.9 | 0.446 | 7.61 | 3. ~~0.59~~ 0.59 5MS 5/7/19 | 0.78 | -93.5 | 350 | 350 | ~~0.45~~ 0.45 | POST SAMPLE READINGS 5/7/19 |

**Recorded By:** [signature] 5/7/19

**QA Checked By:** [signature] 5/8/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** LLmw-065

**Date and Time:** 5/7/19 Start: ~~1235~~ 2m 5/7/19 1230 Complete: 1313

**Personnel:** Lindsey Mayer

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 9.15 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 20 ft. **PSI=** 20 /2 + 10 = 20

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 20 - DTW 9.15 = 10.85

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 10.85 x Tf 21.576 = 234.09

**3.) Total Volume of stagnant water**

Total volume = 622 + 234.09 = 856.09

**2x Total volume =** 1712.20

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA02140 | 5/7/19 |
| Water Level Tape: ~~SOLONIST~~ 2m 5/7/19 Heron | 07-0572 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 43635 | N/A |

**Total Volume of Water Removed (Liters):** 3.525 Sample Method: Bladder Pump

**Sample ID / Date / Time:** LLMW-065-190401-GW | 5-7-19 | 1314 **QC Sample ID** N/A

**Analysis** TAL Metals / Explosives

Field Observations/Site Conditions During Purging: 50's cloudy/overcast water is clear, colorless, odorless

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: 5/7/19 (Signature and Date)

QA Checked By: 5/8/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LL1MW-065

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 9.15

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/7/19 | 1235 | 11.2 | 0.696 | 7.76 | 2.32 | 3.31 | 164.7 | 375mL | 75 | 9.16 | Initial reading through flow cell CPM-1 D=3.0 R=57.0 |
| | 1259 | -- | -- | -- | -- | -- | -- | 1800 | 75 | 9.16 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 1300 | 10.5 | 0.720 | 7.32 | 1.67 | 0.65 | 209.9 | 75 | 75 | 9.16 | Start recording stability parameters |
| | 1305 | 10.4 | 0.716 | 7.31 | 1.03 | 0.59 | 213.8 | 375 | 75 | 9.16 | |
| | 1310 | 10.4 | 0.713 | 7.30 | 1.09 | 0.55 | 216.9 | 375 | 75 | 9.16 | |
| | 1313 | — | — | — | — | — | — | 225 | 75 | 9.16 | A. Spinzel gives approval to sample |
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| | | | | | | | | | | | 5/7/19 |
| 5/7/19 | 1329 | 11.1 | 0.711 | 7.47 | 1.86 | 1.64 | 203.4 | 300 | 75 | 9.16 | POST SAMPLE READINGS |

**Recorded By:** 2. Mg 5/7/19

**QA Checked By:** 5/8/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID Number:** LL1mw-080

**Date and Time:** Start: 5-7-19 / 1222 Complete: DS 5-7-19 ~~5-6~~ 5-7-19 / 1315

**Personnel:** Gabby Gronofsky

**Purge Method(s):** Bailer Bladder Pump Other: N/A

**Depth To Water:** 10.55 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 20.2 ft. **PSI=** 20.2 /2 + 10 = 20.1

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 20.2 - DTW 10.55 = 9.65

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 9.65 x Tf 9.46 = 91.2

**3.) Total Volume of stagnant water**

Total volume = 622 + 91.2 = 713.3

**2x Total volume =** 1,426 ml

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03179 | 5-7-19 |
| Water Level Tape: SOLONIST (Heron) | 07-0573 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 1930 | N/A |

**Total Volume of Water Removed (Liters):** 5.95 L Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL1mw-080-190401-GW / 5-7-19 / 1305 **QC Sample ID** N/A

**Analysis** Explosives

Field Observations/Site Conditions During Purging: water is clear, colorless odorless

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A 5-7-19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: 5-7-19 (Signature and Date)

QA Checked By: 5/8/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LL1mw-080

Initial DTW: 10.55

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5-7-19 | 1223 | 10.0 | 0.655 | 6.84 | 4.4 | 9.41 | 330.8 | 275 ml | ~140 | 10.93 | Initial reading through flow cell (1/15/45) water is clear, colorless, odorless |
| | 1233 | -- | -- | -- | -- | -- | -- | 1,600 ml | 160 | 11.13 | Purged 2x's volume of stagnant water in pump and tubing - stability parameters not recorded |
| | 1238 | 9.7 | 0.312 | 6.73 | 1.6 | 8.78 | 338.3 | 775 ml | 155 | ~~11.13~~ 11.15 DD 5-7-19 | Start recording stability parameters |
| | 1243 | 9.6 | 0.311 | 6.73 | 1.7 | 8.80 | 341.2 | 775 ml | 155 | 11.19 | (1/15/45) |
| | 1248 | 9.9 | 0.305 | 6.72 | 2.3 | 8.72 | 345.4 | DD 5-7-19 825 ml | 145 | 11.23 | (1/10/50) |
| | 1253 | 10.2 | 0.301 | 6.72 | 2.4 | 8.69 | 345.6 | 500 ml | 100 | 11.25 | (1/5/55) |
| ↓ | 1258 | 10.3 | 0.297 | 6.72 | 3.5 | 8.69 | 345.4 | 500 ml | 100 | 11.20 | Stable - verify w/ A. Sprinzl @ 1303 (500 ml purged) |
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DD 5-7-19

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 5-7-19 | 1315 | 10.9 | 0.294 | 6.70 | 3.8 | 8.85 | 347.7 | 300 ml | 100 | 11.20 | POST SAMPLE READINGS |

**Recorded By:** [signature] 5-6-19 (5-7-19)

**QA Checked By:** [signature] 5/8/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** LL1mw-081

**Date and Time:** Start: 5/6/19 1255 Complete: 5/6/19 1525

**Personnel:** Charles Spurr

**Purge Method(s):** Bailer ☐ Bladder Pump ☑ Other: ☐

**Depth To Water:** 29.55 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 38.71 ft. **PSI=** 38.7 /2 + 10 = 29.4

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 38.71 - DTW 29.55 = 9.16

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 9.16 x Tf 9.46 = 86.7

**3.) Total Volume of stagnant water**

Total volume = 622 + 86.7 = 708.7

**2x Total volume =** 1417.4 mL

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03313 | 5/6/19 |
| Water Level Tape: SOLONIST | 250795 | N/A |
| Other: (MP-10 with QED Well Wizzard) or MP-50 | 3308 | N/A |

**Total Volume of Water Removed (Liters):** 14.3 Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL1mw-081-190401-GW 5/6/19 1505 **QC Sample ID** N/A

**Analysis** Explosives & Cyanide

Field Observations/Site Conditions During Purging: 75°F ; Sunny ; breezy

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: [signature] 5/6/19 (Signature and Date)

QA Checked By: [signature] 5/6/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LL1mw-081

| | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|---|
| | 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 29.55

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/6/19 | 1331 | 12.2 | 1.090 | 6.14 | 96.4 | 1.38 | 88.5 | ~4.5L | 150 | 30.62 | Initial reading through flow cell turb. decreased CPM2/4/26 29 PSI |
| — | — | -- | -- | -- | -- | -- | -- | — | — | — | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| 5/6/19 | 1341 | 11.2 | 1.078 | 6.49 | 103.7 | 0.84 | 34.3 | ~6.0L | 150 | 30.65 | Start recording stability parameters CPM2/3/26 29 PSI |
| | 1346 | 11.0 | 1.086 | 6.55 | 90.88 | 0.73 | 23.0 | 0.5 | 100 | 30.65 | |
| | 1351 | 11.0 | 1.095 | 6.58 | 42.71 | 0.89 | 25.2 | 0.5 | 100 | 30.65 | empty flow cell |
| | 1356 | 11.2 | 1.097 | 6.57 | 39.9 | 0.72 | 18.9 | 0.5 | 100 | 30.65 | |
| | 1401 | 11.0 | 1.104 | 6.59 | 39.1 | 0.61 | 14.0 | 0.5 | 100 | 30.65 | |
| | 1406 | 11.0 | 1.111 | 6.60 | 36.7 | 0.87 | 21.5 | 0.5 | 100 | 30.65 | |
| | 1411 | 11.1 | 1.106 | 6.60 | 35.4 | 0.64 | 14.8 | 0.5 | 100 | 30.65 | |
| | 1416 | 10.9 | 1.118 | 6.59 | 33.2 | 0.56 | 9.8 | 0.5 | 100 | 30.65 | |
| | 1421 | 11.2 | 1.118 | 6.61 | 35.8 | 0.82 | 16.3 | 0.5 | 100 | 30.65 | empty flow cell |
| | 1426 | 11.3 | 1.120 | 6.61 | 34.9 | 0.54 | 9.9 | 0.5 | 100 | 30.65 | |
| | 1431 | 11.5 | 1.122 | 6.62 | 34.3 | 0.47 | 4.3 | 0.5 | 100 | 30.65 | |
| | 1436 | 11.6 | 1.125 | 6.61 | 35.1 | 0.44 | 1.9 | 0.5 | 100 | 30.65 | |

Initial water is dark orange in color very turbid Not run through flow cell purge at CPM2 4/26 29 PSI 150 mL/mi

| | | | | | | CS 5/6/19 | | | | | POST SAMPLE READINGS |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Recorded By:** [signature] 5/6/19

**QA Checked By:** [signature] 5/6/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LL1mw-081

| | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|---|
| | 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/6/19 | 1441 | 11.5 | 1.126 | 6.61 | 27.7 | 0.44 | 0.2 | 0.5 | 100 | 30.65 | CPM 2/3/27 29 PSI |
| | 1446 | 11.3 | 1.127 | 6.62 | 24.6 | 0.42 | -0.5 | 0.5 | 100 | 30.65 | |
| | 1451 | 11.5 | 1.126 | 6.61 | 19.7 | 0.41 | -2.1 | 0.5 | 100 | 30.65 | |
| | 1456 | 11.4 | 1.126 | 6.62 | 17.9 | 0.40 | -2.6 | 0.5 | 100 | 30.65 | |
| | 1501 | 11.5 | 1.128 | 6.63 | 17.5 | 0.39 | -5.5 | 0.5 | 100 | 30.65 | |
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| 5/6/19 | 1521 | 13.4 | 1.160 | 6.77 | 16.9 | 1.21 | 40.2 | 300 mL | 100 | 30.65 | Post Sample Reading |

**Recorded By:** [signature] 5/6/19

**QA Checked By:** [signature] 5/6/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID Number:** LL1 mw - 083

**Date and Time:** Start: 5/6/19 1100 Complete: 5/6/19 1205

**Personnel:** Charles Spurr

**Purge Method(s):** Bailer ☐ Bladder Pump ☑ Other: ☐

**Depth To Water:** 34.33 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 40 ft. **PSI=** 40 /2 + 10 = 30

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 40 - DTW 34.33 = 5.67

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 5.67 x Tf 21.576 = 122

**3.) Total Volume of stagnant water**

Total volume = 622 + 122 = 744

**2x Total volume =** 1488

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03313 | 5/6/19 |
| Water Level Tape: SOLONIST | 250795 | N/A |
| Other: (MP-10 with QED Well Wizzard) or MP-50 | 3308 | N/A |

**Total Volume of Water Removed (Liters):** 3.3 Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL1MW-083-190401-GW 5/6/19 1135 **QC Sample ID** N/A

**Analysis** Explosives, Sulfide, Nitrate/Nitrite/Sulfate, & Alkalinity

Field Observations/Site Conditions During Purging: 66°F ; Sunny ; breezy

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: [signature] 5/6/19 (Signature and Date)

QA Checked By: [signature] 5/6/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** LL1mw-083

| Stabilization Requirements | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV |
|---|---|---|---|---|---|---|
| Consecutive Readings to Sample | 3 | 3 | 3 | 1 | 3 | 3 |

Initial DTW: 34.33

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/6/19 | 1105 | 12.1 | 0.866 | 4.56 | 10.51 | 6.21 | 275 | 500mL | 100 | 34.50 | Initial reading through flow cell CPM2 12/28 30 PSI |
| - | - | -- | -- | -- | -- | -- | -- | - | - | - | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| 5/6/19 | 1115 | 11.5 | 0.811 | 4.39 | 19.22 | 6.00 | 338 | 1.5(L) | 100 | 34.50 | Start recording stability parameters CPM2 12/28 30 PSI |
| | 1120 | 11.5 | 0.810 | 4.43 | 16.52 | 5.92 | 341 | 0.5 | 100 | 34.50 | |
| | 1125 | 11.9 | 0.809 | 4.43 | 10.91 | 5.99 | 351 | 0.5 | 100 | 34.50 | |
| | 1130 | 11.9 | 0.807 | 4.44 | 6.08 | 5.97 | 357 | 0.5 | 100 | 34.50 | |
| | | | | | | | CS | 5/6/19 | | | |
| 5/6/19 | 1157 | 13.0 | 0.820 | 4.48 | 1.89 | 6.49 | 338 | 300mL | 100 | 34.50 | POST SAMPLE READINGS |

**Recorded By:** [signature] 5/6/19 **QA Checked By:** [signature] 5/6/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID Number:** LL1mw - 084

**Date and Time:** Start: 5/6/19 0835 Complete: 5/6/19 1020

**Personnel:** Charles Spurr

**Purge Method(s):** Bailer ☐ Bladder Pump ☑ Other: ☐

**Depth To Water:** 27.30 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 37 ft. **PSI=** 37 /2 + 10 = 28.5

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 37 - DTW 27.30 = 9.7

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 9.7 x Tf 21.576 = 209

**3.) Total Volume of stagnant water**

Total volume = 622 + 209 = 831

**2x Total volume =** 1662 mL

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | CS 5/6/19 ~~250795~~ FA03313 | 5/6/19 |
| Water Level Tape: SOLONIST | 250795 | N/A |
| Other: (MP-10 with QED Well Wizzard) or MP-50 | 3308 | N/A |

**Total Volume of Water Removed (Liters):** 2.5

Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL1MW-084-190401-GW 5/6/19 0925 **QC Sample ID**

**Analysis** Explosives, TAL metals, Sulfide, Nitrate/Nitrite/Sulfate, Alkalinity

Field Observations/Site Conditions During Purging: 53°F ; Sunny ; calm

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: [signature] 5/6/19 (Signature and Date)

QA Checked By: [signature] 5/6/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LL1mw - 084

Initial DTW: 27.30

| | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|---|
| | 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/6/19 | 0843 | 10.5 | 1.158 | 6.21 | 0.61 | 7.52 | 213 | 400mL | 50 | 28.11 | Initial reading through flow cell CPM2/1/29 ~29 PSI |
| – | – | -- | -- | -- | -- | -- | -- | – | – | – | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| 5/6/19 | 0910 | 11.1 | 0.860 | 5.51 | 0.53 | 5.07 | 233 | 1.7(L) | 50 | 28.15 | Start recording stability parameters CPM2/1/29 ~29 PSI |
| ↓ | 0915 | 11.3 | 0.864 | 5.57 | 0.64 | 4.97 | 218 | 0.25 | 50 | 28.15 | ↓ ↓ |
| ↓ | 0920 | 11.4 | 0.867 | 5.57 | 0.68 | 4.94 | 223 | 0.25 | 50 | 28.15 | ↓ ↓ |
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|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/6/19 | 1011 | 13.8 | 0.901 | 5.83 | 0.45 | 5.68 | 221 | 300 mL | 50 | 28.16 | POST SAMPLE READINGS |

**Recorded By:** [signature] 5/6/19

**QA Checked By:** [signature] 5/6/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** LL1mw-086

**Date and Time:** 5/7/19 Start: 0837 Complete: 1152

**Personnel:** Lindsey Mosher

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 5.48 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 77 ft. **PSI=** 77 /2 + 10 = 48.5

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 77 - DTW 5.48 = 71.52

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 71.52 x Tf 21.576 = 1543.12

**3.) Total Volume of stagnant water**

Total volume = 622 + 1543.12 = 2165.12

**2x Total volume =** 4330.23

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA02140 | 5/7/19 |
| Water Level Tape: ~~SOLONIST~~ 5/7/19 Heron | 07-0572 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 43635 | N/A |

**Total Volume of Water Removed (Liters):** 27.3 Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL1mw-086-190401-GW/5-7-19/1153 **QC Sample ID** N/A

**Analysis** Alkalinity/TAL metals/cyanide/Filtered metals

Field Observations/Site Conditions During Purging: 50's, cloudy, water is cloudy, odorless, ~~colorless~~ 5/7/19 brownish-like-tint

Sampling Procedure Followed: (YES) NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: 5/7/19 (Signature and Date)

QA Checked By: 5/8/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LLJMW-086

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 5.48

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/7/19 | 0843 | 10.4 | 1,660 | 12.01 | 548.90 | 4.50 | 195.2 | 900mL | 150 | 5.60 | Initial reading through flow cell CPM-1 D-6.0 R-54.0 |
| | 0913 | -- | -- | -- | -- | -- | -- | 4400 | 150 | 5.60 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 0914 | 10.2 | 1.860 | 12.34 | 85.57 | 1.51 | -1.6 | 150 | 150 | 5.60 | Start recording stability parameters |
| | 0919 | 10.2 | 1.379 | 12.14 | 96.51 | 1.15 | 4.1 | 750 | 150 | 5.60 | water appears to have whitish-tint. like- |
| | 0924 | 10.2 | 1.235 | 12.07 | 87.66 | 1.08 | 7.4 | 750 | 150 | 5.60 | |
| | 0929 | 10.2 | 1.077 | 11.97 | 98.55 | 1.33 | 10.2 | 750 | 150 | 5.60 | |
| | 0934 | 10.2 | 1.006 | 11.93 | 76.53 | 1.27 | 11.9 | 750 | 150 | 5.60 | |
| | 0939 | 10.2 | 0.921 | 11.86 | 73.47 | 1.29 | 14.1 | 750 | 150 | 5.58 | |
| | 0944 | 10.2 | 0.791 | 11.68 | 63.19 | 1.15 | 19.2 | 750 | 150 | 5.58 | |
| | 0949 | 10.3 | 0.662 | 11.35 | 45.70 | 0.99 | 28.7 | 750 | 150 | 5.58 | |
| | 0954 | 10.3 | 0.583 | 10.96 | 45.41 | 0.82 | 43.1 | 750 | 150 | 5.58 | |
| | 0959 | 10.3 | 0.548 | 10.62 | 43.76 | 0.76 | 54.0 | 750 | 150 | 5.58 | |
| | 1004 | 10.5 | 0.534 | 10.44 | 51.38 | 0.74 | 66.9 | 750 | 150 | 5.58 | 5/7/19 |
| ↓ | 1009 | 10.5 | 0.527 | 10.20 | 60.29 | 0.68 | 73.7 | 750 | 150 | 5.58 | clean out flow cell w/ D.I water |
| 5/7/19 | 1207 | 10.7 | 0.543 | 9.46 | 267.68 | 0.82 | 95.8 | 300 | 150 | 5.57 | POST SAMPLE READINGS |

**Recorded By:** 5/7/19

**QA Checked By:** 5/8/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LL1mw-086

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/7/19 | 1014 | 10.6 | 0.531 | 10.34 | 77.02 | 0.70 | 82.8 | 750mL | 150 | 5.56 | |
| | 1019 | 10.5 | 0.530 | 10.25 | 87.51 | 0.67 | 83.9 | 750 | 150 | 5.56 | 5/7/19 |
| | 1024 | 10.5 | 0.518 | 9.87 | 93.68 | 0.39 | 90.9 | 750 | 150 | 5.56 | |
| | 1029 | 10.4 | 0.519 | 9.91 | 99.18 | 0.37 | 94.6 | 750 | 150 | 5.56 | Clean out flow cell w/DI water |
| | 1034 | 10.5 | 0.518 | 9.95 | 95.63 | 0.76 | 91.9 | 750 | 150 | 5.55 | 5/7/19 |
| | 1039 | 10.5 | 0.519 | 9.82 | 140.03 | 0.68 | 97.9 | 750 | 150 | 5.55 | Lower purge rate after reading CPM-1 D-4.0 R=56.00 |
| | 1044 | 10.7 | 0.520 | 9.50 | 151.92 | 0.78 | 102.7 | 500 | 100 | 5.53 | |
| | 1049 | 10.9 | 0.523 | 9.29 | 182.14 | 0.29 | 110.1 | 500 | 100 | 5.53 | |
| | 1054 | 10.8 | 0.530 | 9.25 | 146.22 | 0.54 | 114.5 | 500 | 100 | 5.53 | |
| | 1059 | 11.1 | 0.515 | 9.59 | 109.17 | 0.64 | 115.4 | 500 | 100 | 5.52 | |
| | 1104 | 11.1 | 0.511 | 9.86 | 99.24 | 0.80 | 112.6 | 500 | 100 | 5.52 | |
| | 1109 | 11.1 | 0.509 | 10.00 | 89.27 | 0.85 | 109.7 | 500 | 100 | 5.52 | |
| | 1114 | 11.0 | 0.510 | 9.79 | 79.75 | 0.89 | 110.0 | 500 | 100 | 5.52 | 5/7/19 |
| | 1119 | 11.1 | 0.514 | 10.15 | 81.67 | 1.06 | 107.4 | 500 | 100 | 5.52 | Increase to 150mL/min after reading CPM-1 D-6.0 R=54.0 |
| | 1124 | 10.6 | 0.532 | 10.49 | 77.86 | 1.08 | 102.5 | 750 | 150 | 5.56 | |
| | 1129 | 10.7 | 0.535 | 10.49 | 90.87 | 0.89 | 93.4 | 750 | 150 | 5.56 | 5/7/19 |

**Recorded By:** 5/7/19

**QA Checked By:** 5/8/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LL1mw-086

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/7/19 | 1134 | 10.6 | 0.522 | 10.10 | 87.03 | 0.68 | 94.4 | 750mL | 150 | 5.56 | |
| | 1139 | 10.5 | 0.535 | 10.47 | 71.84 | 0.70 | 91.7 | 750 | 150 | 5.56 | |
| | 1144 | 10.6 | 0.544 | 10.52 | 73.73 | 0.72 | 86.4 | 750 | 150 | 5.56 | |
| | 1149 | 10.5 | 0.541 | 10.44 | 87.06 | 0.58 | 83.8 | 750 | 150 | 5.57 | |
| | 1152 | — | — | — | — | — | — | 450 | 150 | 5.57 | A. Spinzol gives permission to sample @ elevated turbidity |

5/7/19

5/7/19

**Recorded By:** 5/7/19

**QA Checked By:** 5/8/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** LL1 mw - 087

**Date and Time:** Start: 5/2/19 1205 Complete: 5/2/19 1425

**Personnel:** Charles Spurr

**Purge Method(s):** Bailer ☐ Bladder Pump ☑ Other: ☐

**Depth To Water:** 4.25 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 12 ft. **PSI=** 12 /2 + 10 = 16

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 12 - DTW 4.25 = 7.75

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 7.75 x Tf 21.576 = 167

**3.) Total Volume of stagnant water**

Total volume = 622 + 167 = 789

**2x Total volume =** 1578 mL

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03179 | 5/2/19 |
| Water Level Tape: SOLONIST | 250795 | N/A |
| Other: (MP-10 with QED Well Wizzard) or MP-50 | 3308 | N/A |

**Total Volume of Water Removed (Liters):** 2.15 Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL1 MW-087-190401-GW 5/2/19 1320 **QC Sample ID** N/A

**Analysis** Explosives & TAL metals

Field Observations/Site Conditions During Purging: 68°F; mostly cloudy; calm

Sampling Procedure Followed: (YES) NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: 5/2/19 (Signature and Date)

QA Checked By: 05/02/19 (Signature and Date)

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# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LL1mw-087

| | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|---|
| | 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 4.25' started w/ CPM 2/2/2 @ 16 psi. Drew down too fast ~250 mL/m

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/2/19 | 1218 | 16.2 | 0.680 | 7.13 | 11.0 | 2.79 | 216 | 325 mL | 25 | 4.58 | Initial reading through flow cell CPM 1/1/59 16 PSI |
| - | - | -- | -- | -- | -- | -- | -- | - | - | - | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| 5/2/19 | 1309 | 17.4 | 0.669 | 7.09 | 8.8 | 1.98 | 247 | 1.6(L) | 25 | 4.58 | Start recording stability parameters CPM 1/1/59 16 PSI |
| ↓ | 1314 | 17.3 | 0.667 | 7.08 | 6.8 | 1.94 | 248 | 0.125 | 25 | 4.58 | |
| ↓ | 1319 | 17.3 | 0.666 | 7.08 | 7.2 | 1.91 | 249 | 0.125 | 25 | 4.58 | |
| | | | | | | | CS | 5/2/19 | | | |
| 5/2/19 | 1422 | 14.4 | 0.695 | 7.12 | 5.3 | 2.73 | 263 | 300mL | 25 | 4.59 | POST SAMPLE READINGS |

**Recorded By:** [signature] 5/2/19

**QA Checked By:** [signature] 05/02/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** LLmw-088

**Date and Time:** 5-8-19 Start: 1302 Complete: 1530

**Personnel:** Gabby Gromofsky

**Purge Method(s):** Bailer Bladder Pump Other: N/A

**Depth To Water:** 4.52 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 22 ft. **PSI=** 22 /2 + 10 = 21

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 22 - DTW 4.52 = 17.48

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 17.48 x Tf 21.576 = 377.1

**3.) Total Volume of stagnant water**

Total volume = 622 + 377.1 = 999.1

**2x Total volume =** 1998 ml

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03313 | 5-8-19 |
| Water Level Tape: (SOLONIST) or Heron | 290795 | N/A |
| Other: (MP-10 with QED Well Wizzard) or MP-50 | 3308 / 18421 | N/A |

**Total Volume of Water Removed (Liters):** 25.2 L Sample Method: Bladder Pump

**Sample ID / Date / Time:** LLmw-088-190401-GW / 5-8-19 / 1505 **QC Sample ID** N/A

**Analysis** Explosives, alkalinity, TAL metals

Field Observations/Site Conditions During Purging: water initially slightly turbid and brownish; water cloudy/grey after stagnant water was removed; NTU is greater than 10 at time of sample collection - purge for 2hrs + no filter needed (NTU <50)

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary:

DP 5-8-19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: 5-8-19 (Signature and Date)

QA Checked By: 5-9-19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** LL1mw-088

Initial DTW: 4.52

| Stabilization Requirements | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV |
|---|---|---|---|---|---|---|
| Consecutive Readings to Sample | 3 | 3 | 3 | 1 | 3 | 3 |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5-8-19 | 1302 | 10.3 | 0.865 | 7.63 | 48.47 | 3.16 | 118.5 | 350 ml | 350 | 5.10 | Initial reading through flow cell (1/20/40) water is light brown, slightly turbid |
| | 1308 | -- | -- | -- | -- | -- | -- | 2,000 ml | ~330 | 5.80 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded (2/4/26) |
| | 1313 | 10.1 | 0.864 | 7.51 | 8.99 | 0.96 | -46.5 | 975 ml | 195 | 5.63 | Start recording stability parameters ~~(2/3/27)~~ D3 5-7-19 (2/2/28) water is clear, colorless, odorless |
| | 1318 | 10.2 | 0.863 | 7.52 | 14.52 | 0.49 | -59.8 | 1025 ml | 205 | 5.61 | lower PSI to 19 to slow purge (2/3/27) |
| | 1323 | 10.3 | 0.863 | 7.53 | 33.77 | 0.43 | -65.7 | 975 ml | 195 | 5.60 | water is cloudy and greyish |
| | 1328 | 10.4 | 0.864 | 7.53 | 47.11 | 0.42 | -68.8 | 1025 ml | 205 | 5.59 | |
| | 1333 | 10.4 | 0.864 | 7.53 | 41.45 | 0.41 | -72.1 | 1075 ml | 215 | 5.59 | |
| | 1338 | 10.4 | 0.863 | 7.53 | 48.40 | 0.41 | -72.6 | 1075 ml | 215 | 5.59 | |
| | 1343 | 10.4 | 0.863 | 7.53 | 34.76 | 0.41 | -74.2 | 975 ml | 195 | 5.59 | |
| | 1348 | | | D @ 5-8-19 | | | | 975 ml | 195 | 5.58 | Empty and spray out flow cell to attempt to decrease turbidity |
| | 1353 | 10.5 | 0.863 | 7.53 | 35.82 | 0.49 | -73.4 | 975 ml | 195 | 5.57 | |
| | 1358 | 10.5 | 0.864 | 7.53 | 31.64 | 0.48 | -75.1 | 950 | 190 | 5.57 | |
| | 1403 | 10.5 | 0.864 | 7.53 | 32.88 | 0.42 | -75.8 | 900 | 180 | 5.55 | |
| | 1408 | 10.6 | 0.864 | 7.53 | 33.27 | 0.41 | -77.6 | 925 | D @ 5-8-19 185 | 5.48 | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5-8-19 | 1527 | 11.2 | 0.868 | 7.52 | 18.25 | 0.58 | -82.0 | 750 | 180 | 5.52 | POST SAMPLE READINGS |

**Recorded By:** 5-8-19 **QA Checked By:** 5-9-19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LL1mw-088

| | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|---|
| | 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5-8-19 | 1413 | 10.5 ~~1415~~ MJS 5-8-19 | 0.864 | 7.53 | 24.41 | 0.40 | -79.0 | 950 ml | 190 | 5.55 | |
| | 1418 | 10.6 | 0.864 | 7.53 | 25.74 | 0.40 | -79.8 | 950 ml | 190 | 5.55 | |
| | 1423 | 10.6 | 0.865 | 7.53 | 23.49 | 0.40 | -80.3 | 950 ml | 190 | 5.55 | |
| | 1428 | 10.7 | 0.865 | 7.55 | 25.33 | 0.41 | -81.7 | 925 ml | 185 | 5.54 | |
| | 1433 | 10.7 | 0.865 | 7.53 | 24.84 | 0.40 | -82.0 | 925 ml | 185 | 5.54 | |
| | 1438 | 10.7 | 0.865 | 7.53 | 23.41 | 0.39 | -82.3 | 900 ml | 180 | 5.53 | |
| | 1443 | 10.8 | 0.865 | 7.53 | 22.80 | 0.40 | -82.5 | 900 ml | 180 | 5.53 | |
| | 1448 | 10.8 | 0.865 | 7.53 | 21.26 | 0.42 | -82.9 | 925 ml | 185 | 5.53 | |
| | 1453 | 10.8 | 0.865 | 7.53 | 22.92 | 0.49 | -83.0 | 925 ml | 185 | 5.52 | |
| | 1458 | 10.8 | 0.868 | 7.53 | 26.61 | ~~0.51~~ 0.51 ~~0.51~~ MJS 5-8-19 | -83.0 | 950 ml | 190 | 5.52 | |
| ↓ | 1503 | 10.8 | 0.866 | 7.53 | 19.25 | 0.50 | -83.9 | 950 ml | 190 | 5.52 | Stable w/elevated turbidity - 2 hr purge reached - confirm stability w/ A. Sprinzl |
| | | | | | | | | | | | |
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MJS 5-8-19

MJS 5-8-19

**Recorded By:** 5-8-19

**QA Checked By:** 5-9-19

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# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** LL1mw-089

**Date and Time:** Start: 5-7-19 | 0837 Complete: 5-7-19 | 1130

**Personnel:** Gabby Gromofsky

**Purge Method(s):** Bailer Bladder Pump Other: N/A

**Depth To Water:** 25.64 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 38 ft. **PSI=** 38 /2 + 10 = 29

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 38 - DTW 25.64 = 12.36

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 12.36 x Tf 9.46 = 116.9

**3.) Total Volume of stagnant water**

Total volume = 622 + 116.9 = 738.9

**2x Total volume =** 1,477 ml

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03179 | 5-7-19 |
| Water Level Tape: SOLONIST (Heron) | 07-0573 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 1930 | N/A |

**Total Volume of Water Removed (Liters):** 4.45 L Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL1mw-089-190401-GW | 5-7-19 | 0920 **QC Sample ID** LL1mw-089-190401-GWMSD | LL1mw-089-190402-GW (Duplicate) | LL1mw-089-190403-GW (Split Sample)

**Analysis** Explosives, Nitroguanidine, Nitrocellulose

Field Observations/Site Conditions During Purging: 52°F cloudy calm; water is clear, colorless, odorless;

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A 5-7-19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: 5-7-19 (Signature and Date)

QA Checked By: 5/8/19 (Signature and Date)

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# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** LL1mw-0089

| Stabilization Requirements | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV |
|---|---|---|---|---|---|---|
| Consecutive Readings to Sample | 3 | 3 | 3 | 1 | 3 | 3 |

Initial DTW: 25.64

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5-7-19 | 0839 | 10.1 | 0.233 | 5.60 | 1.6 | 6.96 | 240.1 | 275 ml | ~140 | 25.75 | Initial reading through flow cell (1 / 20 / 40) water is clear, colorless, odorless |
| | 0851 | -- | -- | -- | -- | -- | -- | 1,500 ml | 125 | 25.65 | Purged 2x's volume of stagnant water in pump and tubing - stability parameters not recorded |
| | 0856 | 9.9 | 0.103 | 4.75 | 1.2 | 1.21 | 317.5 | 800 ml | 160 | 25.67 | Start recording stability parameters water clear, colorless, odorless |
| | 5-7-19 0901 | 9.9 | 0.102 | 4.75 | 1.3 | 1.20 | 321.6 | 800 ml | 160 | 25.67 | 5-7-19 |
| ↓ | 0906 | 9.9 | 0.101 | 4.75 | 1.9 | 1.17 | 5-7-19 331.2 | 800 ml | 160 | 25.68 | (1 / 24 / 36) Stable - Verified by A. Sprinzl @ 0916 (11000 ml purged) |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
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| | | | | | 5-7-19 | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| 5-7-19 | 1130 | 11.8 | 0.106 | 5.42 | 1.5 | 2.68 | 188.6 | 275 | ~140 | 25.60 | POST SAMPLE READINGS |

**Recorded By:** 5-7-19 **QA Checked By:** 5/8/19

# RVAAP-09 LOAD LINE 2

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# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** LL2-MW059

**Date and Time:** Start: 5-6-19 | 0840 Complete: 5-6-19 | 0925

**Personnel:** G. Gromofsky

**Purge Method(s):** Bailer ☑ Bladder Pump Other: N/A

**Depth To Water:** 14.08 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 20' ft. **PSI=** 20 /2 + 10 = 20

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 20 - DTW 14.08 = 5.92

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 5.92 x Tf 9.46 = 56.0

**3.) Total Volume of stagnant water**

Total volume = 622 + 56.0 = 678.0

**2x Total volume =** 1356 ml

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03179 | 5-6-19 |
| Water Level Tape: SOLONIST (Heron WLM) | 07-0573 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 1930 | N/A |

**Total Volume of Water Removed (Liters):** 5.455 Liters Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL2MW-059-190401-GW | 5-6-19 | 0905 **QC Sample ID** N/A

**Analysis** Explosives, metals

Field Observations/Site Conditions During Purging: 58°F, sunny, calm; water is clear, colorless, odorless;

Sampling Procedure Followed: (YES) NO If no, why was deviation necessary: N/A 5-6-19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) NO**

Recorded By: [signature] 5-6-19 (Signature and Date)

QA Checked By: [signature] 5/6/19 (Signature and Date)

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# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** LL2-MW059

Initial DTW: 14.08

| Stabilization Requirements | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV |
|---|---|---|---|---|---|---|
| Consecutive Readings to Sample | 3 | 3 | 3 | 1 | 3 | 3 |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5-6-19 | 0844 | 10.1 | 0.306 | 6.05 | 4.6 | 3.19 | 238.8 | 420 | 140 | 14.34 | Initial reading through flow cell (1/20/40) water is clear, colorless, odorless |
| ↓ | 0849 | -- | -- | -- | -- | -- | -- | 1,125 | 225 | 14.49 | Purged 2x's volume of stagnant water in pump and tubing - stability parameters not recorded (1/10/50) |
| ↓ | 0854 | 9.3 | 0.274 | 5.98 | 4.9 | 0.94 | 252.6 | 625 | 125 | 14.52 | Start recording stability parameters (1/10/50) water is clear, colorless, odorless |
| ↓ | 0859 | 9.5 | 0.273 | 5.97 | 7.0 | 0.93 | 254.0 | 725 | 145 | 14.54 | (1/8/52) |
| ↓ | 0904 | 9.6 | 0.272 | 5.97 | 8.7 | 0.92 | 254.2 | 660 | 130 | 14.56 | ~~(1/8/52)~~ JA 5-6-19 (1/7/53) Parameters stable - Sample |
| | | | | | | | | | | | |
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| | | | | JA | 5-6-19 | | | | | | |
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|---|---|---|---|---|---|---|---|---|---|---|---|
| 5-6-19 | 0921 | 10.6 | 0.274 | 6.01 | 2.6 | 1.72 | 280.1 | 400 | 100 | 14.58 | POST SAMPLE READINGS |

**Recorded By:** 5-6-19 **QA Checked By:** 5/6/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** LL2mw-264

**Date and Time:** 05/02/19 Start: 0854 Complete: 1008

**Personnel:** Jackie Mitchell

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 4.71 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 18.22 ft. **PSI=** 18.22 /2 + 10 = 19.11

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 18.22 - DTW 4.71 = 13.51

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 13.51 x Tf 21.756 = 293.92

**3.) Total Volume of stagnant water**

Total volume = 622 + 293.92 = 915.92

**2x Total volume =** 1831.85

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03966 | 05/02/19 |
| Water Level Tape: SOLONIST 200ft. | Pine 07-0578 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | Pine 43635 | N/A |

**Total Volume of Water Removed (Liters):** 10.4 L Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL2mw-264-190401-GW/05/02/19/1005 **QC Sample ID** N/A

**Analysis** Cyanide

Field Observations/Site Conditions During Purging: Stagnant water cloudy/orange tint - clears up after purge 59°F, cloudy, light wind. Well pad clear, surrounded by mowed grass

Sampling Procedure Followed: (YES) NO If no, why was deviation necessary:

05/02/19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) NO**

Recorded By: 05/02/19 (Signature and Date)

QA Checked By: 5/2/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LL2 mw-264

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements | Initial DTW: 4.71 |
|---|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample | |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/02/19 | 0857 | 10.6 | 0.517 | 7.14 | 10.02 | 8.39 | 228.5 | 400 | 150 | 4.89 | Initial reading through flow cell 1CPM/57.0/3.0 |
| | 0908 | -- | -- | -- | -- | -- | -- | 1600 | 150 | 4.89 | Purged 2x's volume of stagnant water in pump and tubing - stability parameters not recorded |
| | 0913 | 10.0 | 0.430 | 6.96 | 70.34 | 1.09 | 24.8 | 750 | 150 | 4.89 | Start recording stability parameters Water is cloudy with |
| | 0918 | 10.0 | 0.430 | 6.96 | 58.60 | 0.90 | 16.5 | 750 | 150 | 4.89 | an orange tint - water begins to clear after |
| | 0923 | 10.0 | 0.431 | 6.97 | 51.29 | 0.78 | 13.1 | 750 | 150 | 4.89 | Stagnant water purged. |
| | 0928 | 10.0 | 0.432 | 6.99 | 49.02 | 0.72 | 9.0 | 750 | 150 | 4.89 | |
| | 0933 | 9.9 | 0.433 | 6.99 | 45.89 | 0.59 | 5.2 | 750 | 150 | 4.89 | |
| | 0938 | 9.8 | 0.433 | 7.00 | 46.20 | 0.60 | 3.4 | 750 | 150 | 4.89 | |
| | 0943 | 10.0 | 0.433 | 7.00 | 47.71 | 0.54 | 0.9 | 750 | 150 | 4.89 | |
| | 0948 | 10.0 | 0.432 | 7.01 | 47.75 | 0.45 | -0.2 | 750 | 150 | 4.92 | Empty YSI flow cell to see if turbidity clears up |
| | 0953 | 10.0 | 0.434 | 7.01 | 4.90 | 0.65 | 4.2 | 750 | 150 | 4.91 | |
| | 0958 | 10.1 | 0.434 | 7.01 | 5.42 | 0.53 | -4.1 | 750 | 150 | 4.90 | stable. Send confirmation text. |
| | 1001 | -- | -- | -- | -- | -- | -- | 450 | 150 | 4.89 | Amount purge while awaiting stability confirmation |
| | | | | | | | | 05/02/19 | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/02/19 | 1008 | 9.9 | 0.437 | 7.04 | 6.45 | 1.40 | 10.1 | 450 | 150 | 4.89 | POST SAMPLE READINGS |

**Recorded By:** 05/02/19 **QA Checked By:** 5/2/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** LL2mw-267

**Date and Time:** 05/02/19 Start: 1042 Complete: 1333

**Personnel:** Jackie Mitchell

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 7.60 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 18.5 ft. **PSI=** 18.5 /2 + 10 = 19.25

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 18.5 - DTW 7.60 = 10.9

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 10.9 x Tf 21.576 = 235.18

**3.) Total Volume of stagnant water**

Total volume = 622 + 235.18 = 857.18

**2x Total volume =** 1714.36

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03964 | 05/02/19 |
| Water Level Tape: SOLONIST 200 ft. | Pine 0572 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | Pine 43635 | N/A |

**Total Volume of Water Removed (Liters):** 19.7 L Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL2mw-267-190401-GW/05/02/19/1320 **QC Sample ID** N/A

**Analysis** Explosives (6)(A), TAL Metals (7)(C),

Field Observations/Site Conditions During Purging: Stagnant water orange in a turbid. Turbidity remained >10 and less than 50. Sampled after 2 hours of purging.

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary:

05/02/19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: 05/02/19 (Signature and Date)

QA Checked By: 2.Mann 5/2/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** LL2mw-267

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 7.60

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/02/19 | 1048 | 11.7 | 0.301 | 6.41 | 3188.67 | 6.65 | 103.1 | 3000 | 75 | 7.87 | Initial reading through flow cell Stagnant water 1 CPM/2.0/58.0 orange and turbid |
| | 1118 | -- | -- | -- | -- | -- | -- | 40000 | 125 | 7.91 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 1123 | 10.4 | 0.279 | 6.32 | 2440.1 | 0.08 | 66.8 | 625 | 125 | 7.90 | Start recording stability parameters Water slightly 1CPM/3.0/57.0 orange/turbid |
| | 1128 | 10.5 | 0.283 | 6.33 | 112.49 | 0.01 | 61.7 | 625 | 125 | 7.90 | Empty flow cell to try to clear turbidity |
| | 1133 | 10.4 | 0.286 | 6.38 | 107.82 | 0.94 | 63.6 | 625 | 125 | 7.90 | water begins to clear |
| | 1138 | 10.4 | 0.290 | 6.36 | 48.91 | 0.14 | 54.9 | 625 | 125 | 7.90 | |
| | 1143 | 10.6 | 0.293 | 6.36 | 36.59 | 0.03 | 52.0 | 625 | 125 | 7.90 | |
| | 1148 | 10.7 | 0.296 | 6.37 | 29.27 | -0.02 | 49.4 | 625 | 125 | 7.90 | |
| | 1153 | 10.5 | 0.301 | 6.41 | 97.88 | 0.78 | 31.6 | 625 | 125 | 7.90 | |
| | 1158 | 10.6 | 0.304 | 6.39 | 44.62 | 0.12 | 48.5 | 625 | 125 | 7.90 | |
| | 1203 | 10.7 | 0.307 | 6.40 | 45.02 | 0.04 | 44.5 | 625 | 125 | 7.90 | |
| | 1208 | 10.8 | 0.309 | 6.40 | 32.46 | 0.00 | 42.7 | 625 | 125 | 7.90 | |
| | 1213 | 10.9 | 0.311 | 6.41 | 32.64 | 0.02 | 41.9 | 625 | 125 | 7.90 | |
| | 1218 | 10.6 | 0.312 | 6.41 | 34.93 | -0.06 | 41.1 | 625 | 125 | 7.90 | |
| 05/02/19 | 1333 | 11.5 | 0.328 | 6.47 | 24.89 | 1.55 | 48.6 | 400 | 125 | 7.90 | POST SAMPLE READINGS |

**Recorded By:** 05/02/19 **QA Checked By:** 5/2/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LL2mw-267

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/02/19 | 1223 | 10.6 | 0.312 | 6.41 | 42.42 | -0.08 | 40.7 | 625 | 125 | 7.90 | 1 CPM/3.0/57.0 |
| | 1228 | 10.5 | 0.313 | 6.41 | 39.15 | -0.08 | 40.1 | 625 | 125 | 7.90 | |
| | 1233 | 10.6 | 0.314 | 6.42 | 33.98 | -0.08 | 39.2 | 625 | 125 | 7.90 | |
| | 1238 | 11.1 | 0.315 | 6.44 | 36.01 | -0.09 | 37.3 | 625 | 125 | 7.89 | |
| | 1243 ~~1243~~ | 11.1 | 0.316 | 6.43 | 34.39 | -0.09 | 37.5 | 625 | 125 | 7.89 | |
| | 1248 | 11.1 | 0.317 | 6.43 | 37.05 | -0.10 | 36.6 | 625 | 125 | 7.89 | |
| | 1253 | 10.9 | 0.318 | 6.43 | 39.97 | -0.11 | 35.8 | 625 | 125 | 7.89 | |
| | 1258 | 10.9 | 0.319 | 6.43 | 42.68 | -0.12 | 35.4 | 625 | 125 | 7.89 | |
| | 1303 | 10.9 | 0.319 | 6.43 | 39.06 | -0.12 | 35.3 | 625 | 125 | 7.89 | |
| | 1308 | 10.9 | 0.319 | 6.43 | 38.62 | -0.12 | 35.4 | 625 | 125 | 7.89 | |
| | 1313 | 11.2 | 0.320 | 6.44 | 33.61 | -0.12 | 34.3 | 625 | 125 | 7.89 | |
| | 1318 | 11.0 | 0.320 | 6.44 | 39.60 | -0.12 | 41.0 | 625 | 125 | 7.89 | |
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Qa 05/02/19

Qa 05/02/19

**Recorded By:** 05/02/19

**QA Checked By:** 5/2/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** LL2mw-272

**Date and Time:** 5/6/19 Start: 0836 Complete: 1109

**Personnel:** ☐ Lindsey ☑ Mayer ☐

**Purge Method(s):** Bailer Bladder Pump Other: N/A

**Depth To Water:** 6.91 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 26.3 ft. **PSI=** 26.3 /2 + 10 = 23.15

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 26.3 - DTW 6.91 = 19.39

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 19.39 x Tf 21.576 = 418.36

**3.) Total Volume of stagnant water**

Total volume = 622 + 418.36 = 1040.36

**2x Total volume =** 2080.72

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA02140 | 5/6/19 |
| Water Level Tape: ~~SOLONIST~~ 2m 5/6/19 Heron | 07-0572 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 43635 | N/A |

**Total Volume of Water Removed (Liters):** 7.95 Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL2mw-272-190401-GW/5-6-19/1110 **QC Sample ID** N/A

**Analysis** Cyanide

Field Observations/Site Conditions During Purging: 52°F, Sunny, water is clear, colorless, odorless

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: [signature] 5/6/19 (Signature and Date)

QA Checked By: [signature] 5-6-19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LL2mw-272

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements | Initial DTW: 6.91 |
|---|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample | |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/6/19 | 0842 | 11.1 | 0.552 | 7.25 | 16.82 | 8.53 | 197.8 | 300mL | 50 | 7.00 | Initial reading through flow cell CPM-1 D-3.0 R=57.0 |
| | 0924 | -- | -- | -- | -- | -- | -- | 2100 | 50 | 7.10 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded water became orgis |
| | 0925 | 11.0 | 0.410 | 6.70 | 63.44 | 1.00 | 11.2 | 50 | 50 | 7.10 | Start recording stability parameters at 0848 |
| | 0930 | 10.9 | 0.411 | 6.70 | 60.31 | 0.81 | 12.1 | 250 | 50 | 7.10 | 2x 5/6/19 |
| | 0935 | 10.9 | 0.411 | 6.69 | 40.77 | 0.69 | 11.1 | 250 | 50 | 7.10 | |
| | 0940 | 11.0 | 0.409 | 6.75 | 176.39 | 0.70 | 4.3 | 250 | 50 | 7.10 | water became orange in color orange particulates |
| | 0945 | 11.0 | 0.409 | 6.70 | 132.75 | 0.75 | 12.7 | 250 | 50 | 7.10 | clean out flow cell w/DI water |
| | 0950 | 10.6 | 0.394 | 6.68 | 94.92 | 1.26 | 9.1 | 250 | 50 | 7.10 | |
| | 0955 | 11.3 | 0.408 | 6.70 | 86.33 | 0.61 | 2.1 | 250 | 50 | 7.10 | 2x 5/6/19 |
| | 1000 | 11.3 | 0.409 | 6.71 | 85.12 | 0.60 | 0.3 | 250 | 50 | 7.10 | |
| | 1005 | 11.4 | 0.408 | 6.71 | 191.74 | 0.76 | 3.9 | 250 | 50 | 7.10 | water has orange particulates in orangish color |
| | 1010 | 11.5 | 0.409 | 6.71 | 154.24 | 0.82 | 2.8 | 250 | 50 | 7.10 | |
| | 1015 | 11.6 | 0.412 | 6.71 | 75.73 | 0.85 | 3.4 | 250 | 50 | 7.10 | 2x 5/6/19 |
| | 1020 | 11.6 | 0.411 | 6.73 | 52.49 | 0.77 | 0.2 | 250 | 50 | 7.10 | |
| 5/6/19 | 1121 | 13.8 | 0.417 | 6.91 | 7.93 | 3.12 | -6.0 | 300 | 50 | 7.11 | POST SAMPLE READINGS |

**Recorded By:** 5/6/19

**QA Checked By:** 5-6-19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LL2mw-272

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/6/19 | 1025 | 11.6 | 0.411 | 6.73 | 31.40 | 0.74 | -1.9 | 250mL | 50 | 7.12 | |
| | 1030 | 11.7 | 0.409 | 6.72 | 20.94 | 0.71 | -4.3 | 250 | 50 | 7.12 | |
| | 1035 | 11.7 | 0.410 | 6.73 | 15.18 | 0.72 | -6.0 | 250 | 50 | 7.12 | |
| | 1040 | 11.7 | 0.410 | 6.73 | 13.73 | 0.74 | -6.8 | 250 | 50 | 7.12 | |
| | 1045 | 11.8 | 0.410 | 6.73 | 10.31 | 0.72 | -7.9 | 250 | 50 | 7.11 | |
| | 1050 | 12.0 | 0.410 | 6.73 | 15.67 | 0.73 | -8.7 | 250 | 50 | 7.11 | |
| | 1055 | 12.1 | 0.410 | 6.73 | 11.06 | 0.73 | -8.9 | 250 | 50 | 7.11 | |
| | 1100 | 12.0 | 0.411 | 6.74 | 10.38 | 0.74 | -9.4 | 250 | 50 | 7.11 | |
| | 1105 | 12.1 | 0.412 | 6.74 | 8.91 | 0.74 | -9.2 | 250 | 50 | 7.11 | 5/6/19 |
| | 1109 | — | — | — | — | — | — | 200 | 50 | 7.11 | A. Sprinzel gives ok to sample |
| | | | | | | | | | | | |
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**Recorded By:** 5/6/19

**QA Checked By:** 5-6-19

# RVAAP-10 LOAD LINE 3

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** LL3mw-234

**Date and Time:** 05/06/19 Start: 1157 Complete: 1454

**Personnel:** Lindsey Mayer

**Purge Method(s):** Bailer Bladder Pump Other: N/A

**Depth To Water:** 7.90 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 20.71 ft. **PSI=** 20.71 /2 + 10 = 20.35

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 20.71 - DTW 7.90 = 12.81

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 12.81 x Tf 9.46 = 121.18

**3.) Total Volume of stagnant water**

Total volume = 622 + 121.18 = 743.18

**2x Total volume =** 1486.37

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA02140 | 5/6/19 |
| Water Level Tape: ~~SOLONIST~~ 2m 5/6/19 Heron | 07-0572 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 43635 | N/A |

**Total Volume of Water Removed (Liters):** 8.9 Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL3MW-234-190401-GW/5-6-19/1455 **QC Sample ID** N/A

**Analysis** Cyanide

Field Observations/Site Conditions During Purging: 70°F Sunny water is clear, colorless, odorless

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: [signature] 05/06/19 (Signature and Date)

QA Checked By: [signature] 5-6-19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** LL3mw-234

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 7.90

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/6/19 | 1203 | 14.5 | 0.461 | 7.20 | 230.07 | 4.97 | 44.9 | 300ml | 50 | 8.25 | Initial reading through flow cell CPM-1 D=3.0 R=57.0 |
| | 1248 | -- | -- | -- | -- | -- | -- | 2250 | 50 | 8.48 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 1249 | 14.4 | 0.455 | 6.89 | 118.54 | 0.44 | 56.4 | 50 | 50 | 8.48 | flowrate increased, waited longer to start recording ready Start recording stability parameters |
| | 1254 | 14.4 | 0.462 | 6.88 | 91.65 | 0.38 | 43.8 | 250 | 50 | 8.48 | |
| | 1259 | 14.2 | 0.464 | 6.88 | 78.29 | 0.37 | 42.4 | 250 | 50 | 8.47 | ditto 5/5/19 |
| | 1304 | 14.2 | 0.461 | 6.89 | 70.45 | 0.35 | 38.3 | 250 | 50 | 8.47 | clean out flow cell w/D.I. water |
| | 1309 | 13.9 | 0.447 | 6.88 | 66.84 | 1.37 | 41.4 | 250 | 50 | 8.47 | |
| | 1314 | 13.7 | 0.467 | 6.89 | 56.55 | 0.97 | 30.5 | 250 | 50 | 8.47 | |
| | 1319 | 13.7 | 0.466 | 6.90 | 47.31 | 0.60 | 25.4 | 250 | 50 | 8.47 | |
| | 1324 | 13.6 | 0.467 | 6.91 | 42.64 | 0.55 | 25.3 | 250 | 50 | 8.47 | |
| | 1329 | 13.2 | 0.466 | 6.91 | 38.17 | 0.42 | 22.8 | 250 | 50 | 8.47 | ditto |
| | 1334 | 13.0 | 0.467 | 6.91 | 36.28 | 0.44 | 22.5 | 250 | 50 | 8.47 | |
| | 1339 | 13.3 | 0.466 | 6.91 | 37.77 | 0.50 | 20.3 | 250 | 50 | 8.47 | |
| ↓ | 1344 | 13.0 | 0.472 | 6.92 | 33.07 | 0.43 | 21.2 | 250 | 50 | 8.47 | 5/6/19 |
| 5/6/19 | 1508 | 13.8 | 0.464 | 6.98 | 13.57 | 1.52 | 14.4 | 300 | 50 | 8.47 | POST SAMPLE READINGS |

**Recorded By:** [signature] 05/06/19 **QA Checked By:** [signature] 5-6-19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LL3mw-234

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/06/19 | 1349 | 13.2 | 0.472 | 6.97 | 29.31 | 0.45 | 20.2 | 250 | 50 | 8.47 | |
| | 1354 | 13.5 | 0.458 | 6.91 | 27.73 | 0.50 | 18.3 | 250 | 50 | 8.47 | |
| | 1359 | 13.2 | 0.468 | 6.91 | 24.51 | 0.49 | 17.6 | 250 | 50 | 8.47 | |
| | 1404 | 13.5 | 0.466 | 6.91 | 21.04 | 0.42 | 16.3 | 250 | 50 | 8.47 | |
| | 1409 | 13.3 | 0.467 | 6.91 | 19.43 | 0.40 | 14.7 | 250 | 50 | 8.47 | |
| | 1414 | 13.2 | 0.464 | 6.91 | 18.98 | 0.41 | 15.8 | 250 | 50 | 8.47 | |
| | 1419 | 13.2 | 0.460 | 6.92 | 22.89 | 0.52 | 14.2 | 250 | 50 | 8.47 | |
| | 1424 | 13.0 | 0.464 | 6.92 | 17.52 | 0.46 | 13.3 | 250 | 50 | 8.47 | |
| | 1429 | 13.0 | 0.461 | 6.91 | 18.56 | 0.42 | 13.5 | 250 | 50 | 8.47 | |
| | 1434 | 13.3 | 0.464 | 6.91 | 16.64 | 0.40 | 13.6 | 250 | 50 | 8.47 | |
| | 1439 | 13.8 | 0.464 | 6.92 | 15.80 | 043 | 12.6 | 250 | 50 | 8.47 | |
| 1444 | 1444 2ME 5/6/19 | 13.8 | 0.466 | 6.92 | 13.68 | 0.40 | 11.4 | 250 | 50 | 8.47 | |
| | 1449 | 14.0 | 0.466 | 6.92 | 13.77 | 0.40 | 11.0 | 250 | 50 | 8.47 | 5/6/19 |
| ↓ | 1454 | — | — | — | — | — | — | — | 50 | 8.47 | A Spinzel gives approval to sample |
| | | | | | | | | | | | 5/6/19 |
| | | | | | | | | | | | |

**Recorded By:** 05/06/19

**QA Checked By:** 5-6-19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID Number:** LL3mw-237

**Date and Time:** Start: 5-6-19 | ~~1458~~ DS 5-6-19 1200

Complete: 5-6-19 | 1440

**Personnel:** G. Gromofsky

**Purge Method(s):** Bailer ☐ Bladder Pump ☑ Other: N/A ☐

**Depth To Water:** 13.43 ft. from measuring point

**Well Diameter:** 2 inches

**PSI = Intake Depth/2 + 10**

**Intake Depth:** 25.55 ft.

**PSI=** ~~22.7~~ DS 5-6-19 25.55/2 + 10 = 22.8

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 25.55 - DTW 13.43 = 12.12

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 12.12 x Tf 9.46 = 114.7

**3.) Total Volume of stagnant water**

Total volume = 622 + ~~736~~ DS 5-6-19 114.7 = 736.7

**2x Total volume =** 1,473 ml

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03179 | 5-6-19 |
| Water Level Tape: SOLONIST or (Heron) | 07-0573 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 1930 | N/A |

**Total Volume of Water Removed (Liters):** 10.375 L

Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL3mw-237-190401-GW | 5-6-19 | 1415

**QC Sample ID** N/A

**Analysis** Explosives

Field Observations/Site Conditions During Purging: 64°F, sunny, calm; water appears clear, colorless, odorless initially becoming slightly cloudy;

Sampling Procedure Followed: (YES) / NO

If no, why was deviation necessary: DS 5-6-19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: 5-6-19 (Signature and Date)

QA Checked By: 5/6/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** LL3mw-237

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 13.43

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5-6-19 | 1204 | 16.4 | 0.356 | 6.69 | 5.7 | 7.87 | 271.6 | 350 ml | 90 ml/min | 14.05 | Initial reading through flow cell (1/20/40) water is clear, colorless, odorless |
| | 1216 | -- | -- | -- | -- | -- | -- | 1,400ml | 115 ml/min | 14.90 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 1221 | 10.7 | 0.330 | 6.69 | 23.2 | 5.90 | 303.4 | 575 ml | 115 ml/min | 14.90 | Start recording stability parameters (1/6/54) water is clear, colorless, odorless |
| | 1226 | 11.1 | 0.330 | 6.68 | 32.5 | 5.69 | 308.0 | 525ml | 105ml/min | 14.90 | (1/6/54) |
| | 1231 | 11.1 | 0.330 | 6.68 | 46.3 | 5.66 | 310.6 | 475 ml | 95 ml/min | 14.90 | (1/4/56) lower purge rate to decrease turbidity to attempt |
| | 1236 | 12.1 | 0.330 | 6.67 | 51.0 | 5.46 | 315.2 | 375ml | 75ml/min | 14.80 | DUP 5-6-19 |
| | 1241 | 11.8 | 0.330 | 6.66 | 94.9 | 5.43 | 320.9 | 375 ml | 75ml/min | 14.68 | water is slightly cloudy |
| | 1246 | 12.0 | 0.329 | 6.66 | 65.7 | 5.31 | 322.5 | 375 ml | 75 ml/min | 14.68 | |
| | 1251 | 11.8 | 0.330 | 6.64 | 42.5 | 5.15 | DUP 5-6-19 ~~324~~ 324.1 | 375ml | 75ml/min | 14.68 | |
| | 1256 | 11.8 | 0.330 | 6.64 | 104.5 | 4.98 | 327.7 | 375ml | 75ml/min | 14.67 | |
| | 1301 | 12.0 | 0.328 | 6.63 | 10.6 | 4.78 | 329.0 | 375ml | 75ml/min | 14.67 | |
| | 1306 | 12.0 | 0.331 | 6.62 | 29.7 | 4.66 | 331.0 | 575ml | 75 ml/min | 14.63 | |
| | 1311 | 11.8 | 0.328 | 6.61 | 87.3 | 4.49 | 334.6 | 375 ml | 75 ml/min | 14.62 | |
| | 1316 | 11.8 | 0.328 | 6.61 | 102.1 | 4.42 | 337.2 | 375 ml | 75 ml/min | 14.60 | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | DUP 5-6-19 | | | | | see p. 3 | | | | POST SAMPLE READINGS |

**Recorded By:** [signature] 5-6-19 **QA Checked By:** [signature] 5/6/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** LL3mw-237

| | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|---|
| | 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5-6-19 | 1321 | 11.7 | 0.327 | 6.61 | 128.5 | 4.38 | 338.6 | 375 ml | 75 ml/min | 14.60 | (1/4/56) |
| | 1326 | 11.4 | 0.328 | 6.60 | 13.8 | 4.28 | 340.6 | 375 ml | 75 ml/min | 14.60 | |
| | 1331 | 11.3 | 0.327 | 6.60 | 39.6 | 4.24 | 341.4 | 375 ml | 75 ml/min | 14.60 | |
| | 1336 | 11.2 | 0.327 | 6.59 | 23.2 | 4.13 | 343.5 | 375 ml | 75 ml/min | 14.59 | |
| | 1341 | 11.5 | 0.327 | 6.58 | 105.4 | 4.04 | 344.7 | 375 ml | 75 ml/min | 14.60 | |
| | 1346 | 11.2 | 0.325 | 6.57 | 115.1 | 4.00 | 346.5 | 375 ml | 75 ml/min | 14.60 | |
| | 1351 | 11.4 | 0.328 | 6.57 | 2.0 | 4.02 | 346.6 | 375 ml | 75 ml/min | 14.60 | |
| | 1356 | Empty flow cell to verify 20 NTU reading | | | | | | | | | Verify Stability w/ A.Sprinzl - need to show that NTU is <10 |
| | 1405 | 11.9 | 0.330 | 6.53 | 1.8 | 5.98 | 348.2 | 375 ml | 75 ml/min | 14.60 | Refill flow cell - NTU is <10 ~~and~~ 5-6-19 |
| | ~~1410~~ 1408 | 11.8 | 0.328 | 6.55 | 3.8 | 4.04 | 347.9 | 225 ml | 75 ml/min | 14.60 | |
| | 1411 | 11.5 | 0.327 | 6.55 | 6.6 | 3.95 | 344.5 | 225 ml | 75 ml/min | 14.60 | |
| | 1414 | 11.5 | 0.326 | 6.56 | 7.7 | 3.96 | 344.0 | 225 ml | 75 ml/min | 14.60 | Stable |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| 5-6-19 | 1439 | 12.6 | 0.329 | 6.56 | 2.8 | 4.44 | 350.8 | 375 ml | 75 ml/min | 14.60 | *Post Sample reading |

**Recorded By:** 5-6-19 **QA Checked By:** 5/6/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** LL3mw-244

**Date and Time:** Start: 5-6-19 | 1010 Complete: 5-6-19 | 1045

**Personnel:** G. Gromofsky

**Purge Method(s):** Bailer Bladder Pump Other: N/A

**Depth To Water:** 7.04 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 42 ft. **PSI=** 42 /2 + 10 = 31

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 42 - DTW 7.04 = 34.96

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 34.96 x Tf 21.576 =

**3.) Total Volume of stagnant water**

Total volume = 2 (622 + 754.3) = 2,752.6

**2x Total volume =** 2,752.6 ml

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03179 | 5-6-19 |
| Water Level Tape: SOLONIST or (Heron) | 07-0573 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 1930 | N/A |

**Total Volume of Water Removed (Liters):** 11.13 L Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL3mw-244-190401-GW | 5-6-19 | 1040 **QC Sample ID** N/A

**Analysis** Explosives, metals

Field Observations/Site Conditions During Purging: 59° F, sunny, breezy; water is clear, colorless, odorless;

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary:

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: 5-6-19 (Signature and Date)

QA Checked By: 5/6/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** LL3mw-244

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 7.04

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5-6-19 | 1012 | 11.2 | 0.223 | 6.08 | 1.4 | 5.43 | 243.3 | 400 ml | 200 | 7.13 | Initial reading through flow cell (1/17/43) water is clear, colorless, odorless |
| | 1019 | -- | -- | -- | -- | -- | -- | 2,800ml | 400 | 7.09 | Purged 2x's volume of stagnant water in pump and tubing - stability parameters not recorded |
| | 1024 | 9.9 | 0.216 | 6.08 | 2.8 | 4.26 | 264.4 | 1,800ml | 360 | 7.09 | Start recording stability parameters (1/17/43) water is clear, colorless, odorless |
| | 1029 | 9.9 | 0.216 | 6.09 | 2.5 | 4.25 | 273.3 | 1,800 ml | 360 | 7.09 | |
| | 1034 | 9.8 | 0.215 | 6.09 | 1.8 | 4.26 | 284.7 | 1,800ml | 360 | 7.09 | DS 5-6-19 |
| ↓ | 1039 | 9.9 | 0.215 | 6.08 | 1.8 | 4.26 | 291.1 | 1,800ml | 360 | 7.09 | Parameters stable - Sample |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
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DS 5-6-19

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5-6-19 | 1044 | 10.1 | 0.215 | 6.15 | 1.7 | 5.86 | 308.5 | 730ml | 360 | 7.09 | POST SAMPLE READINGS |

**Recorded By:** 5-6-19 **QA Checked By:** 5/6/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** LL3mw-246

**Date and Time:** 5/9/19 Start: 0827 Complete: 0904

**Personnel:** Lindsey Mayer

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 17.75 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 40 ft. **PSI=** 40 /2 + 10 = 30

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 40 - DTW 17.75 = 22.25

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 22.25 x Tf 21.576 = 480.07

**3.) Total Volume of stagnant water**

Total volume = 622 + 480.07 = 1102.07

**2x Total volume =** 2,204.14

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03313 | 5/9/19 |
| Water Level Tape: ~~SOLONIST~~ Heron | 07-0572 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 42406 | N/A |

**Total Volume of Water Removed (Liters):** 7.6 Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL3mw-246-190401-GW / 5-9-19 / 0905 **QC Sample ID** LL3mw-246-190401-GWMS0, LL3mw-246-190402-GW LL3mw-246-190403-GW

**Analysis** Explosives, Perchlorate, TAL metals

Field Observations/Site Conditions During Purging: 70's Sunny water is clear, colorless, odorless

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A 5/9/19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: [signature] 5/9/19 (Signature and Date)

QA Checked By: [signature] 05/09/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LL3mw-246

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 17.75

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/9/19 | 0831 | 11.7 | 0.251 | 6.90 | 1.79 | 6.94 | 129.5 | 400mL | 100 | 17.86 | Initial reading through flow cell CPM=1 D=3.0 R=57.0 |
| | 0843 | -- | -- | -- | -- | -- | -- | 2400 | 200 | 17.97 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded CPM=1 D=5.0 R=55.0 |
| | 0844 | 10.6 | 0.227 | 5.90 | 4.07 | 4.16 | 239.3 | 200 | 200 | 17.97 | Start recording stability parameters |
| | 0849 | 10.8 | 0.226 | 5.89 | 1.59 | 4.30 | 225.2 | 1000 | 200 | 17.97 | |
| | 0854 | 10.8 | 0.226 | 5.90 | 1.39 | 4.19 | 225.1 | 1000 | 200 | 17.97 | |
| | 0859 | 10.6 | 0.227 | 5.90 | 1.52 | 4.16 | 226.6 | 1000 | 200 | 17.97 | 5/9/19 |
| | 0904 | — | — | — | — | — | — | 1000 | 200 | 17.97 | charles confirm stability |
| 5/9/19 | 0940 | 11.5 | 0.227 | 6.05 | 1.07 | 4.39 | 217.0 | 600 | 200 | 18.00 | POST SAMPLE READINGS |

**Recorded By:** _____

**QA Checked By:** 05/09/19

# RVAAP-11 LOAD LINE 4

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** LL4mw-200

**Date and Time:** 5/2/19 Start: 1349 Complete: 1449

**Personnel:** Lindsey Mayer

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 17.98 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 23.91 ft. **PSI=** 23.91 /2 + 10 = 21.95

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 23.91 - DTW 17.98 = 5.93

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 5.93 x Tf 9.46 = 56.10

**3.) Total Volume of stagnant water**

Total volume = 622 + 56.10 = 678.10

**2x Total volume =** 1356.20

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA02140 | 5/2/19 |
| Water Level Tape: ~~SOLONIST~~ QM 5/2/19 Heron | 07-0573 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | ~~420~~ QM 5/2/19 42406 | N/A |

**Total Volume of Water Removed (Liters):** 2.4 Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL4 mw-200-190401-GW/5-2-19/1450 **QC Sample ID** N/A

**Analysis** Cyanide

Field Observations/Site Conditions During Purging: 72°F Partly cloudy water is clear, colorless, odorless

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: [signature] 5/2/19 (Signature and Date)

QA Checked By: [signature] 05/02/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** LL4MW-206

Initial DTW: 17.98

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/2/19 | 1400 | 14.3 | 1.160 | 7.22 | 20.06 | 8.15 | 221.9 | 440mL | 40 | 18.00 | Initial reading through flow cell CPM-1 D-3 R-57.0 |
| 1424 | ~~1422~~ 1434 | -- | -- | -- | -- | -- | -- | 960 | 40 | 18.00 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 1425 | 12.9 | 1.329 | 6.97 | 6.10 | 7.41 | 232.7 | 40 | 40 | 18.00 | Start recording stability parameters |
| | 1430 | 12.8 | 1.325 | 6.96 | 1.72 | 6.96 | 194.6 | 200 | 40 | 18.00 | |
| | 1435 | 12.8 | 1.319 | 6.95 | 1.91 | 7.46 | 203.4 | 200 | 40 | 18.00 | |
| | 1440 | 12.7 | 1.327 | 6.95 | 2.37 | 7.39 | 207.7 | 200 | 40 | 18.00 | |
| | 1445 | 12.6 | 1.320 | 6.95 | 2.80 | 7.44 | 210.7 | 200 | 40 | 18.00 | |
| | 1449 | — | — | — | — | — | — | 160 | 40 | 18.00 | A. Sprinzel gives approval to sample |
| | | | | | | | | | | | |
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| | | | | | | | | | | | 5/2/19 |
| | | | | | | | | | | | |
| 5/2/19 | 1505 | 12.5 | 1.310 | 6.95 | 4.67 | 7.52 | 192.5 | — | 40 | 18.00 | POST SAMPLE READINGS |

**Recorded By:** 5/2/19 **QA Checked By:** 05/02/19

# RVAAP-12 LOAD LINE 12

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID Number:** LL12mw-183

**Date and Time:** Start: 5/1/19 0843 Complete: ~~10/16/19~~ 5/1/19 1016

**Personnel:** Lindsey Mayer

**Purge Method(s):** Bailer ☐ Bladder Pump ☑ Other: ☐

**Depth To Water:** 11.96 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 30.65 ft. **PSI=** 30.65 /2 + 10 = 25.33

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 30.65 - DTW 11.96 = 18.69

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 18.69 x Tf 21.576 = 403.25

**3.) Total Volume of stagnant water**

Total volume = 622 + 403.25 = 1025.25

**2x Total volume =** 2050.51

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA0214O | 5/1/19 |
| Water Level Tape: ~~SOLONIST~~ 5/1/19 Heron | 07-0573 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 42406 | N/A |

**Total Volume of Water Removed (Liters):** 3.6 Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL12mw-183-FA0401-GW/5-1-19/1017 **QC Sample ID** N/A

**Analysis** cyanide

Field Observations/Site Conditions During Purging: 62°F, partly cloudy, water is clear, colorless, odorless

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: [signature] 5/1/19 (Signature and Date)

QA Checked By: [signature] 05/20/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LL12mw-183

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 11.96

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/1/19 | 0847 | 10.9 | 0.993 | 7.59 | 8.81 | 5.21 | 215.7 | 200mL | 50 | 12.51 | Initial reading through flow cell CPM-1 D-2.0 R-58.0 |
| | 0925 | -- | -- | -- | -- | -- | -- | 1900 | 50 | 13.31 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded * During stagnant water purge water had orange tint |
| | 0926 | 11.0 | 0.991 | 7.08 | 40.02 | 1.56 | -22.7 | 25 | 25 | 13.31 | Start recording stability parameters CPM-1 D-1.0 R-59.0 |
| | 0931 | 11.9 | 1.010 | 7.09 | 33.67 | 1.53 | -25.3 | 125 | 25 | 13.31 | |
| | 0936 | 12.3 | 1.000 | 7.09 | 29.57 | 1.62 | -28.2 | 125 | 25 | 13.31 | |
| | 0941 | 12.6 | 1.000 | 7.09 | 29.31 | 1.53 | -28.3 | 125 | 25 | 13.30 | |
| | 0946 | 12.5 | 1.040 | 7.10 | 26.52 | 1.20 | -35.4 | 125 | 25 | 13.31 | |
| | 0951 | 12.7 | 1.039 | 7.10 | 29.85 | 1.25 | -33.1 | 125 | 25 | 13.31 | After reading cleaned out flow cell with DI water. |
| | 0956 | 11.5 | 0.987 | 7.11 | 10.05 | 1.79 | -29.0 | 125 | 25 | 13.31 | |
| | 1001 | 12.5 | 0.982 | 7.10 | 9.13 | 1.62 | -30.8 | 125 | 25 | 13.33 | |
| | 1006 | 12.7 | 0.980 | 7.11 | 9.00 | 1.58 | -33.3 | 125 | 25 | 13.33 | |
| | 1011 | 13.0 | 0.974 | 7.12 | 8.96 | 1.54 | -34.6 | 125 | 25 | 13.35 | |
| | 1016 | - | - | - | - | - | - | 125 | 25 | 13.35 | A-Sprinzel gives approval to sample |
| | | | | | | | | | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/1/19 | 1035 | 14.4 | 1.070 | 7.18 | 3.14 | 2.93 | -43.7 | 225 | 25 | 13.39 | POST SAMPLE READINGS |

**Recorded By:** 5/1/19

**QA Checked By:** 05/01/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID Number:** CL12 mw - 185

**Date and Time:** 5/1/19 Start: ~~1127~~ 1130 Complete: ~~1235~~ 1234

**Personnel:** R. LAURICH

**Purge Method(s):** Bailer ☐ Bladder Pump ☑ Other: ☐

**Depth To Water:** 7.10 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 17.94 ft. **PSI=** 17.94 /2 + 10 = 18.97

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 17.94 - DTW 7.10 = 10.84

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 10.84 x Tf 21.576 = 233.88

**3.) Total Volume of stagnant water**

Total volume = 622 + 233.88 = 855.88

**2x Total volume =** 1711.76

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: YSI PRO DSS or Horiba U-52 | FA03179 | 5/1/19 |
| Water Level Tape: SOLONIST | 34827 | N/A |
| Other: MP-10 with QED Well Wizzard or MP-50 | 1032 / 18836 | N/A |

**Total Volume of Water Removed (Liters):** 2.605 Sample Method: Bladder Pump

**Sample ID / Date / Time:** CL12 mw - 185 - 190401 - GW 5/1/19 1240 **QC Sample ID** N/A

**Analysis** NITRATE.

Field Observations/Site Conditions During Purging: CLEAR / COLORLESS / ODORLESS

Sampling Procedure Followed: YES / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected YES / NO**

Recorded By: [signature] 5/1/19 (Signature and Date)

QA Checked By: [signature] 05/01/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LL12mw-185

Initial DTW: 7.10

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/1/19 | 1134 | 14.4 | 5.624 | 6.45 | 3.6 | 5.25 | 254.1 | 350 | 50 | 7.70 | Initial reading through flow cell CPM 1 58/2 |
| | 1208 | -- | -- | -- | -- | -- | -- | 1370 | ~40 | 9.10 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded CPM 1 59/1 |
| | 1209 | 21.3 | 5.555 | 6.44 | 23.8 | 1.52 | 288.7 | ~25 | ~25 | 8.10 | Start recording stability parameters CLEAR / COLORLESS / ODORLESS |
| | 1214 | 21.7 | 5.546 | 6.42 | 8.5 | 1.55 | 290.0 | 100 | 20 | 8.12 | |
| | 1219 | 21.8 | 5.591 | 6.43 | 4.6 | 2.04 | 292.5 | 100 | 20 | 8.13 | |
| | 1224 | 21.6 | 5.581 | 6.44 | 3.9 | 2.11 | 295.8 | 100 | 20 | 8.14 | |
| | 1229 | 21.2 | 5.568 | 6.45 | 4.2 | 2.13 | 300.4 | 100 | 20 | 8.14 | |
| | ~~13~~ 1234 | 21.2 | 5.571 | 6.45 | 4.4 | 2.12 | 301.0 | 100 | 20 | 8.14 | STABLE |
| | 1236 | — | — | — | — | — | — | 40 | 20 | — | STABILITY CONFIRMED |
| | | | | | | | | | | | |
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5/1/19

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|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/1/19 | 1325 | 21.6 | 5.695 | 6.44 | 10.5 | 3.65 | 297.7 | 320 | 20 | 8.30 | POST SAMPLE READINGS |

**Recorded By:** [signature] 5/1/19

**QA Checked By:** [signature] 05/01/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** LL12mw-187

**Date and Time:** 5/2/19 Start: 1046 Complete: 1147

**Personnel:** Lindsey Mayer

**Purge Method(s):** Bailer ☐ Bladder Pump ☑ Other: ☐

**Depth To Water:** 9.30 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 24.5 ft. **PSI=** 24.5 /2 + 10 = 22.25

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 24.5 - DTW 9.30 = 15.2

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 15.2 x Tf 21.576 = 327.96

**3.) Total Volume of stagnant water**

Total volume = 622 + 327.96 = 949.96

**2x Total volume =** 1899.91

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA62140 | 5/2/19 |
| Water Level Tape: ~~SOLONIST~~ 2m 5/2/19 Heron | 07-0573 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 4240C | N/A |

**Total Volume of Water Removed (Liters):** 3.350 Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL12mw-187-190401-GW/5-2-19/1148 **QC Sample ID** N/A

**Analysis** Nitrate, metals

Field Observations/Site Conditions During Purging: 63°F overcast water is clear, colorless, odorless.

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected** YES / (NO) No discharge sample tube in well!

Recorded By: [signature] 5/2/19 (Signature and Date)

QA Checked By: [signature] 05/02/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** LL12mw-187

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements | Initial DTW: 9.30 |
|---|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample | |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/2/19 | 1056 | 15.1 | 15.475 | 6.60 | 2.09 | 6.14 | 253.0 | 500mL | 50 | 9.50 | Initial reading through flow cell CPM-1 R-57 D-3 |
| | 1124 | -- | -- | -- | -- | -- | -- | 1400 | 50 | 9.55 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 1125 | 13.2 | 15.838 | 6.42 | 2.58 | 1.17 | 227.8 | 50 | 50 | 9.55 | Start recording stability parameters |
| | 1130 | 13.2 | 15.802 | 6.41 | 1.62 | 1.11 | 234.5 | 250 | 50 | 9.55 | |
| | 1135 | 13.3 | 15.835 | 6.41 | 7.33 | 0.96 | 239.3 | 250 | 50 | 9.55 | |
| | 1140 | 13.2 | 15.890 | 6.40 | 8.05 | 1.04 | 241.6 | 250 | 50 | 9.55 | 5/2/19 |
| | 1147 | — | — | — | — | — | — | ~~300~~ 350 | 50 | 9.55 | A. Spinzel gives permission to sample |
| | | | | | | | | am 5/1/19 | | | |
| | | | | | | | | | | | |
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| | | | | | | | | | | | 5/2/19 |
| 5/2/19 | 1210 | 13.8 | 16.230 | 6.51 | 2.91 | 1.29 | 225.3 | 300 | 50 | 9.55 | POST SAMPLE READINGS |

**Recorded By:** 2. Myn 5/2/19 **QA Checked By:** 05/02/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID Number:** LL12mw - 242

**Date and Time:** Start: 5/1/19 1130 Complete: ~~15~~ 2M 5/1/19 1404

**Personnel:** Lindsey Moyer

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 8.55 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 23.5 ft. **PSI=** 23.5 /2 + 10 = 21.75

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 23.5 - DTW 8.55 = 14.95

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 14.95 x Tf 21.576 = 322.56

**3.) Total Volume of stagnant water**

Total volume = 622 + 322.56 = 944.56

**2x Total volume =** 1566.56

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: YSI PRO DSS or Horiba U-52 | FA02140 | 5/1/19 |
| Water Level Tape: ~~SOLONIST~~ 2M 5/1/19 Heron | 07-0573 | N/A |
| Other: MP-10 with QED Well Wizzard or MP-50 | 42406 | N/A |

**Total Volume of Water Removed (Liters):** 8.15 Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL12mw-242-190401-GW/5-1-19/1405 **QC Sample ID** N/A

**Analysis** Nitrate, TAL metals, Filtered metals sample

Field Observations/Site Conditions During Purging: 85°F Sunny, water is slightly cloudy, colorless, odorless call A. Sprinzel, post readings, ~~high~~ 2M 5/1/19 >50NTU, collect filtered sample

Sampling Procedure Followed: YES / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected YES / NO**

Recorded By: [signature] 5/1/19 (Signature and Date)

QA Checked By: [signature] 05/01/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LL12MW-242

Initial DTW: 8.55

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/1/19 | 1140 | 18.6 | 0.885 | 7.51 | 71.44 | 7.06 | 156.3 | 500mL | 50 | 8.63 | Initial reading through flow cell CPM-1 D-5.0 R-55.0 |
| | 1202 | -- | -- | -- | -- | -- | -- | 1100 | 50 | 8.70 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 1203 | 13.7 | 0.888 | 7.28 | 110.70 | 3.70 | 76.4 | 50 | 50 | 8.70 | Start recording stability parameters |
| | 1208 | 13.6 | 0.892 | 7.29 | 56.61 | 3.01 | 39.0 | 250 | 50 | 8.71 | 5-1-19 |
| | 1213 | 13.6 | 0.888 | 7.27 | 57.11 | 2.08 | 8.8 | 250 | 50 | 8.71 | After reading clean, out flow cell w/ DDI water. |
| | 1218 | 13.5 | 0.889 | 7.26 | 55 55.56 am 5/1/19 | 1.17 | -10.3 | 250 | 50 | 8.71 | |
| | 1223 | 13.8 | 0.888 | 7.25 | 61.32 | 0.90 | -17.7 | 250 | 50 | 8.73 | |
| | 1228 | 13.8 | 0.888 | 7.25 | 89.70 | 0.76 | -26.3 | 250 | 50 | 8.73 | 2nd 5-1-19 |
| 1233 | ~~1233~~ am 5/1/19 1232 | 13.8 | 0.892 | 7.27 | 56.83 | 0.70 | -31.6 | 250 | 50 | 8.73 | After readings clean, out flow cell w/ DI water |
| | 1238 | 13.9 | 0.891 | 7.25 | 44.31 | 1.01 | -30.9 | 250 | 50 | 8.73 | |
| | 1243 | 13.6 | 0.889 | 7.25 | 44.72 | 0.68 | -34.1 | 250 | 50 | 8.73 | |
| | 1248 | 14.0 | 0.885 | 7.25 | 26.56 | 0.55 | -39.4 | 250 | 50 | 8.73 | |
| | 1253 | 13.8 | 0.885 | 7.25 | 31.89 | 0.53 | -40.8 | 250 | 50 | 8.73 | 3rd 5-1-19 |
| | 1258 | 13.8 | 0.884 | 7.25 | 30.15 | 0.52 | -42.1 | 250 | 50 | 8.73 | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/1/19 | 1425 | 16.2 | 0.889 | 7.39 | 78.15 | 2.19 | -43.1 | 250 | 50 | 8.75 | POST SAMPLE READINGS |

**Recorded By:** 2 May 5/1/19

**QA Checked By:** 05/01/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LL12MW-242

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/1/19 | 1303 | 14.0 | 0.882 | 7.24 | 34.06 | 0.52 | -39.4 | 250 | 50 | 8.73 | |
| | 1308 | 14.1 | 0.886 | 7.24 | 31.57 | 0.42 | -39.2 | 250 | 50 | 8.73 | |
| | 1313 | 14.9 | 0.881 | 7.25 | 30.88 | 0.41 | -42.6 | 250 | 50 | 8.73 | |
| | 1318 | 14.4 | 0.889 | 7.25 | 26.55 | 0.40 | -45.1 | 250 | 50 | 8.73 | |
| | 1323 | 14.2 | 0.882 | 7.26 | 20.37 | 0.41 | -48.4 | 250 | 50 | 8.73 | |
| | 1328 | 13.6 | 0.888 | 7.26 | 25.66 | 0.44 | -48.0 | 250 | 50 | 8.73 | |
| | 1333 | 13.8 | 0.885 | 7.25 | 19.07 | 0.47 | -47.8 | 250 | 50 | 8.74 | |
| | 1338 | 13.7 | 0.884 | 7.25 | 19.90 | 0.40 | -48.8 | 250 | 50 | 8.74 | |
| | 1343 | 13.7 | 0.886 | 7.27 | 9.89 | 0.42 | -49.1 | 250 | 50 | 8.74 | *After reading turbidity went back up. |
| | 1348 | 13.9 | 0.888 | 7.26 | 27.25 | 0.46 | -48.2 | 250 | 50 | 8.74 | |
| | 1353 | 13.9 | 0.889 | 7.26 | 27.51 | 0.46 | -45.9 | 250 | 50 | 8.74 | |
| | 1358 | 14.0 | 0.889 | 7.27 | 31.42 | 0.45 | -47.0 | 250 | 50 | 8.74 | |
| | 1403 | 14.0 | 0.892 | 7.27 | 29.01 | 0.42 | -47.3 | 250 | 50 | 8.74 | |
| | 1404 | - | - | - | - | - | - | 50 | 50 | 8.74 | Approval to sample after two hours |

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**Recorded By:** 5/1/19

**QA Checked By:** 05/01/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID Number:** LL12 mw - 245

**Date and Time:** ~~19~~ 5/1/19 **Start:** 1422 **Complete:** NO SAMPLE ABORTED PURGE DUE TO TIME CONSTRAINTS

**Personnel:** R Lauruch

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 8.10 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 22.06 ft. **PSI=** 22.06 /2 + 10 = 21.03

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 22.06 - DTW 8.10 = 13.96

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 13.96 x Tf 21.56 = 301.20

**3.) Total Volume of stagnant water**

Total volume = 622 + 301.20 = 923.20

**2x Total volume =** 1846.40

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: YSI PRO DSS or Horiba U-52 | FA03179 | 5/1/19 |
| Water Level Tape: SOLONIST | 34827 | N/A |
| Other: MP-10 with QED Well Wizzard or MP-50 | 1032 / 18836 | N/A |

**Total Volume of Water Removed (Liters):** 1.870 Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL12mw-245-190401-GW 5/1/19 * NO SAMPLE. **QC Sample ID**

**Analysis** EXPLOSIVES, NITRATE, TAL METALS.

Field Observations/Site Conditions During Purging: ENDED PURGE DUE TO TIME LIMITATIONS TURBIDITY WAS HIGH, & FLOW RATE TOO LOW TO FILL BOTTLEWARE BEFORE DEADLINE TO BE OFFSITE.

Sampling Procedure Followed: YES / NO If no, why was deviation necessary: NA

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected YES / NO**

Recorded By: 5/1/19 (Signature and Date)

QA Checked By: 05/01/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** CL12mw-245

Initial DTW: 8.10

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/1/19 | 1455 | 13.5 | 1.475 | 6.94 | 49.4 | 4.35 | 258.7 | 375mL | ~75 | 9.24 | Initial reading through flow cell CPM 1 57/3 |
| | 1449 | -- | -- | -- | -- | -- | -- | 1475 | ~92 | 10.45 | Purged 2x's volume of stagnant water in pump and tubing - stability parameters not recorded |
| | 1450 | 13.3 | 1.454 | 6.92 | 61.1 | 2.84 | 280.2 | ~20 | ~20 | 10.65 | Start recording stability parameters CPM 1 59/1 |
| ↓ | 1455 | | | | | | | | | | ENDED PURGE DUE TO |
| | | | | | | | | | | | TIME LIMITATIONS |
| | | | | | | | | | | | TURBIDITY + LOW FLOW |
| | | | | | TW | | | | | | RATE. |
| | | | | | 5/1/19 | | | | | | |
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|---|---|---|---|---|---|---|---|---|---|---|---|

**Recorded By:** 5/1/19

**QA Checked By:** 05/01/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** LL12mw-245

**Date and Time:** 5/2/19 Start: 0846 Complete: 1620

**Personnel:** Lindsey Mayer

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 8.12 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 22.06 ft. **PSI=** 22.06 /2 + 10 = 21.03

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 22.06 - DTW 8.12 = 13.94

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 13.94 x Tf 21.576 = 300.77

**3.) Total Volume of stagnant water**

Total volume = 622 + 300.77 = 922.77

**2x Total volume =** 1845.54

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: YSI PRO DSS or Horiba U-52 | FA0240 | 5/2/19 |
| Water Level Tape: ~~SOLONIST~~ Heron | 07-0573 | N/A |
| Other: MP-10 with QED Well Wizzard or MP-50 | 42406 | N/A |

**Total Volume of Water Removed (Liters):** ~19 Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL12mw-245-190401-GW/5/2/19/ 1230 **QC Sample ID** N/A

**Analysis** TAL metals, Explosives, Nitrate

Field Observations/Site Conditions During Purging: 63°F overcast. water level dropped, pumped well dry. water clear, colorless, odorless

Sampling Procedure Followed: YES / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected YES / NO**

Recorded By: [signature] 5/2/19 (Signature and Date)

QA Checked By: [signature] 05/02/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** LL12mw-245

Initial DTW: 8.12

| Stabilization Requirements | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV |
|---|---|---|---|---|---|---|
| Consecutive Readings to Sample | 3 | 3 | 3 | 1 | 3 | 3 |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/2/19 | 0851 | 12.4 | 1.521 | 6.98 | 4.32 | 5.24 | 237.6 | 250mL | 50 | 8.72 | Initial reading through flow cell CPM-1 R-58 D-2.0 |
| | 0923 | -- | -- | -- | -- | -- | -- | 1600 | 50 | 10.91 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 0925 | 12.2 | 1.401 | 6.95 | 16.16 | 1.88 | 216.1 | 50 | 25 | 10.93 | Start recording stability parameters CPM-1 R-59 D-1.0 |
| | 0930 | 13.1 | 1.404 | 6.94 | 14.11 | 1.93 | 214.0 | 125 | 25 | 11.05 | |
| | 0935 | 13.3 | 1.405 | 6.95 | 12.15 | 1.87 | 212.3 | 125 | 25 | 11.10 | |
| | 0940 | 13.7 | 1.405 | 6.96 | 7.24 | 1.88 | 207.4 | 125 | 25 | 11.15 | 5/2/19 |
| | 0945 | 14.0 | 1.401 | 6.96 | 4.01 | 1.90 | 20.22 | 125 | 25 | 11.25 | After reading reduced PSI-15, to get 50mL/min |
| | 0950 | 14.2 | 1.401 | 6.97 | 5.07 | 1.91 | 199.4 | 50 | 10 | 11.30 | |
| | 0955 | 14.4 | 1.401 | 7.02 | 8.75 | 1.92 | 169.3 | 50 | 10 | 11.35 | 5/2/19 |
| | 1000 | 14.5 | 1.401 | 6.97 | 9.44 | 1.93 | 174.2 | 50 | 10 | 11.41 | water level dropping at lowest rate, will purge well dry and sample after recharge |
| | 1020 | — | — | — | — | — | — | — | — | Below pump | Sucking Air Approx. Removed 4 gallons |
| | | | | | | | | | | | |
| | | | | | | | | | | | 5/2/19 |
| | | | | | | | | | | | |
| 5/2/19 | 1253 | 14.5 | 1.599 | 7.37 | 2.60 | 3.14 | 62.4 | — | — | 20.09 | POST SAMPLE READINGS |

**Recorded By:** 2. Mgn 5/2/19 **QA Checked By:** 05/02/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** LL12mw-247

**Date and Time:** 5/1/19 Start: 0850 Complete: 1009

**Personnel:** R. LaRICH

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 4.75 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 18 ft. **PSI=** 18 /2 + 10 = 19

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 18 - DTW 4.75 = 13.25

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 13.25 x Tf 21.576 = 285.88

**3.) Total Volume of stagnant water**

Total volume = 622 + 285.88 = 907.88

**2x Total volume =** 1815.76

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: YSI PRO DSS or Horiba U-52 | FA03179 | 5/1/19 |
| Water Level Tape: SOLONIST | 34827 | N/A |
| Other: MP-10 with QED Well Wizzard or MP-50 | 1032 / 18836 | N/A |

**Total Volume of Water Removed (Liters):** 3.265 Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL12mw-247-190401-GW 5/1/19 1015 **QC Sample ID** NA

**Analysis** NITRATE + TAL METALS

Field Observations/Site Conditions During Purging: CLOUDY / SLIGHT ORANGE TINT / NO ODOR - CLEARED UP DURING PURGE. TURBIDITY WOULD NOT DROP >10 NTU STABLE AROUND 17 NTU. AFTER 1 HOUR OF PURGING.

Sampling Procedure Followed: YES / NO If no, why was deviation necessary: NA

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected YES / NO**

Recorded By: 5/1/19 (Signature and Date)

QA Checked By: 05/01/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** LL12 MW-247

Initial DTW: 4.75

| Stabilization Requirements | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV |
|---|---|---|---|---|---|---|
| Consecutive Readings to Sample | 3 | 3 | 3 | 1 | 3 | 3 |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/1/19 | 0854 | 10.3 | 1.063 | 7.13 | 41.7 | 4.55 | 252.4 | ~375 mL | ~75 | 5.18 | Initial reading through flow cell CPM: 57/3 |
| | 0928 | -- | -- | -- | -- | -- | -- | 1450 | ~43 | 5.32 | Purged 2x's volume of stagnant water in pump and tubing - stability parameters not recorded CPM: 58/2 |
| | 0929 | 12.7 | 1.006 | 7.03 | 44.4 | 1.28 | 220.9 | ~40 | ~40 | 5.31 | Start recording stability parameters CPM: 57/1 Cloudy / ORANGE TINT, ODORLESS |
| | 0934 | 13.0 | 1.006 | 7.04 | 47.0 | 1.19 | 209.2 | 150 | 30 | 5.32 | |
| | 0939 | 13.1 | 1.006 | 7.03 | 56.9 | 1.15 | 202.9 | 125 | 25 | 5.32 | |
| | 0944 | 12.1 | 1.010 | 7.05 | 20.7 | 2.63 | 219.9 | 200 | 40 | 5.42 | CPM: 58/2 EMPTIED Flow Cell |
| | 0949 | 12.1 | 1.009 | 7.05 | 18.0 | 2.32 | 215.6 | 125 | 25 | 5.42 | CPM: 59/1 TINT + CLOUDINESS decreased up |
| | 0954 | 12.6 | 1.007 | 7.05 | 16.6 | 1.57 | 191.1 | 100 | 20 | 5.42 | |
| | 0959 | 13.1 | 1.007 | 7.05 | 17.8 | 1.26 | 174.4 | 125 | 25 | 5.42 | |
| | 1004 | 13.4 | ~~1.008~~ 1.008 | 7.06 | 17.2 | 1.16 | 161.6 | 125 | 25 | 5.42 | |
| | 1009 | 13.6 | 1.008 | 7.06 | 17.0 | 1.12 | 156.6 | 125 | 25 | 5.42 | STABLE |
| | 1013 | — | — | — | — | — | — | — | — | — | STABILITY CONFIRMED. |
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|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/1/19 | 1053 | 16.7 | 1.056 | 7.11 | 21.2 | 2.84 | 201.4 | 325 | ~25 | 5.42 | POST SAMPLE READINGS |

**Recorded By:** 5/1/19 **QA Checked By:** 05/01/19

# RVAAP-16 FUZE AND BOOSTER QUARRY LANDFILL/PONDS

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** FBQmw-171

**Date and Time:** Start: 4/30/19 1355 Complete: 4/30/19 1418

**Personnel:** R. Gurich

**Purge Method(s):** Bailer ☐ Bladder Pump ☑ Other: ☐

**Depth To Water:** 16.18 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 29 ft. **PSI=** 29 /2 + 10 = 24.5

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 29 - DTW 16.18 = 12.82

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 12.82 x Tf 9.46 = 121.27

**3.) Total Volume of stagnant water**

Total volume = 622 + 121.27 = 743.27

**2x Total volume =** 1486.55

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: YSI PRO DSS or Horiba U-52 | FA05179 | 4/30/19 |
| Water Level Tape: SOLONIST | 212580 | N/A |
| Other: MP-10 with QED Well Wizzard or MP-50 | 1052 | N/A |

**Total Volume of Water Removed (Liters):** 2.75 Sample Method: Bladder Pump

**Sample ID / Date / Time:** FBQmw-171-190401-GW 4/30/19 1420 **QC Sample ID** N/A

**Analysis** CYANIDE, SULFIDE, NITRATE, NITRITE, SULFATE, + ALKALINITY

Field Observations/Site Conditions During Purging: CLEAR / COLORLESS / ODORLESS

Sampling Procedure Followed: YES / NO If no, why was deviation necessary: N/A RL/4/30/19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected YES / NO**

Recorded By: RL 4/30/19 (Signature and Date)

QA Checked By: [signature] 04/30/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** FBQmw-171

Initial DTW: 16.18

| Stabilization Requirements | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV |
|---|---|---|---|---|---|---|
| Consecutive Readings to Sample | 3 | 3 | 3 | 1 | 3 | 3 |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/30/19 | 1342 | 10.2 | 0.150 | 5.83 | 1.2 | 8.61 | 256.9 | 350 | ~~~80~~ 70 | 16.28 | Initial reading through flow cell CPM 57/3 |
| | 1402 | -- | -- | -- | -- | -- | -- | 1150 | ~58-60 | 16.30 | Purged 2x's volume of stagnant water in pump and tubing - stability parameters not recorded |
| | 1403 | 9.9 | 0.146 | 5.76 | 1.9 | 7.43 | 354.4 | ~50 | ~50 | 16.30 | Start recording stability parameters CPM 58/2 CLEAR/COLORLESS/ODORLESS |
| | 1408 | 9.8 | 0.145 | 5.76 | 2.2 | 7.39 | 346.1 | 300 | 60 | 16.29 | |
| | 1413 | 9.7 | 0.143 | 5.76 | 1.8 | 7.37 | 352.1 | 250 | 50 | 16.30 | |
| | 1418 | 9.7 | 0.144 | 5.76 | 2.1 | 7.35 | 357.7 | 250 | 50 | 16.30 | STABLE |
| | 1419 | — | — | — | — | — | — | 50 | 50 | — | STABILITY CONTINUED |
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| 4/30/19 | ~~1359~~ 1459 | 9.7 | 0.143 | 5.79 | 0.5 | 7.83 | 358.2 | 350 | 50 | 16.21 | POST SAMPLE READINGS |

**Recorded By:** 4/30/19

**QA Checked By:** 04/30/19

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# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** FBQmw-172

**Date and Time:** Start: 4/30/19 1300 Complete: 1350

**Personnel:** Lindsey Myers

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 23.41 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 34 ft. **PSI=** 34 /2 + 10 = 27

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 34 - DTW 23.41 = 10.59

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 10.59 x Tf 9.46 = 100.18

**3.) Total Volume of stagnant water**

Total volume = 622 + 100.18 = 722.18

**2x Total volume =** 1444.36

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: YSI PRO DSS or Horiba U-52 | FA02140 | |
| Water Level Tape: SOLONIST Heron | 07-0573 | N/A |
| Other: MP-10 with QED Well Wizzard or MP-50 | 42406 | N/A |

**Total Volume of Water Removed (Liters):** 2.75 Sample Method: Bladder Pump

**Sample ID / Date / Time:** FBQmw-172-190401-GW 4/30/19 1351 **QC Sample ID** FBQmw-172-190402-GW/FBQmw-172-190403-GW

**Analysis** Cyanide

Field Observations/Site Conditions During Purging: 52°F, clouds water is clear, colorless, odorless.

*check conductivity with D.I water reading 0.0005.

Sampling Procedure Followed: YES / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected YES / NO**

Recorded By: 4/30/19 (Signature and Date)

QA Checked By: 4/30/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** FBQMW-172

Initial DTW: 23.41

| | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|---|
| | 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/30/19 | 1304 | 10.6 | 2.083 | 6.71 | 48.82 | 7.96 | 205.9 | 200mL | 50 | 23.51 | Initial reading through flow cell CPM-1 R-57 D-30 |
| | 1330 | -- | -- | -- | -- | -- | -- | 1300 | 50 | 23.53 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 1332 | 10.0 | 2.207 | 6.65 | 3.48 | 5.64 | 169.8 | 100 | 50 | 23.53 | Start recording stability parameters |
| | 1337 | 9.9 | 2.219 | 6.63 | 2.95 | 5.56 | 196.9 | 250 | 50 | 23.53 | |
| | 1342 | 9.9 | 2.224 | 6.63 | 2.74 | 5.54 | 202.6 | 250 | 50 | 23.53 | |
| | 1347 | 9.8 | 2.226 | 6.63 | 2.38 | 5.53 | 205.7 | 250 | 50 | 23.54 | |
| | 1350 | — | — | — | — | — | — | 150 | 50 | 23.54 | A. Sprinzel gives approval to sample. |
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| 4/30/19 | 1420 | 10.0 | 2.215 | 6.57 | 1.74 | 5.97 | 209.2 | 250 | 50 | 23.57 | POST SAMPLE READINGS |

**Recorded By:** [signature] 4/30/19 **QA Checked By:** [signature] 4/30/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** FBQ MW-174

**Date and Time:** Start: 4/30/19 1432 Complete: 1506

**Personnel:** Lindsey Mayer

**Purge Method(s):** Bailer ☑ Bladder Pump Other:

**Depth To Water:** 14.81 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 19.69 ft. **PSI=** 19.69 /2 + 10 = 19.85

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 19.69 - DTW 14.81 = 4.88

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 4.88 x Tf 21.576 = 105.29

**3.) Total Volume of stagnant water**

Total volume = 622 + 105.29 = 727.29

**2x Total volume =** 1349.29

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA02140 | 4/30/19 |
| Water Level Tape: ~~SOLONIST~~ Heron | 07-0573 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 42406 | N/A |

**Total Volume of Water Removed (Liters):** 3.075 Sample Method: Bladder Pump

**Sample ID / Date / Time:** FBQ MW-174-190401-GW/4/30/19/1507 **QC Sample ID** N/A

**Analysis** ~~Explos~~ Explosives, Alkalinity, Sulfate, nitrate, nitrite, Sulfide

Field Observations/Site Conditions During Purging: 64°F, cloudy, rain. water is clear, colorless, odorless

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected** YES / (NO) no well cap freeze sample tube

Recorded By: L. Mayer 4/30/19 (Signature and Date)

QA Checked By: [signature] 4/30/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** FBQmw-174

Initial DTW: 14.81

| | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|---|
| | 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/30/19 | 1438 | 9.2 | 0.178 | 5.53 | 1.53 | 10.69 | 202.7 | 450mL | 75 | 14.89 | Initial reading through flow cell CPM-1 R=57 D=3.0 |
| | 1451 | -- | -- | -- | -- | -- | -- | 975 | 75 | 14.84 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 1453 | 8.8 | 0.160 | 5.18 | 1.84 | 10.37 | 239.6 | 375 | 75 | 14.89 | Start recording stability parameters |
| | 1458 | 8.7 | 0.159 | 5.17 | 1.67 | 10.29 | 246.5 | 375 | 75 | 14.89 | |
| | 1503 | 8.7 | 0.159 | 5.15 | 1.24 | 10.28 | 254.2 | 375 | 75 | 14.89 | |
| | 1506 | — | — | — | — | — | — | 225 | 75 | 14.89 | A. Spinzel gives permission to sample |
| | | | | | | | | | | | |
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|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/30/19 | 1530 | 9.4 | 0.160 | 5.19 | 3.27 | 10.22 | 243.5 | 300 | 75 | 14.93 | POST SAMPLE READINGS |

**Recorded By:** 4/30/19

**QA Checked By:** 4/30/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 RL 5/7/19

**Well ID Number:** FBQmw-175

**Date and Time:** 5/7/19 Start: ~~0859~~ 0844 Complete: 1108

**Personnel:** R. LAURICH

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 16.04 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 23 ft. **PSI=** 23 /2 + 10 = 21.5

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 23 - DTW 16.04 = 6.96

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 6.96 x Tf 9.46 = 65.84

**3.) Total Volume of stagnant water**

Total volume = 622 + 65.84 = 687.84

**2x Total volume =** 1375.68

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: YSI PRO DSS or Horiba U-52 | FA03313 | 5/7/19 |
| Water Level Tape: ~~SOLONIST~~ RL 5/7/19 HERON | 2178-T | N/A |
| Other: MP-10 with QED Well Wizzard or MP-50 | 1032 / 18836 | N/A |

**Total Volume of Water Removed (Liters):** 7.385

Sample Method: Bladder Pump FBQmw-175-190403-GW

**Sample ID / Date / Time:** FBQmw-175-190401-GW 5/7/19 1115 **QC Sample ID** FBQmw-175-190401-GWMSD, FBQmw-175-190402-GW

**Analysis** SAMPLE + DUPE - SULFIDE, NITRATE, NITRITE, SULFATE, ALKALINITY, HEX CHROME. MSD - HEX CHROME. SPLIT - SULFIDE, NITRATE, NITRITE, SULFATE, ALKALINITY, HEX CHROME

Field Observations/Site Conditions During Purging: SLIGHTLY CLOUDY, COLORLESS, ODORLESS PURGED FOR 2 HRS. TURBIDITY WOULD NOT DROP < 10 NTU. RL 5/7/19

Sampling Procedure Followed: YES / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected YES / NO**

Recorded By: RL 5/7/19 (Signature and Date)

QA Checked By: 5/8/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** FISQmw-175

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 16.04

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/7/19 | 0851 | 10.2 | 0.175 | 6.79 | 155.74 | 10.31 | 212.5 | 350 | 50 | 16.20 | Initial reading through flow cell CPM 1 56/4 |
| | 0907 | -- | -- | -- | -- | -- | -- | 1050 | ~70 | 16.30 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 0908 | 9.6 | 0.102 | 5.61 | 37.50 | 10.21 | 201.4 | ~60 | ~60 | 16.31 | Start recording stability parameters CPM 1 57/3 |
| | 0913 | 9.8 | 0.101 | 5.54 | 34.93 | 10.18 | 202.8 | 325 | 65 | 16.32 | SLIGHTLY CLOUDY / COLORLESS / ODORLESS |
| | 0918 | 9.9 | 0.101 | 5.53 | 37.81 | 10.17 | 203.7 | 325 | 65 | 16.35 | CPM 1 58/2 |
| | 0923 | 10.2 | 0.101 | 5.54 | 38.96 | 10.18 | 207.5 | ~~1250~~ multiple | ~~25~~ 50 | 16.33 | |
| | 0928 | 10.3 | 0.101 | 5.56 | 40.95 | 10.18 | 208.3 | ~~1250~~ multiple | ~~25~~ 50 | 16.33 | |
| | 0933 | 10.4 | 0.101 | 5.55 | 35.04 | 10.18 | 212.2 | 175 | 35 | 16.33 | |
| | 0938 | 10.4 | 0.101 | ~~5.59~~ 5.59 | 33.17 | 10.18 | 205.5 | 150 | 30 | 16.33 | |
| | 0943 | 10.4 | 0.101 | 5.58 | 30.12 | 10.14 | 209.9 | 150 | 30 | 16.33 | |
| | 0948 | 10.1 | 0.101 | 5.58 | 30.28 | 10.22 | 217.0 | 250 | 50 | 16.35 | CPM 1 57/3 |
| | 0953 | 10.0 | 0.101 | 5.58 | 25.36 | 10.21 | 223.0 | 250 | 50 | 16.37 | |
| | 0958 | 10.0 | 0.102 | 5.58 | 24.74 | 10.21 | 227.9 | 250 | 50 | 16.38 | |
| | 1003 | 10.1 | 0.102 | 5.59 | 25.12 | 10.22 | 230.1 | 200 | 40 | 16.40 | |
| 5/7/19 | 1240 | 12.8 | 0.106 | 5.75 | 15.17 | 10.15 | 248.2 | 350 | 50 | 16.55 | POST SAMPLE READINGS |

**Recorded By:** [signature] 5/7/19

**QA Checked By:** [signature] 5/8/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** FBQ mw-175

| | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|---|
| | 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/7/19 | 1008 | 10.0 | 0.102 | 5.59 | 22.22 | 10.22 | 235.1 | 300 | 60 | 16.40 | |
| | 1013 | 10.1 | 0.102 | 5.60 | 21.87 | 10.23 | 218.1 | 200 | 40 | 16.41 | |
| | 1018 | 10.1 | 0.102 | 5.59 | 20.22 | 10.24 | 227.0 | 250 | 50 | 16.42 | CPM: 58/2 |
| | 1023 | 10.1 | 0.102 | 5.61 | 21.59 | 10.24 | 233.4 | 200 | 40 | 16.43 | |
| | 1028 | 10.3 | 0.102 | 5.61 | 20.13 | 10.24 | 237.2 | 125 | 25 | 16.45 | |
| | 1032 | 10.3 | 0.102 | 5.62 | 19.77 | 10.25 | 239.9 | 175 | 35 | 16.47 | |
| | 1037 | 10.3 | 0.102 | 5.60 | 19.58 | 10.27 | 242.9 | 175 | 35 | 16.47 | |
| | 1042 | 10.7 | 0.102 | 5.62 | 18.41 | 10.26 | 216.5 | 175 | 35 | 16.43 | |
| | 1047 | 10.6 | 0.103 | 5.60 | 18.53 | 10.23 | 228.6 | 200 | 40 | 16.44 | CPM: 57/3 |
| | 1053 | 10.6 | 0.103 | 5.61 | 17.63 | 10.26 | 237.3 | 250 | 50 | 16.47 | |
| | 1058 | 10.5 | 0.103 | 5.62 | 17.06 | 10.26 | 241.4 | 250 | 50 | 16.47 | |
| | 1103 | 10.4 | 0.103 | 5.61 | 17.03 | 10.26 | 246.1 | 250 | 50 | 16.47 | |
| | 1108 | 10.6 | 0.103 | 5.61 | 16.77 | 10.28 | 247.7 | 250 | 50 | 16.47 | STABLE - TURBIDITY WOULD NOT DROP ≤10 NTU AFTER 2 HRS PURGING |
| | 1112 | — | — | — | — | — | — | 200 | 50 | 16.47 | STABILITY CONFIRMED. |
| | | | | | | TOC | | | | | |
| | | | | | | 5/7/19 | | | | | |

**Recorded By:** 5/7/19

**QA Checked By:** 5/8/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** FBQmw-176

**Date and Time:** 5/7/19 Start: 1303 Complete: 1523

**Personnel:** R. LAURICH

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 7.08 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 20.19 ft. **PSI=** 20.19 /2 + 10 = 20

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 20.19 - DTW 7.08 = 13.11

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 13.11 x Tf 9.46 = 124.02

**3.) Total Volume of stagnant water**

Total volume = 622 + 124.02 = 746

**2x Total volume =** 1492

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: YSI PRODSS or Horiba U-52 | FA03313 | 5/7/19 |
| Water Level Tape: SOLONIST HERON | 2178-T | N/A |
| Other: MP-10 with QED Well Wizzard or MP-50 | 1052 / 18856 | N/A |

**Total Volume of Water Removed (Liters):** 23.55 Sample Method: Bladder Pump

**Sample ID / Date / Time:** FBQmw-176-190401-GW 5/7/19 **QC Sample ID** N/A

**Analysis** CYANIDE

Field Observations/Site Conditions During Purging: START - TURBID / ORANGE TINT / ODOR(ES)
TURBIDITY WOULD NOT STABILIZE AFTER 2 HOURS OF PURGING BUT WAS < 50 NTU

Sampling Procedure Followed: YES / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected YES / NO**

Recorded By: 5/7/19 (Signature and Date)

QA Checked By: 5/8/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** FBQmw-176

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 7.08

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/7/19 | 1309 | 10.0 | 0.125 | 6.11 | 396.57 | 3.55 | 89.5 | 375 | 75 | 7.08 | ODORLESS Initial reading through flow cell TURBID / ORANGE TINT CPM 1 5/4 in std |
| | 1322 | -- | -- | -- | -- | -- | -- | 1125 | | 7.08 | Purged 2x's volume of stagnant water in pump and tubing - stability parameters not recorded CPM 1 55/5 |
| | 1323 | 9.3 | 0.140 | 6.23 | 257.15 | 0.62 | 36.9 | 100 | 100 | 7.08 | Start recording stability parameters CPM 1 54/6 |
| | 1328 | 9.2 | 0.140 | 6.24 | 176.13 | 0.60 | 33.9 | 600 | 120 | 7.10 | ↓ |
| | 1333 | 9.0 | 0.140 | 6.26 | 158.67 | 0.47 | 30.0 | 600 | 120 | 7.10 | CPM 2 27/3 |
| | 1338 | 8.8 | 0.141 | 6.25 | 165.08 | 0.43 | 28.9 | 775 | 155 | 7.10 | CPM 2 26/4 |
| | 1343 | 8.7 | 0.141 | 6.25 | 112.73 | 0.39 | 27.6 | 800 | 160 | 7.10 | ↓ |
| | 1348 | 8.7 | 0.141 | 6.26 | 107.72 | 0.38 | 26.2 | 800 | 160 | 7.10 | ↓ |
| | 1353 | 8.6 | 0.141 | 6.26 | 104.06 | 0.36 | 25.3 | 1000 | 200 | 7.10 | CPM 2 25/5 |
| | 1358 | 8.7 | 0.141 | 6.26 | 110.85 | 0.36 | 24.2 | 900 | 180 | 7.15 | CPM 2 26/4 |
| | 1403 | 8.7 | 0.142 | 6.25 | 63.48 | 0.37 | 23.9 | 850 | 170 | 7.15 | * SHOOK FLOW CELL * |
| | 1408 | 8.7 | 0.142 | 6.26 | 63.15 | 0.36 | 23.2 | 900 | 180 | 7.15 | |
| | 1413 | 8.7 | 0.142 | 6.23 | 33.73 | 0.35 | 23.2 | 850 | 170 | 7.15 | * SHOOK FLOW CELL * |
| ↓ | 1418 | 8.7 | 0.142 | 6.25 | 44.72 | 0.41 | 22.0 | 850 | 170 | 7.10 | |
| 5/7/19 | 1537 | 9.3 | 0.143 | 6.31 | 55.53 | Ø 2.41 std | 34.8 | 470 | 170 | 7.10 | POST SAMPLE READINGS |

**Recorded By:** 5/7/19

**QA Checked By:** 5/8/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** FBQmw-176

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/7/19 | 1423 | 8.7 | 0.142 | 6.24 | 27.93 | 0.36 | 21.8 | 850 | 170 | 7.10 | |
| | 1428 | 8.7 | 0.142 | 6.26 | 26.80 | 0.34 | 21.2 | 900 | 180 | 7.10 | CS 5/8/19 |
| | 1433 | 8.8 | 0.142 | 6.25 | 25.12 | 0.35 | 20.7 | 900 | 180 | 7.10 | |
| | 1438 | 9.0 | 0.143 | 6.26 | 21.77 | 0.34 | 20.1 | 850 | 170 | 7.10 | |
| | 1443 | 8.9 | 0.143 | 6.26 | 23.46 | 0.33 | ~~19.5~~ 19.5 | 850 | 170 | 7.10 | |
| | 1448 | 8.9 | 0.143 | 6.25 | 16.53 | 0.34 | 19.5 | 850 | 170 | 7.10 | ~~ORANGE~~ CLOUDINESS + TINT CLEARING UP |
| | 1453 | 8.9 | 0.143 | 6.25 | 14.35 | 0.34 | 19.2 | 850 | 170 | 7.10 | |
| | 1458 | 8.9 | 0.143 | 6.25 | 13.24 | 0.33 | 18.8 | 900 | 180 | 7.10 | |
| | 1503 | 8.9 | 0.143 | 6.26 | 12.47 | 0.33 | 18.4 | 850 | 170 | 7.10 | S 5/8/19 |
| | 1508 | 8.8 | 0.143 | 6.25 | 13.30 | 0.34 | 18.2 | 850 | 170 | 7.10 | |
| | 1513 | 8.8 | 0.143 | 6.26 | 10.55 | 0.34 | 18.1 | 850 | 170 | 7.10 | |
| | 1518 | 8.8 | 0.143 | 6.26 | 9.97 | 0.33 | 17.8 | 850 | 170 | 7.10 | TURBIDITY WOULD NOT STABILIZE |
| | 1523 | 8.8 | 0.143 | 6.25 | 39.35 | 0.41 | 18.0 | 850 | 170 | 7.10 | ~~STABLE 2 HRS TO GET NTU <10~~ |
| | 1531 | — | — | — | — | — | — | 1360 | 170 | 7.10 | STABILITY CONFIRMED RL 5/7/19 |
| | | | | | | | RL | | | | |
| | | | | | | | | 5/7/19 | | | |

**Recorded By:** RL 5/7/19

**QA Checked By:** [illegible] 5/8/19

# RVAAP-34 SAND CREEK DISPOSAL ROAD LANDFILL

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** SCLmw-001

**Date and Time:** 05/08/19 Start: 0850 Complete: 1448

**Personnel:** Jackie Mitchell

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** Below Top of pump ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 7.0 ft. **PSI=** 7.0 /2 + 10 = 13.5

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 7.0 - DTW Top of pump = N/A

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW N/A x Tf 21.576 = N/A

**3.) Total Volume of stagnant water**

Total volume = 622 + 0 = 622

**2x Total volume =** 1244.0

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA039160 | 05/08/19 |
| Water Level Tape: SOLONIST 2000 ft. | Pine 07-0572 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | Pine 43635 | N/A |

**Total Volume of Water Removed (Liters):** 2.275 L Sample Method: Bladder Pump

**Sample ID / Date / Time:** SCLmw-001-190401-GW/05/08/19/1015 **QC Sample ID** N/A

**Analysis** VOCs, SVOCs, LL PAHs, PCBs, Pesticides, Explosives, Cyanide, Sulfide, Nitrate/Nitrite/Sulfate, Alkalinity, Nitroguanidine, Nitrocellulose, Perchlorate, TAL Metals + Phosphorus

Field Observations/Site Conditions During Purging: Water is clear, colorless with no odor well pad clear. surrounded by straw & minimal grass & brush

Sampling Procedure Followed: (YES) NO If no, why was deviation necessary:

05/08/19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) NO**

Recorded By: 05/08/19 (Signature and Date)

QA Checked By: 5/8/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** SCLmw-0001

Initial DTW: Below Top of Pump

| | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | |
|---|---|---|---|---|---|---|---|
| Stabilization Requirements | 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/08/19 | 0904 | 11.1 | 1.122 | 7.30 | 9.34 | 6.28 | -4.0 | 3000 | 25 | Top of pump | Initial reading through flow cell 1 CPM/1.0/59.0 |
| | 0945 | -- | -- | -- | -- | -- | -- | 950 | 25 | | Purged 2x's volume of stagnant water in pump and tubing - stability parameters not recorded |
| | 0947 | 11.0 | 1.048 | 7.27 | 7.24 | 1.87 | -32.5 | 50 | 25 | | Start recording stability parameters |
| | 0952 | 10.9 | 1.048 | 7.27 | 5.56 | 1.74 | -32.3 | 125 | 25 | | water is clear, colorless, with no odor |
| | 0957 | 10.8 | 1.048 | 7.27 | 5.03 | 1.63 | -32.6 | 125 | 25 | | |
| | 1002 | 10.9 | 1.048 | 7.27 | 5.57 | 1.41 | -33.4 | 125 | 25 | | |
| | 1007 | 10.9 | 1.048 | 7.27 | 5.52 | 1.32 | -33.8 | 125 | 25 | | |
| | 1012 | 11.0 | 1.048 | 7.26 | 5.66 | 1.25 | -35.0 | 125 | 25 | | |
| | 1014 | -- | -- | -- | -- | -- | -- | 50 | 25 | | Quantity purged while awaiting stability confirmation |
| | | | | | | | | | | | |
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JM 05/08/19

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/08/19 | ~~1504~~ 1448 | 15.9 | 1.073 | 7.22 | 13.19 | 1.17 | -59.6 | 300 | 25 | Top of pump | POST SAMPLE READINGS |

**Recorded By:** JM 05/08/19 05/08/19 **QA Checked By:** 5/8/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** SCLmw-002

**Date and Time:** Start: 5/8/19 | 0851 Complete: 5/8/19 | 1048

**Personnel:** Gabby Gromalski + Charles Spurr

**Purge Method(s):** Bailer Bladder Pump Other: N/A

**Depth To Water:** Below top of pump ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 60 ft. **PSI=** 60 /2 + 10 = 13

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water** ~~N/A~~ 5-8-19

Intake Depth (ID) 60 - DTW ~~N/A~~ 0 = 0

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW ~~60~~ 0 x Tf ~~21.576~~ = 0

**3.) Total Volume of stagnant water**

Total volume = 622 + 0 = 622

**2x Total volume =** 1,244 ml

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03313 | 5-8-2019 |
| Water Level Tape: (SOLONIST) | 250795 | N/A |
| Other: (MP-10 with QED Well Wizzard) or MP-50 ~~N/A~~ 5-8-19 | 3308 + 18421 | N/A |

**Total Volume of Water Removed (Liters):** 10.225 L Sample Method: Bladder Pump

**Sample ID / Date / Time:** SCLmw-002-190401-GW | 5-8-19 | 0925 **QC Sample ID** SCLmw-002-190401-GWMSD (Duplicate) | SCLmw-002-19402-GW | SCLmw-002-1 (Split) 3-GW

**Analysis** VOCs, SVOCs, LLPAHs, PCBs, Pesticides, explosives, cyanide, Sulfide, Nitrate, Nitrite, Sulfate, Alkalinity, Nitroguanidine, Nitrocellulose, Perchlorate, TAL metals

Field Observations/Site Conditions During Purging: water is initially cloudy and orangeish; water became clear, colorless, odorless; 0.45 um and 0.2 um filter used on perchlorate sample

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary:

~~N/A~~ 5-8-19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected** (YES) / NO

Recorded By: [signature] 5-8-19 (Signature and Date)

QA Checked By: [signature] 5/8/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** SCLmw0002

Initial DTW: Below top of pump

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5-8-19 | 0852 | 10.4 | 1.458 | 7.22 | 39.8 | 6.20 | 230.4 | 275 ml | 275 | TOP OF PUMP | Initial reading through flow cell (1/20/40) water is slightly orange, cloudy, odorless |
| | 0859 | -- | -- | -- | -- | -- | -- | 1,350 ml | ~190 | | Purged 2x's volume of stagnant water in pump and tubing - stability parameters not recorded (2/10/40) |
| | 0904 | 8.8 | 1.112 | 6.82 | 16.65 | 0.53 | -15.3 | 1,000 ml | 200 | | Start recording stability parameters (3/10/30) water is clear, slightly orange |
| | 0909 | 8.8 | 1.104 | 6.83 | 10.08 | 0.46 | -33.6 | 1200 ml | 240 | | (6/3.6/6.4) |
| | 0914 | 8.7 | 1.100 | 6.83 | 8.89 | 0.42 | -39.5 | 1,600 ml | 320 | | 5-8-19 |
| ↓ | 0919 | 8.7 | 1.100 | 6.83 | 6.50 | 0.39 | -43.2 | 1,600 ml | 320 | ↓ | Stable- A Sprint confirmed at 0926 (2240ml purged) |
| | | | | | | | | | | | |
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| 5-8-19 | 1045 | 9.1 | 1.084 | 6.95 | 1.22 | 1.90 | ~~-45.8~~ -10 -43.2 5-8-19 | 960 ml | 320 | Top of Pump | POST SAMPLE READINGS |

**Recorded By:** 5-8-19 **QA Checked By:** 5/8/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** SCLmw-003

**Date and Time:** 5/8/19 Start: 0838 Complete: 1009

**Personnel:** Lindsey Mayer

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 16.75 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 21.5 ft. **PSI=** 21.5 /2 + 10 = 20.75

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 21.5 - DTW 16.75 = 4.75

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 4.75 x Tf 21.576 = 102.49

**3.) Total Volume of stagnant water**

Total volume = 622 + 102.49 = 724.49

**2x Total volume =** 1448.97

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA02140 | 5/8/19 |
| Water Level Tape: ~~SOLONIST~~ 5/8/19 Heron | 07-0573 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 42406 | N/A |

**Total Volume of Water Removed (Liters):** 2.575 Sample Method: Bladder Pump

**Sample ID / Date / Time:** SCLmw-003-190401-GW/5-8-19/ **QC Sample ID**

**Analysis** VOC, SVOCs, LL PAH, PCBs, Pesticides, explosives, cyanide, Sulfide, Nitrate/Nitrite/Sulfate, Alkalinity, Nitroguanidine, Nitrocellulose, Perchlorate

Field Observations/Site Conditions During Purging: 50°F overcast/cloudy, water is clear colorless, TAL metals, phosphorus odorless.

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: [signature] 5/8/19 (Signature and Date)

QA Checked By: [signature] 5/8/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** SCLmw-003

| | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV |
|---|---|---|---|---|---|---|
| **Stabilization Requirements** | 3 | 3 | 3 | 1 | 3 | 3 |
| **Consecutive Readings to Sample** | | | | | | |

Initial DTW: 16.75

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/8/19 | 0850 | 9.9 | 1.335 | 7.09 | 3.14 | 9.87 | 262.3 | 300mL | 25 | 17.17 | Initial reading through flow cell CPM-1 D-1.0 R-590 |
| | 0948 | -- | -- | -- | -- | -- | -- | 1450 | 25 | Below top of pump | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded water below top of pump, during stagnant water p |
| | 0949 | 10.9 | 1.526 | 6.86 | 2.02 | 2.38 | 168.3 | 25 | 25 | | Start recording stability parameters |
| | 0954 | 10.9 | 1.517 | 6.88 | 3.53 | 2.67 | 157.2 | 125 | 25 | | |
| | 0959 | 11.0 | 1.512 | 6.88 | 2.09 | 2.89 | 147.2 | 125 | 25 | | CS 5/8/19 |
| | 1004 | 11.1 | 1.514 | 6.88 | 2.25 | 2.66 | 138.1 | 125 | 25 | | |
| | 1009 | — | — | — | — | — | — | 125 | 25 | | Charles confirms stable |
| | | | | | | | | | | | DM |
| | | | | | | | | | | | 5/8/19 |
| 5/8/19 | 1433 | 14.5 | 1.357 | 7.20 | 4.60 | 2.19 | -27.4 | 300 | 25 | Below top of pump | POST SAMPLE READINGS |

**Recorded By:** [signature] 5/8/19 **QA Checked By:** [signature] 5/8/19

# RVAAP-38 NACA TEST AREA

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** NTA mw - 119

**Date and Time:** Start: 4/30/19 0955 Complete: 4/30/19 1130

**Personnel:** Charles Spurr

**Purge Method(s):** Bailer ☐ Bladder Pump ☑ Other: ☐

**Depth To Water:** 11.19 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 98 ft. **PSI=** 98 /2 + 10 = 59

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 98 - DTW 11.19 = 86.81

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 86.81 x Tf 21.576 = 1873

**3.) Total Volume of stagnant water**

Total volume = 622 + 1873 = 2495

**2x Total volume =** 4,990

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03313 | 4/30/19 |
| Water Level Tape: ~~SOLONIST~~ Heron (cs 4/30/19) | 07-0572 | N/A |
| Other: (MP-10 with QED Well Wizzard) or MP-50 | 3308 | N/A |

**Total Volume of Water Removed (Liters):** 10.9 Sample Method: Bladder Pump

**Sample ID / Date / Time:** NTAMW-119-190401-GW 4/30/19 1045 **QC Sample ID** NTAMW-119-190401-GWMSD

**Analysis** LL-PAH, Explosives, TAL metals +Duplicate & Split for explosives only

Field Observations/Site Conditions During Purging: 57°F; Cloudy; Calm

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: [signature] 4/30/19 (Signature and Date)

QA Checked By: [signature] 4/30/19 (Signature and Date)

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# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** NTA mw-119

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 11.19

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/30/19 | 1000 | 10.1 | 2.53 | 7.88 | 8.52 | 2.19 | 233 | 900 mL | 300 | 11.20 | Initial reading through flow cell CPM2 24:6 ~60 PSI |
| - | - | -- | -- | -- | -- | -- | -- | - | - | - | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 1020 | 9.7 | 1.89 | 7.19 | 13.8 | 0.50 | -66.8 | 5 (L) | 250 | 11.20 | Start recording stability parameters CPM2 25:5 |
| | 1025 | 9.8 | 1.89 | 7.20 | 10.76 | 0.50 | -73.3 | 1.25 | 250 | 11.20 | |
| | 1030 | 9.7 | 1.89 | 7.22 | 9.12 | 0.51 | -77.6 | 1.25 | 250 | 11.20 | |
| | 1035 | 9.8 | 1.89 | 7.22 | 8.14 | 0.50 | -80.1 | 1.25 | 250 | 11.20 | |
| | 1040 | 9.8 | 1.89 | 7.22 | 6.26 | 0.51 | -82.5 | 1.25 | 250 | 11.20 | |
| | | | | | | | CM | 4/30/19 | | | |
| 4/30/19 | 1125 | 10.3 | 1.91 | 7.29 | 3.21 | 0.77 | -85.8 | - | 250 | 11.20 | POST SAMPLE READINGS |

**Recorded By:** [signature] 4/30/19 **QA Checked By:** [signature] 4/30/19

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# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** NTAmw-120

**Date and Time:** 04/30/19 Start: 0937 Complete: 1111

**Personnel:** Jackie Mitchell

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 33.13 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 116 ft. **PSI=** 116 /2 + 10 = 68

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 116 - DTW 33.13 = 82.87

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 82.87 x Tf 21.576 = 1788

**3.) Total Volume of stagnant water**

Total volume = 622 + 1788 = 2410 ml

**2x Total volume =** 4820 ml

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03966 | 04/30/19 |
| Water Level Tape: SOLONIST | Pine 2178-T | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | Pine 43635 | N/A |

**Total Volume of Water Removed (Liters):** ~~0.75 L~~ 9.35 L gw 04/30/19 Sample Method: Bladder Pump

**Sample ID / Date / Time:** NTAmw-120-190401-GW/04/30/19/1048 **QC Sample ID** N/A

**Analysis** SVOC: Hexachlorocyclopentadiene,

Field Observations/Site Conditions During Purging: 48°F, light wind, cloudy. Well pad is clear surrounded by mowed grass.

Sampling Procedure Followed: (YES) NO If no, why was deviation necessary: QA 04/30/19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: 04/30/19 (Signature and Date)

QA Checked By: 4/30/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** NTAmw-120

Initial DTW: 33.13

| | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|---|
| | 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/30/19 | 0941 | 9.3 | 0.899 | 8.05 | 4.47 | 10.72 | 213.6 | 300 | 85 | 33.13 | Initial reading through flow cell 2/2/28 |
| | 1003 | -- | -- | -- | -- | -- | -- | 2875 | 85 | 33.15 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 1004 | 10.4 | 0.928 | 7.48 | 3.48 | 0.79 | -27.4 | 75 | 85 | 33.14 | Start recording stability parameters |
| | 1009 | 10.4 | 0.926 | 7.48 | 3.37 | 1.04 | -28.3 | 475 | 95 | 33.14 | 2/2.0/28.0 |
| | 1014 | 10.4 | 0.923 | 7.48 | 5.89 | 0.58 | -30.8 | 450 | 90 | 33.14 | |
| | 1019 | 10.5 | 0.922 | 7.48 | 4.36 | 0.48 | -33.1 | 450 | 90 | 33.14 | |
| | 1024 | 10.5 | 0.922 | 7.48 | 2.87 | 0.39 | -35.9 | 450 | 90 | 33.14 | |
| | 1029 | 10.6 | 0.921 | 7.48 | 3.05 | 0.29 | -38.1 | 450 | 90 | 33.14 | |
| | 1034 | 10.6 | 0.921 | 7.49 | 2.36 | 0.20 | -39.3 | 475 | 90 | 33.15 | |
| | 1039 | 10.7 | 0.920 | 7.49 | 3.30 | 0.16 | -40.6 | 450 | 90 | 33.15 | |
| | 1045 | -- | -- | -- | -- | -- | -- | 550 | 90 | 33.15 | Volume purged while awaiting stability confirmation |
| | | | | | | | | | | | |
| | | | | gm | 04/30/19 | | | | | | |
| | | | | | | | | | | | |
| 04/30/19 | 1111 | 10.8 | 0.928 | 7.52 | 2.89 | 1.55 | -31.8 | 350 | 90 | 33.15 | POST SAMPLE READINGS |

**Recorded By:** 04/30/19 **QA Checked By:** 4/30/19

# RVAAP-40 LOAD LINE 7

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** LL7mw-001

**Date and Time:** Start: 5/1/19 0905 Complete: 5/1/19 1025

**Personnel:** Charles Spurr

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 19.94 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 28.65 ft. **PSI=** 28.65 /2 + 10 = 24

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 28.65 - DTW 19.94 = 8.71

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 8.71 x Tf 21.576 = 187.9

**3.) Total Volume of stagnant water**

Total volume = 622 + 188 = 810

**2x Total volume =** 1620 mL

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | CS 5/1/19 ~~2178-T~~ FA03313 | 5/1/19 |
| Water Level Tape: ~~SOLONIST~~ CS 5/1/19 Heron | 2178-T | N/A |
| Other: (MP-10 with QED Well Wizzard) or MP-50 | 3308 | N/A |

**Total Volume of Water Removed (Liters):** ~~8.55~~ CS 5/1/19 8.85 Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL7MW-001-190401-GW 5/1/19 1020 **QC Sample ID** N/A

**Analysis** TAL metals & Cyanide

Field Observations/Site Conditions During Purging: 62°F; Cloudy; calm

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: 5/1/19 (Signature and Date)

QA Checked By: 05/01/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** LL7mw-001

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 19.94

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/1/19 | 0918 | 11.9 | 1.01 | 6.60 | 956 | 4.27 | 63 | ~600mL | ~50 | 19.97 | Initial reading through flow cell CPM2 29:1 ~24 PSI |
| - | - | -- | -- | -- | -- | -- | -- | - | - | - | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| 5/1/19 | 0930 | 10.5 | 0.683 | 6.22 | 126.2 | 1.19 | 9.8 | 1.8(L) | 150 | 19.98 | Start recording stability parameters CPM2 27:3 24 PSI |
| | 0935 | 10.5 | 0.680 | 6.20 | 69.9 | 0.75 | 7.1 | 0.75 | 150 | 19.98 | |
| | 0940 | 10.6 | 0.681 | 6.20 | 28.6 | 0.61 | 3.0 | 0.75 | 150 | 19.99 | |
| | 0945 | 10.6 | 0.669 | 6.18 | 18.4 | 0.54 | 1.1 | 0.75 | 150 | 19.99 | |
| | 0950 | 10.5 | 0.691 | 6.19 | 14.7 | 0.53 | -0.6 | 0.75 | 150 | 19.99 | |
| | 0955 | 10.6 | 0.684 | 6.18 | 12.7 | 0.50 | -1.7 | 0.75 | 150 | 19.99 | |
| | 1000 | 10.7 | 0.680 | 6.20 | 9.81 | 0.77 | -1.0 | 0.75 | 150 | 19.99 | water clear |
| | 1005 | 10.7 | 0.684 | 6.20 | 9.29 | 0.50 | -3.2 | 0.75 | 150 | 19.99 | |
| | 1010 | 10.8 | 0.679 | 6.19 | 6.78 | 0.48 | -3.5 | 0.75 | 150 | 19.99 | |
| | 1015 | 10.8 | 0.686 | 6.19 | 6.30 | 0.47 | -4.1 | 0.75 | 150 | 19.99 | |
| | | | | | | | CS | | | | |
| | | | | | | | 5/1/19 | | | | |
| 5/1/19 | 1025 | 10.9 | 0.688 | 6.18 | 5.42 | 0.38 | -5.7 | 300mL | 150 | 19.99 | POST SAMPLE READINGS |

Initial water orang in colu

water is clearing up

**Recorded By:** [signature] 5/1/19 **QA Checked By:** [signature] 05/01/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** LL7mw-006

**Date and Time:** Start: 5/1/19 1100 Complete: 5/1/19 1230

**Personnel:** Charles Spurr

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 9.45 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 28.37 ft. **PSI=** 28.4 /2 + 10 = 24

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 28.37 - DTW 9.45 = 18.92

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 18.92 x Tf 21.576 = 408

**3.) Total Volume of stagnant water**

Total volume = 622 + 408 = 1030

**2x Total volume =** 2060 mL

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03313 | 5/1/19 |
| Water Level Tape: ~~SOLONIST~~ cs 5/1/19 Heron | 2178-T | N/A |
| Other: (MP-10 with QED Well Wizzard) or MP-50 | 3308 | N/A |

**Total Volume of Water Removed (Liters):** ~~3.975~~ cs 5/1/19 4.275 Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL7MW-006-190401-GW 5/1/19 1205 **QC Sample ID** N/A

**Analysis** Explosives

Field Observations/Site Conditions During Purging: 75°F; mostly sunny; breezy w/ gusts

Sampling Procedure Followed: (YES) NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: [signature] 5/1/19 (Signature and Date)

QA Checked By: [signature] 05/01/19 (Signature and Date)

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# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LL7mw-006

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 9.45

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/1/19 | 1108 | 12.9 | 0.313 | 5.57 | 10.5 | 3.20 | 123 | ~600mL | 75 | 9.56 | Initial reading through flow cell CPM2 29:1 24 PSI |
| — | — | -- | -- | -- | -- | -- | -- | — | — | — | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| 5/1/19 | 1135 | 12.8 | 0.313 | 5.48 | 6.62 | 2.22 | 191 | 2.1(L) | 75 | 9.57 | Start recording stability parameters CPM2 29:1 24 PSI |
| | 1140 | 13.2 | 0.314 | 5.47 | 5.37 | 2.10 | 186 | 0.375 | 75 | 9.57 | |
| | 1145 | 13.0 | 0.315 | 5.51 | 4.08 | 2.20 | 190 | 0.375 | 75 | 9.57 | |
| | 1150 | 12.6 | 0.315 | 5.49 | 3.78 | 1.97 | 194 | 0.375 | 75 | 9.57 | |
| | 1155 | 12.8 | 0.314 | 5.48 | 5.65 | 1.86 | 198 | 0.375 | 75 | 9.57 | |
| | 1200 | 12.9 | 0.315 | 5.47 | 6.07 | 1.85 | 200 | 0.375 | 75 | 9.57 | |
| | | | | | | | CS 5/1/19 | | | | |
| 5/1/19 | 1220 | 14.2 | 0.324 | 5.54 | 3.36 | 2.30 | 189 | ~~300~~mL | 75 | 9.57 | POST SAMPLE READINGS |

**Recorded By:** 5/1/19

**QA Checked By:** 05/01/19

# RVAAP-43 LOAD LINE 10

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# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** LL10mw-003

**Date and Time:** 05/01/19 Start: 1029 Complete: 1253

**Personnel:** Jackie Mitchell

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 17.25 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 26.9 ft. **PSI=** 26.9 /2 + 10 = 23.45

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 26.9 - DTW 17.25 = 9.65

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 9.65 x Tf 9.46 = 91.29

**3.) Total Volume of stagnant water**

Total volume = 622 + 91.29 = 713.29

**2x Total volume =** 1426.58

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03966 | 05/01/19 |
| Water Level Tape: SOLONIST 200 ft. | Pine 07-0572 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | Pine 43635 | N/A |

**Total Volume of Water Removed (Liters):** 4.25 L Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL10mw-003-190403-GW / 05/01/19 / 1230 **QC Sample ID** Dup/split: LL10mw-003-190402-GW

**Analysis** VOCs

Field Observations/Site Conditions During Purging: Water is clear, colorless, with no odor. 78°F, sunny, moderate winds.

Sampling Procedure Followed: (YES) NO If no, why was deviation necessary:

QA 05/01/19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) NO**

Recorded By: 05/01/19 (Signature and Date)

QA Checked By: 5/1/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** LL10mw-003

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 17.25

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/01/19 | 1140 | 18.4 | 0.502 | 6.85 | 3.19 | 8.42 | 142.3 | 300 | 25 | 17.25 | Initial reading through flow cell 2 CPM/1.0/29.0 |
| | 1203 | -- | -- | -- | -- | -- | -- | 1350 | 50 | 17.25 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded Increased PSI |
| | 1208 | 14.3 | 0.513 | 6.78 | 84.25 | 7.34 | 169.2 | 300 | 50 | 17.25 | Start recording stability parameters Water is clear, colorless, |
| | 1213 | 14.4 | 0.515 | 6.77 | 25.13 | 6.99 | 173.1 | 325 | 50 | 17.25 | with no odor |
| | 1218 | 14.3 | 0.512 | 6.77 | 27.02 | 6.78 | 175.9 | 325 | 50 | 17.25 | |
| | 1223 | 14.4 | 0.512 | 6.77 | 10.17 | 6.70 | 178.0 | 300 | 50 | 17.25 | Parameters Stable, send confirmation text |
| | 1229 | -- | -- | -- | -- | -- | -- | 1050 | 50 | 17.25 | Amount purged while awaiting confirmation |
| | | | | | | | | | | | |
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| | | | | | | | | | | | |
| 05/01/19 | 1253 | 14.7 | 0.504 | 6.74 | 14.04 | 6.82 | 177.3 | 300 | 50 | 17.25 | POST SAMPLE READINGS |

**Recorded By:** 05/01/19 **QA Checked By:** 5/1/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** LLIDmw-005

**Date and Time:** 05/01/19 Start: 1355 Complete: 1516

**Personnel:** Jamie Mitchell

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 12.12 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 25.0 ft. **PSI=** 25.0 /2 + 10 = 22.5

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 25.0 - DTW 12.12 = 12.88

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 12.88 x Tf 9.46 = 121.84

**3.) Total Volume of stagnant water**

Total volume = 622 + 121.84 = 743.84

**2x Total volume =** 1487.69

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03966 | 05/01/19 |
| Water Level Tape: SOLONIST 200 ft. | Pinc 07-0572 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | Pinc 43635 | N/A |

**Total Volume of Water Removed (Liters):** 3.575 L Sample Method: Bladder Pump

**Sample ID / Date / Time:** LLIDmw-005-190401-GW/05/01/19/1505 **QC Sample ID** N/A

**Analysis** TAL Metals

Field Observations/Site Conditions During Purging: water is clear with some black particles, colorless, with no odor. 70°F, moderately windy, sunny

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary:

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: 05/01/19 (Signature and Date)

QA Checked By: 5/1/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LL10mw-005

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 12.12

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/01/19 | 1405 | 19.2 | 0.479 | 6.95 | 36.01 | 5.79 | 166.6 | 300 | 50 | 12.12 | Initial reading through flow cell 2 CPM/1.6/29.0 |
| | 1429 | -- | -- | -- | -- | -- | -- | 1300 | 50 | 12.12 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 1434 | 16.5 | 0.450 | 6.85 | 20.46 | 2.10 | 159.2 | 225 | 50 | 12.12 | Start recording stability parameters |
| | 1439 | 15.9 | 0.456 | 6.84 | 16.77 | 1.55 | 161.4 | 250 | 50 | 12.12 | water is clear with some black particles, colorless, with no odor |
| | 1444 | 15.6 | 0.454 | 6.84 | 11.86 | 1.47 | 162.9 | 225 | 50 | 12.12 | |
| | 1449 | 15.9 | 0.455 | 6.84 | 10.12 | 1.44 | 163.7 | 250 | 50 | 12.12 | |
| | 1454 | 15.9 | 0.454 | 6.84 | 6.41 | 1.39 | 163.9 | 250 | 50 | 12.12 | stable. send confirmation text. |
| | 1459 | -- | -- | -- | -- | -- | -- | 475 | 50 | 12.12 | Amount purged while awaiting confirmation |
| | | | | | | | | | | | |
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| 05/01/19 | 1516 | 17.1 | 0.460 | 6.85 | 4.22 | 4.28 | 164.6 | 300 | 50 | 12.12 | POST SAMPLE READINGS |

05/01/19

**Recorded By:** 05/01/19

**QA Checked By:** 5/1/19

# RVAAP-44 LOAD LINE 11

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID Number:** LL11 mw - 005

**Date and Time:** Start: 5/1/19 1250 Complete: 5/1/19 1430

**Personnel:** Charles Spurr

**Purge Method(s):** Bailer ☑ Bladder Pump Other:

**Depth To Water:** 4.67 ft. from measuring point

**Well Diameter:** _____ inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 13.6 ft. **PSI=** 13.6 /2 + 10 = ~17

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 13.6 - DTW 4.67 = 8.93

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 8.93 x Tf 9.46 = 84.5

**3.) Total Volume of stagnant water**

Total volume = 622 + 84.5 = 706.5

**2x Total volume =** 1413

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03313 | 5/1/19 |
| Water Level Tape: ~~SOLONIST~~ CS 5/1/19 Heron | 2178-T | N/A |
| Other: (MP-10 with QED Well Wizzard) or MP-50 | 3308 | N/A |

**Total Volume of Water Removed (Liters):** ~~1.675~~ CS 5/1/19 1.975 Sample Method: Bladder Pump

**Sample ID / Date / Time:** LL11mw-005-190401-GW 5/1/19 1400 **QC Sample ID** N/A

**Analysis** Cyanide

Field Observations/Site Conditions During Purging: 78°F ; ~~mostly~~ sunny ; windy w/ gusts

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: [signature] 5/1/19 (Signature and Date)

QA Checked By: [signature] 05/01/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** LL11mw-005

Initial DTW: 4.67

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/1/19 | 1315 | 18.2 | 0.221 | 5.44 | 3.32 | 8.11 | 204 | 600mL | 25 | 4.76 | Initial reading through flow cell CPM2 29:1 ~17 PSI |
| – | – | -- | -- | -- | -- | -- | -- | – | – | – | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| 5/1/19 | 1347 | 16.1 | 0.221 | 5.42 | 9.53 | 7.62 | 227 | 1425(L) | 25 | 4.76 | Start recording stability parameters CPM2 29:1 ~17 PSI |
| ↓ | 1352 | 16.0 | 0.220 | 5.41 | 9.39 | 7.66 | 229 | 0.125 | 25 | 4.76 | ↓ ↓ |
| ↓ | 1357 | 15.9 | 0.221 | 5.40 | 9.27 | 7.68 | 232 | 0.125 | 25 | 4.76 | ↓ ↓ |
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|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/1/19 | 1425 | 18.8 | 0.228 | 5.41 | 7.67 | 7.59 | 206 | 300mL | 25 | 4.76 | POST SAMPLE READINGS |

**Recorded By:** [signature] 5/1/19

**QA Checked By:** [signature] 05/01/19

# RVAAP-49 CENTRAL BURN PITS

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** CBPmw-008

**Date and Time:** 5/8/19 Start: 1314 Complete: 1401

**Personnel:** R. Lavoy

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 15.83 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 22.97 ft. **PSI=** 22.97 /2 + 10 = 21.49

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 22.97 - DTW 15.83 = 7.14

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 7.14 x Tf 9.46 = 67.54

**3.) Total Volume of stagnant water**

Total volume = 622 + 67.54 = 689.54

**2x Total volume =** 1379

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: YSI PRO DSS or Horiba U-52 | FA03179 | 5/8/19 |
| Water Level Tape: SOLONIST Heron | T-2178 | N/A |
| Other: MP-10 with QED Well Wizzard or MP-50 | 1032 18836 | N/A |

**Total Volume of Water Removed (Liters):** 2.30 Sample Method: Bladder Pump

**Sample ID / Date / Time:** CBPmw-008-190401-GW 5/8/19 1411 **QC Sample ID** N/A

**Analysis** CYANIDE.

Field Observations/Site Conditions During Purging: CLEAR/COLORLESS/ODORLESS

Sampling Procedure Followed: YES / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected YES / NO**

Recorded By: 5/8/19 (Signature and Date)

QA Checked By: 05/08/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** CISP MW-008

Initial DTW: 15.83

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/8/19 | 1323 | 12.9 | 2.304 | 7.02 | 3.8 | 5.99 | 196.2 | 325 | 25 | 16.35 | Initial reading through flow cell CPM 1 57/3 |
| | 1340 | -- | -- | -- | -- | -- | -- | 1050 | ~60 | 17.10 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded CPM 1 56/4 |
| | 1341 | 12.2 | 2.293 | 7.01 | 2.1 | 4.83 | 195.1 | 25 | 25 | 17.13 | Start recording stability parameters CLEAR / COLORLESS / ODORLESS CPM 1 58/2 |
| | 1346 | 12.7 | 2.295 | 7.01 | 1.9 | 4.71 | 198.2 | 100 | 20 | 17.18 | CPM 1 59/1 |
| | 1351 | 13.2 | 2.284 | 7.01 | 3.2 | 4.65 | 198.8 | 100 | 20 | 17.18 | |
| | 1356 | 13.1 | 2.287 | 7.01 | 2.5 | 4.89 | 198.9 | 100 | 20 | 17.23 | CPM 1 58/2 |
| | 1401 | 13.0 | 2.297 | 6.98 | 2.6 | 4.56 | 188.0 | 100 | 20 | 17.25 | STABLE CPM 1 59/1 |
| | 1410 | — | — | — | — | — | — | 180 | 20 | 17.30 | STABILITY CONFIRMED |
| | | | | | | | | | | | |
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| 5/8/19 | 1456 | 16.7 | 2.316 | 7.02 | 2.6 | 5.54 | 106.5 | 320 | 20 | 17.40 | POST SAMPLE READINGS |

RC 5/8/19

**Recorded By:** RC 5/8/19 **QA Checked By:** 05/08/19

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# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** CBPmw-009

**Date and Time:** 5/9/19 Start: 1425 Complete: 1503

**Personnel:** Lindsey Mayer

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 9.02 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 61.29 ft. **PSI=** 61.29 /2 + 10 = 40.65

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 61.29 - DTW 9.02 = 52.27

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 52.27 x Tf 21.576 = 1,127.78

**3.) Total Volume of stagnant water**

Total volume = 622 + 1127.78 = 1,749.78

**2x Total volume =** 3,499.56

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03313 | 5/9/19 |
| Water Level Tape: ~~SOLONIST~~ 5/9/19 Heron | 07-0572 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 4206 | N/A |

**Total Volume of Water Removed (Liters):** 7.6 Sample Method: Bladder Pump

**Sample ID / Date / Time:** CBPmw-009-190401-GW/5-9-19/1505 **QC Sample ID** N/A

**Analysis** Chronicle

Field Observations/Site Conditions During Purging: 70's cloudy/windy water is clear, colorless, odorless

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: 5/9/19 (Signature and Date)

QA Checked By: 05/09/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** CBPmw-009

Initial DTW: 9.02

| Stabilization Requirements | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV |
|---|---|---|---|---|---|---|
| Consecutive Readings to Sample | 3 | 3 | 3 | 1 | 3 | 3 |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/9/19 | 1429 | 14.5 | 0.689 | 7.05 | 1.71 | 5.75 | 270.2 | 400mL | 100 | 9.10 | Initial reading through flow cell CPM-1 R=58.0 D=2.0 |
| | 1447 | -- | -- | -- | -- | -- | -- | 3600 | 200 | 9.13 | Purged 2x's volume of stagnant water in pump and tubing - stability parameters not recorded CPM-1 R=54.0 D=6.0 |
| | 1448 | 11.8 | 0.699 | 7.28 | 0.80 | 0.81 | -11.2 | 200 | 200 | 9.13 | Start recording stability parameters |
| | 1453 | 11.8 | 0.701 | 7.30 | 0.83 | 0.73 | -21.3 | 1000 | 200 | 9.13 | |
| | 1458 | 11.7 | 0.702 | 7.32 | 0.68 | 0.71 | -32.4 | 1000 | 200 | 9.14 | 5/9/19 |
| | 1503 | 11.7 | 0.701 | 7.33 | 0.69 | 0.72 | -30.0 | 1000 | 200 | 9.14 | Jed Dun 5/9/19 confirms stability |
| | | | | | | | | | | | |
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| | | | | | | | | | | | |
| 5/9/19 | 1510 | 12.3 | 0.703 | 7.34 | 0.84 | 0.98 | -3.3 | 400 | 200 | 9.15 | POST SAMPLE READINGS |

**Recorded By:** 5/9/19 **QA Checked By:** 05/09/19

# RVAAP-66 FACILITY-WIDE GROUNDWATER

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** FWGmw - 004

**Date and Time:** 5/8/19 Start: 0826 Complete: 0906

**Personnel:** R. Launch

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 11.00 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 20.5 ft. **PSI=** 20.5 /2 + 10 = 20.25

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 20.5 - DTW 11.00 = 9.5

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 9.5 x Tf 21.576 = 204.97

**3.) Total Volume of stagnant water**

Total volume = 622 + 204.97 = 826.97

**2x Total volume =** 1653.94

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: YSI PRO DSS or Horiba U-52 | FA03179 | 5/8/19 |
| Water Level Tape: SOLONIST 5/8/19 HERON | T-2178 | N/A |
| Other: MP-10 with QED Well Wizzard or MP-50 | 1032 19836 | N/A |

**Total Volume of Water Removed (Liters):** 3.375 Sample Method: Bladder Pump

**Sample ID / Date / Time:** FWGmw-004-190401-GW 5/8/19 0912 **QC Sample ID** N/A

**Analysis** TAL METALS + EXPLOSIVES

Field Observations/Site Conditions During Purging: CLEAR / COLORLESS / ODORLESS

Sampling Procedure Followed: YES / NO If no, why was deviation necessary: N/A

TL 5/8/19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected YES / NO**

Recorded By: 5/8/19 (Signature and Date)

QA Checked By: 05/08/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** FWGmw - 004

Initial DTW: 11.00

| Stabilization Requirements | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV |
|---|---|---|---|---|---|---|
| Consecutive Readings to Sample | 3 | 3 | 3 | 1 | 3 | 3 |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/8/19 | 0830 | 9.9 | 0.867 | 7.23 | 4.3 | ~~232.0~~ 6.50 | 239.6 | 375 | ~75mL | 11.17 | Initial reading through flow cell CPM 1 57 3 |
| | 0850 | -- | -- | -- | -- | -- | -- | 1325 | ~65 | 11.20 | Purged 2x's volume of stagnant water in pump and tubing - stability parameters not recorded CPM 1 57 2 |
| | 0951 | 9.6 | 0.911 | 6.96 | 2.5 | 1.85 | 249.1 | 50 | 50 | 11.20 | Start recording stability parameters CLEAR \| COLORLESS \| ODORLESS |
| | 0856 | 9.7 | 0.918 | 6.95 | 2.0 | 1.59 | 249.9 | 325 | 65 | 11.18 | |
| | 0901 | 9.8 | 0.921 | 6.95 | 1.9 | 1.45 | 250.7 | 325 | 65 | 11.18 | |
| | 0906 | 9.8 | 0.924 | 6.95 | 2.1 | 1.46 | 251.0 | 325 | 65 | 11.18 | STABLE |
| | 0911 | — | — | — | — | — | — | 325 | 65 | 11.18 | STABILITY CONFIRMED |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | 7L | | | | |
| | | | | | | | 5/8/19 | | | | |
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| | | | | | | | | | | | |
| 5/8/19 | 0935 | 10.5 | 0.936 | 7.01 | 1.8 | 2.16 | 275.6 | 325 | 65 | 11.18 | POST SAMPLE READINGS |

**Recorded By:** [signature] 5/8/19 **QA Checked By:** [signature] 05/08/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** FWGmw-007

**Date and Time:** 04/30/19 Start: 1210 Complete: 1430

**Personnel:** Jackie Mitchell

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 24.43 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 29.9 ft. **PSI=** 29.9 /2 + 10 = 24.95

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 29.9 - DTW 24.43 = 5.47

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 5.47 x Tf 9.46 = 51.75

**3.) Total Volume of stagnant water**

Total volume = 622 + 51.75 = 673.75

**2x Total volume =** 1347.5 ml

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA039666 | 04/30/19 |
| Water Level Tape: SOLONIST | Pine 2178-T | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | Pine 43635 | N/A |

**Total Volume of Water Removed (Liters):** 2.8 L Sample Method: Bladder Pump

**Sample ID / Date / Time:** FWGmw-007-190401-GW/04/30/19/1335 **QC Sample ID** N/A

**Analysis** Explosives(6)(A), TAL Metals(7)(C)

Field Observations/Site Conditions During Purging: 56°F, light wind, cloudy. Well pad clear, surrounded by mud and short grass.

Sampling Procedure Followed: (YES) NO If no, why was deviation necessary:

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) NO**

Recorded By: 04/30/19 (Signature and Date)

QA Checked By: 4/30/19 (Signature and Date)

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# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** FWGmw-007

Initial DTW: 24.43

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 04/30/19 | 1220 | 11.8 | 1.245 | 7.19 | 36.90 | 7.96 | 148.6 | 300 | 25 | 24.49 | Initial reading through flow cell CPM 1/2.0/58.0 |
| | 1258 | -- | -- | -- | -- | -- | -- | 1050 | 25 | 24.52 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 1259 | 11.7 | 1.194 | 7.21 | 12.48 | 2.36 | 110.5 | 25 | 25 | 24.52 | Start recording stability parameters CPM 1/2.0/58.0 |
| | 1304 | 11.8 | 1.192 | 7.21 | 15.69 | 2.44 | 107.3 | 130 | 25 | 24.52 | |
| | 1309 | 11.8 | 1.190 | 7.21 | 29.58 | 2.21 | 104.9 | 140 | 25 | 24.52 | |
| | 1314 | 11.7 | 1.189 | 7.21 | 8.27 | 2.11 | 101.9 | 140 | 25 | 24.52 | |
| | 1319 | 11.7 | 1.210 | 7.21 | 6.45 | 1.67 | 99.2 | 130 | 25 | 24.52 | |
| | 1324 | 11.7 | 1.209 | 7.21 | 7.60 | 1.65 | 95.9 | 130 | 25 | 24.52 | |
| | 1329 | 11.6 | 1.208 | 7.21 | 6.51 | 1.82 | 92.2 | 130 | 25 | 24.52 | |
| | 1334 | -- | -- | -- | -- | -- | -- | 225 | 25 | 24.52 | Volume purged while awaiting stability confirmation |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| 04/30/19 | 1430 | 10.6 | 1.206 | 7.24 | 5.90 | 4.00 | 92.5 | 400 | 25 | 24.52 | POST SAMPLE READINGS |

**Recorded By:** 04/30/19 **QA Checked By:** 4/30/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID Number:** FWGmw-011

**Date and Time:** Start: 5/7/19 1315 Complete: 5/7/19 1535

**Personnel:** Charles Spurr

**Purge Method(s):** ☐ Bailer ☑ Bladder Pump ☐ Other:

**Depth To Water:** 1.60 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 14 ft. **PSI=** 14 /2 + 10 = 17

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 14 - DTW 1.60 = 12.4

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 12.4 x Tf 21.576 = 268

**3.) Total Volume of stagnant water**

Total volume = 622 + 268 = 890

**2x Total volume =** 1780 mL

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03966 | 5/7/19 |
| Water Level Tape: SOLONIST | 212380 | N/A |
| Other: (MP-10 with QED Well Wizzard) or MP-50 | 3308 | N/A |

**Total Volume of Water Removed (Liters):** 37.5 Sample Method: Bladder Pump

**Sample ID / Date / Time:** FWGMW-011-190401-GW 5/7/19 1520 **QC Sample ID** N/A

**Analysis** Explosives + TAL metals

Field Observations/Site Conditions During Purging: 60°F; Cloudy; calm Turbidity > 10 but stable after 2 hours. Receive approval to sample

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: Charles Spurr 5/7/19 (Signature and Date)

QA Checked By: [signature] 5/8/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** FWGmw-011

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 1.60

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/7/19 | 1316 | 10.4 | 0.398 | 7.16 | 368 | 3.11 | -42 | 300 mL | 300 | 1.73 | Initial reading through flow cell CPM2/3/27 ~17 PSI |
| – | – | -- | -- | -- | -- | -- | -- | – | – | – | Purged 2x's volume of stagnant water in pump and tubing - stability parameters not recorded |
| 5/7/19 | 1328 | 10.2 | 0.396 | 6.98 | 96.3 | 1.24 | -45 | 3.9(L) | 300 | 1.80 | Start recording stability parameters CPM2/3/27 ~17 PSI |
| | 1333 | 9.9 | 0.400 | 7.13 | 82.5 | 0.90 | -64 | 1.5 | 300 | 1.80 | |
| | 1338 | 9.8 | 0.400 | 7.17 | 67.2 | 0.83 | -70 | 1.5 | 300 | 1.80 | |
| | 1343 | 9.8 | 0.401 | 7.18 | 64.6 | 0.96 | -71 | 1.5 | 300 | 1.80 | |
| | 1348 | 9.7 | 0.403 | 7.17 | 58.7 | 0.65 | -72 | 1.5 | 300 | 1.80 | |
| | 1353 | 9.7 | 0.402 | 7.16 | 52.6 | 0.98 | -73 | 1.5 | 300 | 1.80 | |
| | 1358 | 9.6 | 0.406 | 7.17 | 48.9 | 0.75 | -74 | 1.5 | 300 | 1.80 | |
| | 1403 | 9.6 | 0.406 | 7.17 | 34.6 | 0.69 | -75 | 1.5 | 300 | 1.80 | |
| | 1408 | 9.7 | 0.404 | 7.18 | 29.8 | 0.76 | -75 | 1.5 | 300 | 1.80 | |
| | 1413 | 9.7 | 0.404 | 7.18 | 26.7 | 0.79 | -76 | 1.5 | 300 | 1.80 | |
| | 1418 | 9.6 | 0.406 | 7.19 | 26.3 | 1.02 | -75 | 1.5 | 300 | 1.80 | |
| | 1423 | 9.6 | 0.406 | 7.19 | 26.4 | 0.80 | -77 | 1.5 | 300 | 1.80 | |

Turbidity jumped very high after first reading Water is a dark orange color purging additional volume to remove fouling

| | | | | | | CS 5/7/19 | | | | | POST SAMPLE READINGS |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Recorded By:** [signature] 5/7/19 **QA Checked By:** [signature] 5/8/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** FWGmw-011

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/7/19 | 1428 | 9.8 | 0.407 | 7.18 | 21.2 | 0.96 | -78 | 1.5 | 300 | 1.80 | CPM 2/3/27 ~17 PSI |
| | 1433 | 9.7 | 0.407 | 7.20 | 18.8 | 0.52 | -82 | 1.5 | 300 | 1.80 | |
| | 1438 | 9.7 | 0.406 | 7.20 | 17.7 | 0.61 | -82 | 1.5 | 300 | 1.80 | |
| | 1443 | 9.9 | 0.406 | 7.19 | 16.3 | 0.57 | -87 | 1.5 | 300 | 1.80 | |
| | 1448 | 9.8 | 0.410 | 7.20 | 16.1 | 0.59 | -83 | 1.5 | 300 | 1.80 | |
| | 1453 | 9.7 | 0.408 | 7.21 | 15.8 | 0.56 | -81 | 1.5 | 300 | 1.80 | |
| | 1458 | 9.7 | 0.409 | 7.21 | 15.2 | 0.49 | -81 | 1.5 | 300 | 1.80 | |
| | 1503 | 9.6 | 0.410 | 7.21 | 14.8 | 0.95 | -81 | 1.5 | 300 | 1.80 | |
| | 1508 | 9.6 | 0.410 | 7.21 | 15.3 | 1.05 | -82 | 1.5 | 300 | 1.80 | |
| | 1513 | 9.7 | 0.407 | 7.20 | 14.7 | 0.99 | -75 | 1.5 | 300 | 1.80 | |
| | 1518 | 9.7 | 0.407 | 7.20 | 14.4 | 1.04 | -78 | 1.5 | 300 | 1.80 | |
| | | | | | | | | | | | |
| | | | | | | | CS | | | | |
| | | | | | | | | 5/7/19 | | | |
| | | | | | | | | | | | |
| 5/7/19 | 1530 | 9.7 | 0.406 | 7.18 | 15.6 | 1.05 | -66 | 600 mL | 300 | 1.80 | Post Sample Reading |

**Recorded By:** 5/7/19

**QA Checked By:** 5/8/19

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# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** FWGmw012

**Date and Time:** Start: 5-7-19 / 1433 Complete: 5-7-19 / 1520

**Personnel:** Gabby Gromofsky

**Purge Method(s):** Bailer Bladder Pump Other: N/A

**Depth To Water:** Approx. 0.25 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 37 ft. **PSI=** 37 /2 + 10 = 28.5

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 37 - DTW 0.25 = 36.75

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 36.75 x Tf ~~0~~ 21.576 = 792.9

**3.) Total Volume of stagnant water**

Total volume = 622 + 792.9 = 1,414.9

**2x Total volume =** 2,829 ml

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03179 | 5-7-19 |
| Water Level Tape: SOLONIST (Heron) | 07-0573 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 1930 | N/A |

**Total Volume of Water Removed (Liters):** 14.95 L Sample Method: Bladder Pump

**Sample ID / Date / Time:** FWGmw-012-190401-GW / 5-7-19 / 1515 **QC Sample ID** N/A

**Analysis** Explosives, TAL Metals

Field Observations/Site Conditions During Purging: water is very turbid, reddish orange, odorless (initially); water becomes clear.

Sampling Procedure Followed (YES) / NO If no, why was deviation necessary:

5-7-19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: 5-7-19 (Signature and Date)

QA Checked By: 5/8/19 (Signature and Date)

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# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** FWGMW012

Initial DTW: Approx. 0.25'

| Stabilization Requirements | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV |
|---|---|---|---|---|---|---|
| Consecutive Readings to Sample | 3 | 3 | 3 | 1 | 3 | 3 |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5-7-19 | 1434 | 9.8 | 0.274 | 6.34 | 34.8 | 0.98 | 177.8 | 500 | 500 | ~~Approx.~~ 0.80 | Initial reading through flow cell (1/20/40) water is redish orange, odorless |
| | 1438 | -- | -- | -- | -- | -- | -- | 3,000 | 750 | 1.12 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded (1/10/50) water is clear orange red |
| | 1443 | 9.8 | 0.266 | 6.20 | 18.0 | 0.82 | 140.0 | 2,300 | 460 | 1.15 | Start recording stability parameters water is slightly red |
| | 1448 | 10.2 | 0.259 | 6.20 | 10.3 | 0.79 | 130.6 | 2,350 | 470 | 1.15 | (1/8/52) water is more clear |
| | 1453 | 9.9 | 0.255 | 6.15 | 7.3 | 0.77 | 123.1 | 2,050 | 410 | 1.10 | (1/5/55) water is clear, colorless, odorless |
| | 1458 | 10.2 | 0.255 | 6.13 | 5.9 | 0.76 | 119.0 | 1,950 | 390 | 0.97 | |
| ↓ | 1503 | 10.1 | 0.254 | 6.12 | 5.5 | 0.74 | 116.3 | ~~1,950~~ 2,000 ml | 400 | 0.95 | Stable - continue w/ A. Sprinzl |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | MM 5-7-19 | | | | | | | |
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|---|---|---|---|---|---|---|---|---|---|---|---|
| 5-7-19 | 1520 | 10.0 | 0.255 | 6.19 | 4.3 | 1.96 | 152.9 | 8000 ml | 400 ml | 1.02 | POST SAMPLE READINGS |

**Recorded By:** [signature] 5-7-19

**QA Checked By:** [signature] 5/8/19

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# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** FWGmw-015

**Date and Time:** 05/02/19 Start: 1436 Complete: N/A

**Personnel:** Jackie Mitchell

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 2.52 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 18.5 ft. **PSI=** 18.5 /2 + 10 = 19.25

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 18.5 - DTW 2.52 = 15.98

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 15.98 x Tf 21.576 = 344.78

**3.) Total Volume of stagnant water**

Total volume = 622 + 344.78 = 966.78

2x Total volume = ~~1932~~ gm 05/02/19 1933.57

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03966 | 05/02/19 |
| Water Level Tape: SOLONIST 200 ft. | Pine 07-0572 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | Pine 43635 | N/A |

**Total Volume of Water Removed (Liters):** ~~gm 05/02/19 N/A~~ 1300 L gm 05/02/19

Sample Method: Bladder Pump

**Sample ID / Date / Time:** FWGmw-015-190401-GW/~~05/02/19~~/N/A **QC Sample ID** N/A

**Analysis** N/A

Field Observations/Site Conditions During Purging: Higher turbidity then expected.

Sampling Procedure Followed: YES / (NO) If no, why was deviation necessary: gm 05/02/19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) NO**

Recorded By: 05/02/19 (Signature and Date)

QA Checked By: 5/2/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** FWGmw-015

Initial DTW: 2.52

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/02/19 | 1441 | 16.7 | 2.979 | 6.96 | 6.51 | 3.94 | 137.7 | 3000 | 50 | 3.15 | Initial reading through flow cell |
| | | -- | -- | -- | -- | -- | -- | | | | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | | | | | | | | | | | Start recording stability parameters |
| Due to time constraints the decision to end purging was made due to turbidity >60 NTU, additional 1000 mL purged | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
|

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# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** FWGmw-015

**Date and Time:** 5/8/19 Start: ~~0959~~ 1004 (NLS 5/8/19) Complete: 1040

**Personnel:** R. Laurich

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 4.23 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 18.5 ft. **PSI=** 18.5 /2 + 10 = 19.25

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

1.) **Length of Tubing w/ stagnant water**
Intake Depth (ID) 18.5 - DTW 4.23 = 14.27

2.) **Volume of stagnant water in tubing**
Difference of ID-DTW 14.27 x Tf 21.576 = 307.88

3.) **Total Volume of stagnant water**
Total volume = 622 + 307.88 = 929.88

**2x Total volume =** 1859.77

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: YSI PRO DSS or Horiba U-52 | FN03179 | 5/8/19 |
| Water Level Tape: SOLONIST (NLS 5/8/19) HERON | T-2178 | N/A |
| Other: MP-10 with QED Well Wizzard or MP-50 | 1032 18836 | N/A |

**Total Volume of Water Removed (Liters):** 2.82 Sample Method: Bladder Pump

**Sample ID / Date / Time:** FWGmw-015-190401-GW 5/8/19 1055 **QC Sample ID** N/A

**Analysis** EXPLOSIVES + TAL METALS

Field Observations/Site Conditions During Purging: CLEAR / COLORLESS / ODORLESS TL 5/8/19

Sampling Procedure Followed: YES / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected YES / NO**

Recorded By: 5/8/19 (Signature and Date)

QA Checked By: 05/08/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** FWGMW-015

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 4.23

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/8/19 | 1009 | 11.4 | 3.252 | 6.96 | 1.9 | 5.52 | 266.4 | 375 | 75 | 4.80 | Initial reading through flow cell CLEAR / COLORLESS / ODORLESS CPM 1 57/3 |
| | 1024 | -- | -- | -- | -- | -- | -- | 1500 | 100 | 6.25 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 1025 | 11.0 | 3.253 | 6.89 | 2.4 | 1.61 | 270.1 | 25 | 25 | 6.23 | Start recording stability parameters CPM 1 59/1 |
| | 1030 | 11.5 | 3.249 | 6.89 | 2.7 | 1.55 | 269.9 | 125 | 25 | 6.20 | CPM 1 58/2 |
| | 1035 | 11.7 | 3.256 | 6.88 | 1.7 | 1.41 | 269.7 | 225 | 45 | 6.21 | ↓ |
| ↓ | 1040 | 11.4 | 3.264 | 6.89 | 2.1 | 1.40 | 269.2 | 225 | 45 | 6.25 | CPM 1 59/1 STABLE |
| | | | | | | | | | | | |
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| | | | | | | 5/8/19 | | | | | |
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|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/8/19 | 1202 | 13.6 | 3.324 | 6.94 | 2.2 | 3.83 | 226.0 | 345 | 45 | 6.20 | POST SAMPLE READINGS |

**Recorded By:** 5/8/19 **QA Checked By:** 05/08/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** FWGMW-016

**Date and Time:** Start: 4/29/19 1426 Complete: 1519

**Personnel:** Lindsey Mayer

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 15.87 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 59.5 ft. **PSI=** 59.5 /2 + 10 = 39.75

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 59.5 - DTW 15.87 = 43.63

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 43.63 x Tf 21.576 = 941.36

**3.) Total Volume of stagnant water**

Total volume = 622 + 941.36 = 1563.36

**2x Total volume =** 3126.72

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA02140 | 4/29/19 |
| Water Level Tape: ~~SOLONIST~~ Heron (4/29/19) | 07-0573 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 42406 | N/A |

**Total Volume of Water Removed (Liters):** 6.16 Sample Method: Bladder Pump

**Sample ID / Date / Time:** FWGMW-016-190401-GW/4/29/19/1520 **QC Sample ID** N/A

**Analysis** Explosives / Tal metals

Field Observations/Site Conditions During Purging: 61°F, cloudy water is clear, colorless, odorless

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary:

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: [signature] 4/29/19 (Signature and Date)

QA Checked By: Amanda Spring 04/29/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** FWGMW-016

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 15.87

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/29/19 | 1429 | 11.9 | 1.245 | 7.30 | 0.03 | 5.10 | 176.0 | 330mL | 110 | 15 ~~15.92~~ 15.92 4/29/19 | Initial reading through flow cell CPM-1 D=5.0 R=55.0 |
| | 1458 | -- | -- | -- | -- | -- | -- | 3190 | 110 | 15.93 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 1503 | 12.1 | 1.254 | 7.14 | 6.10 | 0.84 | -40.7 | 550 | 110 | 15.93 | Start recording stability parameters |
| | 1508 | 12.2 | 1.257 | 7.14 | 0.31 | 0.82 | -42.2 | 550 | 110 | 15.93 | |
| | 1513 | 12.0 | 1.252 | 7.14 | 0.09 | 0.68 | -43.5 | 550 | 110 | 15.93 | |
| | 1519 | — | — | — | — | — | — | 660 | 110 | 15.93 | 1517 A.Sprinzel gives approval to sample |
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|---|---|---|---|---|---|---|---|---|---|---|---|
| 4/29/19 | ~~1537~~ 1537 4/29/19 | 12.3 | 1.260 | 7.15 | 0.04 | 0.98 | -30.2 | 330 | 110 | 15.93 | POST SAMPLE READINGS |

**Recorded By:** 4/29/19 **QA Checked By:** Amanda Sprinzl 04/29/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** FNGmw-0018

**Date and Time:** 05/09/19 Start: 0830 Complete: 0935

**Personnel:** Jackie Mitchell

**Purge Method(s):** Bailer Bladder Pump Other: N/A

**Depth To Water:** 20.90 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 141.0 ft. **PSI=** ~~80.5~~ 141.0 /2 + 10 = 80.5

gm 05/08/19

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 141.0 - DTW 20.90 = 120.1

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 120.1 x Tf 21.576 =

**3.) Total Volume of stagnant water**

Total volume = 622 + 2591.28 = 3213.28

**2x Total volume =** 6426.56

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03966 | 05/09/19 |
| Water Level Tape: SOLONIST 300 ft. | 34827 | N/A |
| Other: (MP-10 with QED Well Wizzard) or MP-50 | MP10-3308, QED 18421 | N/A |

**Total Volume of Water Removed (Liters):** 14.25 L Sample Method: Bladder Pump

**Sample ID / Date / Time:** FNGmw-0018-MP0401-GW/05/09/19/0925 **QC Sample ID** N/A

**Analysis** VOCs, Cyanide, TAL Metals

Field Observations/Site Conditions During Purging: Water is clear, colorless, with a slight organic odor. Well pad clear.

Sampling Procedure Followed: (YES) NO If no, why was deviation necessary:

gm 05/09/19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) NO**

Recorded By: 05/09/19 (Signature and Date)

QA Checked By: 5-9-19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** FNGMW-018

| | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV |
|---|---|---|---|---|---|---|
| Stabilization Requirements | 3 | 3 | 3 | 1 | 3 | 3 |
| Consecutive Readings to Sample | | | | | | |

Initial DTW: 20.90

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/09/19 | 0832 | 11.6 | 0.815 | 7.24 | 8.33 | 1.45 | -79.9 | 500 | 250 | 21.69 | Initial reading through flow cell 2 CPM/2.0/28.0 |
| | 0854 | -- | -- | -- | -- | -- | -- | 6000 | 250 | 21.69 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 0857 | 11.5 | 0.811 | 7.28 | 1.89 | 1.25 | -65.7 | 750 | 250 | 21.60 | Start recording stability parameters |
| | 0902 | 11.6 | 0.810 | 7.29 | 1.82 | 0.91 | -58.7 | 1250 | 250 | 21.60 | Water is clear, colorless, with a slight organic odor |
| | 0907 | 11.6 | 0.810 | 7.29 | 3.53 | 0.94 | -59.8 | 1250 | 250 | 21.60 | |
| | 0912 | 11.6 | 0.812 | 7.29 | 8.76 | 0.81 | -60.9 | 1250 | 250 | 21.60 | Stable |
| | 0923 | -- | -- | -- | -- | -- | -- | 2750 | 250 | 21.60 | Stability confirmed |
| 05/09/19 | 0935 | 11.8 | 0.813 | 7.30 | 4.15 | 1.30 | -55.3 | 5000 | 250 | 21.62 | POST SAMPLE READINGS |

05/09/19

**Recorded By:** 05/09/19

**QA Checked By:**

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** FWGmw - 019

**Date and Time:** Start: 5/2/19 0955 Complete: 5/2/19 1100

**Personnel:** Charles Spurr

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 114.50 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 230 ft. **PSI=** 230 /2 + 10 = 125

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 230 - DTW 114.50 = 115.5

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 115.5 x Tf 21.576 = 2492

**3.) Total Volume of stagnant water**

Total volume = 622 + 2492 = 3114

**2x Total volume =** 6228

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03179 | 5/2/19 |
| Water Level Tape: SOLONIST | 250795 | N/A |
| Other: (MP-10 with QED Well Wizzard) or MP-50 | 3308 | N/A |

**Total Volume of Water Removed (Liters):** 9.6 Sample Method: Bladder Pump

**Sample ID / Date / Time:** FWGmw-019-190401-GW 5/2/19 1035 **QC Sample ID** N/A

**Analysis** Nitrocellulose & Nitroguanidine

Field Observations/Site Conditions During Purging: 63°F; Cloudy; calm

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: [signature] 5/2/19 (Signature and Date)

QA Checked By: [signature] 05/02/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** FWGmw - 019

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 114.50

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/2/19 | 1000 | 11.6 | 0.835 | 7.34 | 1.6 | 3.62 | -54 | 1.5(L) | 300 | 114.75 | Initial reading through flow cell CPM1/35/25 max pressure of pump 110 PSI |
| — | — | -- | -- | -- | -- | -- | -- | — | — | — | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| 5/2/19 | 1021 | 10.9 | 0.836 | 7.09 | 1.2 | 1.02 | -73 | 6.3(L) | 300 | 114.75 | Start recording stability parameters CPM1/35/25 |
| ↓ | 1026 | 10.8 | 0.835 | 7.09 | 1.3 | 0.98 | -69 | 1.5 | 300 | 114.75 | ↓ ↓ |
| ↓ | 1031 | 11.0 | 0.834 | 7.09 | 1.2 | 0.97 | -66 | 1.5 | 300 | 114.75 | ↓ ↓ |
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| 5/2/19 | 1046 | 11.8 | 0.847 | 7.19 | 0.7 | 2.70 | 92.5 | 300 mL | 300 | 114.75 | POST SAMPLE READINGS |

**Recorded By:** [signature] 5/2/19

**QA Checked By:** [signature] 05/02/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** FWGMW-020

**Date and Time:** Start: 5/13/19 0935 Complete: 5/13/19 1030

**Personnel:** Charles Spurr

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 21.47 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 40 ft. **PSI=** 40 /2 + 10 = 30

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 40 - DTW 21.47 = 18.53

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 18.53 x Tf 21.576 = 400

**3.) Total Volume of stagnant water**

Total volume = 622 + 400 = 1022

**2x Total volume =** 2044 mL

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | F103179 | 5/13/19 |
| Water Level Tape: SOLONIST | 212380 | N/A |
| Other: (MP-10 with QED Well Wizzard) or MP-50 | 1032 & 18836 | N/A |

**Total Volume of Water Removed (Liters):** 3.7 Sample Method: Bladder Pump

**Sample ID / Date / Time:** FWGMW-020-190401-GW 5/13/19 1015 **QC Sample ID** N/A

**Analysis** VOCs, CYANIDE, + TAL METALS

Field Observations/Site Conditions During Purging: 48°F ; Cloudy; calm ; S.S. portable bladder pump used in well. Set on 5/9/19

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected** ~~YES / NO~~ cc 5/13/19 N/A

Recorded By: Charles Spurr 5/13/19 (Signature and Date)

QA Checked By: [signature] 5/20/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** FWGmw-020

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements | Initial DTW: 21.47 |
|---|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample | |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/13/19 | 0939 | 10.2 | 0.934 | 7.14 | 12.7 | 7.74 | 229 | 300 mL | 100 | 21.73 | Initial reading through flow cell CPM2/2/28 30 PSI |
| — | — | -- | -- | -- | -- | -- | -- | — | — | — | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| 5/13/19 | 1000 | 10.1 | 0.902 | 7.08 | 8.9 | 4.88 | 180 | 2.4(L) | 100 | 21.73 | Start recording stability parameters CPM2/2/28 30 PSI |
| ↓ | 1005 | 10.1 | 0.902 | 7.08 | 9.1 | 4.79 | 175 | 0.5 | 100 | 21.73 | ↓ ↓ |
| ↓ | 1010 | 10.1 | 0.901 | 7.08 | 8.8 | 4.67 | 172 | 0.5 | 100 | 21.73 | ↓ ↓ |
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| 5/13/19 | 1028 | 10.2 | 0.911 | 7.12 | 7.6 | 5.79 | 204 | 300 mL | 100 | 21.73 | POST SAMPLE READINGS |

CS 5/13/19

**Recorded By:** [signature] 5/13/19 **QA Checked By:** [signature] 5/14/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** FWGmw-021

**Date and Time:** 5/9/19 Start: 1012 Complete: 1119

**Personnel:** Lindsey Moyer

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 18.18 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 40 ft. **PSI=** 40 /2 + 10 = 30

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 40 - DTW 18.18 = 21.82

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 21.82 x Tf 21.576 = 470.79

**3.) Total Volume of stagnant water**

Total volume = 622 + 470.79 = 1092.79

**2x Total volume =** 2185.58

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03313 | 5/9/19 |
| Water Level Tape: ~~SOLONIST~~ Heron (2m 5/9/19) | 07-0572 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | 42406 | N/A |

**Total Volume of Water Removed (Liters):** 13.4 Sample Method: Bladder Pump

**Sample ID / Date / Time:** FWGmw-021-190401-GW/5-9-19/1120 **QC Sample ID** FWGmw-021-190401-GWMSD/FWGmw-021-190402FB FWGmw-021-190403-GW

**Analysis** Explosives, TAL metals

Field Observations/Site Conditions During Purging: 72°F Sunny, 1020 water became turbid. Sampling water is clear, colorless, odorless

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A /2m 5/9/19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: 5/9/19 (Signature and Date)

QA Checked By: 05/09/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** FWGMW-021

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 18.18

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/9/19 | 1016 | 14.1 | 0.218 | 6.57 | 6.48 | 8.98 | 198.1 | 400mL | 100 | 18.40 | Initial reading through flow cell CPM=1 D=2.0 R=58.0 |
| | 1036 | -- | -- | -- | -- | -- | -- | 4000 | 200 | 18.55 | Purged 2x's volume of stagnant water in pump and tubing - stability parameters not recorded CPM=1 D=5.0 |
| | 1037 | 13.0 | 0.229 | 6.23 | 44.07 | 4.44 | 207.9 | 200 | 200 | 18.55 | Start recording stability parameters water was turbid, waited longer to start read R=550 |
| | 1042 | 11.6 | 0.226 | 6.09 | 32.09 | 4.15 | 193.3 | 1000 | 200 | 18.55 | |
| | 1047 | 11.7 | 0.226 | 6.04 | 24.17 | 4.09 | 203.7 | 1000 | 200 | 18.55 | |
| | 1052 | 11.7 | 0.226 | 6.03 | 11.19 | 4.09 | 210.7 | 1000 | 200 | 18.55 | |
| | 1057 | 11.7 | 0.226 | 6.02 | 15.14 | 4.12 | 214.1 | 1000 | 200 | 18.56 | |
| | 1102 | 11.7 | 0.225 | 6.02 | 10.50 | 4.04 | 217.1 | 1000 | 200 | 18.57 | |
| | 1107 | 11.8 | 0.226 | 6.02 | 8.63 | 3.99 | 219.3 | 1000 | 200 | 18.57 | |
| | 1112 | 11.7 | 0.226 | 6.01 | 6.64 | 3.95 | 222.1 | 1000 | 200 | 18.57 | 5/9/19 |
| | 1119 | — | — | — | — | — | — | 1400 | 200 | 18.57 | R. Lavrich approves sampling parameters stable |
| | | | | | | | | | | | 5/9/19 |
| 5/9/19 | 1201 | 12.9 | 0.229 | 6.20 | 4.12 | 4.04 | 223.5 | 400 | 200 | 18.60 | POST SAMPLE READINGS |

**Recorded By:** 5/9/19

**QA Checked By:** 05/09/19

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# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** FWGmw-022

**Date and Time:** Start: 5/2/19 0835 Complete: 5/2/19 0935

**Personnel:** Charles Spurr

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 113.52 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 160 ft. **PSI=** 160 /2 + 10 = 90

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 160 - DTW 113.52 = 46.48

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 46.48 x Tf 21.576 = 1003

**3.) Total Volume of stagnant water**

Total volume = 622 + 1003 = 1625

**2x Total volume =** 3250 mL

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03179 | 5/2/19 |
| Water Level Tape: SOLONIST | 250795 | N/A |
| Other: (MP-10 with QED Well Wizzard) or MP-50 | 3308 | N/A |

**Total Volume of Water Removed (Liters):** 11.4

Sample Method: Bladder Pump

**Sample ID / Date / Time:** FWGMW-022-190401-GW 5/2/19 0915 **QC Sample ID** N/A

**Analysis** Nitrocellulose & Nitroguanidine

Field Observations/Site Conditions During Purging: 60°F; Cloudy; Calm

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary: N/A

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: 5/2/19 (Signature and Date)

QA Checked By: 05/02/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** FWGmw-022

Initial DTW: 113.57

| Stabilization Requirements | +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV |
|---|---|---|---|---|---|---|
| Consecutive Readings to Sample | 3 | 3 | 3 | 1 | 3 | 3 |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/2/19 | 0840 | 11.6 | 0.816 | 7.25 | 6.2 | 4.47 | 242 | 1200 mL | 300 | 113.68 | Initial reading through flow cell CPM 1 / 35 / 25 90 PSI |
| - | - | -- | -- | -- | -- | -- | -- | - | - | - | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| 5/2/19 | 0848 | 10.9 | 0.784 | 7.03 | 27.6 | 1.63 | 93 | 3.6(L) | 300 | 113.68 | Start recording stability parameters CPM 1 / 35 / 25 Air bubbles around sensors |
| | 0853 | 10.8 | 0.783 | 7.04 | 12.6 | 1.21 | 56 | 1.5 | 300 | 113.68 | water clear in YS |
| | 0858 | 10.8 | 0.782 | 7.04 | 9.5 | 1.11 | 39 | 1.5 | 300 | 113.68 | bubbles dissipated |
| | 0903 | 10.9 | 0.781 | 7.04 | 9.1 | 1.06 | 27 | 1.5 | 300 | 113.68 | |
| | 0908 | 10.9 | 0.782 | 7.04 | 7.5 | 1.05 | 18 | 1.5 | 300 | 113.68 | |
| | 0913 | 10.9 | 0.781 | 7.04 | 9.6 | 1.04 | 12 | 1.5 | 300 | 113.68 | |
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| 5/2/19 | 0927 | 11.5 | 0.788 | 7.17 | 5.9 | 2.57 | 165 | 300 mL | 300 | 113.69 | POST SAMPLE READINGS |

**Recorded By:** 5/2/19 **QA Checked By:** 05/02/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** FWGmw-023

**Date and Time:** 05/01/19 Start: 0910 Complete: 1041

**Personnel:** Jackie Mitchell

**Purge Method(s):** Bailer Bladder Pump Other:

**Depth To Water:** 115.51 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 208.5 ft. **PSI=** 208.5 /2 + 10 = 114

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 208.5 - DTW 115.51 = 92.99

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 92.99 x Tf 21.576 = 2006.35

**3.) Total Volume of stagnant water**

Total volume = 622 + 2006.35 = 2628.35

**2x Total volume =** 5256.70

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA039466 | 05/01/19 |
| Water Level Tape: SOLONIST 200 ft. | Pine 07-0572 | N/A |
| Other: MP-10 with QED Well Wizzard or (MP-50) | Pine 43635 | N/A |

**Total Volume of Water Removed (Liters):** 8.43 L Sample Method: Bladder Pump

**Sample ID / Date / Time:** FWGmw-023-190401-GW/05/01/19/1009 **QC Sample ID** N/A

**Analysis** Nitroguanidine (6)(A), Nitrocellulose (12)(A)

Field Observations/Site Conditions During Purging: 65°F, partly sunny, light wind. Well pad clear, surrounded by med. length grass. Water is clear, colorless, with NO odor.

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary:

05/01/19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected (YES) / NO**

Recorded By: 05/01/19 (Signature and Date)

QA Checked By: 5/1/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** FWGmw-023

Initial DTW: 115.51

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/01/19 | 0918 | 11.5 | 0.716 | 7.55 | 1.71 | 10.37 | 221.5 | 400 | 200 | 115.51 | Initial reading through flow cell 1 CPM/20.0/40.0 |
| | 0953 | -- | -- | -- | -- | -- | -- | 5200 | 145 | 115.54 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded 1 CPM/18.0/38 |
| | 0955 | 11.5 | 0.702 | 7.09 | 1.68 | 0.60 | -22.6 | 425 | 145 | 115.54 | Start recording stability parameters |
| | 1000 | 11.5 | 0.702 | 7.09 | 1.72 | 0.55 | -21.4 | 725 | 145 | 115.54 | Water is clear, colorless, with no odor |
| | 1005 | 11.7 | 0.701 | 7.09 | 1.69 | 0.53 | -21.9 | 725 | 145 | 115.54 | Parameters stable, send confirmation text to A. Sprinzl |
| | 1008 | -- | -- | -- | -- | -- | -- | 575 | 145 | 115.54 | Amount purged while awaiting confirmation |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| 05/01/19 | 1041 | 13.6 | 0.709 | 7.12 | 1.49 | 2.03 | -19.1 | 380 | 145 | 115.54 | POST SAMPLE READINGS |

05/01/19

5/1/19 42.1

**Recorded By:** 05/01/19

**QA Checked By:** 5/1/19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** FNGmw-024

**Date and Time:** 05/09/19 Start: 1231 Complete: 1347

**Personnel:** Jackie Mitchell

**Purge Method(s):** Bailer Bladder Pump Other: N/A

**Depth To Water:** 14.03 ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** 31.0 ft. **PSI=** 31.0 /2 + 10 = 25.5

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

**1.) Length of Tubing w/ stagnant water**

Intake Depth (ID) 31.0 - DTW 14.03 = 16.97

**2.) Volume of stagnant water in tubing**

Difference of ID-DTW 16.97 x Tf 21.576 = 366.14

**3.) Total Volume of stagnant water**

Total volume = 622 + 366.14 = 988.14

**2x Total volume =** 1976.29

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03966 | 05/08/19 |
| Water Level Tape: SOLONIST 300 ft. | 34827 | N/A |
| Other: (MP-10 with QED Well Wizzard) or MP-50 | MP10-3308, QED 18421 | N/A |

**Total Volume of Water Removed (Liters):** 22.75 L Sample Method: Bladder Pump

**Sample ID / Date / Time:** FNGmw-024-190401-GW/05/09/19/1340 **QC Sample ID** N/A

**Analysis** Explosives, TAL Metals

Field Observations/Site Conditions During Purging: Water turbid and orange upon initial purging, cleared once stagnant water removed. Tall grasses surround well pad

Sampling Procedure Followed: (YES) / NO If no, why was deviation necessary:

05/09/19

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected** (YES) / NO

Recorded By: 05/09/19 (Signature and Date)

QA Checked By: 5-9-19 (Signature and Date)

leidos

# WELL PURGE FORM

Volume removed and flow rate opposite starting at 1247 - jm 05/09/19 1336



**Project Name:** Facility-wide Groundwater RVAAP-66

**Well ID:** FNGMW-024

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 14.03

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 05/09/19 | 1234 | 13.1 | 0.610 | 6.95 | 7.92 | 3.36 | -38.4 | 450 | 225 | 14.03 | Initial reading through flow cell 2 CPM/3.0/27.0 |
| | 1241 | -- | -- | -- | -- | -- | -- | 2350 | 350 | 14.03 | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | 1242 | 11.6 | 0.569 | 6.92 | 154.88 | 0.15 | -19.0 | 350 | 350 | 14.03 | Start recording stability parameters - Water is orange and cloudy |
| | 1247 | 11.7 | 0.573 | 6.93 | 47.03 | -0.02 | -26.9 | 350 | 1750 | 14.03 | 2 CPM/5.0/29.0 |
| | 1252 | 11.6 | 0.578 | 6.93 | 40.33 | 0.07 | -30.5 | 350 | 1750 | 14.03 | |
| | 1257 | 11.6 | 0.586 | 6.99 | 27.73 | 1.02 | -35.4 | 350 | 1750 | 14.03 | Emptied flow cell to try to clear turbidity |
| | 1302 | 11.6 | 0.587 | 6.96 | 22.90 | -0.05 | -37.5 | 350 | 1750 | 14.03 | 2CPM/5.0/25.0 |
| | 1307 | 11.6 | 0.590 | 6.97 | 17.98 | -0.09 | -39.4 | 350 | 1750 | 14.03 | |
| | 1312 | 11.7 | 0.590 | 6.97 | 13.99 | -0.10 | -41.0 | 350 | 1750 | 14.03 | |
| | 1317 | 11.7 | 0.594 | 6.98 | 12.89 | -0.06 | -43.7 | 350 | 1750 | 14.03 | |
| | 1323 | 11.8 | 0.594 | 6.99 | 12.45 | -0.10 | -44.0 | 350 | 1750 | 14.03 | |
| | 1328 | 11.9 | 0.596 | 7.00 | 11.05 | -0.13 | -45.0 | 350 | 1750 | 14.03 | |
| | 1333 | 11.9 | 0.598 | 7.00 | 9.96 | -0.12 | -45.2 | 350 | 1750 | 14.03 | Stable |
| | 1336 | -- | -- | -- | -- | -- | -- | 1200 | 1750 | 14.03 | Stability confirmed |
| 05/09/19 | 1347 | 12.2 | 0.603 | 7.06 | 7.27 | 0.16 | -36.9 | 850 | 350 | 14.03 | POST SAMPLE READINGS |

**Recorded By:** 05/09/19

**QA Checked By:** 5-9-19

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID Number:** SCFmw-004

**Date and Time:** Start: 5/2/19 1350 Complete: 5/2/19 1410

**Personnel:** Charles Spurr CS 5/2/19

**Purge Method(s):** ☐ Bailer ☒ Bladder Pump Other: artesian No purge

**Depth To Water:** 31.00' ATOC ft. from measuring point

**Well Diameter:** 2 inches **PSI = Intake Depth/2 + 10**

**Intake Depth:** N/A ft. **PSI=** N/A /2 + 10 = N/A

**Calculate 2x's volume of stagnant water in well**

Pump vol. = **622** ml, Tubing factor (Tf) **1/4" = 9.46, 3/8" = 21.576**

1.) **Length of Tubing w/ stagnant water**

Intake Depth (ID) _____ - CS DTW _____ = _____

2.) **Volume of stagnant water in tubing**

Difference of ID-DTW _____ x 5/2/19 Tf _____ = _____

3.) **Total Volume of stagnant water**

Total volume = 622 + _____ = _____

2x Total volume =

| FIELD INSTRUMENT (circle model used) | SERIAL NUMBER | DATE OF LAST CALIBRATION |
|---|---|---|
| Water Quality Meter: (YSI PRO DSS) or Horiba U-52 | FA03179 | 5/2/19 |
| Water Level Tape: SOLONIST Not used | N/A | N/A |
| Other: MP-10 with QED Well Wizzard or MP-50 Not Used | N/A | N/A |

**Total Volume of Water Removed (Liters):** N/A Sample Method: ~~Bladder Pump~~ bailer CS 5/2/19

**Sample ID / Date / Time:** SCFmw-004-190401-GW 5/2/19 1405 **QC Sample ID** N/A

**Analysis** TAL metals

Field Observations/Site Conditions During Purging: 72°F; partly cloudy; calm

Sampling Procedure Followed: YES / (NO) If no, why was deviation necessary: Well is artesian and no pump is present. Sample taken directly from water column with bailer

**Well Wizard - Well Cap Freeze Protection used to discharge sample tube above frost line after sample was collected YES / NO**

Recorded By: _____ 5/2/19 (Signature and Date)

QA Checked By: _____ 05/02/19 (Signature and Date)

leidos

# WELL PURGE FORM



**Project Name:** Facility-wide Groundwater RVAAP-66 **Well ID:** SCFmw-004

| +/- 0.5 °C | +/- 3% | +/-0.1 SU | ≤ 10 NTU | +/- 10% or 0.2 mg/L, whichever is greater | +/- 20 mV | Stabilization Requirements |
|---|---|---|---|---|---|---|
| 3 | 3 | 3 | 1 | 3 | 3 | Consecutive Readings to Sample |

Initial DTW: 3 /100' ATOC

| Date | Time | Temp (°C) | Specific Cond. (mS/cm) | pH (std. unit) | Turbidity (NTU) | Dissolved Oxygen (mg/L) | eH (mV) | Total Volume Removed | Flow Rate mL/min | Water Level (ft btoc) | Comments *Record Cycles per minute/Discharge/Refill (CPM/D/R) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 5/2/19 | 1400 | 9.8 | 1.376 | 7.20 | 37.7 | 2.96 | 261 | N/A | N/A | 3/100' ATOC | Initial reading through flow cell Well artesian: No purge |
| | | -- | -- | -- | -- | -- | -- | | | | Purged 2x's volume of stagnant water in pump and tubing - stabality parameters not recorded |
| | | | | | | | | | | | Start recording stability parameters |
| | | | | | | | CS | | | | |
| | | | | | | | | 5/2/19 | | | |
| | | | | | CS 5/2/19 | | | | | | POST SAMPLE READINGS |

**Recorded By:** 5/2/19 **QA Checked By:** 05/02/19

# D.3 Chains of Custody

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leido.

280-123183 Chain of Custody

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-100 -TA

Date: 04/29/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | DA2mw-115-190401-GW | | 4/29/19 | 0930 | W | 1 | | 1 | |
| | DA2mw-115-190401-GWMSD | | ↓ | | W | 1 | | 1 | Extra Volume for MS/MSD |
| | DA2mw-115-190402-GW | | ↓ | | W | 1 | | 1 | |

Signature: Amanda Springer — 04/29/19
Printed Name: AMANDA SPRINGER
Company: Leidos
Time: 1501

Received by: Test America
Signature: RC Robison
Printed Name: RICK ROBISON
Company:
Date: 4/29/19
Time: 1501

Relinquished by: TAi 240
Signature: RC Robison
Printed Name: RICK ROBISON
Company:
Date:
Time:

Received by: TADEN
Signature:
Printed Name: Steven Zimmerman
Date: 4/30/19
Time: 0930

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Temperature Blank

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

1.9, +0, IR9, xfered by SF, 4/30/19

# Chain of Custody Record

leidos

Page 1 of 1

COC No.: RVAAP-104-TA

Date: 04/30/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Jackie Mitchell

Requested Parameters

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Hexachlorocyclopentadiene (2)(A) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | NTAmw-120-190401-GW | GW | 04/30/19 | 1048 | W | 2 | | 2 | |

280-123221 Chain of Custody

Ans 04/30/19

| Relinquished by | Date | Received by | Date | Notes: Total Number of Containers: 2 |
|---|---|---|---|---|
| Amanda Springl | 04/30/19 | TestAmerica | 4/30/19 | A. Cool, 4C |
| Signature | | Signature | | B. HCl, pH<2, Cool, 4C |
| AMANDA SPRINGL | Time 1505 | RC Robison | Time 1505 | C. HNO3, pH<2, Cool, 4C |
| Printed Name | | Printed Name | | D. NaOH, pH>12, Cool 4C |
| Leidos | | RICK ROBISON | | 1. SW 8260B Notes: |
| Company | | Company | | 2. SW 8270D |
| Relinquished by | Date 4/30 | Received by TA-Den | Date 5/1/19 | 3. SW 8270D SIM |
| Signature | | Signature Reed Pottruff | | 4. SW 8082A |
| Printed Name | Time 1615 | Printed Name Reed Pottruff | Time 0915 | 5. SW 8081B |
| Company | | Company | | 6. SW 8330 |
| | | | | 7. SW 6010/6020/7470 |
| | | | | 8. SW 9012B |
| | | | | 9. SW 9034 |
| | | | | 10. SW 9056/9056A |
| | | | | 11. SW 6860 |
| | | | | 12. EPA 353.2 |
| | | | | 13. SW 7196 |
| | | | | 14. SM2320B |

Shipment Method: Courier

Temperature Blank

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

4.8, 0.6 BRDG 0.0 Transfer RP 5/1/19

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-103-TA
Date: 04/30/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) [signature] (Printed Name) Charles Spurr

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | LL PAHs (3)(A) | Explosives (6)(A) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | NTAmw-119-190401-GW | — | 4/30/19 | 1045 | W | 2 | 2 | 1 | | 5 | |
| | NTAmw-119-190401-GWMSD | — | 4/30/19 | 1045 | W | | 4 | | | 4 | |
| | NTAmw-119-190402-GW | — | 4/30/19 | 1045 | W | | 2 | | | 2 | |

~~[illegible] 04/30/19~~

| Relinquished by | Date | | Date |
|---|---|---|---|
| Amanda Springl (Signature) | 04/30/19 | Test America (Signature) | 4/30/19 |
| AMANDA SPRINZL (Printed Name) | Time 1505 | RC [signature] (Printed Name) | Time 1505 |
| Leidos (Company) | | RICK REBISCH (Company) | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| [signature] (Signature) | 4/30 | TA-Den (Signature) | 5/1/19 |
| [signature] (Printed Name) | Time 1605 | [signature] (Printed Name) | Time 0915 |
| (Company) | | Reed Pottruck (Company) | |

Notes: Total Number of Containers: 11

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

4.8, 0.6 IR#9 0.0 Transfer RP 5/11/19

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-101 -TA
Date: 04/30/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name) Ryan Lawrence

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | VOCs (1)(B) | Phthalates/Nitroaromatics/ Phenols (2)(A) | LL PAHs (3)(A) | PCBs (4)(A) | Pesticides (5)(A) | Explosives (6)(A) | Cyanide (8)(D) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DET-003-190401-GW | — | 4/29/19 | 1055 | W | 3 | 2 | 2 | 2 | | 2 | 1 | 1 | | 13 | |
| | DET-003-190401-GWMSD | — | ↓ | ↓ | W | 4 | | | 4 | 4 | 4 | 1 | | | 17 | Extra Volume for MS/MSD |
| | DET-003-190402-GW | — | ↓ | ↓ | W | 3 | | | 2 | | 2 | 1 | 1 | | 9 | |
| | FWGTB-191001-TB | — | ↓ | 0900 | W | 2 | | | | | | | | | 2 | Trip Blank |

Total Number of Containers: 41

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Amanda Sprinzl (Signature) | 04/30/19 | Test America (Signature) | 4/30/19 |
| Amanda Sprinzl (Printed Name) | Time 1505 | RC Robison (Printed Name) | Time 1505 |
| Leidos (Company) | | Rick Robison (Company) | |
| Relinquished by | Date 4/30 | Received by Reed Pottruff (Signature) | Date 5/1/19 |
| (Signature) | Time 1615 | Reed P (Printed Name) | Time 0915 |
| (Printed Name) | | TA-Den (Company) | |
| (Company) | | | |

Notes:
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

Temperature Blank

Lab:

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

0.7, 0.7, 0.6 IR# : 0.0 Transfer RP 5/1/19

# Chain of Custody Record

leidos

Page 1 of 1

COC No.: RVAAP-102-TA

Date: 04/30/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Jackie Mitchell

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | VOCs (1)(B) | Phthalates/Nitroaromatics/ Phenols (2)(A) | LL PAHs (3)(A) | PCBs (4)(A) | Pesticides (5)(A) | Explosives (6)(A) | Cyanide (8)(D) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | DET-004-190401-GW | GW | 04/29/19 | 1004 | W | 3 | 2 | 2 | 2 | 2 | 1 | | 1 | | 13 | USE TRIP Blank: FWGTB-191@001-TB |

Jms 04/30/19

| Relinquished by | Date | Received by | Date | Time |
|---|---|---|---|---|
| Amanda Springl | 04/30/19 | TestAmerica | 4/30/19 | |
| Signature | | Signature | | |
| AMANDA SPRINGL | Time 1505 | Rick Robison | Time 1505 | |
| Printed Name | | Printed Name | | |
| Leidos | | | | |
| Company | | Company | | |
| Relinquished by | Date | Received by | Date | Time |
| | 4/30 | TA-Den | 5/1/19 | |
| Signature | | Signature | | |
| | Time 1415 | Reed Pottruff | Time 0915 | |
| Printed Name | | Printed Name | | |
| Company | | Company | | |

Notes: Total Number of Containers: 13

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

0.6, 0.7 IRH 9 0.0 Transfer RP 5/1/19

# Chain of Custody Record

leidos

COC No.: RVAAP- 110 -TA

Page( of 1

Date: 04/30/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Jackie Mitchell

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | TAL Metals (7)(C ) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | FWGmw-007-190401-GW | GW | 04/30/19 | 1335 | W | 2 | 1 | | 3 | |

dns 04/30/19

| Relinquished by | Date | Received by | Date | Notes: Total Number of Containers: 3 | Shipment Method: Courier |
|---|---|---|---|---|---|
| Amanda Sprinzl<br>Signature | 04/30/19 | TestAmerica<br>Signature | 4/30/19 | A. Cool, 4C<br>B. HCl, pH<2, Cool, 4C<br>C. HNO3, pH<2, Cool, 4C<br>D. NaOH, pH>12, Cool 4C | |
| AMANDA SPRINZL<br>Printed Name | Time 1505 | RICK ROBISON<br>Printed Name | Time 1505 | 1. SW 8260B Notes:<br>2. SW 8270D<br>3. SW 8270D SIM<br>4. SW 8082A<br>5. SW 8081B | |
| Leidos<br>Company | | Company | | 6. SW 8330<br>7. SW 6010/6020/7470<br>8. SW 9012B<br>9. SW 9034<br>10. SW 9056/9056A | |
| Relinquished by<br>Signature | Date 4/30 | Received by<br>TA-Den<br>Signature | Date 5/1/19 | 11. SW 6860<br>12. EPA 353.2<br>13. SW 7196<br>14. SM2320B | Temperature Blank |
| Printed Name | Time 1415 | Reed Pottruff<br>Printed Name | Time 0915 | | Lab: Leidos<br>8866 Commons Drive<br>Twinsburg, OH 44087<br>(330) 405-5802 |
| Company | | Company | | | |

2.4 IR # 900 Transfer RP 5/1/19

# Chain of Custody Record

leidos

COC No.: RVAAP-109-TA

Page 1 of 1

Date: 04/30/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name) Ryan Lanham

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | WBGmw-020-190401-GW | — | 4/30/19 | 1150 | W | 2 | 1 | | 3 | |

Requested Parameters

Relinquished by: Amanda Sprinzl (Signature) — Amanda Sprinzl (Printed Name) — Leidos (Company) — Date: 04/30/19 — Time: 1505

Received by: Test America (Signature) — Rick Robison (Printed Name) — Company — Date: 4/30/19 — Time: 1505

Relinquished by: (Signature) — (Printed Name) — Company — Date: 4/30 — Time: 1615

Received by: TA-Den (Signature) — Reed Pottmeyer (Printed Name) — Company — Date: 5/1/19 — Time: 0915

Notes:
Total Number of Containers: 3

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

0.6, 0.6 IR# 9 0.0 Transfer RP 5/1/19

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-106-TA

Date: 04/30/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Lindsey Meyer

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Depth | Date | Time | Matrix | Explosives (6)(A) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | WBGmw-006-190401-GW | | | 4/30/19 | 0910 | W | 2 | 1 | | 3 | |

Rec'd: 04/30/19

| Relinquished by | Date | Received by | Date | Notes: Total Number of Containers: 3 | Shipment Method: Courier |
|---|---|---|---|---|---|
| Amanda Spinzl | 04/30/19 | Test America | 4/30/19 | A. Cool, 4C<br>B. HCl, pH<2, Cool, 4C<br>C. HNO3, pH<2, Cool, 4C<br>D. NaOH, pH>12, Cool 4C | |
| Signature | | Signature | | | |
| AMANDA SPINZL | Time 1505 | RC Kobison | Time 1505 | 1. SW 8260B Notes:<br>2. SW 8270D<br>3. SW 8270D SIM<br>4. SW 8082A<br>5. SW 8081B<br>6. SW 8330<br>7. SW 6010/6020/7470<br>8. SW 9012B<br>9. SW 9034<br>10. SW 9056/9056A<br>11. SW 6860<br>12. EPA 353.2<br>13. SW 7196<br>14. SM2320B | |
| Printed Name | | Printed Name | | | |
| Leidos | | RIC ROBISON | | | |
| Company | | Company | | | |
| Relinquished by | Date 4/30 | Received by TA-Den | Date 5/1/19 | | Temperature Blank |
| Signature | | Signature | | | |
| Printed Name | Time 1610 | Printed Name Reed Pottruff | Time 0915 | | Lab: Leidos 8866 Commons Drive Twinsburg, OH 44087 (330) 405-5802 |
| Company | | Company | | | |

0.6.0.6 RLA 9 0.0 Transfer RP 5/1/19

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-108-TA

Date: 04/30/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Ryan Lawson

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | WBGmw-021-190401-GW | | 4/30/19 | 0945 | W | 2 | 1 | | 3 | |

Requested Parameters

Relinquished by: Amanda Spinzl — Signature — Printed Name: AMANDA SPINZL — Company: Leidos — Date: 04/30/19 — Time: 1505

Received by: TestAmerica — Signature — Printed Name: Rick Robison — Company — Date: 4/30/19 — Time: 1505

Relinquished by: — Signature — Printed Name — Company — Date: 4/30 — Time: 1605

Received by: TA-Dem — Signature — Printed Name: Reed Pothruff — Company — Date: 5/1/19 — Time: 0945

Notes: Total Number of Containers: 3

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

0.6, 0.6 RLA 90.0 Transfer RP 5/1/19

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-107 -TA

Date: 04/30/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Lindsey Meyer

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No | Sample ID | Site Type | Depth | Date | Time | Matrix | Explosives (6)(A) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | WBGmw-009-190401-GW | | | 4/30/19 | 1053 | W | 2 | 1 | | 3 | |

dms 04/30/19

| Relinquished by | Date | Received by | Date | Notes: Total Number of Containers: 3 | Shipment Method: Courier |
|---|---|---|---|---|---|
| Signature: Amanda Springl | 04/30/19 | Signature: Test America | 4/30/19 | A. Cool, 4C<br>B. HCl, pH<2, Cool, 4C<br>C. HNO3, pH<2, Cool, 4C<br>D. NaOH, pH>12, Cool 4C | |
| Printed Name: AMANDA SPRINGL | Time: 1515 | Printed Name: RICK ROBISON | Time: 1505 | 1. SW 8260B Notes:<br>2. SW 8270D<br>3. SW 8270D SIM<br>4. SW 8082A<br>5. SW 8081B<br>6. SW 8330<br>7. SW 6010/6020/7470<br>8. SW 9012B<br>9. SW 9034<br>10. SW 9056/9056A<br>11. SW 6860<br>12. EPA 353.2<br>13. SW 7196<br>14. SM2320B | |
| Leidos | | | | | |
| Company | | Company | | | |
| Relinquished by | Date: 4/30 | Received by: TA-Den | Date: 5/1/19 | | |
| Signature | | Signature: Reed Pf | | | |
| Printed Name | Time: 1615 | Printed Name: Reed Pothroff | Time: 0915 | | Temperature Blank |
| Company | | Company | | | Lab: Leidos 8866 Commons Drive Twinsburg, OH 44087 (330) 405-5802 |

0.6, 0.6 DRB900 Transfer RP 5/1/19

# Chain of Custody Record

leidos

COC No.: RVAAP-105 -TA

Page 1 of 1

Date: 04/30/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Lindsey Mase

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | TAL Metals (7)(C ) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | FWGmw-016-190401-GW | — | 4/29/19 | 1520 | W | 2 | 1 | | 3 | |

Requested Parameters

Relinquished by: Amanda Sprinzl — Signature — Printed Name: AMANDA SPRINZL — Company: Leidos — Date: 04/30/19 — Time: 1505

Received by: Test America — Signature: RC Robison — Printed Name: RICK ROBISON — Company — Date: 4/30/19 — Time: 1505

Relinquished by — Signature — Printed Name — Company — Date: 4/30 — Time: 1615

Received by: TA Dev — Signature: Reed Puthuff — Printed Name: Reed Puthuff — Company — Date: 5/1/19 — Time: 0915

Notes: Total Number of Containers: 3

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

0.6, 0.6 IR# 9 a.d Transfer RP 5/1/19

# Chain of Custody Record

leidos

Page 1 of 1

COC No.: RVAAP- 111 -TA

Date: 05/01/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

L. Mayer — Lindsey Mayer

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Cyanide (8)(D) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | FBQmw-172-190401-GW | | 4/30/19 | 1351 | W | 1 | | 1 | |
| | FBQmw-172-190402-GW | | 4/30/19 | 1351 | W | 1 | | 1 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Requested Parameters

Relinquished by: Jed Thomas — Signature: Jed Thomas — Printed Name: Leidos Leidos — Company: Leidos
Date: 05/01/19 — Time: 1515

Relinquished by — Signature — Printed Name — Company
Date: 5/1/19 — Time: 1632

Received by: M. Kowalski TA Canton — Signature — Printed Name — Company
Date: 5/2/19 — Time: 8:50

Notes: Total Number of Containers: 2

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

0.6, 1.8, +0, IR9, Received by SS, 5/2/19

280-123261 Chain of Custody

# Chain of Custody Record

leidos

Page 1 of 1

COC No.: RVAAP-112-TA

Date: 05/01/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name) Ryan Lanich

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Cyanide (8)(D) | Sulfide (9)(E) | Nitrate/Nitrite/Sulfate (10)(A) | Alkalinity (14)(A) | Temperature Blank | Total Number of Containers |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | FBQmw-171-190401-GW | — | 4/30/19 | 1420 | W | 1 | 1 | 1 | | | 3 |

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS

Relinquished by: Jed Thomas — Date: 05/01/19 — Time: 1515
Printed Name: Jed Thomas — Company: Leidos

Received by: Test America — Signature: RC — Printed Name: RICK ROBSON — Company:
Date: 5/1/19 — Time: 1515

Relinquished by: RC — Date: 5/1/19 — Time: 1632
Printed Name: — Company:

Received by: — Signature: — Printed Name: — Company:
Date: 5/2/19 — Time: 850

Notes:
Total Number of Containers: 3

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP- 113 -TA
Date: 05/01/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | Sulfide (9)(E) | Nitrate/Nitrite/Sulfate (10)(A) | Alkalinity (14)(A) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FBQmw-174-190401-GW | — | 4/30/19 | 1507 | W | 2 | 1 | 1 | | | 4 | |

Ans 04/30/19

Total Number of Containers: 4

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Jed Thomas | 05/01/19 | Test America | 5/1/19 |
| Signature | | Signature | |
| Jed Thomas | Time | Rick Robison | Time |
| Printed Name | 1515 | Printed Name | 1515 |
| Leidos | | | |
| Company | | Company | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| | 5/1/19 | TA Denver | 5/2/19 850 |
| Signature | | Signature | |
| Rc Robison | Time | Printed Name | Time |
| Printed Name | 1632 | | |
| Company | | Company | |

Notes:
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-21-TA

Date: 05/01/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Jackie Mitchell

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Requested Parameters: Nitroguanidine (6)(A) | Nitrocellulose (12)(A) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | FWGmw-023-190401-GW | GW | 05/01/19 | 1009 | W | 2 | 2 | | 4 | |

JJ 05/01/19

| Relinquished by | Date | Received by | Date | Notes: Total Number of Containers: 4 |
|---|---|---|---|---|
| Signature: Jed Thomas | 05/01/19 | Signature: Test America | 5/1/19 | A. Cool, 4C<br>B. HCl, pH<2, Cool, 4C<br>C. HNO3, pH<2, Cool, 4C<br>D. NaOH, pH>12, Cool 4C |
| Printed Name: Jed Thomas | Time: 1515 | Printed Name: Rick Robison | Time: 1515 | 1. SW 8260B<br>2. SW 8270D<br>3. SW 8270D SIM<br>4. SW 8082A<br>5. SW 8081B<br>6. SW 8330<br>7. SW 6010/6020/7470<br>8. SW 9012B<br>9. SW 9034<br>10. SW 9056/9056A<br>11. SW 6860<br>12. EPA 353.2<br>13. SW 7196<br>14. SM2320B |
| Leidos / Company | | Company | | Notes: |
| Relinquished by | Date 5/1/19 | Received by | Date 5/2/19 8:50 | |
| Signature | | Signature | | |
| Printed Name | Time 1632 | Printed Name | Time | |
| Company | | Company | | |

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP- 115 -TA

Date: 05/01/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
RYAN LAURICH

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Nitrate (10)(A) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | LL12mw-247-190401-GW | | 5/1/19 | 1015 | W | 1 | 1 | | 2 | |

05/01/19

Relinquished by: Jed Thomas — Signature — Jed Thomas — Printed Name — Leidos — Company
Date: 05/01/19 Time: 1515

Received by: Test America — Signature — Rick Robison — Printed Name — Company
Date: 5/1/19 Time: 1515

Relinquished by: Rick Robison — Signature — Printed Name — Company
Date: 5/1/19 Time: 1632

Received by: [signature] — Signature — Printed Name — Company
Date: 5/2/19 Time: 850

Notes: Total Number of Containers: 2

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-114-TA

Date: 05/01/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
L. Meyer Lindsey Meyer

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Cyanide (8)(D) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | LL12mw-183-190401-GW | | 5/1/19 | 1017 | W | 1 | | 1 | |

Requested Parameters

JT 05/01/19

| Relinquished by | Date | Received by | Date | Time |
|---|---|---|---|---|
| Signature: Jed Thomas | 05/01/19 | Signature: TestAmerica | 5/1/19 | |
| Printed Name: Jed Thomas | Time: 1515 | Printed Name: RACK ROBISON | Time: 1515 | |
| Company: Leidos | | Company: | | |
| Relinquished by | Date: 5/1/19 | Received by | Date: 5/2/19 | |
| Signature: RC | Time: 1632 | Signature: | Time: 850 | |
| Printed Name: | | Printed Name: | | |
| Company: | | Company: | | |

Notes: Total Number of Containers: 1

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

# Chain of Custody Record

leidos

COC No.: RVAAP- 117 -TA

Page 1 of 1

Date: 05/01/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Charles Spurr

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Cyanide (8)(D) | TAL Metals (7)(C ) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | LL7mw-001-190401-GW | | 5/1/19 | 1020 | W | 1 | 1 | | 2 | |

Jed Thomas 05/01/19

| Relinquished by | Date | Received by | Date | Notes: Total Number of Containers: 2 |
|---|---|---|---|---|
| Signature: Jed Thomas | 5/01/19 | Signature: Test America | 5/1/19 | A. Cool, 4C<br>B. HCl, pH<2, Cool, 4C<br>C. HNO3, pH<2, Cool, 4C<br>D. NaOH, pH>12, Cool 4C |
| Printed Name: Jed Thomas | Time: 1515 | Printed Name: Rick Robison | Time: 1515 | 1. SW 8260B Notes:<br>2. SW 8270D<br>3. SW 8270D SIM<br>4. SW 8082A<br>5. SW 8081B |
| Company: Leidos | | Company | | 6. SW 8330<br>7. SW 6010/6020/7470<br>8. SW 9012B<br>9. SW 9034<br>10. SW 9056/9056A<br>11. SW 6860<br>12. EPA 353.2<br>13. SW 7196<br>14. SM2320B |
| Relinquished by | Date | Received by | Date | |
| Signature | 5/1/19 | Signature | 5/2/19 850 | |
| Printed Name | Time: 1632 | Printed Name | Time | |
| Company | | Company | | |

Shipment Method: Courier

Temperature Blank

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

# Chain of Custody Record

leidos

Page 1 of 1

COC No.: RVAAP-120-TA

Date: 05/01/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Charles Spurr

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | LL7mw-006-190401-GW | | 5/1/19 | 1205 | W | 2 | | 2 | |
| | | | | 05/01/19 | | | | | |

Requested Parameters

| Relinquished by | Date | Received by | Date | Notes: Total Number of Containers: 2 |
|---|---|---|---|---|
| Jed Thomas (Signature) | 05/01/19 | Test America (Signature) | 5/1/19 | A. Cool, 4C |
| Jed Thomas (Printed Name) | Time 1515 | Rick Robison (Printed Name) | Time 1525 | B. HCl, pH<2, Cool, 4C |
| Leidos (Company) | | (Company) | | C. HNO3, pH<2, Cool, 4C |
| | | | | D. NaOH, pH>12, Cool 4C |
| Relinquished by | Date | Received by | Date | 1. SW 8260B Notes: |
| R C (Signature) | 5/1/19 | (Signature) | 5/2/19 | 2. SW 8270D |
| (Printed Name) | Time 1632 | (Printed Name) | Time 850 | 3. SW 8270D SIM |
| (Company) | | (Company) | | 4. SW 8082A |
| | | | | 5. SW 8081B |
| | | | | 6. SW 8330 |
| | | | | 7. SW 6010/6020/7470 |
| | | | | 8. SW 9012B |
| | | | | 9. SW 9034 |
| | | | | 10. SW 9056/9056A |
| | | | | 11. SW 6860 |
| | | | | 12. EPA 353.2 |
| | | | | 13. SW 7196 |
| | | | | 14. SM2320B |

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-119 -TA

Date: 05/01/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Jackie Mitchell

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | VOCs (1)(B) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | LL10mw-003-190401-GW | GW | 05/01/19 | 1230 | W | 3 | | 3 | |
| | LL10mw-003-190402-GW | GW | 05/01/19 | ↓ | W | 3 | | 3 | |
| | FWGTB-191002-TB | | 05/01/19 | 1215 | W | 2 | | 2 | |

JT 05/01/19

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Jed Thomas (Signature) | 05/01/19 | 1st America (Signature) | 5/1/19 |
| Jed Thomas (Printed Name) | Time 1515 | RC Robson (Printed Name) | Time 1515 |
| Leidos (Company) | | Rick Robson (Company) | |
| Relinquished by | Date 5/1/19 | Received by | Date 5/2/19 850 |
| RC Robson (Signature) | Time 1632 | [signature] TA 5/2/19 Denver (Signature) | Time |
| Printed Name | | Printed Name | |
| Company | | Company | |

Notes: Total Number of Containers: 8

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

**Temperature Blank**

Lab:

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

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-116-TA
Date: 05/01/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Ryan Lanuch

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Nitrate (10)(A) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | LL12mw-185-190401-GW | | 5/1/19 | 1240 | W | 1 | | 1 | |

JT 05/01/19

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Jed Thomas | 05/01/19 | Test America | 5/1/19 |
| Signature | | Signature | |
| Jed Thomas | Time | RC Robison | Time |
| Printed Name | 1515 | Printed Name | 1515 |
| Leidos | | Rick Robison | |
| Company | | Company | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| | 5/1/19 | [signature] | 5/2/19 850 |
| Signature | | Signature | |
| RC Robison | Time | | Time |
| Printed Name | 1632 | Printed Name | |
| Company | | Company | |

Notes: Total Number of Containers: 1

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP- 118 -TA

Date: 05/01/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Charles Spurr

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No | Sample ID | Site Type | Date | Time | Matrix | Requested Parameters: Cyanide (8)(D) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | LL11mw-005-190401-GW | | 5/1/19 | 1400 | W | 1 | | 1 | |

JT 05/01/19

| Relinquished by | Date | Received by | Date | Time |
|---|---|---|---|---|
| Signature: Jed Thomas | 05/01/19 | Signature: Test America | 5/1/19 | 1515 |
| Printed Name: Jed Thomas | Time: 1515 | Printed Name: Rick Robson | | |
| Company: Leidos | | Company | | |
| Relinquished by | Date: 5/2/19 | Received by: TA Canton | Date: 5/2/19 0850 | |
| Signature: Rick Robson | Time: 1632 | Signature | Time | |
| Printed Name | | Printed Name | | |
| Company | | Company | | |

Notes: Total Number of Containers: 1

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 8012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

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

# Chain of Custody Record

eurofins | Environment Testing TestAmerica

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: Rydberg, Donna R | Carrier Tracking No(s): | COC No: 280-481782.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: donna.rydberg@testamericainc.com | State of Origin: Ohio | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): DoD ELAP - A2LA | | Job #: 280-123261-1 |
| Address: 880 Riverside Parkway, , | Due Date Requested: 5/20/2019 | | | |
| City: West Sacramento | TAT Requested (days): | | | |
| State, Zip: CA, 95605 | | | | |
| Phone: 916-373-5600(Tel) 916-372-1059(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Leidos RFP# 001088 - Ravenna AAP-66 | 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, 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) | 8330_NGu/Filtration_47D Nitroguanidine Only | 353.2_Nitrocell/NCEL_Prep_A (MOD) Local Method | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| FWGmw-023-190401-GW (280-123261-5) | 5/1/19 | 10:09 Eastern | | Water | | | X | X | 4 | Q5.0_DIL1 |

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out 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 TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

| *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: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|---|
| 1 | Dawna Castro | 5-3-19 1325 | TAL D | | 905 5/4/19 | TAL SAC |
| 2 | Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| 3 | Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 0.5 |
|---|---|---|

Ver: 01/16/2019

280-123330 Chain of Custody

leidos

# hain of Custody Record

Page of 1

COC No.: RVAAP-122-TA

Date: 5/1/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

D. Maye Lindsey Maye

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Nitrate (10)(A) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | LL12mw-242-190401-GW | | 5/1/19 | 1405 | W | 1 | 1 ST | | 2 ST | Please analyze and report metals as two parameters 1) filtered ST filtered metals and 2) unfiltered metals |

OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS

| Relinquished by | Date | Received by | Date | Time |
|---|---|---|---|---|
| Signature | 5/2/19 | Signature | 5/2/19 | 1500 |
| Printed Name: Heather Means | Time: 1500 | Printed Name: Rick Robison | Time: 1500 | |
| Company: Leidos | | Company | | |
| Relinquished by | Date | Received by | Date | Time |
| Signature | 5/3 | Signature | 5/3/19 | 900 |
| Printed Name | Time: 1630 | Printed Name: Chris Kovatch | Time: 900 | |
| Company | | Company: TAL | | |

5/3/19

Notes: Total Number of Containers: 3

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

# Chain of Custody Record

leidos

Page of 1

COC No.: RVAAP-123-TA

Date: 05/01/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Jackie Mitchell

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Requested Parameters: TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | LL10mw-005-190401-GW | GW | 05/01/19 | 1505 | W | 1 | | 1 | |

| Relinquished by | Date | Received by | Date | Notes: Total Number of Containers: 1 |
|---|---|---|---|---|
| Signature | 5/2/19 | Test America<br>Signature | 5/2/19 | A. Cool, 4C<br>B. HCl, pH<2, Cool, 4C<br>C. HNO3, pH<2, Cool, 4C<br>D. NaOH, pH>12, Cool 4C |
| Heather Adams | Time 1500 | Rick Robison | Time 1500 | 1. SW 8260B Notes:<br>2. SW 8270D<br>3. SW 8270D SIM<br>4. SW 8082A<br>5. SW 8081B<br>6. SW 8330<br>7. SW 6010/6020/7470<br>8. SW 9012B<br>9. SW 9034<br>10. SW 9056/9056A<br>11. SW 6860<br>12. EPA 353.2<br>13. SW 7196<br>14. SM2320B |
| Printed Name<br>Leidos<br>Company | | Printed Name<br>Company | | |
| Relinquished by<br>Signature | Date 5/3 | Received by<br>Signature | Date 5/3/19 | |
| Printed Name<br>Company | Time 1630 | Chris Kovitch<br>Printed Name<br>TA Oen<br>Company | Time 900 | |

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page of 1

COC No.: RVAAP- 124 -TA

Date: 05/02/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Charles Spurr

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Requested Parameters: Nitroguanidine (6)(A) | Nitrocellulose (12)(A) | Temperature Blank | Total Number of Containers |
|---|---|---|---|---|---|---|---|---|---|
| | FWGmw-022-190401-GW | | 5/2/19 | 0915 | W | 2 | 2 | | 4 |

| Relinquished by | Date | Received by | Date | Notes: Total Number of Containers: 4 |
|---|---|---|---|---|
| Signature | 5/2/19 | Signature | 5/2/19 | A. Cool, 4C<br>B. HCl, pH<2, Cool, 4C<br>C. HNO3, pH<2, Cool, 4C<br>D. NaOH, pH>12, Cool 4C |
| Heather Adams | Time 1500 | Rick Robison | Time 1500 | 1. SW 8260B Notes:<br>2. SW 8270D<br>3. SW 8270D SIM<br>4. SW 8082A<br>5. SW 8081B<br>6. SW 8330<br>7. SW 6010/6020/7470<br>8. SW 9012B<br>9. SW 9034<br>10. SW 9056/9056A<br>11. SW 6860<br>12. EPA 353.2<br>13. SW 7196<br>14. SM2320B |
| Leidos | | Test America | | |
| Company | | Company | | |
| Relinquished by | Date 5/2 | Received by | Date 5/3/19 | |
| Signature | | Signature | | |
| Printed Name | Time 1630 | Printed Name | Time 900 | |
| Company | | Company | | |

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page of 1

COC No.: RVAAP- 128 -TA

Date: 05/02/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Jackie Mitchell

Requested Parameters

| Laboratory No. | Sample ID | Site Type | | Date | Time | Matrix | Cyanide (8)(D) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | LL2mw-264-190401-GW | GW | | 05/02/19 | 1005 | W | 1 | | 1 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Relinquished by | Date | Received by | Date | Notes: Total Number of Containers: 1 |
|---|---|---|---|---|
| Signature | 5/2/19 | Signature | 5/2/19 | A. Cool, 4C<br>B. HCl, pH<2, Cool, 4C<br>C. HNO3, pH<2, Cool, 4C<br>D. NaOH, pH>12, Cool 4C |
| Printed Name: HEATHER ADAMS | Time: 1500 | Printed Name: Rick Robison | Time: 1500 | 1. SW 8260B Notes:<br>2. SW 8270D<br>3. SW 8270D SIM<br>4. SW 8082A<br>5. SW 8081B<br>6. SW 8330<br>7. SW 6010/6020/7470<br>8. SW 9012B<br>9. SW 9034<br>10. SW 9056/9056A<br>11. SW 6860<br>12. EPA 353.2<br>13. SW 7196<br>14. SM2320B |
| Company: Leidos | | Company | | |
| Relinquished by | Date 5/2 | Received by | Date 5/3/19 | |
| Signature | | Signature | | |
| Printed Name | Time 1630 | Printed Name | Time 900 | |
| Company | | Company | | |

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page of 1

COC No.: RVAAP-125-TA

Date: 05/02/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Charles Spurr

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Requested Parameters: Nitroguanidine (6)(A) | Nitrocellulose (12)(A) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | FWGmw-019-190401-GW | | 5/2/19 | 1035 | W | 2 | 2 | | 4 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

| Relinquished by | Date | Received by | Date | Notes: Total Number of Containers: 4 |
|---|---|---|---|---|
| Signature | 5/2/19 | Signature | 5/2/19 | A. Cool, 4C |
| Heather Adams | Time 1500 | Rick Robison | Time 1500 | B. HCl, pH<2, Cool, 4C |
| Printed Name | | Printed Name | | C. HNO3, pH<2, Cool, 4C |
| Leidos | | Company | | D. NaOH, pH>12, Cool 4C |
| Company | | | | |
| Relinquished by | Date 5/3 | Received by | Date 5/3/19 | 1. SW 8260B Notes: |
| Signature | | Signature | | 2. SW 8270D |
| Printed Name | Time 1630 | Printed Name TA Del | Time 900 | 3. SW 8270D SIM |
| Company | | Company | | 4. SW 8082A |
| | | | | 5. SW 8081B |
| | | | | 6. SW 8330 |
| | | | | 7. SW 6010/6020/7470 |
| | | | | 8. SW 9012B |
| | | | | 9. SW 9034 |
| | | | | 10. SW 9056/9056A |
| | | | | 11. SW 6860 |
| | | | | 12. EPA 353.2 |
| | | | | 13. SW 7196 |
| | | | | 14. SM2320B |

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page of 1

COC No.: RVAAP- 126 -TA

Date: 05/02/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Nitrate (10)(A) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | LL12mw-187-190401-GW | | 5/2/19 | 1148 | W | 1 | 1 | | 2 | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature | 5/2/19 | Signature | 5/2/19 |
| Printed Name: Heather Adams | Time: 1500 | Printed Name: Rick Robison | Time: 1500 |
| Company: Leidos | | Company: | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature | 5/2 | Signature | 5/3/19 |
| Printed Name | Time: 1630 | Printed Name: Chris Kovitch | Time: 900 |
| Company | | Company: TA Dan | |

Notes: Total Number of Containers: 2

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page of 1

COC No.: RVAAP- 127 -TA
Date: 05/02/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | Nitrate (10)(A) | TAL metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | LL12mw-245-190401-GW | | 5/2/19 | 1230 | W | 2 | 1 | 1 | | 4 | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature: [signature] | 05/02/19 | Signature: Test America | 5/2/19 |
| Printed Name: HEATHER Adams | Time: 1500 | Printed Name: RC Robison | Time: 1500 |
| Company: Leidos | | Company: Rick Robison | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature: [signature] | 5/2 | Signature: [signature] TADen Chris Kovach | 5/3/19 |
| Printed Name: [signature] | Time: 1630 | Printed Name: TADen | Time: 900 |
| Company: | | Company: TADen | |

Notes: Total Number of Containers: 4

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

**Temperature Blank**

Lab:

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

# Chain of Custody Record

leidos

Page of 1

COC No.: RVAAP- 17-TA

Date: 05/02/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Jackie Mitchell

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | | Date | Time | Matrix | Explosives (6)(A) | TAL Metals (7)(C ) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | LL2mw-267-190401-GW | GW | | 05/02/19 | 1320 | W | 2 | 1 | | 3 | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

Requested Parameters

| Relinquished by | Date | Received by | Date | Notes: Total Number of Containers: 3 |
|---|---|---|---|---|
| Signature | 5/2/19 | Signature | 5/2/19 | A. Cool, 4C<br>B. HCl, pH<2, Cool, 4C<br>C. HNO3, pH<2, Cool, 4C<br>D. NaOH, pH>12, Cool 4C |
| Printed Name: Heather Adams | Time: 1500 | Printed Name: Rick Robison | Time: 1500 | 1. SW 8260B<br>2. SW 8270D<br>3. SW 8270D SIM<br>4. SW 8082A<br>5. SW 8081B<br>6. SW 8330<br>7. SW 6010/6020/7470<br>8. SW 9012B<br>9. SW 9034<br>10. SW 9056/9056A<br>11. SW 6860<br>12. EPA 353.2<br>13. SW 7196<br>14. SM2320B |
| Leidos | | Test America | | |
| Company | | Company | | |
| Relinquished by | Date 5/2 | Received by | Date 5/3/19 | Notes: |
| Signature | | Signature | | |
| Printed Name | Time 1630 | Printed Name Chris Kovtch | Time 900 | |
| Company | | Company TA Denver | | |

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

COC No.: RVAAP- 131 -TA

Page of 1

Date: 05/02/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Charles Spurr

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Requested Parameters: Explosives (6)(A) | TAL Metals (7)(C ) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | LL1mw-087-190401-GW | | 5/2/19 | 1320 | W | 2 | 1 | | 3 | |

| Relinquished by | Date | Received by | Date | Notes: Total Number of Containers: 3 |
|---|---|---|---|---|
| Signature | 5/2/19 | Signature | 5/2/19 | A. Cool, 4C<br>B. HCl, pH<2, Cool, 4C<br>C. HNO3, pH<2, Cool, 4C<br>D. NaOH, pH>12, Cool 4C |
| Printed Name: HEATHER JOHNS | Time: 1500 | Printed Name: RICK ROBISON | Time: 1500 | 1. SW 8260B Notes:<br>2. SW 8270D<br>3. SW 8270D SIM<br>4. SW 8082A<br>5. SW 8081B |
| Leidos / Company | | Company | | 6. SW 8330<br>7. SW 6010/6020/7470<br>8. SW 9012B<br>9. SW 9034<br>10. SW 9056/9056A<br>11. SW 6860<br>12. EPA 353.2<br>13. SW 7196<br>14. SM2320B |
| Relinquished by | Date: 5/2 | Received by | Date: 5/3/19 | |
| Signature | | Signature | | |
| Printed Name | Time: 1630 | Printed Name: TA Courier | Time: 900 | |
| Company | | Company | | |

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page of 1

COC No.: RVAAP-132-TA

Date: 05/02/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Charles Spurr

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Requested Parameters: TAL Metals (7)(C ) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | SCFmw-004-190401-GW | | 5/2/19 | 1405 | W | 1 | | 1 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

| Relinquished by | Date | Received by | Date | Notes: Total Number of Containers: 1 |
|---|---|---|---|---|
| Signature | 5/2/19 | Test America Signature | 5/2/19 | A. Cool, 4C<br>B. HCl, pH<2, Cool, 4C<br>C. HNO3, pH<2, Cool, 4C<br>D. NaOH, pH>12, Cool 4C |
| Printed Name: HEATHER ADAMS | Time: 1500 | Printed Name: RICK ROBISON | Time: 1500 | 1. SW 8260B Notes:<br>2. SW 8270D<br>3. SW 8270D SIM<br>4. SW 8082A<br>5. SW 8081B<br>6. SW 8330<br>7. SW 6010/6020/7470<br>8. SW 9012B<br>9. SW 9034<br>10. SW 9056/9056A<br>11. SW 6860<br>12. EPA 353.2<br>13. SW 7196<br>14. SM2320B |
| Leidos Company | | Company | | |
| Relinquished by | Date | Received by | Date | |
| Signature | | Signature | 5/3/19 | |
| Printed Name | Time | Printed Name | Time 900 | |
| Company | | Company | | |

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

COC No.: RVAAP-133-TA

Page of 1

Date: 05/02/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
2.My Lindsey Mayer

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No | Sample ID | Site Type | Date | Time | Matrix | Requested Parameters: Cyanide (8)(D) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | LL4mw-200-190401-GW | | 5/2/19 | 1450 | W | 1 | | 1 | |

| Relinquished by | Date | Received by | Date | Notes: Total Number of Containers: 1 |
|---|---|---|---|---|
| Signature: [signature] | 5/2/19 | Signature: [signature] | 5/2/19 | A. Cool, 4C<br>B. HCl, pH<2, Cool, 4C<br>C. HNO3, pH<2, Cool, 4C<br>D. NaOH, pH>12, Cool 4C |
| Printed Name: HEATHER ADAMS | Time: 1500 | Printed Name: RICK ROBISON | Time: 1500 | 1. SW 8260B Notes:<br>2. SW 8270D<br>3. SW 8270D SIM<br>4. SW 8082A<br>5. SW 8081B |
| Leidos | | Company | | 6. SW 8330<br>7. SW 6010/6020/7470<br>8. SW 9012B<br>9. SW 9034<br>10. SW 9056/9056A<br>11. SW 6860<br>12. EPA 353.2<br>13. SW 7196<br>14. SM2320B |
| Relinquished by | Date | Received by | Date | |
| Signature: [signature] | 5/3/19 | Signature: [signature] | 5/3/19 | |
| Printed Name: | Time: 1615 | Printed Name: [signature] | Time: ~~1615~~ 900 | |
| Company | | Company: TA Courier | | |

Shipment Method: Courier

Temperature Blank

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

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

# Chain of Custody Record

eurofins | Environment Testing TestAmerica

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: Rydberg, Donna R | Carrier Tracking No(s): | COC No: 280-482181.1 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: donna.rydberg@testamericainc.com | State of Origin: Ohio | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): DoD ELAP - A2LA | | Job #: 280-123330-2 |
| Address: 880 Riverside Parkway, , | Due Date Requested: 5/21/2019 | | | |
| City: West Sacramento | TAT Requested (days): | | | |
| State, Zip: CA, 95605 | | | | |
| Phone: 916-373-5600(Tel) 916-372-1059(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Leidos RFP# 001088 - Ravenna AAP-66 | Project #: 28018729 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

| | |
|---|---|
| A - HCL | M - Hexane |
| B - NaOH | N - None |
| C - Zn Acetate | O - AsNaO2 |
| D - Nitric Acid | P - Na2O4S |
| E - NaHSO4 | Q - Na2SO3 |
| F - MeOH | R - Na2S2O3 |
| G - Amchlor | S - H2SO4 |
| H - Ascorbic Acid | T - TSP Dodecahydrate |
| I - Ice | U - Acetone |
| J - DI Water | V - MCAA |
| K - EDTA | W - pH 4-5 |
| L - EDA | 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) | 8330_NGu/Filtration_47D Nitroguanidine Only | 353.2_Nitrocell/NCEL_Prep_A (MOD) Local Method | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| FWGmw-022-190401-GW (280-123330-3) | 5/2/19 | 09:15 Eastern | | Water | | | X | X | 4 | Q5.0_DIL1 |
| FWGmw-019-190401-GW (280-123330-5) | 5/2/19 | 10:35 Eastern | | Water | | | X | X | 4 | Q5.0_DIL1 |

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out 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 TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

| | |
|---|---|
| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *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: Laura Castro | Date/Time: 5-6-19 1430 | Company: TAD | Received by: [signature] | Date/Time: 7 May 19 0910 | Company: ETAW Sac |
| Relinquished by: | Date/Time: | Company: | Received by: | Date/Time: | Company: |
| Relinquished by: | Date/Time: | Company: | Received by: | Date/Time: | Company: |

| | | |
|---|---|---|
| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: MAN 5/7/19 seal | Cooler Temperature(s) °C and Other Remarks: 2.1°C 1.6°C 0.8°C |

Ver: 01/16/2019

leidos

# Chain of Custody Record

Page of 1

COC No.: RVAAP-[illegible]-TA

Date: 05/06/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Charles Spur

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | Sulfide (9)(E) | Nitrate/Nitrite/Sulfate (10)(A) | Alkalinity (14)(A) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LL1mw-084-190401-GW | | 5/6/19 | 0925 | W | 2 | 1 | 1 | | 1 | | 5 | |

280-123457 Chain of Custody

| Relinquished by | Date | Received by | Date | Time |
|---|---|---|---|---|
| Signature | 5/6/19 | Signature | 5/6/19 | 1518 |
| Printed Name: HEATHER Adams | Time: 1500 | Printed Name: RICK ROBISON | | |
| Company: Leidos | | Company: TestAmerica | | |
| Relinquished by | Date | Received by | Date | Time |
| Signature | | Signature | 5/7/19 | 0945 |
| Printed Name | | Printed Name | | |
| Company | | Company | | |

Notes: Total Number of Containers: 5

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

2.2. to, IR#9 by AP 5/7/19

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-(39)-TA

Date: 5-6-19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Gabby Gramofsky

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | LL3mw-244-190401-GW | | 5-6-19 | 1040 | W | 2 | 1 | | 3 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Relinquished by | Date | Received by | Date | Time |
|---|---|---|---|---|
| Signature | 5/6/19 | Test America | 5/6/19 | 1517 |
| Heather Adams | Time | Signature | Time | |
| Printed Name | 1500 | Printed Name | | |
| Leidos | | Rick Robson | | |
| Company | | Company | | |
| Relinquished by | Date | Received by | Date | Time |
| Signature | | Signature | 5/7/19 | 0945 |
| Printed Name | Time | Printed Name | Time | |
| Company | | Company | | |

Notes:
Total Number of Containers: 3

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page of 1

COC No.: RVAAP- 139 -TA

Date: 05/06/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Charles Spurr

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | Sulfide (9)(E) | Nitrate/Nitrite/Sulfate (10)(A) | Alkalinity (14)(A) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LL1mw-083-190401-GW | | 5/6/19 | 1135 | W | 2 | 1 | 1 | | | 4 | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature | 5/6/19 | Signature | 5/6/19 |
| Printed Name: HEATHER Adams | Time: 1500 | Printed Name: RKK ROBSON | Time: 1518 |
| Company: Leidos | | Company: | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature | | Signature | 5/7/19 |
| Printed Name | Time | Printed Name | Time: 0945 |
| Company | | Company | |

Notes: Total Number of Containers: 4

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

**Temperature Blank**

Lab:

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

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-140-TA

Date: 5-6-19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Gabby Granofsky

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | LL3mw-237-190401-GW | | 5-6-19 | 1415 | W | 2 | | 2 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Relinquished by | Date | Received by | Date | Time |
|---|---|---|---|---|
| Signature | 5/6/19 | Signature | 5/6/19 | 1548 |
| Printed Name: HEATHER ADAMS | Time: 1500 | Printed Name: RICK ROBSON | Time: 1548 | |
| Company: Leidos | | Company | | |
| Relinquished by | Date | Received by | Date | Time |
| Signature | | Signature | 5/7/19 | 0945 |
| Printed Name | Time | Printed Name | Time: 0945 | |
| Company | | Company | | |

Notes: Total Number of Containers: 2

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP- 135-TA

Date: 5-6-19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Gabby Gronefsky

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | LL2mw-059-190401-GW | | 5-6-19 | 0905 | W | 2 | 1 | | 3 | |

Requested Parameters

| Relinquished by | Date | Received by | Date | Notes: Total Number of Containers: 3 |
|---|---|---|---|---|
| Signature | 5/6/19 | Signature | 5/6/19 | A. Cool, 4C |
| Heather Adams | Time | Printed Name | Time | B. HCl, pH<2, Cool, 4C |
| Printed Name | 1600 | Rick Parsons | 1518 | C. HNO3, pH<2, Cool, 4C |
| Leidos | | Company | | D. NaOH, pH>12, Cool 4C |
| Company | | | | |

| Relinquished by | Date | Received by | Date | 1. SW 8260B Notes: |
|---|---|---|---|---|
| Signature | | Signature | 5/7/19 | 2. SW 8270D |
| | Time | | Time | 3. SW 8270D SIM |
| Printed Name | | Printed Name | 0945 | 4. SW 8082A |
| | | | | 5. SW 8081B |
| Company | | Company | | 6. SW 8330 |
| | | | | 7. SW 6010/6020/7470 |
| | | | | 8. SW 9012B |
| | | | | 9. SW 9034 |
| | | | | 10. SW 9056/9056A |
| | | | | 11. SW 6860 |
| | | | | 12. EPA 353.2 |
| | | | | 13. SW 7196 |
| | | | | 14. SM2320B |

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page of 1

COC No.: RVAAP- 142-TA
Date: 05/06/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Charles Spurr

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | Cyanide (8)(D) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | LL1mw-081-190401-GW | | 5/6/19 | 1505 | W | 2 | 1 | | 3 | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature | 05/07/19 | Test America Signature | 5/7/19 |
| Heather Adams Printed Name | Time 1515 | RC Robison Printed Name | Time 1515 |
| Leidos Company | | Rick Robison Company | |
| Relinquished by | Date 5/7 | Received by TA Den | Date 5/8/19 905 |
| Signature | | Signature | |
| Printed Name | Time 1622 | Chris Kovitch Printed Name | Time 905 |
| Company | | TA Denver Company | |

Notes: Total Number of Containers: 3

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page of 1

COC No.: RVAAP-14 -TA

Date: 05/06/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Q. Myer Lindsey Myer

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Cyanide (8)(D) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | LL3mw-234-190401-GW | | 05/06/19 | 1455 | W | 1 | | 1 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Requested Parameters

Relinquished by: Signature [signature] Printed Name Heather Leidos Company — Date 05/07/19 — Time 1515

Received by: Signature TestAmerica Printed Name RC - RICK TESSEAU Company — Date 5/7/19 — Time 1515

Relinquished by: Signature [signature] Printed Name [illegible] Company — Date 5/8/19 — Time 1622

Received by: Signature TA DOT Chris Kuehl Printed Name TA Courier Company — Date 5/8/19 905 — Time 905

Notes: Total Number of Containers: 1

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

# Chain of Custody Record

leidos

Page of 1

COC No.: RVAAP-42-TA

Date: 05/06/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Charles Spurr

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | Cyanide (8)(D) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | LL1mw-081-190401-GW | | 5/6/19 | 1505 | W | 2 | 1 | | 3 | |

Relinquished by
Signature
Printed Name: Heather Adams
Company: Leidos
Date: 05/07/19
Time: 1515

Received by
Signature
Printed Name: Rick Rossow
Company
Date: 5/7/19
Time: 1515

Relinquished by
Signature
Printed Name
Company
Date: 5/7/19
Time: 622

Received by
Signature
Printed Name: Chris Kavitch
Company: TA Denver
Date: 5/8/19 905
Time: 905

Notes: Total Number of Containers: 3

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page of 1

COC No.: RVAAP-141-TA
Date: 05/06/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Q. Myer Lindsey Moran

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Cyanide (8)(D) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | LL3mw-234-190401-GW | | 05/06/19 | 1455 | W | 1 | | 1 | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature: [signature] | 05/07/19 | Signature: Test America RC Robson | 5/7/19 |
| Printed Name: Heather | Time: 1515 | Printed Name: - Rick Robison | Time: 1515 |
| Company: Leidos | | Company: | |
| Relinquished by | Date: 5/7 | Received by: TA Den | Date: 5/8/19 |
| Signature: [signature] | | Signature: [signature] | 905 |
| Printed Name: | Time: 1622 | Printed Name: Chris Kovitch TA Denver | Time: 905 |
| Company: | | Company: | |

Notes: Total Number of Containers: 1
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

# Chain of Custody Record

leidos

Page of 1

COC No.: RVAAP- 130-TA

Date: 05/06/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Lindsey Mayer

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Requested Parameters: Cyanide (8)(D) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | LL2mw-272-190401-GW | | 05/06/19 | 1110 | W | 1 | | 1 | |

| Relinquished by | Date | Received by | Date | Time |
|---|---|---|---|---|
| Signature | 5/6/19 | Test America Signature | 5/6/19 | 1518 |
| Printed Name: Heather Adams | Time: 1500 | Printed Name: Rick Robison | | |
| Company: Leidos | | Company | | |
| Relinquished by | Date | Received by | Date | Time |
| Signature | | Signature | 5/7/19 | 0945 |
| Printed Name | | Printed Name | | |
| Company | | Company | | |

Notes: Total Number of Containers: 1

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

# Chain of Custody Record

leidos

COC No.: RVAAP- 15 -TA

Page of 1

Date: 05/07/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Lindsey Mayer

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Requested Parameters: TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | LL1mw-064-190401-GW | | 05/07/19 | 1429 | W | 1 | | 1 | |

280-123467 Chain of Custody

| Relinquished by | Date | Received by | Date | Time |
|---|---|---|---|---|
| Signature | 5/7/19 | Signature | 5/7/19 | 1515 |
| Printed Name: Heather Adams | Time: 1515 | Printed Name: Rick Robison | Time: 1515 | |
| Company: Leidos | | Company: Test America | | |
| Relinquished by | Date | Received by | Date | Time |
| Signature | 5/7 | Signature | 5/8/19 | 905 |
| Printed Name | Time: 1615 | Printed Name: TA Courier | Time: 905 | |
| Company | | Company | | |

Notes:
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

Total Number of Containers: 1

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

3.9, 2.8, 0.1, +0, IR9, offered by SB, 5/8/19

leidos

# Chain of Custody Record

Page of 1

COC No.: RVAAP- 15@TA
Date: 05/07/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | LL1mw-065-190401-GW | | 05/07/19 | 1314 | W | 2 | 1 | | 3 | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature: [signature] | 5/7/19 | Signature: Test America | 5/7/19 |
| Printed Name: Heather Adams | Time: 1515 | Printed Name: Rick Robison | Time: 1515 |
| Company: Leidos | | Company: | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature: [signature] | 5/7 | Signature: [signature] | 5/8/19 |
| Printed Name: | Time: 1622 | Printed Name: Chris Kautz | Time: 905 |
| Company: | | Company: TA Cannell | |

Notes: Total Number of Containers: 3

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page of 1

COC No.: RVAAP-147-TA
Date: 05/07/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name) Ryan Lawrence

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Sulfide (9)(E) | Nitrate/Nitrite/Sulfate (10)(A) | Alkalinity (14)(A) | Hexavalent Chromium (13)(A) * | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FBQmw-175-190401-GW | | 5/7/19 | 1115 | W | 1 | 1 | | 1 | | 3 | Cr6 24 hr HT bottles stay at No. CANTON |
| | FBQmw-175-190401-GWMSD | | ↓ | 1115 | W | | | | 1 | | 1 | Cr6 24 hr HT bottles stay at No. CANTON |
| | FBQmw-175-190402-GW | | ↓ | 1115 | W | 1 | 1 | | 1 | | 3 | Cr6 24 hr HT bottles stay at No. CANTON |

Total Number of Containers: 7

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature: [signature] | 5/7/19 | Signature: Rick Robisch, Test America | 5/7/19 |
| Printed Name: Heather Adams | Time: 1515 | Printed Name: [signature] | Time: 1515 |
| Company: Leidos | | Company: | |
| Relinquished by: TAY 240 | Date: 5/7/19 | Received by: [signature] TA Den | Date: 5/8/19 |
| Signature: [signature] | | Signature: Chris Kovitch | 905 |
| Printed Name: | Time: 1622 | Printed Name: Chris Kovitch | Time: 905 |
| Company: | | Company: TA Den | |

Notes:
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page of 1

COC No.: RVAAP-46-TA

Date: 05/07/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

D. Mayer Lindsey Mayer

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Cyanide (8)(D) | Alkalinity (14)(A) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | LL1mw-086-190401-GW | | 05/07/19 | 1153 | W | 1 | 1 | 2 | 4 | 4 | ONE METAL FIELD FILTERED SAMPLE COLLECTED. |

Requested Parameters

Relinquished by
Signature
Heather Adams
Printed Name
Leidos
Company
Date 05/07/19
Time 1515

Received by
Signature
Rick Robison
Printed Name
Company
Date 5/7/19
Time 1515

Relinquished by
Signature
Printed Name
Company
Date 5/7
Time 1622

Received by
Signature
Chris Kartch
Printed Name
TA Denver
Company
Date 5/8/19
Time 905

Notes: Total Number of Containers: 3 4
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page of 1

COC No.: RVAAP- 145-TA
Date: 05/07/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Charles Spurr

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Cyanide (8)(D) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | EBGmw-131-190401-GW | | 5/7/19 | 1205 | W | 1 | | 1 | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature | 05/07/19 | Test America | 5/7/19 |
| Printed Name: Heather Adams | Time: 1515 | Printed Name: Rick Robison | Time: 1515 |
| Company: Leidos | | Company: | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature | 5/7 | Signature | 5/8/19 |
| Printed Name | Time: 1622 | Printed Name: Chris Kovitch | Time: 905 |
| Company | | Company: TA Canton | |

Notes: Total Number of Containers: 1

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

# Chain of Custody Record

leidos

Page of 1

COC No.: RVAAP-144-TA

Date: 05/07/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Charles Spurr

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Cyanide (8)(D) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | EBGmw-125-190401-GW | | 5/7/19 | 1055 | W | 1 | | 1 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Requested Parameters

Relinquished by (Signature) — Printed Name: HEATHER ADAMS — Company: Leidos — Date: 05/08/19 — Time: 1515

Received by (Signature) — Printed Name: Rick Robson — Company: Test America — Date: 5/7/19 — Time: 1515

Relinquished by (Signature) — Printed Name: — Company: — Date: 5/8/19 — Time: 1600

Received by (Signature) — Printed Name: Chris Kovitch — Company: TA Canton — Date: 5/8/19 905 — Time: 905

Notes:
Total Number of Containers: 1
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record



COC No.: RVAAP-143TA

Date: 5-7-19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Gabby Gurnofsky

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | Nitroguanidine (6)(A) | Nitrocellulose (12)(A) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | LL1mw-089-190401-GW | | 5-7-19 | 0920 | W | 2 | 2 | 2 | | 6 | |
| | LL1mw-089-190401-GWMSD | | 5-7-19 | 0920 | W | | 4 | 4 | | 8 | Extra Volume for MS/MSD |
| | LL1mw-089-190402-GW | | 5-7-19 | 0920 | W | 2 | 2 | 2 | | 6 | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

Requested Parameters

| Relinquished by | Date | Received by | Date | Notes: Total Number of Containers: 20 |
|---|---|---|---|---|
| Signature | 05/07/19 | Signature TestAmerica | 5/7/19 | A. Cool, 4C<br>B. HCl, pH<2, Cool, 4C<br>C. HNO3, pH<2, Cool, 4C<br>D. NaOH, pH>12, Cool 4C |
| Printed Name Heather Adams | Time 1515 | Printed Name Rick Robison | Time 1515 | 1. SW 8260B Notes:<br>2. SW 8270D<br>3. SW 8270D SIM<br>4. SW 8082A<br>5. SW 8081B |
| Leidos | | | | 6. SW 8330<br>7. SW 6010/6020/7470<br>8. SW 9012B<br>9. SW 9034<br>10. SW 9056/9056A<br>11. SW 6860<br>12. EPA 353.2<br>13. SW 7196<br>14. SM2320B |
| Company | | Company | | |
| Relinquished by | Date | Received by | Date | |
| Signature | 5/7 | Signature TA Denver | 5/8/19 | |
| Printed Name | Time 1622 | Printed Name Chris Kovitch | Time 905 | |
| Company | | Company TA Denver | | |

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page of 1

COC No.: RVAAP-147-TA

Date: 05/07/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Sulfide (9)(E) | Nitrate/Nitrite/Sulfate (10)(A) | Alkalinity (14)(A) | Hexavalent Chromium (13)(A)* | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FBQmw-175-190401-GW | | 5/7/19 | 1115 | W | 1 | 1 | | 1 | | 3 | Cr6 24 hr HT bottles stay at No. CANTON |
| | FBQmw-175-190401-GWMSD | | ↓ | 1115 | W | | | | 1 | | 1 | Cr6 24 hr HT bottles stay at No. CANTON |
| | FBQmw-175-190402-GW | | ↓ | 1115 | W | 1 | 1 | | 1 | | 3 | Cr6 24 hr HT bottles stay at No. CANTON |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

Relinquished by
Signature
Printed Name: Heather Adams
Company: Leidos
Date: 5/7/19
Time: 1515

Received by
Signature: Rick Robison
Printed Name
Company: Test America
Date: 5/7/19
Time: 1515

Relinquished by: TAJ 240
Signature
Printed Name
Company
Date: 5/7/19
Time: 1622

Received by
Signature
Printed Name
Company
Date: 5-7-19
Time: 1622

Notes: Total Number of Containers: 7

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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





280-123467 Chain of Custody

# Chain of Custody Record

leidos

COC No.: RVAAP- 15 -TA

Page of 1

Date: 05/07/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Lindsey Mayer

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Requested Parameters: TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | LL1mw-064-190401-GW | | 05/07/19 | 1429 | W | 1 | | 1 | |

280-123467 Chain of Custody

| Relinquished by | Date | Received by | Date | Time |
|---|---|---|---|---|
| Signature | 5/7/19 | Signature | 5/7/19 | 1515 |
| Printed Name: HEATHER Adams | Time: 1515 | Printed Name: Rick Robison | Time: 1515 | |
| Company: Leidos | | Company | | |
| Relinquished by | Date | Received by | Date | Time |
| Signature | 5/7 | Signature | 5/8/19 | 905 |
| Printed Name | Time: 1615 | Printed Name | Time: 905 | |
| Company | | Company | | |

Notes: Total Number of Containers: 1

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

3.9, 2.8, 0.1, +0, IR9, offered by SB, 5/8/19

leidos

# Chain of Custody Record

Page of 1

COC No.: RVAAP- 15-TA

Date: 05/07/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

DMayer Lindsey Mayer

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | TAL Metals (7)(C ) | Temperature Blank | Total Number of Containers |
|---|---|---|---|---|---|---|---|---|---|
| | LL1mw-065-190401-GW | | 05/07/19 | 1314 | W | 2 | 1 | | 3 |

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature | 5/7/19 | Signature | 5/7/19 |
| Heather Adams | Time 1515 | Printed Name Rick Robison | Time 1515 |
| Leidos | | Company | |
| Company | | | |
| Relinquished by | Date 5/7 | Received by | Date 5/8/19 |
| Signature | | Signature | |
| Printed Name | Time 1622 | Printed Name | Time 0905 |
| Company | | Company | |

Notes: Total Number of Containers: 3

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page of 1

COC No.: RVAAP-147-TA
Date: 05/07/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name) Ryan Lawrence

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Sulfide (9)(E) | Nitrate/Nitrite/Sulfate (10)(A) | Alkalinity (14)(A) | Hexavalent Chromium (13)(A) * | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FBQmw-175-190401-GW | | 5/7/19 | 1115 | W | 1 | 1 | | 1 | | 3 | Cr6 24 hr HT bottles stay at No. CANTON |
| | FBQmw-175-190401-GWMSD | | ↓ | 1115 | W | | | | 1 | | 1 | Cr6 24 hr HT bottles stay at No. CANTON |
| | FBQmw-175-190402-GW | | ↓ | 1115 | W | 1 | 1 | | 1 | | 3 | Cr6 24 hr HT bottles stay at No. CANTON |

Total Number of Containers: 7

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature: [signature] | 5/7/19 | Signature: Rick Robisch, Test America | 5/7/19 |
| Printed Name: Heather Adams | Time: 1515 | Printed Name: [signature] | Time: 1515 |
| Company: Leidos | | Company: | |
| Relinquished by: TAY 240 | Date: 5/7/19 | Received by: [signature] TA Den | Date: 5/8/19 |
| Signature: [signature] | | Signature: Chris Kovitch | 905 |
| Printed Name: | Time: 1622 | Printed Name: Chris Kovitch | Time: 905 |
| Company: | | Company: TA Den | |

Notes:
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page of 1

COC No.: RVAAP-46-TA

Date: 05/07/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

D. Mayer Lindsey Mayer

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Cyanide (8)(D) | Alkalinity (14)(A) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | LL1mw-086-190401-GW | | 05/07/19 | 1153 | W | 1 | 1 | 2 | 4 | 4 | ONE METAL FIELD FILTERED SAMPLE COLLECTED. |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

Relinquished by
Signature
Heather Adams
Printed Name
Leidos
Company
Date 05/07/19
Time 1515

Received by
Signature
Rick Robison
Printed Name
Company
Date 5/7/19
Time 1515

Relinquished by
Signature
Printed Name
Company
Date 5/8/19
Time 1622

Received by
Signature
Chris Kartch
Printed Name
TA Denver
Company
Date 5/8/19
Time 905

Notes: Total Number of Containers: 3 4
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page of 1

COC No.: RVAAP- 145-TA
Date: 05/07/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Charles Spurr

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Cyanide (8)(D) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | EBGmw-131-190401-GW | | 5/7/19 | 1205 | W | 1 | | 1 | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature | 05/07/19 | Test America | 5/7/19 |
| Printed Name: Heather Adams | Time: 1515 | Printed Name: Rick Robison | Time: 1515 |
| Company: Leidos | | Company: | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature | 5/7 | Signature | 5/8/19 |
| Printed Name | Time: 1622 | Printed Name: Chris Kovitch | Time: 905 |
| Company | | Company: TA Canton | |

Notes: Total Number of Containers: 1

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page of 1

COC No.: RVAAP-144-TA

Date: 05/07/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Charles Spurr

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Requested Parameters: Cyanide (8)(D) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | EBGmw-125-190401-GW | | 5/7/19 | 1055 | W | 1 | | 1 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Relinquished by
Signature
HEATHER ADAMS
Printed Name
Leidos
Company
Date 05/07/19
Time 1515

Received by
Test America
Signature
Rick Robson
Printed Name
Company
Date 5/7/19
Time 1515

Relinquished by
Signature
Printed Name
Company
Date 5/8/19
Time 1605

Received by
Signature
Chris Kovitch
Printed Name
TA Canton
Company
Date 5/8/19 905
Time 905

Notes: Total Number of Containers: 1

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record



COC No.: RVAAP-143TA

Date: 5-7-19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Gabby Gurnofsky

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | Nitroguanidine (6)(A) | Nitrocellulose (12)(A) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | LL1mw-089-190401-GW | | 5-7-19 | 0920 | W | 2 | 2 | 2 | | 6 | |
| | LL1mw-089-190401-GWMSD | | 5-7-19 | 0920 | W | | 4 | 4 | | 8 | Extra Volume for MS/MSD |
| | LL1mw-089-190402-GW | | 5-7-19 | 0920 | W | 2 | 2 | 2 | | 6 | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

Requested Parameters

| Relinquished by | Date | Received by | Date | Notes: Total Number of Containers: 20 | Shipment Method: Courier |
|---|---|---|---|---|---|
| Signature | 05/07/19 | Signature: TestAmerica | 5/7/19 | A. Cool, 4C<br>B. HCl, pH<2, Cool, 4C<br>C. HNO3, pH<2, Cool, 4C<br>D. NaOH, pH>12, Cool 4C | |
| Printed Name: Heather Adams | Time: 1515 | Printed Name: Rick Robison | Time: 1515 | 1. SW 8260B<br>2. SW 8270D<br>3. SW 8270D SIM<br>4. SW 8082A<br>5. SW 8081B<br>6. SW 8330<br>7. SW 6010/6020/7470<br>8. SW 9012B<br>9. SW 9034<br>10. SW 9056/9056A<br>11. SW 6860<br>12. EPA 353.2<br>13. SW 7196<br>14. SM2320B | Notes: |
| Company: Leidos | | Company | | | |
| Relinquished by | Date 5/7 | Received by: TA Driver | Date 5/8/19 905 | | Temperature Blank |
| Signature | | Signature: Chris Kovatch | | | Lab: Leidos<br>8866 Commons Drive<br>Twinsburg, OH 44087<br>(330) 405-5802 |
| Printed Name | Time 1625 | Printed Name: TA Driver | Time 905 | | |
| Company | | Company | | | |

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-155-TA
Date: 05/07/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) RC (Printed Name) Ryan Lauwick

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Cyanide (8)(D) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | FBQmw-176-190401-GW | | 5/7/19 | 1532 | W | 1 | | 1 | |

280-123584 Chain of Custody

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| [signature] Signature | 5/8/19 | Test America Signature | 5/8/19 |
| HEATHER Adams Printed Name | Time 1530 | R. Robson Printed Name | Time 1530 |
| Leidos Company | | Rick Robson Company | |
| Relinquished by TAC Signature | Date 5/8/19 | Received by [signature] TA-DEN Signature | Date 5-9-19 |
| R. Robson Printed Name | Time 1640 | Ryan Paul Printed Name | Time 0900 |
| Company | | TA-DEN Company | |

Notes: Total Number of Containers: 1

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

Temp: 2.4, 1.6, 2.1, 0.6, 0.3, 0.7, 0.5, to IR9 x [illegible] by RDP 5-9-19

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP- 154 -TA

Date: 05/07/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Charles Spurr

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | FWGmw-011-190401-GW | | 5/7/19 | 1520 | W | 2 | 1 | | 3 | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature | 5/8/19 | Test America | 5/8/19 |
| Printed Name: Heather Adams | Time: 1530 | Printed Name: Rick Robison | Time: 1530 |
| Company: Leidos | | Company: | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature: TAi | 5/8/19 | Signature: Ryan Paul | 5-9-19 |
| Printed Name: R | Time: 1640 | Printed Name: TA-DEN | Time: 0900 |
| Company: | | Company: | |

Notes: Total Number of Containers: 3

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

# Chain of Custody Record

leidos

Page 1 of 1

COC No.: RVAAP-153-TA

Date: 5-7-19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Gabby Gromofsky

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | FWGmw-012-190401-GW | | 5-7-19 | 1515 | W | 2 | 1 | | 3 | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

Requested Parameters

| Relinquished by | Date | Received by | Date | Time |
|---|---|---|---|---|
| Signature | 5/8/19 | Signature | 5/8/19 | 1532 |
| Printed Name: HEATHER ADAMS | Time: 1530 | Printed Name: RICK FERRISOLA | | |
| Company: Leidos | | Company | | |
| Relinquished by | Date: 5/8/19 | Received by | Date: 5-9-19 | |
| Signature | Time: 1600 | Signature: Ryan Paul | Time: 0900 | |
| Printed Name | | Printed Name: TA-DEN | | |
| Company | | Company | | |

Notes: Total Number of Containers: 3

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-152-TA

Date: 5-7-19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Gabby Gromofsky

Requested Parameters

| Laboratory No | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | LL1mw-080-190401-GW | | 05/07/2019 | 1305 | W | 2 | | 2 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature | 5/8/19 | Signature | 5/8/19 |
| Printed Name: HEATHER ADAMS | Time: 1530 | Printed Name: RICK ROBSON | Time: 1530 |
| Company: Leidos | | Company | |
| Relinquished by | Date | Received by | Date |
| Signature | 5/8/19 | Signature | 5-9-19 |
| Printed Name | Time: 1640 | Printed Name: TA-DEN | Time: 0900 |
| Company | | Company | |

Notes: Total Number of Containers: 2

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-157-TA

Date: 05/06/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
[signature] Ryan Laurich

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | FWGmw-015-190401-GW | | 5/8/19 | 1055 | W | 2 | 1 | | 3 | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| [signature] Signature | 5/8/19 | Test America Signature | 5/8/19 |
| HEATHER Adams Printed Name | Time 1530 | [signature] Printed Name | Time 1530 |
| Leidos Company | | RICK ROBSON Company | |
| Relinquished by | Date | Received by | Date |
| [signature] Signature | 5/8/19 | [signature] Signature | 5-9-19 |
| [signature] Printed Name | Time 1640 | Ryan Paul Printed Name | Time 0900 |
| Company | | TA·DEN Company | |

Notes: Total Number of Containers: 3

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP- 150-TA
Date: 05/08/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Ryan Lawrence

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | FWGmw-004-190401-GW | | 5/8/19 | 0912 | W | 2 | 1 | | 3 | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature: [signature] | 5/8/19 | Signature: Test America | 5/8/19 |
| Printed Name: HEATHER Adams | Time: 1530 | Printed Name: RC [signature] | Time: 1530 |
| Company: Leidos | | Company: RICK ROBISON | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature: [signature] | 5/8/19 | Signature: [signature] | 5-9-19 |
| Printed Name: R. [signature] | Time: 1640 | Printed Name: Ryan Paul | Time: 0900 |
| Company: | | Company: TA-DEN | |

Notes: Total Number of Containers: 3

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

COC No.: RVAAP-160-TA

Page 1 of 1

Date:

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Lindsey Moyer

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | VOCs (1)(B) | SVOCs (TCL) (2)(A) | LL PAHs (3)(A) | PCBs (4)(A) | Pesticides (5)(A) | Explosives (6)(A) | Cyanide (8)(D) | Sulfide (9)(E) | Nitrate/Nitrite/Sulfate (10)(A) | Alkalinity (14)(A) | Nitroguanidine (6)(A) | Nitrocellulose (12)(A) | Perchlorate (11)(A) | TAL Metals + Phosphorus(7)(C) | | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SCLmw-003-190401-GW | | 05/08/19 | 1010 | W | 3 | 2 | 2 | 2 | | 2 | 1 | 1 | 1 | | 2 | 2 | 1 | 1 | | | 20 | Sample Assc. with FWGTB-191005-TB |

Total Number of Containers: 20

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature: [signature] | 5/8/19 | Signature: [signature] | 5/8/19 |
| Printed Name: Heather Adams | Time: 1530 | Printed Name: R Robison | Time: 1530 |
| Company: Leidos | | Company: Rick Robison | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature: TAC | 5/8/19 | Signature: [signature] | 5-9-19 |
| Printed Name: R [signature] | Time: 1610 | Printed Name: Ryan Paul | Time: 0900 |
| Company: | | Company: TA-DEW | |

Notes:
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP- 158-TA

Date: 5-8-19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Gabby Gromofsky

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | VOCs (1)(B) | SVOCs (TCL) (2)(A) | LL PAHs (3)(A) | PCBs (4)(A) | Pesticides (5)(A) | Explosives (6)(A) | Cyanide (8)(D) | Sulfide (9)(E) | Nitrate/Nitrite/Sulfate (10)(A) | Alkalinity (14)(A) | Nitroguanidine (6)(A) | Nitrocellulose (12)(A) | Perchlorate (11)(A) | TAL Metals+Phosphorus (7)(C) | | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SCLmw-002-190401-GW | | 5-8-19 | 0925 | W | 3 | 2 | 2 | 2 | | 2 | 1 | 1 | 1 | | 2 | 2 | 1 | 1 | | | 20 | |
| | SCLmw-002-190401-GWMSD | | 5-8-19 | 0925 | W | | 4 | 4 | | | | 2 | | | | | | | 1 | | | 11 | Extra Volume for MS/MSD |
| | SCLmw-002-190402-GW | | 5-8-19 | 0925 | W | | 2 | 2 | | | | 1 | | | | | | | 1 | | | 6 | |
| | FWGTB-191005-TB | | 5-8-19 | 0925 | W | 2 | | | | | | | | | | | | | | | | 2 | Trip Blank |
| | | | | | | | | | | | | | | | | | | | | | | | |

Page 3565 of 3570

| Relinquished by | Date | Received by | Date | Time |
|---|---|---|---|---|
| Signature | 5/8/19 | Signature | 5/8/19 | 1530 |
| Printed Name: Heather Adams | Time: 1530 | Printed Name: Rick Robison | | |
| Company: Leidos | | Company | | |
| Relinquished by | Date: 5/8/19 | Received by | Date: 5-9-19 | |
| Signature | | Signature | | Time: 0900 |
| Printed Name | Time: 1640 | Printed Name: TA-DEN | | |
| Company | | Company | | |

Notes: Total Number of Containers: 39

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

**Temperature Blank**

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

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-159-TA

Date: 05/06/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Ryan Lankill

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Cyanide (8)(D) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | CBPmw-008-190401-GW | | 5/8/19 | 1411 | W | 1 | | 1 | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature: [signature] | 5/8/19 | Signature: Test America | 5/8/19 |
| Printed Name: Heather Adams | Time: 1530 | Printed Name: R. Robison | Time: 1530 |
| Company: Leidos | | Company: Rick Robison | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature: [signature] | 5/8/19 | Signature: [signature] | 5-9-19 |
| Printed Name: RC Robison | Time: 1640 | Printed Name: Ryan Paul | Time: 0900 |
| Company: | | Company: TH-DEN | |

Notes: Total Number of Containers: 1

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

Lab:

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

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-101 -TA

Date: 05/08/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
[signature] Jackie Mitchell

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | VOCs (1)(B) | SVOCs (TCL) (2)(A) | LL PAHs (3)(A) | PCBs (4)(A) | Pesticides (5)(A) | Explosives (6)(A) | Cyanide (8)(D) | Sulfide (9)(E) | Nitrate/Nitrite/Sulfate (10)(A) | Alkalinity (14)(A) | Nitroguanidine (6)(A) | Nitrocellulose (12)(A) | Perchlorate (11)(A) | TAL Metals+Phosphorus (7)(C) | | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SCLmw-001-190401-GW | GW | 05/08/19 | 1015 | W | 3 | 2 | 2 | 2 | | 2 | 1 | 1 | 1 | | 2 | 2 | 1 | 1 | | | 20 | Sample Assc. with FWGTB-191005-TB |

gm 05/08/19

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| [signature] Signature | 5/8/09 | Test America Signature | 5/8/19 |
| HEATHER Adams Printed Name | Time 1530 | [signature] Printed Name | Time 1530 |
| Leidos Company | | RICK ROBISON Company | |
| Relinquished by | Date | Received by | Date |
| [signature] Signature | 5/8/19 | [signature] Signature | 5-9-19 |
| [signature] Printed Name | Time 1640 | Ryan Paul Printed Name | Time 0900 |
| Company | | TA-DEN Company | |

Notes: Total Number of Containers: 20

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

**Temperature Blank**

Lab:

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

leidos

# Chain of Custody Record

COC No.: RVAAP-~~163~~ 163-TA

Page 1 of 1

Date: 5-8-19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Gabby Gromofsky

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | Alkalinity (14)(A) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | LL1mw-088-190401-GW | | 5-8-19 | 1505 | W | 2 | 1 | 1 | | 4 | |
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| | | | | | | | | | | | |
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Requested Parameters

Relinquished by
Signature
HEATHER ADAMS
Printed Name
Leidos
Company
Date 5/9/19
Time 1530

Received by
Signature
William R Cordell
Printed Name
Company ETPL
Date 5-9-19
Time 1545

Relinquished by
Signature
Printed Name
Company
Date 5-9
Time

Received by
240 1755
Signature
Reed Pottruff
Printed Name
Company TIA - Denver
Date 5/10/19
Time 0915

Notes: Total Number of Containers: 4

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

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

# Chain of Custody Record

eurofins | Environment Testing TestAmerica

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: Rydberg, Donna R | Carrier Tracking No(s): | COC No: 280-483002.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: donna.rydberg@testamericainc.com | State of Origin: Ohio | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): DoD ELAP - A2LA | | Job #: 280-123584-1 |
| Address: 880 Riverside Parkway, , | Due Date Requested: 5/28/2019 | | | |
| City: West Sacramento | TAT Requested (days): | | | |
| State, Zip: CA, 95605 | | | | |
| Phone: 916-373-5600(Tel) 916-372-1059(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Leidos RFP# 001088 - Ravenna AAP-66 | 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, 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) | 8330_NGu/Filtration_47D Nitroguanidine Only | 353.2_Nitrocell/NCEL_Prep_A (MOD) Local Method | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| SCLmw-003-190401-GW (280-123584-7) | 5/8/19 | 10:10 Eastern | | Water | | | X | X | 4 | Q5.0_DIL1 |
| SCLmw-002-190401-GW (280-123584-8) | 5/8/19 | 09:25 Eastern | | Water | | | X | X | 4 | Q5.0_DIL1 |
| SCLmw-001-190401-GW (280-123584-12) | 5/8/19 | 10:15 Eastern | | Water | | | X | X | 4 | Q5.0_DIL1 |

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out 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 TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

| ***Possible Hazard Identification*** *Unconfirmed* | ***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*** ☐ *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: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| Laura Castro | 5-10-19 1630 | TAL | Gabriela Arroyo | 5/11/19 940 | EAB Sac |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: ∆ Yes ∆ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 1.8°C, 1.4°C |
|---|---|---|

Ver: 01/16/2019

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-~~175~~-TA -174 HA

Date: 05/09/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Jackie Mitchell

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers |
|---|---|---|---|---|---|---|---|---|---|
| | FWGmw-024-190401-GW | GW | 05/09/19 | 1340 | W | 2 | 1 | | 3 |

05/09/19

280-123656 Chain of Custody

| Relinquished by | Date | Received by | Date | Time |
|---|---|---|---|---|
| Signature | 5/9/19 | Signature | 5-9-19 | |
| Printed Name: Heather Adams | Time: 1530 | Printed Name: William R Corder | Time: 1545 | |
| Company: Leidos | | Company: ETR | | |
| Relinquished by | Date: 5-9 | Received by: 240 1755 | Date: 5/10/19 | |
| Signature | | Signature: Reed Pottruff | | |
| Printed Name | Time | Printed Name: Reed Pottruff | Time: 0915 | |
| Company | | Company: TA-Denver | | |

Notes: Total Number of Containers:

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes: 1.6, 0.2, 0.2, 3.0, 0.7, 1.2 IR#9 0.0 Transfer RP 5/10/19

Temperature Blank

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

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-104-TA
Date: 5/9/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Laboratory Name: CT Labs
Address: 1230 Lange Court
Baraboo, WI 53913
Phone: (608) 356-2760
Fax:
Contact: Eric Korthals

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | Perchlorate (11)(A) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | LL3mw-246-190401-GW | | 5/9/19 | 0905 | W | 2 | 1 | 1 | | 4 | |
| | LL3mw-246-190401-GWMSD | | 5/9/19 | 0905 | W | | 2 | | | 2 | Extra Volume for Matrix Spike/Duplicate |
| | LL3mw-246-190402-GW | | 5/9/19 | 0905 | W | 2 | 1 | 1 | | 4 | |

Total Number of Containers: 10

| Relinquished by | Date | Signature | Date |
|---|---|---|---|
| Signature: [signature] | 5/9/19 | Signature: [signature] | 5-9-19 |
| Printed Name: Heather Adams | Time: 1530 | Printed Name: William R Cordell | Time: 1545 |
| Company: Leidos | | Company: ETAL | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature: [signature] | 5-9 | Signature: Reed Pott | 5/10/19 |
| Printed Name: | Time: | Printed Name: Reed Pottruff | Time: 0913 |
| Company: | | Company: TA-Denver | |

Notes:
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

**Temperature Blank**

Lab:

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

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-173-TA
Date: 05/09/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Q. Myer Lindsey Myer

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Sulfide (9)(E) | Nitrate/Nitrite/Sulfate (10)(A) | Alkalinity (14)(A) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | RQLmw-013-190401-GW | | 5/9/19 | 1353 | W | 1 | 1 | | | 2 | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature: [signature] | 05/09/19 | Signature: [signature] | 5-9-19 |
| Printed Name: Heather Adams | Time: 1530 | Printed Name: William R Cordell | Time: 1545 |
| Company: Leidos | | Company: ETRL | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature: Charles [signature] | 5-9 | Signature: Reed Pottruff | 5/10/19 |
| Printed Name: | Time: | Printed Name: Reed Pottruff | Time: 0915 |
| Company: | | Company: TA-Deliver | |

Notes: Total Number of Containers: 2

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

COC No.: RVAAP-[illegible]-TA

Page 1 of 1

Date: 5-9-19

Name Leidos
*Address*: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Gabby Gromofsky

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Cyanide (8)(D) | Sulfide (9)(E) | Nitrate/Nitrite/Sulfate (10)(A) | Alkalinity (14)(A) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RQLmw-012-190401-GW | | 5-9-19 | 1420 | W | 1 | 1 | 1 | | | 3 | |
| | | | | | | | | | | | | |
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| | | | | | | | | | | | | |
| | | | | | | | | | | | | |
| | | | | | | | | | | | | |

Requested Parameters

Relinquished by
Signature
Heather Adams
Printed Name
Leidos
Company
Date 5/9/19
Time 1530

Received by
Signature
William R Cordell
Printed Name
ETRC
Company
Date 5-9-19
Time 1545

Relinquished by
Signature
Charles B
Printed Name
Company
Date 5-9
Time

Received by
Signature
Reed Loftruft
Printed Name
TA-Denver
Company
Date 5/10/19
Time 0915

Notes:
Total Number of Containers: 3
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

# Chain of Custody Record

leidos

Page 1 of 1

COC No.: RVAAP-[illegible]-TA

Date:

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

L. Mayer Lindsey Mayer

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Cyanide (8)(D) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | CBPmw-009-190401-GW | | 5/9/19 | 1505 | W | 1 | | 1 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Relinquished by | Date | Received by | Date | Time |
|---|---|---|---|---|
| Signature | 05/9/19 | Signature | 5-9-19 | |
| Printed Name: HEATHER Adams | Time: 1520 | Printed Name: WILLIAM R Cordell | Time: 1545 | |
| Company: Leidos | | Company: ETEC | | |
| Relinquished by | Date: 5-9 | Received by: 240 1755 | Date: 5/10/19 | |
| Signature | | Signature: Reed Pottruff | | |
| Printed Name | Time | Printed Name: Reed Pottruff | Time: 0915 | |
| Company | | Company: TA-Denver | | |

Notes: Total Number of Containers: 1

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

Temperature Blank

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

# Chain of Custody Record

leidos

Page 1 of 1

COC No.: RVAAP-175-TA

Date: 05/09/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
RYAN CURRICH

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No | Sample ID | Site Type | Date | Time | Matrix | Requested Parameters: Cyanide (8)(D) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|
| | RQLmw-016-190401-GW | | 5/9/19 | 1530 | W | 1 | | 1 | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

| Relinquished by | Date | Received by | Date | Time |
|---|---|---|---|---|
| Signature | 5/9/19 | Signature | 5-9-19 | |
| Printed Name: HEATHER ADAMS | Time: 1530 | Printed Name: WILLIAM R CORDELL | Time: 1545 | |
| Company: Leidos | | Company: ETR | | |
| Relinquished by: Charles S | Date: 5-9 | Received by: 240 | Date: 1755 5/10/19 | |
| Signature | | Signature: Reed Poff | | |
| Printed Name | Time | Printed Name: Reed Poffraff | Time: 0915 | |
| Company | | Company: TA-Denver | | |

Notes: Total Number of Containers: 1

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

Temperature Blank

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

# Chain of Custody Record

leidos

Page 1 of 1

COC No.: RVAAP-169-TA

Date: 05/09/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
Ryan Lynch

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Sulfide (9)(E) | Nitrate/Nitrite/Sulfate (10)(A) | Alkalinity (14)(A) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | RQLmw-011-190401-GW | | 5/9/19 | 0953 | W | 1 | 1 | | | 2 | |
| | RQLmw-011-190401-GWMSD | | ↓ | 0953 | W | 1 | 1 | | | 2 | Extra Volume for Matrix Spike |
| | RQLmw-011-190402-GW | | ↓ | 0953 | W | 1 | 1 | | | 2 | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

Relinquished by
Signature
Heather Adams
Printed Name
Leidos
Company
Date 5/9/19
Time 1539

Signature
William R Cordell
Printed Name
ETPL
Company
Date 5-9-19
Time 1545

Notes: Total Number of Containers: 6
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Relinquished by
Signature
Charles S
Printed Name
Company
Date 5-9
Time

Received by
Signature
Reed Pot
Printed Name
Reed Pottruff
Company TA-Denver
Date 5/10/19
Time 0915

**Temperature Blank**

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

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-165-TA

Date: 5/9/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)
D. Moyer Lindsey Moyer

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Explosives (6)(A) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|
| | FWGmw-021-190401-GW | | 5/9/19 | 1120 | W | 2 | 1 | | 3 | |
| | FWGmw-021-190401-GWMSD | | ↓ | 1120 | W | 4 | 1 | | 5 | Extra volume for MS/MSD |
| | FWGmw-021-190402-GW | | ↓ | 1120 | W | 2 | 1 | | 3 | |

| Relinquished by | Date | | Date |
|---|---|---|---|
| Signature: [signature] | 5/9/19 | Signature: [signature] | 5-9-19 |
| Printed Name: Heather Adams | Time: 1530 | Printed Name: William R Cordell | Time: 1545 |
| Company: Leidos | | Company: ETPL | |
| Relinquished by: Charles G | Date: 5-9 | Received by: 240 1755 | Date: 5/10/19 |
| Signature: | | Signature: Reed Pott | |
| Printed Name: | Time: | Printed Name: Reed Pottruff | Time: 0915 |
| Company: | | Company: TA-Denver | |

Notes: Total Number of Containers: 11
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

Temperature Blank

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

# Chain of Custody Record

leidos

Page 1 of 1

COC No.: RVAAP-175-TA

Date: 05/09/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Jackie Mitchell

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | Requested Parameters: VOCs (1)(B) | Cyanide (8)(D) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | FWGmw-018-190401-GW | GW | 05/09/19 | 0925 | W | 3 | 1 | 1 | | 5 | |
| | FWGTB-190003-TB | | ↓ | 0920 | W | 2 | | | | 2 | Trip Blank |
| | | | | | | | | | | | |
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On 05/09/19

Relinquished by
Signature
Heather Adams
Printed Name
Leidos
Company
Date 5/9/19
Time 1330

Received by
Signature
William R Cordell
Printed Name
William R Cordell
Company ETEC
Date 5-9-19
Time 1545

Relinquished by
Signature
Charles P
Printed Name
Company
Date 5-9
Time

Received by
Signature
Reed Pottratt
Printed Name
Reed Pottratt
Company TA-Denver
Date 5/10/19
Time 0915

Notes: Total Number of Containers: 16

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record



COC No.: RVAAP-171-TA

Date: 5-9-19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Gabby Gromofsky

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | VOCs (1)(B) | Phthalates/Phenols (2)(A) | LL PAHs (3)(A) | PCBs (4)(A) | Pesticides (5)(A) | Explosives (6)(A) | Cyanide (8)(D) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RQLmw-008-190401-GW | | 5-9-19 | 1200 | W | 3 | 2 | 2 | 2 | | 2 | 1 | 1 | | 13 | Sample Assc. With FWGTB-191008-TB |
| | | | | | | | | | | | | | | | | |
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Requested Parameters

| Relinquished by | Date | Received by | Date | Notes: Total Number of Containers: 13 |
|---|---|---|---|---|
| Signature | 5/9/19 | Signature | 5-9-19 | A. Cool, 4C<br>B. HCl, pH<2, Cool, 4C<br>C. HNO3, pH<2, Cool, 4C<br>D. NaOH, pH>12, Cool 4C |
| Printed Name: HEATHER ADAMS | Time: 1530 | Printed Name: WILLIAM R Cordell | Time: 1545 | 1. SW 8260B<br>2. SW 8270D<br>3. SW 8270D SIM<br>4. SW 8082A<br>5. SW 8081B<br>6. SW 8330<br>7. SW 6010/6020/7470<br>8. SW 9012B<br>9. SW 9034<br>10. SW 9056/9056A<br>11. SW 6860<br>12. EPA 353.2<br>13. SW 7196<br>14. SM2320B |
| Company: Leidos | | Company: ETRL | | |
| Relinquished by: Charles M | Date: 5-9 | Received by: 240 1755 | Date: 5/10/19 | |
| Signature | | Signature: Reed Pottruff | | |
| Printed Name | Time | Printed Name: Reed Pottruff | Time: 0915 | |
| Company | | Company: TA - Denver | | |

Shipment Method: Courier

**Temperature Blank**

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

# Chain of Custody Record

leidos

COC No.: RVAAP- 190-TA

Page 1 of 1

Date: 5-9-19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Gabby Gramofsky

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | VOCs (1)(B) | Phthalates/Phenols (2)(A) | LL PAHs (3)(A) | PCBs (4)(A) | Pesticides (5)(A) | Explosives (6)(A) | Cyanide (8)(D) | TAL Metals+Phosphorus (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RQLmw-007-190401-GW | | 5-9-19 | 0940 | W | 3 | 2 | 2 | 2 | | 2 | 1 | 1 | | 13 | |
| | FWGTB-191008-TB | | 5-9-19 | 0940 | W | 2 | | | | | | | | | 2 | Trip Blank |
| | | | | | | | | | | | | | | | | |
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Page 3755 of 3757

| Relinquished by | Date | Received by | Date | Time |
|---|---|---|---|---|
| Signature | 5/9/19 | Signature | 5-9-19 | |
| Printed Name: HEATHER ADAMS | Time: 1530 | Printed Name: WILLIAM R CORDELL | Time: 1545 | |
| Company: Leidos | | Company: ETRL | | |
| Relinquished by | Date: 5-9 | Received by: 240 1755 | Date: 5/10/19 | |
| Signature | | Signature: Reed Pettruff | | |
| Printed Name | Time | Printed Name: Reed Pettruff | Time: 0915 | |
| Company | | Company: TTA - Denver | | |

Notes: Total Number of Containers: 15

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

Temperature Blank

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

leidos

# Chain of Custody Record

Page 1 of 1

COC No.: RVAAP-172-TA

Date: 5/9/19

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name) Ryan Carrick

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | VOCs (1)(B) | Phthalates/Phenols (2)(A) | LL PAHs (3)(A) | PCBs (4)(A) | Pesticides (5)(A) | Explosives (6)(A) | Cyanide (8)(D) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | RQLmw-009-190401-GW | | 5/9/19 | 1240 | W | 3 | 2 | 2 | 2 | | 2 | 1 | 1 | | 13 | Sample Assc. With FWGTB-191008-TB |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature: [signature] | 5/9/19 | Signature: [signature] | 5-9-19 |
| Printed Name: Heather Adams | Time: 1530 | Printed Name: William R Cordell | Time: 1545 |
| Company: Leidos | | Company: ETRC | |

| Relinquished by | Date | Received by | Date |
|---|---|---|---|
| Signature: [signature] | 5-9 | Signature: Reed Pottruff | 5/10/19 |
| Printed Name: | Time: | Printed Name: Reed Pottruff | Time: 0915 |
| Company: | | Company: TH-Denver | |

Notes: Total Number of Containers: 13

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Notes:

Shipment Method: Courier

**Temperature Blank**

Lab:

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

leidos

# Chain of Custody Record

COC No.: RVAAP- 178 -TA

Page 1 of 1

Date: 5/13/2019

Name Leidos
Address: 8866 Commons Blvd. Suite 201, Twinsburg, OH 44087
Phone Number: (330) 405-5802
Project Manager: Jed Thomas
Project: RVAAP FWGW Sampling Event Spring 2019
Job/P.O. No.: P010216426
Sampler (Signature) (Printed Name)

Laboratory Name: Test America - Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Site Type | Date | Time | Matrix | VOCs (1)(B) | Cyanide (8)(D) | TAL Metals (7)(C) | Temperature Blank | Total Number of Containers | OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | FWGmw-020-190401-GW | GW | 5/13/2019 | 1015 | W | 3 | 1 | 1 | | 5 | |
| | FWGTB-191006-TB | TB | 5/13/2019 | 1015 | W | 2 | | | | 2 | Trip Blank |

Relinquished by: [signature] Signature; Heather Adams Printed Name; Leidos Company — Date: 5/13/19 — Time: 1200

Received by: Test America Signature; RC Robison Printed Name; RICK ROBISON Company — Date: 5/13/19 — Time: 1200

Relinquished by: TAE 240 Signature; RC Robison Printed Name; RICK Company — Date: 5/13/19 — Time: 1250

Received by: [signature] Signature; Ryan Paul Printed Name; TA-DEN Company — Date: 5-14-19 — Time: 0920

Notes: Total Number of Containers: 7

A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C

Notes:
1. SW 8260B
2. SW 8270D
3. SW 8270D SIM
4. SW 8082A
5. SW 8081B
6. SW 8330
7. SW 6010/6020/7470
8. SW 9012B
9. SW 9034
10. SW 9056/9056A
11. SW 6860
12. EPA 353.2
13. SW 7196
14. SM2320B

Shipment Method: Courier

280-123802 Chain of Custody

**Temperature Blank**

Lab:

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

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# D.4 Calibration Logs

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## EQUIPMENT CALIBRATION

**PROJECT NAME: RVAAP Groundwater Monitoring 2018**

## Calibration Log

| IDENTIFIER | ITEM DESCRIPTION | CALIBRATION MEASUREMENTS | | | Standard/Lot # | Comments | NAME | DATE |
|---|---|---|---|---|---|---|---|---|
| | | PRE | ADJUSTMENT | POST | | | | |
| FA03179 | YSI ProDSS | DO 97.5 % | Calibration | 100.1% | DI Water | None | Jackie Mitchell | 04/29/19 |
| | Cond. | 1.295 ms/cm | | 1.413 ms/cm | 1.413 ms/cm 8GE038 | | | |
| | pH 4.0 | 4.17 SU | | 4.00 SU | pH 4.0 8GJ315 | | | |
| | pH 7.0 | 7.06 SU | | 7.00 SU | pH 7 8GD396 | | | |
| | pH 10.0 | 10.28 SU | | 10.07 SU | pH 10 8GD929 | | | |
| | Turbidity | 261.5 N/A | | N/A | N/A | | | |
| | ORP | 261.5 mV | | 240.0 mV | 240 mV 8GL723 | None | Jackie Mitchell | 04/29/19 |
| FA03966 | YSI ProDSS | DO 93.1% | Calibration | 97.7% | DI Water | | | |
| | Cond. | 1.304 ms/cm | | 1.413 ms/cm | 1.413 ms/cm 8GE038 | | | |
| | pH 4.0 | 4.34 SU | | 4.00 SU | pH 4 8GJ315 | | | |
| | pH 7.0 | 7.06 SU | | 7.00 SU | 7 pH 8GD396 | | | |
| | pH 10.0 | 10.03 SU | | 10.00 SU | pH 10 8GD929 | | | |
| | Turbidity | N/A | | N/A | N/A | | | |
| | ORP | 248.0 mV | | 239.9 mV | 240.0 mV 8GL723 | | | |
| FA02140 | YSI ProDSS | DO 94.2 % | Calibration | 97.7% | DI Water | None | Jackie Mitchell | 04/29/19 |
| | Cond. | 0.873 ms/cm | | 1.463 ms/cm | 1.413 ms/cm 8GE038 | | | |
| | pH 4.0 | 4.17 SU | | 4.00 SU | pH 4 8GJ315 | | | |
| | pH 7.0 | 6.95 SU | | 7.04 SU | 7 pH 8GD396 | | | |
| | pH 10.0 | 9.92 SU | | 10.0 SU | pH 10 8GD292 | | | |
| | Turbidity | N/A | | N/A | N/A | | | |
| | ORP | 260.3 mV | | 240.0 mV | 240.0 mV 8GL723 | | | |
| | | | | | Jm 04/29/19 | | | |

QA performed by: [signature] 5/2/19

# EQUIPMENT CALIBRATION

## PROJECT NAME: RVAAP Groundwater Monitoring 2018

## Calibration Log

| IDENTIFIER | ITEM DESCRIPTION | CALIBRATION MEASUREMENTS | | | Standard/Lot # | Comments | NAME | DATE |
|---|---|---|---|---|---|---|---|---|
| | | PRE | ADJUSTMENT | POST | | | | |
| FA03313 | YSI ProDSS DO | 97.1% | Calibration | 97.6% | DI water | None | Jackie Mitchell | 04/29/19 |
| | Cond. | 1.403 ms/cm | | 1.413 ms/cm | 1.413 ms/cm 8GE038 | | | |
| | pH 4.0 | 4.08SU | | 4.00 SU | 4pH8GJ315 | | | |
| | pH 7.0 | 6.94SU | | 7.00 SU | 7pH GJ396 | | | |
| | pH 10.0 | 9.97SU | | 10.00 SU | pH10 8GD929 | | | |
| | ORP | 264.0 mV | | 239.8 mV | 240 mV 8GZ723 | | | |
| FA03313 | YSI ProDSS DO | 100.5% | Calibration | 99.4% | DI water | None | Jackie Mitchell | 04/30/19 |
| | cond | 1.214 | | 1.413 | 1.413 8GF038 | | | |
| | pH 4.0 | 3.98 | | 4.00 | pH4 3GJ315 | | | |
| | pH 7.0 | 6.92 | | 7.00 | 7pH GJ396 | | | |
| | pH 10.0 | 10.02 | | 10.00 | pH10 8GD929 | | | |
| | ORP | 236.9 | | 240.0 | 240mV 8GZ723 | | | |
| FA02140 | YSI ProDSS DO | 101.5% | Calibration | 97.4% | DI water | None | Jackie Mitchell | 04/30/19 |
| | cond | 1.344 | | 1.413 | 1.413ms/cm 8GF038 | | | |
| | pH 4.0 | 3.97 | | 4.00 | 4pH H3GJ315 | | | |
| | pH 7.0 | 6.90 | | 7.05 | 7pH GD396 | | | |
| | pH 10.0 | 10.09 | | 10.00 | 10pH8GD929 | | | |
| | ORP | 233.5 | | 240.0 | 240mV 8GZ723 | | | |
| | | | | | | | | |
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| | | | | | | | | |

QA performed by: EQ 5/20/19

# EQUIPMENT CALIBRATION

**PROJECT NAME: RVAAP Groundwater Monitoring 2018**

## Calibration Log

| IDENTIFIER | ITEM DESCRIPTION | CALIBRATION MEASUREMENTS PRE | ADJUSTMENT | POST | Standard/Lot # | Comments | NAME | DATE |
|---|---|---|---|---|---|---|---|---|
| FA03966 | YSI Pro DSS DO | 99.6% | Calibration | 99.4% | DI Water | None | Jackie Mitchell | 04/30/19 |
| | cond | 1.270 ms/cm | | 1.413 ms/cm | 1.413 ms/cm 8GF038 | | | |
| | pH 4.0 | 4.10 SU | | 4.0 SU | 4pH H3GJ315 | | | |
| | pH 7.0 | 7.05 SU | | 7.0 SU | 7pH GD396 | | | |
| | pH 10.0 | 10.48 SU | | 10.01 SU | 10pH 8GD929 | | | |
| | ORP | 235.3 mV | | 240.3 mV | 240 mV 8G2723 | | | |
| FA03179 | YSI Pro DSS DO | 102.2% | Calibration | 99.8% | DI Water | None | Jackie Mitchell | 04/30/19 |
| | cond | 1.374 ms/cm | | 1.413 ms/cm | 1.413 ms/cm 8GF038 | | | |
| | pH 4.0 | 4.01 SU | | 4.0 SU | 4pH H3GJ315 | | | |
| | pH 7.0 | 6.94 SU | | 7.0 SU | 7pH GD396 | | | |
| | pH 10.0 | 10.37 SU | | 10.15 SU | 10pH 8GD929 | | | |
| | ORP | 237.7 mV | | 239.9 mV | 240mV 8G2723 | | | |
| FA03179 | YSI Pro DSS DO | 101.5% | calibration | 99.5% | ~~99.5%~~ DI | None | L. Mage | 5/1/19 |
| | cond | 1.306 ms/cm | | 1.413 ms/cm | 1.413ms 8GF038 | | | |
| | pH 4.0 | 4.02 SU | | 4.00 SU | 4pH H3GJ315 | | | |
| | pH 7.0 | 7.04 SU | | 7.00 SU | 7pH GD396 | | | |
| | pH 10.0 | 10.33 SU | | 10.00 SU | 10pH 8GD929 | | | |
| | ORP | 241.2mv | | 240.0mv | 240mv 8G2723 | | | |
| | | | | | | | | |
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| | | | | | | | | |

5/2/19

QA performed by: [signature] 5/2/19

## EQUIPMENT CALIBRATION

**PROJECT NAME: RVAAP Groundwater Monitoring 2018**

## Calibration Log

| IDENTIFIER | ITEM DESCRIPTION | CALIBRATION MEASUREMENTS | | | Standard/Lot # | Comments | NAME | DATE |
|---|---|---|---|---|---|---|---|---|
| | | PRE | ADJUSTMENT | POST | | | | |
| FA02140 | YSI ProDSS DO | 99.5 % | calibration | 97.0 % | DI water | None | L. Mason | 5/1/19 |
| | cond | 1.103 ms/cm | | 1.413 ms/cm | 1413 ms/cm SGF038 | | | |
| | pH 4.0 | 4.01 SU | | 4.00 SU | 4pH H3GJ315 | | | |
| | pH 7.0 | 6.83 SU | | 7.00 SU | 7pH GD396 | | | |
| | pH 10.0 | 10.02 SU | | 10.00 SU | 10 pH SGD929 | | | |
| | ORP | 236.0 mV | | 236.0 mV | 240mV SGJ723 | | | |
| FA03313 | YSI ProDSS DO | 99.4 % | | 96.9 % | DI $H_2O$ | | J. Mitchell | |
| | cond | 2.228 ms/cm | | 1.416 ms/cm | 1.413 ms/cm SGF038 | | | |
| | pH 4.0 | 4.11 SU | | 4.00 SU | 4pH H3GJ315 | | | |
| | pH 7.0 | ~~7.00 SU~~ ~~10.12 SU~~ | | 7.00 SU | 7pH GD396 | | | |
| | pH 10.0 | 10.12 SU | | 10.00 SU | 10 pH SGD929 | | | |
| | ORP | 235.7 mV | | 240.0 mV | 240mV SGJ723 | | | |
| FA03966 | YSI ProDSS DO | 101.3 % | | 97.0 % | DI $H_2O$ | | | |
| | cond | 1.490 ms/cm | | 1.414 ms/cm | 1.413ms SGF038 | | | |
| | pH 4.0 | 3.96 SU | | 4.00 SU | 4pH H3GJ315 | | | |
| | pH 7.0 | 7.04 SU | | 7.00 SU | 7pH GD396 | | | |
| | pH 10.0 | 10.12 SU | | 10.05 SU | 10pH SGD929 | | | |
| | ORP | 235.8 mV | | 240.1 mV | 240mV SGJ723 | | | |

QA performed by: _____ 5/20/19

## EQUIPMENT CALIBRATION

**PROJECT NAME: RVAAP Groundwater Monitoring 2018**

## Calibration Log

| IDENTIFIER | ITEM DESCRIPTION | CALIBRATION MEASUREMENTS | | | Standard/Lot # | Comments | NAME | DATE |
|---|---|---|---|---|---|---|---|---|
| | | PRE | ADJUSTMENT | POST | | | | |
| YSI Pro DSS | DO | 98.9 % | Calibration | 97.1 % | DI Water | None | Jackie Mitchell | 05/02/19 |
| #FA02140 | Conductivity | 1.487 ms/cm | | 1.413 ms/cm | 1.413 ms/cm 86E038 | | | |
| | 4pH | 4.06 SU | | 4.0 SU | 4pH H3GJ315 | | | |
| | 7pH | 7.03 SU | | 7.03 SU | 7pH GD396 | | | |
| | 10pH | 10.09 SU | | 10.04 SU | 10pH 8GD | | | |
| | ORP | 234.0 mV | | 240.0 mV | 240 mV 8G2723 | | | |
| YSI Pro DSS | DO | 101.3 % | | 99.5 | | | | |
| #FA03179 | Conductivity | 1.413 ms/cm | | 1.413 ms/cm | | | | |
| | 4 pH | 4.02 SU | | 4.0 SU | | | | |
| | 7 pH | 7.03 SU | | 7.0 SU | | | | |
| | 10 pH | 10.10 SU | | 10.04 SU | | | | |
| | ORP | 230.8 mV | | 239.9 mV | | | | |
| YSI ProDSS | DO | 99.8% | | 97.1 % | | | | |
| #FA03966 | Conductivity | 1.404 ms/cm | | 1.414 ms/cm | | | | |
| | 4pH | 3.99 SU | | 4.0 SU | | | | |
| | 7pH | 7.03 SU | | 7.0 SU | | | | |
| | 10pH | 10.09 SU | | 10.04 SU | | | | |
| | ORP | 238.3 mV | | 239.9 mV | | | | |
| | | | | | | | | |
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| | | | | | | | | |

QA performed by: _____ 5/6/19

## EQUIPMENT CALIBRATION

**PROJECT NAME: RVAAP Groundwater Monitoring 2018**

## Calibration Log

| IDENTIFIER | ITEM DESCRIPTION | CALIBRATION MEASUREMENTS | | | Standard/Lot # | Comments | NAME | DATE |
|---|---|---|---|---|---|---|---|---|
| | | PRE | ADJUSTMENT | POST | | | | |
| FA03313 | YSI Pro DSS DO | 97.7 % | calibration | 96.6 % | DI water | None | L Meyer | 5/6/19 |
| | cond | 1.274 ms/cm | | 1.413 ms/cm | 8GE038 1.413 ms/cm | | | |
| | pH 4.0 | 3.98 SU | | 4.00 SU | pH4.0 H3GJ35 | | | |
| | pH 7.0 | 6.72 SU | | 7.00 SU | pH7.0 GP396 | | | |
| | pH 10.0 | 9.95 SU | | 10.00 SU | pH10. 8GD929 | | | |
| | ORP | 234.3 mV | | 240.0 mV | 240mV 8GL723 | | | |
| FA03179 | YSI Pro DSS DO | 92.3 % | | 99.1 % | | | | |
| | cond | 1.422 ms/cm | | 1.413 ms/cm | | | | |
| | pH 4.0 | 4.11 SU | | 4.00 SU | | | | |
| | pH 7.0 | 6.88 SU | | 7.00 SU | | | | |
| | pH 10.0 | 9.96 SU | | 10.00 SU | | | | |
| | ORP | 225.8 mV | | 240.0 mV | 240mV 8GL723 5/6/19 | | | |
| FA02140 | YSI Pro DSS DO | 93.9 % | | 96.7 % | | | | |
| | cond | 1.370 ms/cm | | 1.413 ms/cm | | | | |
| | pH 4.0 | 4.09 SU | | 4.00 SU | | | | |
| | pH 7.0 | 6.81 SU | | 7.00 SU | | | | |
| | pH 10.0 | 9.93 SU | | 10.00 SU | | | | |
| | ORP | 238.0 mV | | 240.0 mV | | | | |
| | | | | | | | | |
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| | | | | | | | | |

QA performed by: _____ 5/6/19

## EQUIPMENT CALIBRATION

**PROJECT NAME: RVAAP Groundwater Monitoring 2018**

## Calibration Log

| IDENTIFIER | ITEM DESCRIPTION | CALIBRATION MEASUREMENTS | | | Standard/Lot # | Comments | NAME | DATE |
|---|---|---|---|---|---|---|---|---|
| | | PRE | ADJUSTMENT | POST | | | | |
| FA03179 | YSI ProDSS DO | 105.8 | calibration | 99.5 | DI water | none | C Rowan | 5/17/19 |
| | cond | 1.423 | | 1.413 | 1.413 ms/cm 8GE038 | | | |
| | pH 4.0 | 4.10 | | 4.0 | pH 4.0 #3GJ315 | | | |
| | pH 7.0 | 6.85 | | 7.0 | pH 7.0 GD316 | | | |
| | pH 10.0 | 9.90 | | 10.00 | pH 10. 8GD927 | | | |
| | ORP | 240.8 | | 240.0 | 240mV 8GL723 | | | |
| FA03313 | YSI ProDSS DO | 97.4 | | 97.0 | | | | |
| | cond | 3.191 | | 1.413 | | | | |
| | pH 4.0 | 4.16 | | 4.00 | | | | |
| | pH 7.0 | 6.81 | | 7.00 | | | | |
| | pH 10.0 | 9.94 | | 10.00 | | | | |
| | ORP | 232.7 | | 240.0 | | | | |
| FA02140 | YSI ProDSS DO | 99.5% | | 99.7% | | | | |
| | cond | 1.408 ms/cm | | 1.413 ms/cm | | | | |
| | pH 4.0 | 4.11 SU | | 4.00 SU | | | | |
| | pH 7.0 | 7.17 SU | | 7.00 SU | | | | |
| | pH 10.0 | 10.54 SU | | 10.00 SU | | | | |
| | ORP | 236.2 mV | | 240.0 mV | | | | |
| | | | | start | | | | |

QA performed by: _____ 5/17/19

## EQUIPMENT CALIBRATION

**PROJECT NAME: RVAAP Groundwater Monitoring 2018**

## Calibration Log

| IDENTIFIER | ITEM DESCRIPTION | CALIBRATION MEASUREMENTS | | | Standard/Lot # | Comments | NAME | DATE |
|---|---|---|---|---|---|---|---|---|
| | | PRE | ADJUSTMENT | POST | | | | |
| FA03966 | YSI Pro DSS DO | 96.1% | calibration | 97.1% | DI water | None | L. Mayer | 5/7/19 |
| | cond | 1.311 ms/cm | | 1.413 ms/cm | 1.413 ms/cm 8GE038 | | | |
| | pH 4.0 | 4.00 SU | | 4.00 SU | pH4.0 HG3315 | | | |
| | pH 7.0 | 6.84 SU | | 7.00 | pH7.0 GD396 | | | |
| | pH 10.0 | 10.0 SU | | 10.0 SU | pH10. 8GD928 | | | |
| | ORP | 233.5 mV | | 240.0 mV | 240mV 8GL723 | | | |
| FA03313 | YSI Pro DSS DO | 95.3 | | 97.6 | | None | G. Grandesky | 5-8-19 |
| | cond | 1.379 | | 1.413 | | | | |
| | pH 4 | 4.03 | | 4.00 | | | | |
| | pH 7.0 | 6.82 | | 7.04 | | | | |
| | pH 10 | 9.95 | | 10.00 | | | | |
| | ORP | 242.2 | | 240.0 | | | | |
| FA03966 | YSI Pro DSS DO | 94.5 | | 97.6 | | | | |
| | cond | 1.367 | | 1.413 | | | | |
| | pH 4 | 4.18 | | 4.00 | | | | |
| | pH 7.0 | 6.84 | | 7.04 | | | | |
| | pH 10.0 | 9.93 | | 10.00 | | | | |
| | ORP | 242.0 | | 240.0 | | | | |
| | | | | No station | | | | |
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QA performed by: _____ 5/8/19

## EQUIPMENT CALIBRATION

**PROJECT NAME: RVAAP Groundwater Monitoring 2018**

## Calibration Log

| IDENTIFIER | ITEM DESCRIPTION | CALIBRATION MEASUREMENTS | | | Standard/Lot # | Comments | NAME | DATE |
|---|---|---|---|---|---|---|---|---|
| | | PRE | ADJUSTMENT | POST | | | | |
| FA02140 | YSI ProDSS DO | 88.7% | calibration | 94.1% | DI water | None | L. Mgh | 5/8/19 |
| | cond | 1.370 ms/cm | | 1.413 ms/cm | 1.413 ms/cm 8GE038 | | | |
| | pH 4.0 | 4.11 SU | | 4.00 SU | pH4.0 H3GJ315 | | | |
| | pH 7.0 | 6.85 SU | | 7.04 SU | pH7.0 GD3GG | | | |
| | pH 10.0 | 10.02 SU | | 10.00 SU | pH10.0 8GD929 | | | |
| | ORP | 240.2 mV | | 240.0 mV | 240 mV 8GL723 | | | |
| FA03179 | YSI ProDSS DO | 93.5% | | 99.9% | | | | |
| | cond | 1.310 ms/cm | | 1.413 ms/cm | | | | |
| | pH 4.0 | 4.06 SU | | 4.00 SU | | | | |
| | pH 7.0 | 6.97 SU | | 7.00 SU | | | | |
| | pH 10.0 | 10.22 SU | | 10.00 SU | | | | |
| | ORP | 254.5 mV | | 240.0 mV | | | | |
| FA02140 | YSI ProDSS DO | 97.8% | | 96.5% | | None | L. Morgan | 5/9/19 |
| | cond | 1.412 ms/cm | | 1.413 ms/cm | | | | |
| | pH 4.0 | 4.03 SU | | 4.00 SU | | | | |
| | pH 7.0 | 6.92 SU | | 7.03 SU | | | | |
| | pH 10.0 | 10.04 SU | | 10.00 SU | | | | |
| | ORP | 234.1 mV | | 240.0 mV | | | | |
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my station

QA performed by: 5/2/19

## EQUIPMENT CALIBRATION

**PROJECT NAME: RVAAP Groundwater Monitoring 2018**

# Calibration Log

| IDENTIFIER | ITEM DESCRIPTION | CALIBRATION MEASUREMENTS | | | Standard/Lot # | Comments | NAME | DATE |
|---|---|---|---|---|---|---|---|---|
| | | PRE | ADJUSTMENT | POST | | | | |
| FA03179 | YSI ProDSS DO | 98.2% | calibration | 99.0% | DI water | None | G. Gromolsky | 5-9-19 |
| | cond | 1.411 mS/cm | | 1.413 mS/cm | 1.413 mS/cm ~~BGG838~~ | | | |
| | pH 4.0 | 4.03 SU | | 4.00 SU | pH4 ~~HBGEJ315~~ | | | |
| | pH 7.0 | 6.93 SU | | 7.03 SU | pH7 GD396 | | | |
| | pH 10.0 | 10.05 SU | | 10.00 SU | pH10 8GD929 | | | |
| | ORP | 234.7 mV | | 240.0 mV | 240mV 8GL723 | | | |
| FA03313 | YSI ProDSS DO | 90.7% | | 96.5% | | | L. Moyer | |
| | cond | 1.354 mS/cm | | 1.413 mS/cm | | | | |
| | pH 4.0 | 4.21 SU | | 4.00 SU | | | | |
| | pH 7.0 | 7.08 SU | | 7.03 SU | | | | |
| | pH 10.0 | 10.25 SU | | 10.00 SU | | | | |
| | ORP 5/9/19 | ~~235.9mV~~ 235.9mV | | 240.0mV | | | | |
| FA03966 | YSI ProDSS DO | 92.9% | | 95.6% | | | | |
| | cond | 1.350 mS/cm | | 1.413 mS/cm | | | | |
| | pH 4.0 | 4.19 SU | | 4.00 SU | | | | |
| | pH 7.0 | 6.93 SU | | 7.00 SU | | | | |
| | pH 10.0 | 10.21 SU | | 10.00 SU | | | | |
| | ORP | 236.0 mV | | 240.0 | | | | |

QA performed by: [signature]

# EQUIPMENT CALIBRATION

**PROJECT NAME: RVAAP Groundwater Monitoring 2018**

## Calibration Log

| IDENTIFIER | ITEM DESCRIPTION | CALIBRATION MEASUREMENTS | | | Standard/Lot # | Comments | NAME | DATE |
|---|---|---|---|---|---|---|---|---|
| | | PRE | ADJUSTMENT | POST | | | | |
| FA03179 | YSI PRO DSS | – | – | – | – | None | C. Spurr | 5/13/19 |
| | D.O. | 104.2 % | Calibration | 98.2 % | DI $H_2O$ | | | |
| | Sp. Cond. | 1.439 mS/cm | | 1.413 mS/cm | 1.413 mS/cm 8GE038 | | | |
| | pH 4 | 4.15 SU | | 4.00 SU | pH 4 HBGJ315 | | | |
| | pH 7 | 6.93 SU | | 7.04 SU | pH 7 GD396 | | | |
| | pH 10 | 10.01 SU | | 10.00 SU | pH 10 8GD929 | | | |
| | ORP | 245.2 mV | | 239.8 mV | 240 mV 8GL723 | | | |

QA performed by: _____ 5/13/19

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# APPENDIX E

# Investigation-Derived Waste Documentation

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# E.1 Characterization and Disposal Plan, dated June 11, 2019

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June 11, 2019

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

**Subject:** **May 2019 Facility-wide Groundwater Monitoring Program Sampling - Investigation-Derived Waste (IDW) Characterization and Disposal Plan**
**Reference:** **Contract No. W912QR-16-D-0003, Delivery Order No. W912QR-18-F-0337, Groundwater Investigation and Reporting Services, RVAAP Restoration Program**

Dear Ms. Tait:

Investigative activities in accordance with the *Facility-wide Groundwater Monitoring Addendum for 2019* were performed from April 29, 2019 through May 13, 2019. These activities resulted in the generation of liquid IDW (consisting of purge water and equipment decontamination fluids). The purpose of this letter is to characterize and classify the IDW and to propose methods for disposal. This letter report includes a summary of IDW generated, the origin of the IDW, and proposed classification and recommendations for disposal of the IDW.

The May 2019 IDW stream was generated during the collection of groundwater from wells within the former RVAAP. These were the same activities conducted in October 2018 which generated the same liquid IDW stream. The October 2018 IDW stream was characterized under provisions established by the *Facility-Wide Sampling and Analysis Plan* (USACE 2011) (herein referred to at the Facility-wide SAP). Please reference Attachment 1 for the October 2018 Facility-wide Groundwater Monitoring Program Sampling - Investigation-Derived Waste (IDW) Characterization and Disposal Plan. That IDW stream was classified as non-hazardous, non-contaminated under Clean Harbors Profile No. CH1784679. Please reference Attachment 2 for the Waste Material Profile Sheet, Clean Harbors Profile No. CH1784679.

As the October 2018 and May 2019 liquid IDW streams are generated from the same sampling activities and have the same characteristics, Leidos recommends that the four (4), 55 gallon drums containing approximately 163.5 gallons of groundwater be classified as non-hazardous, noncontaminated utilizing generator knowledge and prior characterization results. Leidos also recommends that the liquid IDW and be removed offsite and disposed of at a permitted water treatment or waste facility unless the ARNG/OHARNG has additional information that would result in the IDW meeting the definition of a listed hazardous waste as defined in 40 CFR Part 261 Subpart D. Table 1 presents the disposal pathway identified as a result of IDW characterization data.

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

| Container Number | Container Type and Size | Contents | Generation Date | Disposal Recommendation |
|---|---|---|---|---|
| Leidos-FWGW-012-L | 55 Gallon, Steel, Closed Top Drum | Purge Water, Equipment Decon Fluids – 45 gal | 4/23/19-5/2/19 | Permitted Treatment or Waste Facility |
| Leidos-FWGW-013-L | 55 Gallon, Steel, Closed Top Drum | Purge Water, Equipment Decon Fluids – 45 gal | 5/3/19-5/8/19 | Permitted Treatment or Waste Facility |
| Leidos-FWGW-014-L | 55 Gallon, Steel, Closed Top Drum | Purge Water, Equipment Decon Fluids – 38 gal | 5/7/19-5/8/19 | Permitted Treatment or Waste Facility |
| Leidos-FWGW-015-L | 55 Gallon, Steel, Closed Top Drum | Purge Water, Equipment Decon Fluids – 35.5 gal | 5/9/19-5/13/19 | Permitted Treatment or Waste Facility |

Since the former RVAAP, under RCRA, is the generator of this material, Leidos requests concurrence or direction on the waste classification. Following your concurrence, we will proceed with generating waste manifest and coordinating waste disposal under previous Clean Harbors Profile No. CH1784679.

If you have any questions, or require additional information, please do not hesitate to contact me at (330) 405-5802.

Leidos

Jed Thomas, P.E.
Deputy Project Manager

cc: David Connolly, ARNG
Kevin Sedlak, ARNG, Camp James A. Garfield
Jay Trumble, USACE Louisville
Vasu Peterson, Leidos
Heather Adams, Leidos

ATTACHMENT 1.
October 2018 Facility-wide Groundwater Monitoring Program Sampling - Investigation-Derived Waste (IDW) Characterization and Disposal Plan

January 29, 2019

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

**Subject:** **October 2018 Facility-wide Groundwater Monitoring Program Sampling - Investigation-Derived Waste (IDW) Characterization and Disposal Plan**
**Reference:** **Contract No. W912QR-16-D-0003, Delivery Order No. W912QR-18-F-0337, Groundwater Investigation and Reporting Services, RVAAP Restoration Program**

Dear Ms. Tait:

Investigative activities in accordance with the *Facility-wide Groundwater Monitoring Addendum for 2018* were performed from October 18, 2018 through November 06, 2018 and January 28, 2019. These activities have resulted in the generation of solid IDW (consisting of soil cuttings) and liquid IDW (consisting of purge water and equipment decontamination fluids). The purpose of this letter is to characterize and classify IDW for disposal and to propose methods for disposing of the IDW.

This letter report includes a summary of IDW generated, the origin of the IDW and proposed classification and recommendations for disposal of the IDW (Table 1), a summary of the analytical results (Attachment A), and the laboratory data package (Attachment B). In addition to the specified plans, this letter report follows guidance established by the *Facility-Wide Sampling and Analysis Plan* (USACE 2011) (herein referred to at the Facility-wide SAP).

Two distinct IDW streams were generated as part of the field activities. Each waste stream was composited and sampled per requirements outlined in Section 8.0 of the Facility-wide SAP.

IDW streams generated are:

- Eleven (11), 55 gallon drums containing approximately 437 gallons of groundwater well purge water and equipment decontamination fluids (liquinox wash water, 10% nitric acid, isopropanol, and DI water); and
- Five (5), 55-gallon drum containing soil cuttings.

**Liquid IDW Discussion**

Per Section 8.4 of the Facility-wide SAP, one composite waste sample was collected for laboratory analysis of 1) metals, herbicides, pesticides, semi-volatile organic compounds (SVOCs), and volatile organic compounds (VOCs) using the Toxicity Characteristic Leaching Procedure (TCLP) and 2) total PCBs, total sulfide, total cyanide, nitrate/nitrite, corrosivity (pH), and flashpoint to characterize the waste for disposal. Samples FWGIDW-181001-WW and FWGIDW-181002-WW (cyanide only) were collected to characterize the liquid drums containing groundwater well purge water and equipment decontamination fluids [liquinox wash water, 10% nitric acid, isopropanol, and deionized (DI) water]. Upon receipt from the laboratory, the analytical results were reviewed to determine if the waste was potentially hazardous. This review consisted of a comparison of the analytical results against the TCLP criteria presented in Table 8-1: Maximum Concentration of Contaminants for the Toxicity Characteristic (40 *CFR* 261.24) and Table 8-2: Maximum Concentration of Hazardous Waste Characterization Analytes (40 *CFR* 261.21-23) presented in the Facility-wide SAP (USACE 2011), as well as other applicable Resource Conservation Recovery Act (RCRA) Hazardous Waste regulations 40 *CFR* 261 – 265.

Attachment A, Table A.1 presents the analytical laboratory data for the liquid IDW sample. The results are summarized below:

1) All analytical results were below the Maximum Concentration for Toxicity Characteristic per 40 *CFR* 261.24;
2) The sample had nondetectable concentrations for all PCBs analyzed;
3) The pH for the IDW is considered neutral (2 S.U. < pH < 12.5 S.U.);
4) The flash point is >60ûC (140ûF);
5) A detection of cyanide at 0.27 mg/L was identified in sample FWGIDW-181002-WW. Table 8-2 of the FWSAP lists the cyanide criteria as 0.01 mg/L. However, this is not consistent with 40 CFR 261.23 and 261.24, as numerical standards are not specified. Rather, the US Environmental Protection Agency requires generators to use their knowledge to make a D003 determination per 40 CFR 261.23(a)(5) for cyanide-bearing wastes. Based on generator knowledge of the site and a visual assessment of the current condition of the waste, the waste does not qualify as reactive waste.

Given the observed analytical results, it is recommended that the liquid IDW be classified as non-hazardous, non-contaminated.

**Solid IDW Discussion**

Per Section 8.4 of the Facility-wide SAP, a composite waste sample (FWGIDW-181001-WS) was collected for laboratory analysis 1) metals, herbicides, pesticides, SVOCs, and VOCs using the TCLP and 2) total PCBs, total sulfide, total cyanide, nitrate/nitrite, corrosivity (pH), and flashpoint to characterize the soil IDW for disposal. Upon receipt from the laboratory, the analytical results were reviewed to determine if the waste was potentially hazardous. This review consisted of a comparison of the analytical results against the TCLP criteria presented in Table 8-1: Maximum Concentration of Contaminants for the Toxicity Characteristic (40 *CFR* 261.24) and Table 8-2: Maximum Concentration of Hazardous Waste Characterization Analytes (40 CFR 261.21-23), presented in the Facility-wide SAP (USACE 2011) and RCRA Hazardous Waste regulations 40 *CFR* 261 – 265.

Attachment A, Table A.2 presents the analytical laboratory data for solid IDW generated during ongoing field activities. The results are summarized below:

1) All analytical results were below the Maximum Concentration for Toxicity Characteristic per 40 *CFR* 261.24;
2) The sample had nondetectable concentrations for all PCBs analyzed;
3) The pH for the IDW is considered neutral (2 S.U. < pH < 12.5 S.U.);
4) The flash point is >60ûC (140ûF); and
5) A detection of cyanide at 37B mg/kg was identified in the sample. Table 8-2 of the FWSAP lists the cyanide criteria as 0.66 mg/kg. However, this is not consistent with 40 CFR 261.23 and 261.24, as numerical standards are not specified. Rather, the US Environmental Protection Agency requires generators to use their knowledge to make a D003 determination per 40 CFR 261.23(a)(5) for cyanide-bearing wastes. Based on generator knowledge of the site and a visual assessment of the current condition of the waste, the waste does not qualify as reactive waste.

Given the observed analytical results, it is recommended that the solid IDW waste stream be classified as non-hazardous, non-contaminated.

**Recommended Disposal Pathways for IDW**

Table 1s present the disposal pathway identified as a result of IDW characterization data. This IDW has been characterized under provisions of the Facility-Wide SAP using TCLP analyses and process knowledge. Leidos recommends that all IDW be disposed as non-hazardous, non-contaminated waste to be removed offsite by a permitted water treatment or waste facility unless the ARNG/OHARNG has additional information that would result in the IDW meeting the definition of a listed hazardous waste as defined in 40 *CFR* Part 261 Subpart D.

Since the former RVAAP, under RCRA, is the generator of this material, Leidos requests concurrence or direction on the waste classification. Following your concurrence, we will proceed with generating a waste profile, waste manifest, and coordinating waste disposal.

If you have any questions, or require additional information, please do not hesitate to contact me at (330) 405-5802.

Leidos



Jed Thomas, P.E.
Deputy Project Manager

cc: David Connolly, ARNG
Kevin Sedlak, ARNG, Camp James A. Garfield
Jay Trumble, USACE Louisville
Vasu Peterson, Leidos
Heather Adams, Leidos

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

| Container Number | Container Type and Size | Contents | Generation Date | Sample ID | Date(s) Sampled | Disposal Recommendation |
|---|---|---|---|---|---|---|
| Leidos-FWGW-001-S | 55 Gallon, Steel, Open Top Drum | Soil Cuttings and Sediment | 10/23/18 | FWGIDW-181001-WS | 10/31/2018 | Permitted Treatment or Waste Facility |
| Leidos-FWGW-002-S | 55 Gallon, Steel, Open Top Drum | Soil Cuttings and Sediment | 10/23/18 | FWGIDW-181001-WS | 10/31/2018 | Permitted Treatment or Waste Facility |
| Leidos-FWGW-003-S | 55 Gallon, Steel, Open Top Drum | Soil Cuttings and Sediment | 10/24/18 | FWGIDW-181001-WS | 10/31/2018 | Permitted Treatment or Waste Facility |
| Leidos-FWGW-004-S | 55 Gallon, Steel, Open Top Drum | Soil Cuttings and Sediment | 10/23/18 | FWGIDW-181001-WS | 10/31/2018 | Permitted Treatment or Waste Facility |
| Leidos-FWGW-005-S | 55 Gallon, Steel, Open Top Drum | Soil Cuttings and Sediment | 10/26/18 | FWGIDW-181001-WS | 10/31/2018 | Permitted Treatment or Waste Facility |
| Leidos-FWGW-001-L | 55 Gallon, Steel, Closed Top Drum | Purge Water, Equipment Decon Fluids – 40 gal | 10/15/18 | FWGIDW-181001-WW | 11/2/2018 | Permitted Treatment or Waste Facility |
| Leidos-FWGW-002-L | 55 Gallon, Steel, Closed Top Drum | Purge Water, Equipment Decon Fluids – 40 gal | 10/22/18 | FWGIDW-181001-WW | 11/2/2018 | Permitted Treatment or Waste Facility |
| Leidos-FWGW-003-L | 55 Gallon, Steel, Closed Top Drum | Purge Water, Equipment Decon Fluids – 39 gal | 10/24/18 | FWGIDW-181001-WW | 11/2/2018 | Permitted Treatment or Waste Facility |
| Leidos-FWGW-004-L | 55 Gallon, Steel, Closed Top Drum | Purge Water, Equipment Decon Fluids – 41.5 gal | 10/25/18 | FWGIDW-181001-WW | 11/2/2018 | Permitted Treatment or Waste Facility |
| Leidos-FWGW-005-L | 55 Gallon, Steel, Closed Top Drum | Purge Water, Equipment Decon Fluids – 42 gal | 10/26/18 | FWGIDW-181001-WW | 11/2/2018 | Permitted Treatment or Waste Facility |
| Leidos-FWGW-006-L | 55 Gallon, Steel, Closed Top Drum | Purge Water, Equipment Decon Fluids – 43.5 gal | 10/29/18 | FWGIDW-181001-WW | 11/2/2018 | Permitted Treatment or Waste Facility |
| Leidos-FWGW-007-L | 55 Gallon, Steel, Closed Top Drum | Purge Water, Equipment Decon Fluids – 39.5 gal | 10/30/18 | FWGIDW-181001-WW | 11/2/2018 | Permitted Treatment or Waste Facility |
| Leidos-FWGW-008-L | 55 Gallon, Steel, Closed Top Drum | Purge Water, Equipment Decon Fluids – 39.5 gal | 10/30/18 | FWGIDW-181001-WW | 11/2/2018 | Permitted Treatment or Waste Facility |
| Leidos-FWGW-009-L | 55 Gallon, Steel, Closed Top Drum | Purge Water, Equipment Decon Fluids – 30 gal | 10/20/18 | FWGIDW-181001-WW | 11/2/2018 | Permitted Treatment or Waste Facility |
| Leidos-FWGW-010-L | 55 Gallon, Steel, Closed Top Drum | Purge Water, Equipment Decon Fluids – 39 gal | 11/01/18 | FWGIDW-181001-WW | 11/2/2018 | Permitted Treatment or Waste Facility |
| Leidos-FWGW-011-L | 55 Gallon, Steel, Closed Top Drum | Purge Water, Equipment Decon Fluids – 43 gal | 10/29/18 | FWGIDW-181001-WW | 11/2/2018 | Permitted Treatment or Waste Facility |

Note 1: Sample FWGIDW-181002-WW was collected on 11/14/18 for cyanide analysis of the liquid drums due to an incorrectly preserved sample bottle on 11/2/18.
Note 2: A total of 9 gallons of liquid IDW were generated during the 1/28/19 sampling event. This liquid IDW was placed in drum Leidos-FWGW-010-L.

**ATTACHMENT A**
**ANALYTICAL RESULTS**

**Table A.1. Liquid IDW Sample Results (FWGIDW-181001-WW)**

| 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 | <0.5 U |
| Barium | 7440-39-3 | mg/L | Metals (ICP) | TCLP | 40 CFR 261.24 | 100 | 0.015 J |
| Cadmium | 7440-43-9 | mg/L | Metals (ICP) | TCLP | 40 CFR 261.24 | 1 | <0.1 U |
| Chromium | 7440-47-3 | mg/L | Metals (ICP) | TCLP | 40 CFR 261.24 | 5 | <0.5 U |
| Lead | 7439-92-1 | mg/L | Metals (ICP) | TCLP | 40 CFR 261.24 | 5 | <0.5 U |
| Mercury | 7439-97-6 | mg/L | Mercury (CVAA) | TCLP | 40 CFR 261.24 | 0.2 | <0.002 U |
| Selenium | 7782-49-2 | mg/L | Metals (ICP) | TCLP | 40 CFR 261.24 | 1 | <0.1 U |
| Silver | 7440-22-4 | mg/L | Metals (ICP) | TCLP | 40 CFR 261.24 | 5 | <0.5 U |
| 2,4-D | 94-75-7 | mg/L | Herbicides (GC) | TCLP | 40 CFR 261.24 | 10 | <0.04 U |
| Silvex (2,4,5-TP) | 93-72-1 | mg/L | Herbicides (GC) | TCLP | 40 CFR 261.24 | 1 | <0.01 U |
| Chlordane (technical) | 57-74-9 | mg/L | Organochlorine Pesticides (GC) | TCLP | 40 CFR 261.24 | 0.03 | <0.005 U |
| Endrin | 72-20-8 | mg/L | Organochlorine Pesticides (GC) | TCLP | 40 CFR 261.24 | 0.02 | <0.005 U |
| Heptachlor | 76-44-8 | mg/L | Organochlorine Pesticides (GC) | TCLP | 40 CFR 261.24 | 0.008 | <0.005 U |
| Heptachlor epoxide | 1024-57-3 | mg/L | Organochlorine Pesticides (GC) | TCLP | 40 CFR 261.24 | 0.008 | <0.005 U |
| Methoxychlor | 72-43-5 | mg/L | Organochlorine Pesticides (GC) | TCLP | 40 CFR 261.24 | 10 | <0.02 U |
| Toxaphene | 8001-35-2 | mg/L | Organochlorine Pesticides (GC) | TCLP | 40 CFR 261.24 | 0.5 | <0.001 U |
| gamma-BHC (Lindane) | 58-89-9 | mg/L | Organochlorine Pesticides (GC) | TCLP | 40 CFR 261.24 | 0.4 | <0.0005 U |
| 1,4-Dichlorobenzene | 106-46-7 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 7.5 | <0.02 U |
| 2,4,5-Trichlorophenol | 95-95-4 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 400 | <0.05 U |
| 2,4,6-Trichlorophenol | 88-06-2 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 2 | <0.025 U |
| 2,4-Dinitrotoluene | 121-14-2 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 0.13 | <0.05 U |
| 2-Methylphenol (o-cresol) | 95-48-7 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 200 | <0.05 U |
| 3 & 4 Methylphenol (m,p-cresol) | 15831-10-4 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 200 | <0.05 U |
| Hexachlorobenzene | 118-74-1 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 0.13 | <0.05 U |
| Hexachlorobutadiene | 87-68-3 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 0.5 | <0.05 U |
| Hexachloroethane | 67-72-1 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 3 | <0.05 U |
| Nitrobenzene | 98-95-3 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 2 | <0.05 U |
| Pentachlorophenol | 87-86-5 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 100 | <0.25 U |
| Pyridine | 110-86-1 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 5 | <0.1 U |
| 1,1-Dichloroethene | 75-35-4 | mg/L | Volatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 0.7 | <0.01 U |
| 1,2-Dichloroethane | 107-06-2 | mg/L | Volatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 0.5 | <0.01 U |
| 2-Butanone (MEK) | 78-93-3 | mg/L | Volatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 200 | <0.1 U |
| Benzene | 71-43-2 | mg/L | Volatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 0.5 | <0.01 U |
| Carbon tetrachloride | 56-23-5 | mg/L | Volatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 0.5 | <0.01 U |
| Chlorobenzene | 108-90-7 | mg/L | Volatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 100 | <0.01 U |
| Chloroform | 67-66-3 | mg/L | Volatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 6 | <0.01 U |
| Tetrachloroethene | 127-18-4 | mg/L | Volatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 0.7 | <0.01 U |
| Trichloroethene | 79-01-6 | mg/L | Volatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 0.5 | <0.01 U |

**Table A.1. Liquid IDW Sample Results (FWGIDW-181001-WW)**

| Analyte | CAS Number | Units | Specific Method | Basis | Regulatory Level Citation | Regulatory Level | Sample Result |
|---|---|---|---|---|---|---|---|
| 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 | ug/L | Polychlorinated Biphenyls (PCBs) by Gas Chromatography | Total | 40 CFR 761.60 | 50,000 | <0.0011 U |
| PCB-1221 | 11104-28-2 | ug/L | Polychlorinated Biphenyls (PCBs) by Gas Chromatography | Total | 40 CFR 761.60 | 50,000 | <0.0011 U |
| PCB-1232 | 11141-16-5 | ug/L | Polychlorinated Biphenyls (PCBs) by Gas Chromatography | Total | 40 CFR 761.60 | 50,000 | <0.0011 U |
| PCB-1242 | 53469-21-9 | ug/L | Polychlorinated Biphenyls (PCBs) by Gas Chromatography | Total | 40 CFR 761.60 | 50,000 | <0.0011 U |
| PCB-1248 | 12672-29-6 | ug/L | Polychlorinated Biphenyls (PCBs) by Gas Chromatography | Total | 40 CFR 761.60 | 50,000 | <0.0011 U |
| PCB-1254 | 11097-69-1 | ug/L | Polychlorinated Biphenyls (PCBs) by Gas Chromatography | Total | 40 CFR 761.60 | 50,000 | <0.0011 U |
| PCB-1260 | 11096-82-5 | ug/L | Polychlorinated Biphenyls (PCBs) by Gas Chromatography | Total | 40 CFR 761.60 | 50,000 | <0.0011 U |
| PCB-1262 | 37324-23-5 | ug/L | Polychlorinated Biphenyls (PCBs) by Gas Chromatography | Total | 40 CFR 761.60 | 50,000 | <0.0011 U |
| PCB-1268 | 11100-14-4 | ug/L | Polychlorinated Biphenyls (PCBs) by Gas Chromatography | Total | 40 CFR 761.60 | 50,000 | <0.0011 U |
| Flashpoint | N/A | Deg C | Ignitability, Pensky-Martens Closed-Cup Method | Total | 40 CFR 261.21 | >60ûC (140ûF) | >60ûC (140ûF) |
| Cyanide, Total | 57-12-5 | mg/L | Cyanide, Total and/or Amenable | Total | 40 CFR 261.23 | See Note 1 | 0.27 |
| Sulfide, Total | 18496-25-8 | mg/L | Sulfide, Acid Soluble and Insoluble (Titrimetric) | Total | 40 CFR 261.23 | See Note 1 | <4 U |
| pH adj. to 25 deg C | N/A | SU | pH | Total | 40 CFR 261.22 | 2 ≤ pH ≤ 12.5 | 7.8 HF |
| Nitrate as N | 14797-55-8 | mg/L | Anions, Ion Chromatography | Total | NA | --- | 14 D |
| Nitrite as N | 14797-65-0 | mg/L | Anions, Ion Chromatography | Total | NA | --- | 0.52 B |
| Temperature | N/A | Deg C | pH | Total | NA | --- | 7.8 HF (S.U) |

The liquid IDW sample for analysis of cyanide was collected on 11/14/18 under sample ID FWGIDW-181002-WW due to an incorrectly preserved sample bottle on 11/2/18. All other analyses were from sample collected on 11/2/18 under sample ID FWGIDW-181001-WW.
Waste with PCB concentrations greater than 50 ppm (mg/L) [or 50,000 ppb (ug/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.
--- = No regulatory standards for determination of hazardous waste exist.
B = Compound was found in the blank and in the sample.
D = The reported value is from a dilution.
HF = Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J = Estimated concentration, less than the reporting limit - Lab Qualifier
Q = One or more laboratory quality control criteria failed.
U = Non-detect, concentration reported is reporting limit - Lab Qualifier

**Table A.2. Solid IDW Sample Results (FWGIDW-181001-WS)**

| 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 | <0.5 U |
| Barium | 7440-39-3 | mg/L | Metals (ICP) | TCLP | 40 CFR 261.24 | 100 | 0.65 JB |
| Cadmium | 7440-43-9 | mg/L | Metals (ICP) | TCLP | 40 CFR 261.24 | 1 | <0.1 U |
| Chromium | 7440-47-3 | mg/L | Metals (ICP) | TCLP | 40 CFR 261.24 | 5 | <0.5 U |
| Lead | 7439-92-1 | mg/L | Metals (ICP) | TCLP | 40 CFR 261.24 | 5 | <0.5 U |
| Mercury | 7439-97-6 | mg/L | Mercury (CVAA) | TCLP | 40 CFR 261.24 | 0.2 | <0.002 U |
| Selenium | 7782-49-2 | mg/L | Metals (ICP) | TCLP | 40 CFR 261.24 | 1 | <0.1 U |
| Silver | 7440-22-4 | mg/L | Metals (ICP) | TCLP | 40 CFR 261.24 | 5 | <0.5 U |
| 2,4-D | 94-75-7 | mg/L | Herbicides (GC) | TCLP | 40 CFR 261.24 | 10 | <0.04 U |
| Silvex (2,4,5-TP) | 93-72-1 | mg/L | Herbicides (GC) | TCLP | 40 CFR 261.24 | 1 | <0.01 U |
| Chlordane (technical) | 57-74-9 | mg/L | Organochlorine Pesticides (GC) | TCLP | 40 CFR 261.24 | 0.03 | <0.005 U |
| Endrin | 72-20-8 | mg/L | Organochlorine Pesticides (GC) | TCLP | 40 CFR 261.24 | 0.02 | <0.0005 U |
| Heptachlor | 76-44-8 | mg/L | Organochlorine Pesticides (GC) | TCLP | 40 CFR 261.24 | 0.008 | <0.0005 U |
| Heptachlor epoxide | 1024-57-3 | mg/L | Organochlorine Pesticides (GC) | TCLP | 40 CFR 261.24 | 0.008 | <0.0005 U |
| Methoxychlor | 72-43-5 | mg/L | Organochlorine Pesticides (GC) | TCLP | 40 CFR 261.24 | 10 | <0.001 U |
| Toxaphene | 8001-35-2 | mg/L | Organochlorine Pesticides (GC) | TCLP | 40 CFR 261.24 | 0.5 | <0.02 U |
| gamma-BHC (Lindane) | 58-89-9 | mg/L | Organochlorine Pesticides (GC) | TCLP | 40 CFR 261.24 | 0.4 | <0.0005 U |
| 1,4-Dichlorobenzene | 106-46-7 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 7.5 | <0.02 U |
| 2,4,5-Trichlorophenol | 95-95-4 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 400 | <0.05 U |
| 2,4,6-Trichlorophenol | 88-06-2 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 2 | <0.025 U |
| 2,4-Dinitrotoluene | 121-14-2 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 0.13 | <0.05 U |
| 2-Methylphenol (o-cresol) | 95-48-7 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 200 | <0.05 U |
| 3 & 4 Methylphenol (m,p-cresol) | 15831-10-4 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 200 | <0.05 U |
| Hexachlorobenzene | 118-74-1 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 0.13 | <0.05 U |
| Hexachlorobutadiene | 87-68-3 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 0.5 | <0.05 U |
| Hexachloroethane | 67-72-1 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 3 | <0.05 U |
| Nitrobenzene | 98-95-3 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 2 | <0.05 U |
| Pentachlorophenol | 87-86-5 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 100 | <0.25 U |
| Pyridine | 110-86-1 | mg/L | Semivolatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 5 | <0.1 UF2 |
| 1,1-Dichloroethene | 75-35-4 | mg/L | Volatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 0.7 | <0.01 U |
| 1,2-Dichloroethane | 107-06-2 | mg/L | Volatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 0.5 | <0.01 U |
| 2-Butanone (MEK) | 78-93-3 | mg/L | Volatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 200 | <0.1 U |
| Benzene | 71-43-2 | mg/L | Volatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 0.5 | <0.01 U |
| Carbon tetrachloride | 56-23-5 | mg/L | Volatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 0.5 | <0.01 U |
| Chlorobenzene | 108-90-7 | mg/L | Volatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 100 | <0.01 U |
| Chloroform | 67-66-3 | mg/L | Volatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 6 | <0.01 U |
| Tetrachloroethene | 127-18-4 | mg/L | Volatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 0.7 | <0.01 U |

**Table A.2. Solid IDW Sample Results (FWGIDW-181001-WS)**

| Analyte | CAS Number | Units | Specific Method | Basis | Regulatory Level Citation | Regulatory Level | Sample Result |
|---|---|---|---|---|---|---|---|
| Trichloroethene | 79-01-6 | mg/L | Volatile Organic Compounds (GC/MS) | TCLP | 40 CFR 261.24 | 0.5 | <0.01 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 | ug/Kg | Polychlorinated Biphenyls (PCBs) by Gas Chromatography | Total | 40 CFR 761.60 | 50,000 | <0.8 UF1 |
| PCB-1221 | 11104-28-2 | ug/Kg | Polychlorinated Biphenyls (PCBs) by Gas Chromatography | Total | 40 CFR 761.60 | 50,000 | <1.1 U |
| PCB-1232 | 11141-16-5 | ug/Kg | Polychlorinated Biphenyls (PCBs) by Gas Chromatography | Total | 40 CFR 761.60 | 50,000 | <0.8 U |
| PCB-1242 | 53469-21-9 | ug/Kg | Polychlorinated Biphenyls (PCBs) by Gas Chromatography | Total | 40 CFR 761.60 | 50,000 | <0.8 U |
| PCB-1248 | 12672-29-6 | ug/Kg | Polychlorinated Biphenyls (PCBs) by Gas Chromatography | Total | 40 CFR 761.60 | 50,000 | <0.8 U |
| PCB-1254 | 11097-69-1 | ug/Kg | Polychlorinated Biphenyls (PCBs) by Gas Chromatography | Total | 40 CFR 761.60 | 50,000 | <0.8 U |
| PCB-1260 | 11096-82-5 | ug/Kg | Polychlorinated Biphenyls (PCBs) by Gas Chromatography | Total | 40 CFR 761.60 | 50,000 | <0.8 U |
| PCB-1262 | 37324-23-5 | ug/Kg | Polychlorinated Biphenyls (PCBs) by Gas Chromatography | Total | 40 CFR 761.60 | 50,000 | <0.8 U |
| PCB-1268 | 11100-14-4 | ug/Kg | Polychlorinated Biphenyls (PCBs) by Gas Chromatography | Total | 40 CFR 761.60 | 50,000 | <0.8 U |
| Flashpoint | N/A | Deg C | Ignitability, Pensky-Martens Closed-Cup Method | Total | 40 CFR 261.21 | >60ûC (140ûF) | >60ûC (140ûF) |
| Cyanide, Total | 57-12-5 | mg/Kg | Cyanide, Total and/or Amenable | Total | 40 CFR 261.23 | See Note 1 | 37 B |
| Sulfide, Total | 18496-25-8 | mg/Kg | Sulfide, Acid Soluble and Insoluble (Titrimetric) | Total | 40 CFR 261.23 | See Note 1 | 17 J |
| pH adj. to 25 deg C | N/A | SU | pH | Soluble | 40 CFR 261.22 | 2 ≤ pH ≤ 12.5 | 8.4 HF |
| Nitrate as N | 14797-55-8 | mg/Kg | Anions, Ion Chromatography | Soluble | NA | --- | 0.41 J |
| Nitrite as N | 14797-65-0 | mg/Kg | Anions, Ion Chromatography | Soluble | NA | --- | <5.8 U |
| Temperature | N/A | Deg C | pH | Soluble | NA | --- | 22.8 HF |
| Percent Moisture | N/A | % | Percent Moisture | Total | NA | --- | 18.9% |
| Percent Solids | N/A | % | Percent Moisture | Total | NA | --- | 81.1% |

The solid IDW sample for analysis was collected on 10/31/18.
Waste with PCB concentrations greater than 50 ppm (mg/L) [or 50,000 ppb (ug/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.
--- = No regulatory standards for determination of hazardous waste exist.
B = Compound was found in the blank and sample
F1 = MS and/or MSD Recovery is outside acceptance limits.
F2 = MS/MSD RPD exceeds control limits
HF = Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
J = Estimated concentration, less than the reporting limit - Lab Qualifier
Q = One or more laboratory quality control criteria failed.
U = Non-detect, concentration reported is reporting limit - Lab Qualifier

**ATTACHMENT B**
**LABORATORY ANALYTICAL REPORTS**

Job Number: 280-116404-1: Containing Sample FWGIDW-181001-WS
Job Number: 280-116538-2: Containing Samples FWGIDW-181001-WW, FWGIDW-181002-WW

# ANALYTICAL REPORT

Job Number: 280-116404-1

Job Description: Leidos RFP# 001088 - Ravenna AAP-66

For:
Leidos, Inc.
Picatinny Arsenal
356 Ninth Avenue
Suite 106
Dover, NJ 07801

Attention: Rita Schmon-Stasik



Approved for release.
Donna R Rydberg
Senior Project Manager
12/13/2018 7:31 PM

Donna R Rydberg, Senior Project Manager
4955 Yarrow Street, Arvada, CO, 80002
(303)736-0192
donna.rydberg@testamericainc.com
12/13/2018

The test results in this report relate only to the samples in this report and meet all requirements of NELAC, with any exceptions noted. Pursuant to NELAP, this report shall not be reproduced except in full, without the written approval of the laboratory. All questions regarding this report should be directed to the TestAmerica Denver Project Manager.

The Lab Certification ID# is 4025.

Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

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## Qualifiers

### GC/MS Semi VOA

| Qualifier | Qualifier Description |
|---|---|
| F2 | MS/MSD RPD exceeds control limits |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

### GC Semi VOA

| Qualifier | Qualifier Description |
|---|---|
| F1 | MS and/or MSD Recovery is outside acceptance limits. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| X | Surrogate is outside control limits |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| B | Compound was found in the blank and sample. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| HF | Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request. |
| B | Compound was found in the blank and sample. |

## 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 |
| 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) |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| 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) |

# CASE NARRATIVE

## Client: Leidos, Inc.

## Project: Leidos RFP# 001088 - Ravenna AAP-66

## Report Number: 280-116404-1

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 11/1/2018 at 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 1.0º C, 1.0º C and 1.1º C.

**TCLP VOLATILE ORGANIC COMPOUNDS (GC-MS)**
Sample FWGIDW-181001-WS (280-116404-1) was analyzed for TCLP volatile organic compounds (GC-MS) in accordance with 1311. The samples were leached on 11/05/2018 and analyzed on 11/09/2018.

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

**TCLP SEMIVOLATILE ORGANIC COMPOUNDS (GC-MS)**
Sample FWGIDW-181001-WS (280-116404-1) was analyzed for TCLP semivolatile organic compounds (GC-MS) in accordance with 8270D. The samples were leached on 11/05/2018, prepared on 11/06/2018 and analyzed on 11/14/2018.

Pyridine exceeded the RPD limit for the MS/MSD of sample FWGIDW-181001-WS (280-116404-1) in batch 280-437601. The individual spike recoveries were in control. The associated LCS was in control and provides evidence that operating procedures were in control.

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

**ORGANOCHLORINE PESTICIDES (GC)**
Sample FWGIDW-181001-WS (280-116404-1) was analyzed for Organochlorine Pesticides (GC) in accordance with EPA SW-846 Method 1311/8081B. The samples were leached on 11/05/2018, prepared on 11/08/2018 and analyzed on 12/03/2018.

DCB Decachlorobiphenyl failed the surrogate recovery criteria low for sample LB 280-436399/1-F. The surrogate Tetrachloro-m-xylene is in control. The associated samples surrogates were in control and the LCS surrogates were in control. The sample was not reanalyzed as hold times had expired. The data was reported.

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

**POLYCHLORINATED BIPHENYLS (PCBS)**
Sample FWGIDW-181001-WS (280-116404-1) was analyzed for polychlorinated biphenyls (PCBs) in accordance with EPA SW-846 Method 8082A. The samples were prepared on 11/06/2018 and analyzed on 11/27/2018.

PCB-1016 failed the recovery criteria low for the MS/MSD of sample FWGIDW-181001-WS (280-116404-1) in batch 280-438897. The associated LCS was in control and provides evidence that operating procedures were in control.

Sample FWGIDW-181001-WS (280-116404-1)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

The following samples required a sulfuric acid clean-up, via EPA Method 3665A, to reduce matrix interferences: FWGIDW-181001-WS (280-116404-1), (LCS 280-436527/2-A), (MB 280-436527/1-A), (280-116404-C-1-D MS) and (280-116404-C-1-E MSD). Acid Lot: 161554.

The following samples required a mercury clean-up, via EPA Method 3660A, to reduce matrix interferences caused by sulfur: FWGIDW-181001-WS (280-116404-1), (LCS 280-436527/2-A), (MB 280-436527/1-A), (280-116404-C-1-D MS) and (280-116404-C-1-E

MSD). The reagent lot number used was: T31E034.

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

**TCLP CHLORINATED HERBICIDES**
Sample FWGIDW-181001-WS (280-116404-1) was analyzed for TCLP chlorinated herbicides in accordance with EPA SW-846 Methods 1311/8151A. The samples were leached on 11/05/2018, prepared on 11/07/2018 and analyzed on 11/09/2018.

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

**TCLP METALS**
Sample FWGIDW-181001-WS (280-116404-1) was analyzed for TCLP metals in accordance with EPA SW846 Methods 1311/6010C. The samples were leached on 11/05/2018, prepared on 11/07/2018 and analyzed on 11/08/2018.

Barium was detected in method blank LB 280-436399/1-D at a level that was less than one half the RL; therefore, corrective action was deemed unnecessary. The value should be considered an estimate, and has been flagged “J”.

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

**TCLP MERCURY**
Sample FWGIDW-181001-WS (280-116404-1) was analyzed for TCLP mercury in accordance with SW-846 1311/7470. The samples were leached on 11/05/2018, and prepared and analyzed on 11/08/2018.

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

**IGNITABILITY**
Sample FWGIDW-181001-WS (280-116404-1) was analyzed for Ignitability in accordance with 1010A. The samples were analyzed on 11/16/2018.

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

**TOTAL CYANIDE**
Sample FWGIDW-181001-WS (280-116404-1) was analyzed for Total Cyanide in accordance with 9012B. The samples were prepared and analyzed on 11/14/2018.

Cyanide, Total was detected in method blank MB 280-437593/4-A at a level that was less than the RL; therefore, corrective action was deemed unnecessary. The value should be considered an estimate, and has been flagged “J”.

Sample FWGIDW-181001-WS (280-116404-1)[2X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

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

**TOTAL SULFIDE**
Sample FWGIDW-181001-WS (280-116404-1) was analyzed for total sulfide in accordance with EPA SW-846 Method 9034. The samples were prepared and analyzed on 11/07/2018.

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

**CORROSIVITY (PH)**
Sample FWGIDW-181001-WS (280-116404-1) was analyzed for Corrosivity (pH) in accordance with EPA SW-846 Method 9045D. The samples were leached on 11/08/2018 and analyzed on 11/08/2018.

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

**ANIONS**
Sample FWGIDW-181001-WS (280-116404-1) was analyzed for anions in accordance with SW 846 9056A. The samples were leached on 11/13/2018 and analyzed on 11/14/2018.

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

**PERCENT SOLIDS**
Sample FWGIDW-181001-WS (280-116404-1) was analyzed for percent solids in accordance with ASTM D2216-90. The samples were analyzed on 11/06/2018.

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: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116404-1

## Client Sample ID: FWGIDW-181001-WS

## Lab Sample ID: 280-116404-1

| Analyte | Result | Qualifier | RL | | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 0.65 | J B | 1.0 | | 0.0040 | mg/L | 1 | | 6010C | TCLP |
| Flashpoint | >60 | | 1.00 | | 1.00 | Degrees C | 1 | | 1010A | Total/NA |
| Cyanide, Total | 37 | B | 1.2 | | 0.25 | mg/Kg | 2 | ☼ | 9012B | Total/NA |
| Sulfide | 17 | J | 21 | | 5.0 | mg/Kg | 1 | ☼ | 9034 | Total/NA |
| pH adj. to 25 deg C | 8.4 | HF | 0.1 | | 0.1 | SU | 1 | | 9045D | Soluble |
| Temperature | 22.8 | HF | 1.0 | | 1.0 | Degrees C | 1 | | 9045D | Soluble |
| Nitrate as N | 0.41 | J | 5.8 | | 0.36 | mg/Kg | 1 | ☼ | 9056A | Soluble |

This Detection Summary does not include radiochemical test results.

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

**Client Sample ID: FWGIDW-181001-WS** **Lab Sample ID: 280-116404-1**
**Date Collected: 10/31/18 13:00** **Matrix: Solid**
**Date Received: 11/01/18 09:30**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Benzene | ND | | 0.010 | 0.0016 | mg/L | | 11/09/18 21:21 | 1 |
| 2-Butanone (MEK) | ND | | 0.10 | 0.020 | mg/L | | 11/09/18 21:21 | 1 |
| Carbon tetrachloride | ND | | 0.010 | 0.0019 | mg/L | | 11/09/18 21:21 | 1 |
| Chlorobenzene | ND | | 0.010 | 0.0017 | mg/L | | 11/09/18 21:21 | 1 |
| Chloroform | ND | | 0.010 | 0.0016 | mg/L | | 11/09/18 21:21 | 1 |
| 1,2-Dichloroethane | ND | | 0.010 | 0.0013 | mg/L | | 11/09/18 21:21 | 1 |
| 1,1-Dichloroethene | ND | | 0.010 | 0.0023 | mg/L | | 11/09/18 21:21 | 1 |
| Tetrachloroethene | ND | | 0.010 | 0.0020 | mg/L | | 11/09/18 21:21 | 1 |
| Trichloroethene | ND | | 0.010 | 0.0016 | mg/L | | 11/09/18 21:21 | 1 |
| Vinyl chloride | ND | | 0.010 | 0.0010 | mg/L | | 11/09/18 21:21 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Toluene-d8 (Surr)* | *102* | | *78 - 120* | | *11/09/18 21:21* | *1* |
| *1,2-Dichloroethane-d4 (Surr)* | *111* | | *64 - 129* | | *11/09/18 21:21* | *1* |
| *4-Bromofluorobenzene (Surr)* | *112* | | *78 - 121* | | *11/09/18 21:21* | *1* |
| *Dibromofluoromethane (Surr)* | *101* | | *79 - 119* | | *11/09/18 21:21* | *1* |

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

**Client Sample ID: FWGIDW-181001-WS** **Lab Sample ID: 280-116404-1**
**Date Collected: 10/31/18 13:00** **Matrix: Solid**
**Date Received: 11/01/18 09:30**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| 2-Methylphenol | ND | | 0.050 | 0.0049 | mg/L | | 11/14/18 19:46 | 1 |
| 3 & 4 Methylphenol | ND | | 0.050 | 0.0013 | mg/L | | 11/14/18 19:46 | 1 |
| 1,4-Dichlorobenzene | ND | | 0.020 | 0.0016 | mg/L | | 11/14/18 19:46 | 1 |
| 2,4-Dinitrotoluene | ND | | 0.050 | 0.0083 | mg/L | | 11/14/18 19:46 | 1 |
| Hexachlorobenzene | ND | | 0.050 | 0.0033 | mg/L | | 11/14/18 19:46 | 1 |
| Hexachlorobutadiene | ND | | 0.050 | 0.017 | mg/L | | 11/14/18 19:46 | 1 |
| Hexachloroethane | ND | | 0.050 | 0.011 | mg/L | | 11/14/18 19:46 | 1 |
| Nitrobenzene | ND | | 0.050 | 0.0041 | mg/L | | 11/14/18 19:46 | 1 |
| Pentachlorophenol | ND | | 0.25 | 0.10 | mg/L | | 11/14/18 19:46 | 1 |
| Pyridine | ND | F2 | 0.10 | 0.0057 | mg/L | | 11/14/18 19:46 | 1 |
| 2,4,5-Trichlorophenol | ND | | 0.050 | 0.0022 | mg/L | | 11/14/18 19:46 | 1 |
| 2,4,6-Trichlorophenol | ND | | 0.025 | 0.0014 | mg/L | | 11/14/18 19:46 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *75* | | *49 - 120* | *11/06/18 18:15* | *11/14/18 19:46* | *1* |
| *2-Fluorophenol (Surr)* | *76* | | *50 - 120* | *11/06/18 18:15* | *11/14/18 19:46* | *1* |
| *2,4,6-Tribromophenol (Surr)* | *99* | | *51 - 120* | *11/06/18 18:15* | *11/14/18 19:46* | *1* |
| *Nitrobenzene-d5 (Surr)* | *80* | | *51 - 120* | *11/06/18 18:15* | *11/14/18 19:46* | *1* |
| *Phenol-d5 (Surr)* | *70* | | *47 - 120* | *11/06/18 18:15* | *11/14/18 19:46* | *1* |
| *Terphenyl-d14 (Surr)* | *105* | | *56 - 120* | *11/06/18 18:15* | *11/14/18 19:46* | *1* |

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

**Client Sample ID: FWGIDW-181001-WS** **Lab Sample ID: 280-116404-1**
**Date Collected: 10/31/18 13:00** **Matrix: Solid**
**Date Received: 11/01/18 09:30**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Endrin | ND | | 0.00050 | 0.000079 | mg/L | | 12/03/18 17:52 | 1 |
| Heptachlor | ND | | 0.00050 | 0.000077 | mg/L | | 12/03/18 17:52 | 1 |
| Heptachlor epoxide | ND | | 0.00050 | 0.000075 | mg/L | | 12/03/18 17:52 | 1 |
| gamma-BHC (Lindane) | ND | | 0.00050 | 0.000069 | mg/L | | 12/03/18 17:52 | 1 |
| Methoxychlor | ND | | 0.0010 | 0.00013 | mg/L | | 12/03/18 17:52 | 1 |
| Toxaphene | ND | | 0.020 | 0.0037 | mg/L | | 12/03/18 17:52 | 1 |
| Chlordane (technical) | ND | | 0.0050 | 0.0014 | mg/L | | 12/03/18 17:52 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Tetrachloro-m-xylene* | *83* | | *28 - 115* | *11/08/18 13:15* | *12/03/18 17:52* | *1* |
| *DCB Decachlorobiphenyl* | *104* | | *34 - 122* | *11/08/18 13:15* | *12/03/18 17:52* | *1* |

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

**Client Sample ID: FWGIDW-181001-WS** **Lab Sample ID: 280-116404-1**
**Date Collected: 10/31/18 13:00** **Matrix: Solid**
**Date Received: 11/01/18 09:30** **Percent Solids: 81.1**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| PCB-1016 | ND | F1 | 800 | 120 | ug/Kg | ☼ | 11/27/18 16:17 | 10 |
| PCB-1221 | ND | | 1100 | 380 | ug/Kg | ☼ | 11/27/18 16:17 | 10 |
| PCB-1232 | ND | | 800 | 120 | ug/Kg | ☼ | 11/27/18 16:17 | 10 |
| PCB-1242 | ND | | 800 | 220 | ug/Kg | ☼ | 11/27/18 16:17 | 10 |
| PCB-1248 | ND | | 800 | 140 | ug/Kg | ☼ | 11/27/18 16:17 | 10 |
| PCB-1254 | ND | | 800 | 130 | ug/Kg | ☼ | 11/27/18 16:17 | 10 |
| PCB-1260 | ND | | 800 | 64 | ug/Kg | ☼ | 11/27/18 16:17 | 10 |
| PCB-1262 | ND | | 800 | 280 | ug/Kg | ☼ | 11/27/18 16:17 | 10 |
| PCB-1268 | ND | | 800 | 95 | ug/Kg | ☼ | 11/27/18 16:17 | 10 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Tetrachloro-m-xylene* | *77* | | *44 - 130* | *11/06/18 15:55* | *11/27/18 16:17* | *10* |
| *DCB Decachlorobiphenyl* | *88* | | *59 - 130* | *11/06/18 15:55* | *11/27/18 16:17* | *10* |

## Method: 8151A DOD - Herbicides (GC) - TCLP

**Client Sample ID: FWGIDW-181001-WS** **Lab Sample ID: 280-116404-1**
**Date Collected: 10/31/18 13:00** **Matrix: Solid**
**Date Received: 11/01/18 09:30**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| 2,4-D | ND | | 0.040 | 0.0021 | mg/L | | 11/09/18 17:30 | 1 |
| Silvex (2,4,5-TP) | ND | | 0.010 | 0.0017 | mg/L | | 11/09/18 17:30 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2,4-Dichlorophenylacetic acid* | *37* | | *10 - 131* | *11/07/18 08:15* | *11/09/18 17:30* | *1* |

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

**Client Sample ID: FWGIDW-181001-WS** **Lab Sample ID: 280-116404-1**
**Date Collected: 10/31/18 13:00** **Matrix: Solid**
**Date Received: 11/01/18 09:30**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Arsenic | ND | | 0.50 | 0.022 | mg/L | | 11/08/18 01:20 | 1 |

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

**Client Sample ID: FWGIDW-181001-WS** **Lab Sample ID: 280-116404-1**
**Date Collected: 10/31/18 13:00** **Matrix: Solid**
**Date Received: 11/01/18 09:30**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| **Barium** | **0.65** | **J B** | 1.0 | 0.0040 | mg/L | | 11/08/18 01:20 | 1 |
| Cadmium | ND | | 0.10 | 0.0020 | mg/L | | 11/08/18 01:20 | 1 |
| Chromium | ND | | 0.50 | 0.0030 | mg/L | | 11/08/18 01:20 | 1 |
| Lead | ND | | 0.50 | 0.014 | mg/L | | 11/08/18 01:20 | 1 |
| Selenium | ND | | 0.10 | 0.032 | mg/L | | 11/08/18 01:20 | 1 |
| Silver | ND | | 0.50 | 0.0040 | mg/L | | 11/08/18 01:20 | 1 |

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

**Client Sample ID: FWGIDW-181001-WS** **Lab Sample ID: 280-116404-1**
**Date Collected: 10/31/18 13:00** **Matrix: Solid**
**Date Received: 11/01/18 09:30**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Mercury | ND | | 0.0020 | 0.000030 | mg/L | | 11/08/18 20:08 | 1 |

## General Chemistry

**Client Sample ID: FWGIDW-181001-WS** **Lab Sample ID: 280-116404-1**
**Date Collected: 10/31/18 13:00** **Matrix: Solid**
**Date Received: 11/01/18 09:30**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| **Flashpoint** | **>60** | | 1.00 | 1.00 | Degrees C | | 11/16/18 01:16 | 1 |
| **Cyanide, Total** | **37** | **B** | 1.2 | 0.25 | mg/Kg | ☼ | 11/14/18 20:40 | 2 |
| **Sulfide** | **17** | **J** | 21 | 5.0 | mg/Kg | ☼ | 11/07/18 20:06 | 1 |

## General Chemistry - Soluble

**Client Sample ID: FWGIDW-181001-WS** **Lab Sample ID: 280-116404-1**
**Date Collected: 10/31/18 13:00** **Matrix: Solid**
**Date Received: 11/01/18 09:30**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| **pH adj. to 25 deg C** | **8.4** | **HF** | 0.1 | 0.1 | SU | | 11/08/18 19:04 | 1 |
| **Temperature** | **22.8** | **HF** | 1.0 | 1.0 | Degrees C | | 11/08/18 19:04 | 1 |
| **Nitrate as N** | **0.41** | **J** | 5.8 | 0.36 | mg/Kg | ☼ | 11/14/18 01:34 | 1 |
| Nitrite as N | ND | | 5.8 | 0.39 | mg/Kg | ☼ | 11/14/18 01:34 | 1 |

# Default Detection Limits

Client: Leidos, Inc. TestAmerica Job ID: 280-116404-1
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

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

### Leach: 1311

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| 1,1-Dichloroethene | 0.010 | 0.0023 | mg/L | 8260B |
| 1,2-Dichloroethane | 0.010 | 0.0013 | mg/L | 8260B |
| 2-Butanone (MEK) | 0.10 | 0.020 | mg/L | 8260B |
| Benzene | 0.010 | 0.0016 | mg/L | 8260B |
| Carbon tetrachloride | 0.010 | 0.0019 | mg/L | 8260B |
| Chlorobenzene | 0.010 | 0.0017 | mg/L | 8260B |
| Chloroform | 0.010 | 0.0016 | mg/L | 8260B |
| Tetrachloroethene | 0.010 | 0.0020 | mg/L | 8260B |
| Trichloroethene | 0.010 | 0.0016 | mg/L | 8260B |
| Vinyl chloride | 0.010 | 0.0010 | mg/L | 8260B |

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

### Prep: 3510C
### Leach: 1311

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| 1,4-Dichlorobenzene | 0.020 | 0.0016 | mg/L | 8270D |
| 2,4,5-Trichlorophenol | 0.050 | 0.0022 | mg/L | 8270D |
| 2,4,6-Trichlorophenol | 0.025 | 0.0014 | mg/L | 8270D |
| 2,4-Dinitrotoluene | 0.050 | 0.0083 | mg/L | 8270D |
| 2-Methylphenol | 0.050 | 0.0049 | mg/L | 8270D |
| 3 & 4 Methylphenol | 0.050 | 0.0013 | mg/L | 8270D |
| Hexachlorobenzene | 0.050 | 0.0033 | mg/L | 8270D |
| Hexachlorobutadiene | 0.050 | 0.017 | mg/L | 8270D |
| Hexachloroethane | 0.050 | 0.011 | mg/L | 8270D |
| Nitrobenzene | 0.050 | 0.0041 | mg/L | 8270D |
| Pentachlorophenol | 0.25 | 0.10 | mg/L | 8270D |
| Pyridine | 0.10 | 0.0057 | mg/L | 8270D |

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

### Prep: 3510C
### Leach: 1311

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| Chlordane (technical) | 0.0050 | 0.0014 | mg/L | 8081B |
| Endrin | 0.00050 | 0.000079 | mg/L | 8081B |
| gamma-BHC (Lindane) | 0.00050 | 0.000069 | mg/L | 8081B |
| Heptachlor | 0.00050 | 0.000077 | mg/L | 8081B |
| Heptachlor epoxide | 0.00050 | 0.000075 | mg/L | 8081B |
| Methoxychlor | 0.0010 | 0.00013 | mg/L | 8081B |
| Toxaphene | 0.020 | 0.0037 | mg/L | 8081B |

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

### Prep: 3546

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| PCB-1016 | 66 | 10 | ug/Kg | 8082A |
| PCB-1221 | 94 | 31 | ug/Kg | 8082A |
| PCB-1232 | 66 | 10 | ug/Kg | 8082A |
| PCB-1242 | 66 | 18 | ug/Kg | 8082A |
| PCB-1248 | 66 | 11 | ug/Kg | 8082A |
| PCB-1254 | 66 | 11 | ug/Kg | 8082A |

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

### Prep: 3546

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| PCB-1260 | 66 | 5.3 | ug/Kg | 8082A |
| PCB-1262 | 66 | 23 | ug/Kg | 8082A |
| PCB-1268 | 66 | 7.9 | ug/Kg | 8082A |

## Method: 8151A DOD - Herbicides (GC) - TCLP

### Prep: 8151A
### Leach: 1311

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| 2,4-D | 0.040 | 0.0021 | mg/L | 8151A DOD |
| Silvex (2,4,5-TP) | 0.010 | 0.0017 | mg/L | 8151A DOD |

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

### Prep: 3010A
### Leach: 1311

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| Arsenic | 0.50 | 0.022 | mg/L | 6010C |
| Barium | 1.0 | 0.0040 | mg/L | 6010C |
| Cadmium | 0.10 | 0.0020 | mg/L | 6010C |
| Chromium | 0.50 | 0.0030 | mg/L | 6010C |
| Lead | 0.50 | 0.014 | mg/L | 6010C |
| Selenium | 0.10 | 0.032 | mg/L | 6010C |
| Silver | 0.50 | 0.0040 | mg/L | 6010C |

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

### Prep: 7470A
### Leach: 1311

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| Mercury | 0.0020 | 0.000030 | mg/L | 7470A |

## General Chemistry

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| Flashpoint | 1.00 | 1.00 | Degrees C | 1010A |

## General Chemistry

### Prep: 9012B

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| Cyanide, Total | 0.50 | 0.10 | mg/Kg | 9012B |

## General Chemistry

### Prep: 9030B

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| Sulfide | 10 | 2.4 | mg/Kg | 9034 |

## General Chemistry - Soluble

### Leach: DI Leach

# Default Detection Limits

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116404-1

## General Chemistry - Soluble

### Leach: DI Leach

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| pH adj. to 25 deg C | 0.1 | 0.1 | SU | 9045D |
| Temperature | 1.0 | 1.0 | Degrees C | 9045D |
| Nitrate as N | 5.0 | 0.31 | mg/Kg | 9056A |
| Nitrite as N | 5.0 | 0.34 | mg/Kg | 9056A |

# Surrogate Summary

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116404-1

## 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) |
| 280-116404-1 | FWGIDW-181001-WS | 102 | 111 | 112 | 101 |
| LB 280-436398/1-A | Method Blank | 95 | 104 | 110 | 100 |
| LCS 280-436398/2-A | Lab Control Sample | 96 | 107 | 108 | 98 |

**Surrogate Legend**

TOL = Toluene-d8 (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (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 | (49-120) | (50-120) | (51-120) | (51-120) | (47-120) | (56-120) |
| 280-116404-1 | FWGIDW-181001-WS | 75 | 76 | 99 | 80 | 70 | 105 |
| 280-116404-1 MS | FWGIDW-181001-WS | 85 | 86 | 96 | 93 | 80 | 101 |
| 280-116404-1 MSD | FWGIDW-181001-WS | 81 | 81 | 93 | 86 | 76 | 99 |
| LB 280-436399/1-C | Method Blank | 67 | 66 | 85 | 70 | 61 | 94 |
| LCS 280-436399/2-C | Lab Control Sample | 74 | 74 | 90 | 79 | 68 | 96 |

**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 | DCBP2 |
| Lab Sample ID | Client Sample ID | (28-115) | (34-122) |
| 280-116404-1 | FWGIDW-181001-WS | 83 | 104 |
| 280-116404-1 MS | FWGIDW-181001-WS | 86 | 103 |
| 280-116404-1 MS | FWGIDW-181001-WS | 81 | 108 |
| 280-116404-1 MSD | FWGIDW-181001-WS | 89 | 107 |
| 280-116404-1 MSD | FWGIDW-181001-WS | 84 | 107 |
| LB 280-436399/1-F | Method Blank | 83 | 18 X |
| LCS 280-436399/2-E | Lab Control Sample | 84 | 56 |
| LCS 280-436399/3-C | Lab Control Sample | 79 | 44 |

**Surrogate Legend**

TCX = Tetrachloro-m-xylene
DCBP = DCB Decachlorobiphenyl

# Surrogate Summary

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116404-1

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

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

| | | Percent Surrogate Recovery (Acceptance Limits) | |
|---|---|---|---|
| Lab Sample ID | Client Sample ID | TCX2 (44-130) | DCBP2 (59-130) |
| 280-116404-1 | FWGIDW-181001-WS | 77 | 88 |
| 280-116404-1 MS | FWGIDW-181001-WS | 70 | 81 |
| 280-116404-1 MSD | FWGIDW-181001-WS | 72 | 82 |
| LCS 280-436527/2-A | Lab Control Sample | 83 | 89 |
| MB 280-436527/1-A | Method Blank | 82 | 88 |

**Surrogate Legend**

TCX = Tetrachloro-m-xylene

DCBP = DCB Decachlorobiphenyl

## Method: 8151A DOD - Herbicides (GC)

**Matrix: Solid** **Prep Type: TCLP**

| | | Percent Surrogate Recovery (Acceptance Limits) |
|---|---|---|
| Lab Sample ID | Client Sample ID | DCPAA1 (10-131) |
| 280-116404-1 | FWGIDW-181001-WS | 37 |
| 280-116404-1 MS | FWGIDW-181001-WS | 44 |
| 280-116404-1 MSD | FWGIDW-181001-WS | 39 |
| LB 280-436399/1-E | Method Blank | 38 |
| LCS 280-436399/3-B | Lab Control Sample | 44 |

**Surrogate Legend**

DCPAA = 2,4-Dichlorophenylacetic acid

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

**Lab Sample ID: LB 280-436398/1-A**
**Matrix: Solid**
**Analysis Batch: 437024**

**Client Sample ID: Method Blank**
**Prep Type: TCLP**

| Analyte | LB Result | LB Qualifier | RL | | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Benzene | ND | | 0.010 | | 0.0016 | mg/L | | 11/09/18 15:11 | 1 |
| 2-Butanone (MEK) | ND | | 0.10 | | 0.020 | mg/L | | 11/09/18 15:11 | 1 |
| Carbon tetrachloride | ND | | 0.010 | | 0.0019 | mg/L | | 11/09/18 15:11 | 1 |
| Chlorobenzene | ND | | 0.010 | | 0.0017 | mg/L | | 11/09/18 15:11 | 1 |
| Chloroform | ND | | 0.010 | | 0.0016 | mg/L | | 11/09/18 15:11 | 1 |
| 1,2-Dichloroethane | ND | | 0.010 | | 0.0013 | mg/L | | 11/09/18 15:11 | 1 |
| 1,1-Dichloroethene | ND | | 0.010 | | 0.0023 | mg/L | | 11/09/18 15:11 | 1 |
| Tetrachloroethene | ND | | 0.010 | | 0.0020 | mg/L | | 11/09/18 15:11 | 1 |
| Trichloroethene | ND | | 0.010 | | 0.0016 | mg/L | | 11/09/18 15:11 | 1 |
| Vinyl chloride | ND | | 0.010 | | 0.0010 | mg/L | | 11/09/18 15:11 | 1 |

| *Surrogate* | *LB %Recovery* | *LB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Toluene-d8 (Surr)* | *95* | | *78 - 120* | | *11/09/18 15:11* | *1* |
| *1,2-Dichloroethane-d4 (Surr)* | *104* | | *64 - 129* | | *11/09/18 15:11* | *1* |
| *4-Bromofluorobenzene (Surr)* | *110* | | *78 - 121* | | *11/09/18 15:11* | *1* |
| *Dibromofluoromethane (Surr)* | *100* | | *79 - 119* | | *11/09/18 15:11* | *1* |

**Lab Sample ID: LCS 280-436398/2-A**
**Matrix: Solid**
**Analysis Batch: 437024**

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

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | | | 0.0500 | 0.0496 | | mg/L | | 99 | 74 - 135 | | |
| 2-Butanone (MEK) | | | 0.200 | 0.158 | | mg/L | | 79 | 44 - 150 | | |
| Carbon tetrachloride | | | 0.0500 | 0.0481 | | mg/L | | 96 | 67 - 135 | | |
| Chlorobenzene | | | 0.0500 | 0.0467 | | mg/L | | 93 | 76 - 135 | | |
| Chloroform | | | 0.0500 | 0.0495 | | mg/L | | 99 | 76 - 120 | | |
| 1,2-Dichloroethane | | | 0.0500 | 0.0522 | | mg/L | | 104 | 70 - 135 | | |
| 1,1-Dichloroethene | | | 0.0500 | 0.0439 | | mg/L | | 88 | 71 - 136 | | |
| Tetrachloroethene | | | 0.0500 | 0.0438 | | mg/L | | 88 | 70 - 135 | | |
| Trichloroethene | | | 0.0500 | 0.0464 | | mg/L | | 93 | 73 - 135 | | |
| Vinyl chloride | | | 0.0500 | 0.0420 | | mg/L | | 84 | 40 - 144 | | |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *Toluene-d8 (Surr)* | *96* | | *78 - 120* |
| *1,2-Dichloroethane-d4 (Surr)* | *107* | | *64 - 129* |
| *4-Bromofluorobenzene (Surr)* | *108* | | *78 - 121* |
| *Dibromofluoromethane (Surr)* | *98* | | *79 - 119* |

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

**Lab Sample ID: LB 280-436399/1-C**
**Matrix: Solid**
**Analysis Batch: 437601**

**Client Sample ID: Method Blank**
**Prep Type: TCLP**
**Prep Batch: 436573**

| Analyte | LB Result | LB Qualifier | RL | | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2-Methylphenol | ND | | 0.050 | | 0.0049 | mg/L | | 11/14/18 16:23 | 1 |

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

**Lab Sample ID: LB 280-436399/1-C** **Client Sample ID: Method Blank**
**Matrix: Solid** **Prep Type: TCLP**
**Analysis Batch: 437601** **Prep Batch: 436573**

| Analyte | LB Result | LB Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| 3 & 4 Methylphenol | ND | | 0.050 | 0.0013 | mg/L | | 11/14/18 16:23 | 1 |
| 1,4-Dichlorobenzene | ND | | 0.020 | 0.0016 | mg/L | | 11/14/18 16:23 | 1 |
| 2,4-Dinitrotoluene | ND | | 0.050 | 0.0083 | mg/L | | 11/14/18 16:23 | 1 |
| Hexachlorobenzene | ND | | 0.050 | 0.0033 | mg/L | | 11/14/18 16:23 | 1 |
| Hexachlorobutadiene | ND | | 0.050 | 0.017 | mg/L | | 11/14/18 16:23 | 1 |
| Hexachloroethane | ND | | 0.050 | 0.011 | mg/L | | 11/14/18 16:23 | 1 |
| Nitrobenzene | ND | | 0.050 | 0.0041 | mg/L | | 11/14/18 16:23 | 1 |
| Pentachlorophenol | ND | | 0.25 | 0.10 | mg/L | | 11/14/18 16:23 | 1 |
| Pyridine | ND | | 0.10 | 0.0057 | mg/L | | 11/14/18 16:23 | 1 |
| 2,4,5-Trichlorophenol | ND | | 0.050 | 0.0022 | mg/L | | 11/14/18 16:23 | 1 |
| 2,4,6-Trichlorophenol | ND | | 0.025 | 0.0014 | mg/L | | 11/14/18 16:23 | 1 |

| *Surrogate* | *LB %Recovery* | *LB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *67* | | *49 - 120* | *11/06/18 18:15* | *11/14/18 16:23* | *1* |
| *2-Fluorophenol (Surr)* | *66* | | *50 - 120* | *11/06/18 18:15* | *11/14/18 16:23* | *1* |
| *2,4,6-Tribromophenol (Surr)* | *85* | | *51 - 120* | *11/06/18 18:15* | *11/14/18 16:23* | *1* |
| *Nitrobenzene-d5 (Surr)* | *70* | | *51 - 120* | *11/06/18 18:15* | *11/14/18 16:23* | *1* |
| *Phenol-d5 (Surr)* | *61* | | *47 - 120* | *11/06/18 18:15* | *11/14/18 16:23* | *1* |
| *Terphenyl-d14 (Surr)* | *94* | | *56 - 120* | *11/06/18 18:15* | *11/14/18 16:23* | *1* |

**Lab Sample ID: LCS 280-436399/2-C** **Client Sample ID: Lab Control Sample**
**Matrix: Solid** **Prep Type: TCLP**
**Analysis Batch: 437601** **Prep Batch: 436573**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| 2-Methylphenol | 0.250 | 0.190 | | mg/L | | 76 | 45 - 120 |
| 3 & 4 Methylphenol | 0.500 | 0.429 | | mg/L | | 86 | 44 - 120 |
| 1,4-Dichlorobenzene | 0.250 | 0.161 | | mg/L | | 64 | 36 - 120 |
| 2,4-Dinitrotoluene | 0.100 | 0.0526 | | mg/L | | 53 | 36 - 120 |
| Hexachlorobenzene | 0.100 | 0.0860 | | mg/L | | 86 | 52 - 120 |
| Hexachlorobutadiene | 0.250 | 0.160 | | mg/L | | 64 | 35 - 120 |
| Hexachloroethane | 0.250 | 0.155 | | mg/L | | 62 | 35 - 120 |
| Nitrobenzene | 0.250 | 0.192 | | mg/L | | 77 | 50 - 120 |
| Pentachlorophenol | 0.500 | 0.430 | | mg/L | | 86 | 39 - 120 |
| Pyridine | 0.250 | 0.127 | | mg/L | | 51 | 10 - 121 |
| 2,4,5-Trichlorophenol | 0.250 | 0.200 | | mg/L | | 80 | 46 - 120 |
| 2,4,6-Trichlorophenol | 0.250 | 0.201 | | mg/L | | 81 | 43 - 120 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *74* | | *49 - 120* |
| *2-Fluorophenol (Surr)* | *74* | | *50 - 120* |
| *2,4,6-Tribromophenol (Surr)* | *90* | | *51 - 120* |
| *Nitrobenzene-d5 (Surr)* | *79* | | *51 - 120* |
| *Phenol-d5 (Surr)* | *68* | | *47 - 120* |
| *Terphenyl-d14 (Surr)* | *96* | | *56 - 120* |

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

**Lab Sample ID: 280-116404-1 MS** **Client Sample ID: FWGIDW-181001-WS**
**Matrix: Solid** **Prep Type: TCLP**
**Analysis Batch: 437601** **Prep Batch: 436573**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| 2-Methylphenol | ND | | 0.250 | 0.218 | | mg/L | | 87 | 45 - 120 |
| 3 & 4 Methylphenol | ND | | 0.500 | 0.474 | | mg/L | | 95 | 44 - 120 |
| 1,4-Dichlorobenzene | ND | | 0.250 | 0.184 | | mg/L | | 74 | 36 - 120 |
| 2,4-Dinitrotoluene | ND | | 0.100 | 0.0651 | | mg/L | | 65 | 36 - 120 |
| Hexachlorobenzene | ND | | 0.100 | 0.0898 | | mg/L | | 90 | 52 - 120 |
| Hexachlorobutadiene | ND | | 0.250 | 0.191 | | mg/L | | 76 | 35 - 120 |
| Hexachloroethane | ND | | 0.250 | 0.175 | | mg/L | | 70 | 35 - 120 |
| Nitrobenzene | ND | | 0.250 | 0.218 | | mg/L | | 87 | 50 - 120 |
| Pentachlorophenol | ND | | 0.500 | 0.448 | | mg/L | | 90 | 39 - 120 |
| Pyridine | ND | F2 | 0.250 | 0.0566 | J | mg/L | | 23 | 10 - 121 |
| 2,4,5-Trichlorophenol | ND | | 0.250 | 0.216 | | mg/L | | 87 | 46 - 120 |
| 2,4,6-Trichlorophenol | ND | | 0.250 | 0.219 | | mg/L | | 88 | 43 - 120 |

| *Surrogate* | *MS %Recovery* | *MS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *85* | | *49 - 120* |
| *2-Fluorophenol (Surr)* | *86* | | *50 - 120* |
| *2,4,6-Tribromophenol (Surr)* | *96* | | *51 - 120* |
| *Nitrobenzene-d5 (Surr)* | *93* | | *51 - 120* |
| *Phenol-d5 (Surr)* | *80* | | *47 - 120* |
| *Terphenyl-d14 (Surr)* | *101* | | *56 - 120* |

**Lab Sample ID: 280-116404-1 MSD** **Client Sample ID: FWGIDW-181001-WS**
**Matrix: Solid** **Prep Type: TCLP**
**Analysis Batch: 437601** **Prep Batch: 436573**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-Methylphenol | ND | | 0.250 | 0.210 | | mg/L | | 84 | 45 - 120 | 4 | 30 |
| 3 & 4 Methylphenol | ND | | 0.500 | 0.464 | | mg/L | | 93 | 44 - 120 | 2 | 30 |
| 1,4-Dichlorobenzene | ND | | 0.250 | 0.181 | | mg/L | | 72 | 36 - 120 | 2 | 30 |
| 2,4-Dinitrotoluene | ND | | 0.100 | 0.0618 | | mg/L | | 62 | 36 - 120 | 5 | 30 |
| Hexachlorobenzene | ND | | 0.100 | 0.0882 | | mg/L | | 88 | 52 - 120 | 2 | 30 |
| Hexachlorobutadiene | ND | | 0.250 | 0.176 | | mg/L | | 70 | 35 - 120 | 8 | 30 |
| Hexachloroethane | ND | | 0.250 | 0.174 | | mg/L | | 70 | 35 - 120 | 1 | 30 |
| Nitrobenzene | ND | | 0.250 | 0.204 | | mg/L | | 82 | 50 - 120 | 7 | 30 |
| Pentachlorophenol | ND | | 0.500 | 0.444 | | mg/L | | 89 | 39 - 120 | 1 | 30 |
| Pyridine | ND | F2 | 0.250 | 0.194 | F2 | mg/L | | 77 | 10 - 121 | 110 | 30 |
| 2,4,5-Trichlorophenol | ND | | 0.250 | 0.210 | | mg/L | | 84 | 46 - 120 | 3 | 30 |
| 2,4,6-Trichlorophenol | ND | | 0.250 | 0.214 | | mg/L | | 86 | 43 - 120 | 2 | 30 |

| *Surrogate* | *MSD %Recovery* | *MSD Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *81* | | *49 - 120* |
| *2-Fluorophenol (Surr)* | *81* | | *50 - 120* |
| *2,4,6-Tribromophenol (Surr)* | *93* | | *51 - 120* |
| *Nitrobenzene-d5 (Surr)* | *86* | | *51 - 120* |
| *Phenol-d5 (Surr)* | *76* | | *47 - 120* |
| *Terphenyl-d14 (Surr)* | *99* | | *56 - 120* |

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

### Lab Sample ID: LB 280-436399/1-F
### Matrix: Solid
### Analysis Batch: 439676

### Client Sample ID: Method Blank
### Prep Type: TCLP
### Prep Batch: 436783

| Analyte | LB Result | LB Qualifier | RL | | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Endrin | ND | | 0.00050 | | 0.000079 | mg/L | | 12/03/18 16:59 | 1 |
| Heptachlor | ND | | 0.00050 | | 0.000077 | mg/L | | 12/03/18 16:59 | 1 |
| Heptachlor epoxide | ND | | 0.00050 | | 0.000075 | mg/L | | 12/03/18 16:59 | 1 |
| gamma-BHC (Lindane) | ND | | 0.00050 | | 0.000069 | mg/L | | 12/03/18 16:59 | 1 |
| Methoxychlor | ND | | 0.0010 | | 0.00013 | mg/L | | 12/03/18 16:59 | 1 |
| Toxaphene | ND | | 0.020 | | 0.0037 | mg/L | | 12/03/18 16:59 | 1 |
| Chlordane (technical) | ND | | 0.0050 | | 0.0014 | mg/L | | 12/03/18 16:59 | 1 |

| *Surrogate* | *LB %Recovery* | *LB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Tetrachloro-m-xylene* | *83* | | *28 - 115* | *11/08/18 13:15* | *12/03/18 16:59* | *1* |
| *DCB Decachlorobiphenyl* | *18* | *X* | *34 - 122* | *11/08/18 13:15* | *12/03/18 16:59* | *1* |

### Lab Sample ID: LCS 280-436399/2-E
### Matrix: Solid
### Analysis Batch: 439676

### Client Sample ID: Lab Control Sample
### Prep Type: TCLP
### Prep Batch: 436783

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Endrin | | | 0.00500 | 0.00557 | | mg/L | | 111 | 66 - 143 | | |
| Heptachlor | | | 0.00500 | 0.00522 | | mg/L | | 104 | 59 - 143 | | |
| Heptachlor epoxide | | | 0.00500 | 0.00509 | | mg/L | | 102 | 37 - 142 | | |
| gamma-BHC (Lindane) | | | 0.00500 | 0.00495 | | mg/L | | 99 | 68 - 142 | | |
| Methoxychlor | | | 0.00500 | 0.00580 | | mg/L | | 116 | 30 - 150 | | |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *Tetrachloro-m-xylene* | *84* | | *28 - 115* |
| *DCB Decachlorobiphenyl* | *56* | | *34 - 122* |

### Lab Sample ID: LCS 280-436399/3-C
### Matrix: Solid
### Analysis Batch: 439676

### Client Sample ID: Lab Control Sample
### Prep Type: TCLP
### Prep Batch: 436783

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Toxaphene | | | 0.200 | 0.244 | | mg/L | | 122 | 63 - 142 | | |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *Tetrachloro-m-xylene* | *79* | | *28 - 115* |
| *DCB Decachlorobiphenyl* | *44* | | *34 - 122* |

### Lab Sample ID: 280-116404-1 MS
### Matrix: Solid
### Analysis Batch: 439676

### Client Sample ID: FWGIDW-181001-WS
### Prep Type: TCLP
### Prep Batch: 436783

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Endrin | ND | | 0.00500 | 0.00530 | | mg/L | | 106 | 66 - 143 | | |
| Heptachlor | ND | | 0.00500 | 0.00499 | | mg/L | | 100 | 59 - 143 | | |
| Heptachlor epoxide | ND | | 0.00500 | 0.00491 | | mg/L | | 98 | 37 - 142 | | |
| gamma-BHC (Lindane) | ND | | 0.00500 | 0.00479 | | mg/L | | 96 | 68 - 142 | | |

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

**Lab Sample ID: 280-116404-1 MS** — **Client Sample ID: FWGIDW-181001-WS**
**Matrix: Solid** — **Prep Type: TCLP**
**Analysis Batch: 439676** — **Prep Batch: 436783**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Methoxychlor | ND | | 0.00500 | 0.00561 | | mg/L | | 112 | 30 - 150 |

| *Surrogate* | *MS %Recovery* | *MS Qualifier* | *Limits* |
|---|---|---|---|
| *Tetrachloro-m-xylene* | *86* | | *28 - 115* |
| *DCB Decachlorobiphenyl* | *103* | | *34 - 122* |

**Lab Sample ID: 280-116404-1 MS** — **Client Sample ID: FWGIDW-181001-WS**
**Matrix: Solid** — **Prep Type: TCLP**
**Analysis Batch: 439676** — **Prep Batch: 436783**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Toxaphene | ND | | 0.200 | 0.223 | | mg/L | | 111 | 63 - 142 |

| *Surrogate* | *MS %Recovery* | *MS Qualifier* | *Limits* |
|---|---|---|---|
| *Tetrachloro-m-xylene* | *81* | | *28 - 115* |
| *DCB Decachlorobiphenyl* | *108* | | *34 - 122* |

**Lab Sample ID: 280-116404-1 MSD** — **Client Sample ID: FWGIDW-181001-WS**
**Matrix: Solid** — **Prep Type: TCLP**
**Analysis Batch: 439676** — **Prep Batch: 436783**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Endrin | ND | | 0.00500 | 0.00583 | | mg/L | | 117 | 66 - 143 | 9 | 30 |
| Heptachlor | ND | | 0.00500 | 0.00554 | | mg/L | | 111 | 59 - 143 | 10 | 30 |
| Heptachlor epoxide | ND | | 0.00500 | 0.00540 | | mg/L | | 108 | 37 - 142 | 9 | 30 |
| gamma-BHC (Lindane) | ND | | 0.00500 | 0.00525 | | mg/L | | 105 | 68 - 142 | 9 | 30 |
| Methoxychlor | ND | | 0.00500 | 0.00591 | | mg/L | | 118 | 30 - 150 | 5 | 30 |

| *Surrogate* | *MSD %Recovery* | *MSD Qualifier* | *Limits* |
|---|---|---|---|
| *Tetrachloro-m-xylene* | *89* | | *28 - 115* |
| *DCB Decachlorobiphenyl* | *107* | | *34 - 122* |

**Lab Sample ID: 280-116404-1 MSD** — **Client Sample ID: FWGIDW-181001-WS**
**Matrix: Solid** — **Prep Type: TCLP**
**Analysis Batch: 439676** — **Prep Batch: 436783**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Toxaphene | ND | | 0.200 | 0.232 | | mg/L | | 116 | 63 - 142 | 4 | 30 |

| *Surrogate* | *MSD %Recovery* | *MSD Qualifier* | *Limits* |
|---|---|---|---|
| *Tetrachloro-m-xylene* | *84* | | *28 - 115* |
| *DCB Decachlorobiphenyl* | *107* | | *34 - 122* |

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

**Lab Sample ID: MB 280-436527/1-A**
**Matrix: Solid**
**Analysis Batch: 438897**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 436527**

| Analyte | MB Result | MB Qualifier | RL | | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | ND | | 59 | | 9.1 | ug/Kg | | 11/27/18 15:35 | 1 |
| PCB-1221 | ND | | 83 | | 28 | ug/Kg | | 11/27/18 15:35 | 1 |
| PCB-1232 | ND | | 59 | | 9.1 | ug/Kg | | 11/27/18 15:35 | 1 |
| PCB-1242 | ND | | 59 | | 16 | ug/Kg | | 11/27/18 15:35 | 1 |
| PCB-1248 | ND | | 59 | | 9.9 | ug/Kg | | 11/27/18 15:35 | 1 |
| PCB-1254 | ND | | 59 | | 9.8 | ug/Kg | | 11/27/18 15:35 | 1 |
| PCB-1260 | ND | | 59 | | 4.7 | ug/Kg | | 11/27/18 15:35 | 1 |
| PCB-1262 | ND | | 59 | | 21 | ug/Kg | | 11/27/18 15:35 | 1 |
| PCB-1268 | ND | | 59 | | 7.0 | ug/Kg | | 11/27/18 15:35 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Tetrachloro-m-xylene* | *82* | | *44 - 130* | *11/06/18 15:55* | *11/27/18 15:35* | *1* |
| *DCB Decachlorobiphenyl* | *88* | | *59 - 130* | *11/06/18 15:55* | *11/27/18 15:35* | *1* |

**Lab Sample ID: LCS 280-436527/2-A**
**Matrix: Solid**
**Analysis Batch: 438897**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 436527**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | | | 123 | 105 | | ug/Kg | | 85 | 47 - 134 | | |
| PCB-1260 | | | 123 | 106 | | ug/Kg | | 86 | 53 - 140 | | |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *Tetrachloro-m-xylene* | *83* | | *44 - 130* |
| *DCB Decachlorobiphenyl* | *89* | | *59 - 130* |

**Lab Sample ID: 280-116404-1 MS**
**Matrix: Solid**
**Analysis Batch: 438897**

**Client Sample ID: FWGIDW-181001-WS**
**Prep Type: Total/NA**
**Prep Batch: 436527**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | ND | F1 | 160 | ND | F1 | ug/Kg | ☼ | 0 | 47 - 134 | | |
| PCB-1260 | ND | | 160 | 87.5 | J | ug/Kg | ☼ | 55 | 53 - 140 | | |

| *Surrogate* | *MS %Recovery* | *MS Qualifier* | *Limits* |
|---|---|---|---|
| *Tetrachloro-m-xylene* | *70* | | *44 - 130* |
| *DCB Decachlorobiphenyl* | *81* | | *59 - 130* |

**Lab Sample ID: 280-116404-1 MSD**
**Matrix: Solid**
**Analysis Batch: 438897**

**Client Sample ID: FWGIDW-181001-WS**
**Prep Type: Total/NA**
**Prep Batch: 436527**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | ND | F1 | 160 | ND | F1 | ug/Kg | ☼ | 0 | 47 - 134 | NC | 30 |
| PCB-1260 | ND | | 160 | 93.3 | J | ug/Kg | ☼ | 58 | 53 - 140 | 6 | 30 |

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

**Lab Sample ID: 280-116404-1 MSD**
**Matrix: Solid**
**Analysis Batch: 438897**

**Client Sample ID: FWGIDW-181001-WS**
**Prep Type: Total/NA**
**Prep Batch: 436527**

| *Surrogate* | *MSD %Recovery* | *MSD Qualifier* | *Limits* |
|---|---|---|---|
| *Tetrachloro-m-xylene* | *72* | | *44 - 130* |
| *DCB Decachlorobiphenyl* | *82* | | *59 - 130* |

## Method: 8151A DOD - Herbicides (GC)

**Lab Sample ID: LB 280-436399/1-E**
**Matrix: Solid**
**Analysis Batch: 437038**

**Client Sample ID: Method Blank**
**Prep Type: TCLP**
**Prep Batch: 436606**

| Analyte | LB Result | LB Qualifier | RL | | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2,4-D | ND | | 0.040 | | 0.0021 | mg/L | | 11/09/18 16:57 | 1 |
| Silvex (2,4,5-TP) | ND | | 0.010 | | 0.0017 | mg/L | | 11/09/18 16:57 | 1 |

| *Surrogate* | *LB %Recovery* | *LB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2,4-Dichlorophenylacetic acid* | *38* | | *10 - 131* | *11/07/18 08:15* | *11/09/18 16:57* | *1* |

**Lab Sample ID: LCS 280-436399/3-B**
**Matrix: Solid**
**Analysis Batch: 437038**

**Client Sample ID: Lab Control Sample**
**Prep Type: TCLP**
**Prep Batch: 436606**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,4-D | | | 0.0500 | 0.0327 | J | mg/L | | 65 | 13 - 115 | | |
| Silvex (2,4,5-TP) | | | 0.0500 | 0.0319 | | mg/L | | 64 | 10 - 158 | | |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2,4-Dichlorophenylacetic acid* | *44* | | *10 - 131* |

**Lab Sample ID: 280-116404-1 MS**
**Matrix: Solid**
**Analysis Batch: 437038**

**Client Sample ID: FWGIDW-181001-WS**
**Prep Type: TCLP**
**Prep Batch: 436606**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,4-D | ND | | 0.0500 | 0.0318 | J | mg/L | | 64 | 13 - 115 | | |
| Silvex (2,4,5-TP) | ND | | 0.0500 | 0.0383 | | mg/L | | 77 | 10 - 158 | | |

| *Surrogate* | *MS %Recovery* | *MS Qualifier* | *Limits* |
|---|---|---|---|
| *2,4-Dichlorophenylacetic acid* | *44* | | *10 - 131* |

**Lab Sample ID: 280-116404-1 MSD**
**Matrix: Solid**
**Analysis Batch: 437038**

**Client Sample ID: FWGIDW-181001-WS**
**Prep Type: TCLP**
**Prep Batch: 436606**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,4-D | ND | | 0.0500 | 0.0322 | J | mg/L | | 64 | 13 - 115 | 1 | 30 |
| Silvex (2,4,5-TP) | ND | | 0.0500 | 0.0373 | | mg/L | | 75 | 10 - 158 | 3 | 30 |

## Method: 8151A DOD - Herbicides (GC) (Continued)

**Lab Sample ID: 280-116404-1 MSD**
**Matrix: Solid**
**Analysis Batch: 437038**

**Client Sample ID: FWGIDW-181001-WS**
**Prep Type: TCLP**
**Prep Batch: 436606**

| *Surrogate* | *MSD %Recovery* | *MSD Qualifier* | *Limits* |
|---|---|---|---|
| *2,4-Dichlorophenylacetic acid* | *39* | | *10 - 131* |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: LB 280-436399/1-D**
**Matrix: Solid**
**Analysis Batch: 436794**

**Client Sample ID: Method Blank**
**Prep Type: TCLP**
**Prep Batch: 436590**

| Analyte | LB Result | LB Qualifier | RL | | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | ND | | 0.50 | | 0.022 | mg/L | | 11/08/18 00:33 | 1 |
| Barium | 0.00459 | J | 1.0 | | 0.0040 | mg/L | | 11/08/18 00:33 | 1 |
| Cadmium | ND | | 0.10 | | 0.0020 | mg/L | | 11/08/18 00:33 | 1 |
| Chromium | ND | | 0.50 | | 0.0030 | mg/L | | 11/08/18 00:33 | 1 |
| Lead | ND | | 0.50 | | 0.014 | mg/L | | 11/08/18 00:33 | 1 |
| Selenium | ND | | 0.10 | | 0.032 | mg/L | | 11/08/18 00:33 | 1 |
| Silver | ND | | 0.50 | | 0.0040 | mg/L | | 11/08/18 00:33 | 1 |

**Lab Sample ID: LCS 280-436399/2-D**
**Matrix: Solid**
**Analysis Batch: 436794**

**Client Sample ID: Lab Control Sample**
**Prep Type: TCLP**
**Prep Batch: 436590**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | | | 4.00 | 3.84 | | mg/L | | 96 | 80 - 120 | | |
| Barium | | | 12.0 | 11.6 | | mg/L | | 97 | 80 - 120 | | |
| Cadmium | | | 1.10 | 1.06 | | mg/L | | 96 | 80 - 120 | | |
| Chromium | | | 5.20 | 5.03 | | mg/L | | 97 | 80 - 120 | | |
| Lead | | | 5.50 | 5.39 | | mg/L | | 98 | 80 - 120 | | |
| Selenium | | | 3.00 | 2.85 | | mg/L | | 95 | 80 - 120 | | |
| Silver | | | 1.05 | 1.05 | | mg/L | | 100 | 80 - 120 | | |

**Lab Sample ID: LCSD 280-436399/13-B**
**Matrix: Solid**
**Analysis Batch: 436794**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: TCLP**
**Prep Batch: 436590**

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | | | 4.00 | 3.99 | | mg/L | | 100 | 80 - 120 | 4 | 20 |
| Barium | | | 12.0 | 11.9 | | mg/L | | 99 | 80 - 120 | 3 | 20 |
| Cadmium | | | 1.10 | 1.09 | | mg/L | | 99 | 80 - 120 | 3 | 20 |
| Chromium | | | 5.20 | 5.20 | | mg/L | | 100 | 80 - 120 | 3 | 20 |
| Lead | | | 5.50 | 5.59 | | mg/L | | 102 | 80 - 120 | 4 | 20 |
| Selenium | | | 3.00 | 2.97 | | mg/L | | 99 | 80 - 120 | 4 | 20 |
| Silver | | | 1.05 | 1.08 | | mg/L | | 103 | 80 - 120 | 3 | 20 |

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: LB 280-436399/1-H**
**Matrix: Solid**
**Analysis Batch: 436972**

**Client Sample ID: Method Blank**
**Prep Type: TCLP**
**Prep Batch: 436799**

| Analyte | LB Result | LB Qualifier | RL | | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | ND | | 0.0020 | | 0.000030 | mg/L | | 11/08/18 20:01 | 1 |

**Lab Sample ID: LCS 280-436399/2-G**
**Matrix: Solid**
**Analysis Batch: 436972**

**Client Sample ID: Lab Control Sample**
**Prep Type: TCLP**
**Prep Batch: 436799**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | | | 0.00500 | 0.00539 | | mg/L | | 108 | 90 - 116 | | |

**Lab Sample ID: LCSD 280-436399/13-C**
**Matrix: Solid**
**Analysis Batch: 436972**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: TCLP**
**Prep Batch: 436799**

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | | | 0.00500 | 0.00543 | | mg/L | | 109 | 90 - 116 | 1 | 10 |

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

**Lab Sample ID: MB 160-401121/1**
**Matrix: Solid**
**Analysis Batch: 401121**

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

| Analyte | MB Result | MB Qualifier | RL | | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Flashpoint | >60 | | 1.00 | | 1.00 | Degrees C | | 11/15/18 23:43 | 1 |

**Lab Sample ID: LCS 160-401121/2**
**Matrix: Solid**
**Analysis Batch: 401121**

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

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Flashpoint | | | 25.0 | 27.00 | | Degrees C | | 108 | 90 - 110 | | |

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

**Lab Sample ID: MB 280-437593/4-A**
**Matrix: Solid**
**Analysis Batch: 437647**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 437593**

| Analyte | MB Result | MB Qualifier | RL | | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Cyanide, Total | 0.268 | J | 0.50 | | 0.10 | mg/Kg | | 11/14/18 19:22 | 1 |

**Lab Sample ID: HLCS 280-437593/1-A**
**Matrix: Solid**
**Analysis Batch: 437647**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 437593**

| Analyte | | | Spike Added | HLCS Result | HLCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cyanide, Total | | | 17.5 | 18.5 | | mg/Kg | | 106 | 90 - 110 | | |

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

**Lab Sample ID: LCS 280-437593/3-A**
**Matrix: Solid**
**Analysis Batch: 437647**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 437593**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Cyanide, Total | 5.00 | 5.50 | | mg/Kg | | 110 | 76 - 120 |

**Lab Sample ID: LLCS 280-437593/2-A**
**Matrix: Solid**
**Analysis Batch: 437647**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 437593**

| Analyte | Spike Added | LLCS Result | LLCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Cyanide, Total | 5.00 | 5.35 | | mg/Kg | | 107 | 51 - 150 |

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

**Lab Sample ID: MB 280-436723/1-A**
**Matrix: Solid**
**Analysis Batch: 436735**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 436723**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Sulfide | ND | | 2.0 | 0.48 | mg/Kg | | 11/07/18 20:06 | 1 |

**Lab Sample ID: LCS 280-436723/3-A**
**Matrix: Solid**
**Analysis Batch: 436735**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 436723**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sulfide | 22.3 | 16.0 | | mg/Kg | | 72 | 38 - 104 |

## Method: 9045D - pH

**Lab Sample ID: LCS 280-436854/1-A**
**Matrix: Solid**
**Analysis Batch: 436907**

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

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| pH adj. to 25 deg C | 7.00 | 7.1 | | SU | | 101 | 97 - 103 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MRL 280-437376/3**
**Matrix: Solid**
**Analysis Batch: 437376**

**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 | 0.200 | 0.212 | J | mg/L | | 106 | 50 - 150 |
| Nitrite as N | 0.200 | 0.221 | J | mg/L | | 110 | 50 - 150 |

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

**Lab Sample ID: MB 280-437455/3-A**
**Matrix: Solid**
**Analysis Batch: 437376**

**Client Sample ID: Method Blank**
**Prep Type: Soluble**

| Analyte | MB Result | MB Qualifier | RL | | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Nitrate as N | ND | | 5.0 | | 0.31 | mg/Kg | | 11/14/18 00:42 | 1 |
| Nitrite as N | ND | | 5.0 | | 0.34 | mg/Kg | | 11/14/18 00:42 | 1 |

**Lab Sample ID: LCS 280-437455/1-A**
**Matrix: Solid**
**Analysis Batch: 437376**

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

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nitrate as N | | | 50.0 | 50.5 | | mg/Kg | | 101 | 87 - 111 | | |
| Nitrite as N | | | 50.0 | 50.2 | | mg/Kg | | 100 | 86 - 115 | | |

**Lab Sample ID: LCSD 280-437455/2-A**
**Matrix: Solid**
**Analysis Batch: 437376**

**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 | | | 49.9 | 50.1 | | mg/Kg | | 100 | 87 - 111 | 1 | 10 |
| Nitrite as N | | | 49.9 | 49.9 | | mg/Kg | | 100 | 86 - 115 | 1 | 10 |

# QC Association Summary

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116404-1

## GC/MS VOA

### Leach Batch: 436398

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | TCLP | Solid | 1311 | |
| LB 280-436398/1-A | Method Blank | TCLP | Solid | 1311 | |
| LCS 280-436398/2-A | Lab Control Sample | TCLP | Solid | 1311 | |

### Analysis Batch: 437024

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | TCLP | Solid | 8260B | 436398 |
| LB 280-436398/1-A | Method Blank | TCLP | Solid | 8260B | 436398 |
| LCS 280-436398/2-A | Lab Control Sample | TCLP | Solid | 8260B | 436398 |

## GC/MS Semi VOA

### Leach Batch: 436399

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | TCLP | Solid | 1311 | |
| LB 280-436399/1-C | Method Blank | TCLP | Solid | 1311 | |
| LCS 280-436399/2-C | Lab Control Sample | TCLP | Solid | 1311 | |
| 280-116404-1 MS | FWGIDW-181001-WS | TCLP | Solid | 1311 | |
| 280-116404-1 MSD | FWGIDW-181001-WS | TCLP | Solid | 1311 | |

### Prep Batch: 436573

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | TCLP | Solid | 3510C | 436399 |
| LB 280-436399/1-C | Method Blank | TCLP | Solid | 3510C | 436399 |
| LCS 280-436399/2-C | Lab Control Sample | TCLP | Solid | 3510C | 436399 |
| 280-116404-1 MS | FWGIDW-181001-WS | TCLP | Solid | 3510C | 436399 |
| 280-116404-1 MSD | FWGIDW-181001-WS | TCLP | Solid | 3510C | 436399 |

### Analysis Batch: 437601

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | TCLP | Solid | 8270D | 436573 |
| LB 280-436399/1-C | Method Blank | TCLP | Solid | 8270D | 436573 |
| LCS 280-436399/2-C | Lab Control Sample | TCLP | Solid | 8270D | 436573 |
| 280-116404-1 MS | FWGIDW-181001-WS | TCLP | Solid | 8270D | 436573 |
| 280-116404-1 MSD | FWGIDW-181001-WS | TCLP | Solid | 8270D | 436573 |

## GC Semi VOA

### Leach Batch: 436399

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | TCLP | Solid | 1311 | |
| LB 280-436399/1-E | Method Blank | TCLP | Solid | 1311 | |
| LB 280-436399/1-F | Method Blank | TCLP | Solid | 1311 | |
| LCS 280-436399/2-E | Lab Control Sample | TCLP | Solid | 1311 | |
| LCS 280-436399/3-B | Lab Control Sample | TCLP | Solid | 1311 | |
| LCS 280-436399/3-C | Lab Control Sample | TCLP | Solid | 1311 | |
| 280-116404-1 MS | FWGIDW-181001-WS | TCLP | Solid | 1311 | |
| 280-116404-1 MSD | FWGIDW-181001-WS | TCLP | Solid | 1311 | |

## GC Semi VOA (Continued)

### Prep Batch: 436527

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | Total/NA | Solid | 3546 | |
| MB 280-436527/1-A | Method Blank | Total/NA | Solid | 3546 | |
| LCS 280-436527/2-A | Lab Control Sample | Total/NA | Solid | 3546 | |
| 280-116404-1 MS | FWGIDW-181001-WS | Total/NA | Solid | 3546 | |
| 280-116404-1 MSD | FWGIDW-181001-WS | Total/NA | Solid | 3546 | |

### Prep Batch: 436606

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | TCLP | Solid | 8151A | 436399 |
| LB 280-436399/1-E | Method Blank | TCLP | Solid | 8151A | 436399 |
| LCS 280-436399/3-B | Lab Control Sample | TCLP | Solid | 8151A | 436399 |
| 280-116404-1 MS | FWGIDW-181001-WS | TCLP | Solid | 8151A | 436399 |
| 280-116404-1 MSD | FWGIDW-181001-WS | TCLP | Solid | 8151A | 436399 |

### Prep Batch: 436783

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | TCLP | Solid | 3510C | 436399 |
| LB 280-436399/1-F | Method Blank | TCLP | Solid | 3510C | 436399 |
| LCS 280-436399/2-E | Lab Control Sample | TCLP | Solid | 3510C | 436399 |
| LCS 280-436399/3-C | Lab Control Sample | TCLP | Solid | 3510C | 436399 |
| 280-116404-1 MS | FWGIDW-181001-WS | TCLP | Solid | 3510C | 436399 |
| 280-116404-1 MS | FWGIDW-181001-WS | TCLP | Solid | 3510C | 436399 |
| 280-116404-1 MSD | FWGIDW-181001-WS | TCLP | Solid | 3510C | 436399 |
| 280-116404-1 MSD | FWGIDW-181001-WS | TCLP | Solid | 3510C | 436399 |

### Analysis Batch: 437038

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | TCLP | Solid | 8151A DOD | 436606 |
| LB 280-436399/1-E | Method Blank | TCLP | Solid | 8151A DOD | 436606 |
| LCS 280-436399/3-B | Lab Control Sample | TCLP | Solid | 8151A DOD | 436606 |
| 280-116404-1 MS | FWGIDW-181001-WS | TCLP | Solid | 8151A DOD | 436606 |
| 280-116404-1 MSD | FWGIDW-181001-WS | TCLP | Solid | 8151A DOD | 436606 |

### Analysis Batch: 438897

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | Total/NA | Solid | 8082A | 436527 |
| MB 280-436527/1-A | Method Blank | Total/NA | Solid | 8082A | 436527 |
| LCS 280-436527/2-A | Lab Control Sample | Total/NA | Solid | 8082A | 436527 |
| 280-116404-1 MS | FWGIDW-181001-WS | Total/NA | Solid | 8082A | 436527 |
| 280-116404-1 MSD | FWGIDW-181001-WS | Total/NA | Solid | 8082A | 436527 |

### Analysis Batch: 439676

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | TCLP | Solid | 8081B | 436783 |
| LB 280-436399/1-F | Method Blank | TCLP | Solid | 8081B | 436783 |
| LCS 280-436399/2-E | Lab Control Sample | TCLP | Solid | 8081B | 436783 |
| LCS 280-436399/3-C | Lab Control Sample | TCLP | Solid | 8081B | 436783 |
| 280-116404-1 MS | FWGIDW-181001-WS | TCLP | Solid | 8081B | 436783 |
| 280-116404-1 MS | FWGIDW-181001-WS | TCLP | Solid | 8081B | 436783 |
| 280-116404-1 MSD | FWGIDW-181001-WS | TCLP | Solid | 8081B | 436783 |
| 280-116404-1 MSD | FWGIDW-181001-WS | TCLP | Solid | 8081B | 436783 |

# QC Association Summary

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116404-1

## Metals

### Leach Batch: 436399

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | TCLP | Solid | 1311 | |
| LB 280-436399/1-D | Method Blank | TCLP | Solid | 1311 | |
| LB 280-436399/1-H | Method Blank | TCLP | Solid | 1311 | |
| LCS 280-436399/2-D | Lab Control Sample | TCLP | Solid | 1311 | |
| LCS 280-436399/2-G | Lab Control Sample | TCLP | Solid | 1311 | |
| LCSD 280-436399/13-B | Lab Control Sample Dup | TCLP | Solid | 1311 | |
| LCSD 280-436399/13-C | Lab Control Sample Dup | TCLP | Solid | 1311 | |

### Prep Batch: 436590

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | TCLP | Solid | 3010A | 436399 |
| LB 280-436399/1-D | Method Blank | TCLP | Solid | 3010A | 436399 |
| LCS 280-436399/2-D | Lab Control Sample | TCLP | Solid | 3010A | 436399 |
| LCSD 280-436399/13-B | Lab Control Sample Dup | TCLP | Solid | 3010A | 436399 |

### Analysis Batch: 436794

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | TCLP | Solid | 6010C | 436590 |
| LB 280-436399/1-D | Method Blank | TCLP | Solid | 6010C | 436590 |
| LCS 280-436399/2-D | Lab Control Sample | TCLP | Solid | 6010C | 436590 |
| LCSD 280-436399/13-B | Lab Control Sample Dup | TCLP | Solid | 6010C | 436590 |

### Prep Batch: 436799

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | TCLP | Solid | 7470A | 436399 |
| LB 280-436399/1-H | Method Blank | TCLP | Solid | 7470A | 436399 |
| LCS 280-436399/2-G | Lab Control Sample | TCLP | Solid | 7470A | 436399 |
| LCSD 280-436399/13-C | Lab Control Sample Dup | TCLP | Solid | 7470A | 436399 |

### Analysis Batch: 436972

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | TCLP | Solid | 7470A | 436799 |
| LB 280-436399/1-H | Method Blank | TCLP | Solid | 7470A | 436799 |
| LCS 280-436399/2-G | Lab Control Sample | TCLP | Solid | 7470A | 436799 |
| LCSD 280-436399/13-C | Lab Control Sample Dup | TCLP | Solid | 7470A | 436799 |

## General Chemistry

### Analysis Batch: 401121

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | Total/NA | Solid | 1010A | |
| MB 160-401121/1 | Method Blank | Total/NA | Solid | 1010A | |
| LCS 160-401121/2 | Lab Control Sample | Total/NA | Solid | 1010A | |

### Analysis Batch: 436543

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | Total/NA | Solid | Moisture | |

## General Chemistry (Continued)

### Prep Batch: 436723

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | Total/NA | Solid | 9030B | |
| MB 280-436723/1-A | Method Blank | Total/NA | Solid | 9030B | |
| LCS 280-436723/3-A | Lab Control Sample | Total/NA | Solid | 9030B | |

### Analysis Batch: 436735

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | Total/NA | Solid | 9034 | 436723 |
| MB 280-436723/1-A | Method Blank | Total/NA | Solid | 9034 | 436723 |
| LCS 280-436723/3-A | Lab Control Sample | Total/NA | Solid | 9034 | 436723 |

### Leach Batch: 436854

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | Soluble | Solid | DI Leach | |
| LCS 280-436854/1-A | Lab Control Sample | Soluble | Solid | DI Leach | |

### Analysis Batch: 436907

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | Soluble | Solid | 9045D | 436854 |
| LCS 280-436854/1-A | Lab Control Sample | Soluble | Solid | 9045D | 436854 |

### Analysis Batch: 437376

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | Soluble | Solid | 9056A | 437455 |
| MB 280-437455/3-A | Method Blank | Soluble | Solid | 9056A | 437455 |
| LCS 280-437455/1-A | Lab Control Sample | Soluble | Solid | 9056A | 437455 |
| LCSD 280-437455/2-A | Lab Control Sample Dup | Soluble | Solid | 9056A | 437455 |
| MRL 280-437376/3 | Lab Control Sample | Total/NA | Solid | 9056A | |

### Leach Batch: 437455

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | Soluble | Solid | DI Leach | |
| MB 280-437455/3-A | Method Blank | Soluble | Solid | DI Leach | |
| LCS 280-437455/1-A | Lab Control Sample | Soluble | Solid | DI Leach | |
| LCSD 280-437455/2-A | Lab Control Sample Dup | Soluble | Solid | DI Leach | |

### Prep Batch: 437593

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | Total/NA | Solid | 9012B | |
| MB 280-437593/4-A | Method Blank | Total/NA | Solid | 9012B | |
| HLCS 280-437593/1-A | Lab Control Sample | Total/NA | Solid | 9012B | |
| LCS 280-437593/3-A | Lab Control Sample | Total/NA | Solid | 9012B | |
| LLCS 280-437593/2-A | Lab Control Sample | Total/NA | Solid | 9012B | |

### Analysis Batch: 437647

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | Total/NA | Solid | 9012B | 437593 |
| MB 280-437593/4-A | Method Blank | Total/NA | Solid | 9012B | 437593 |
| HLCS 280-437593/1-A | Lab Control Sample | Total/NA | Solid | 9012B | 437593 |
| LCS 280-437593/3-A | Lab Control Sample | Total/NA | Solid | 9012B | 437593 |
| LLCS 280-437593/2-A | Lab Control Sample | Total/NA | Solid | 9012B | 437593 |

# Lab Chronicle

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116404-1

## Client Sample ID: FWGIDW-181001-WS
**Date Collected: 10/31/18 13:00**
**Date Received: 11/01/18 09:30**

## Lab Sample ID: 280-116404-1
**Matrix: Solid**

| 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 | 436398 | 11/05/18 17:37 | DFB1 | TAL DEN |
| TCLP | Analysis | 8260B | | 1 | 2 mL | 20 mL | 437024 | 11/09/18 21:21 | GPM | TAL DEN |
| TCLP | Leach | 1311 | | | 1.0 g | 1.0 mL | 436399 | 11/05/18 17:37 | DFB1 | TAL DEN |
| TCLP | Prep | 3510C | | | 200 mL | 1 mL | 436573 | 11/06/18 18:15 | MAM | TAL DEN |
| TCLP | Analysis | 8270D | | 1 | | | 437601 | 11/14/18 19:46 | DCK | TAL DEN |
| TCLP | Leach | 1311 | | | 1.0 g | 1.0 mL | 436399 | 11/05/18 17:37 | DFB1 | TAL DEN |
| TCLP | Prep | 3510C | | | 100 mL | 10 mL | 436783 | 11/08/18 13:15 | AAG | TAL DEN |
| TCLP | Analysis | 8081B | | 1 | | | 439676 | 12/03/18 17:52 | TEB | TAL DEN |
| TCLP | Leach | 1311 | | | 1.0 g | 1.0 mL | 436399 | 11/05/18 17:37 | DFB1 | TAL DEN |
| TCLP | Prep | 8151A | | | 100 mL | 10 mL | 436606 | 11/07/18 08:15 | JZ | TAL DEN |
| TCLP | Analysis | 8151A DOD | | 1 | | | 437038 | 11/09/18 17:30 | AMB1 | TAL DEN |
| TCLP | Leach | 1311 | | | 1.0 g | 1.0 mL | 436399 | 11/05/18 17:37 | DFB1 | TAL DEN |
| TCLP | Prep | 3010A | | | 10 mL | 50 mL | 436590 | 11/07/18 16:00 | DAL | TAL DEN |
| TCLP | Analysis | 6010C | | 1 | | | 436794 | 11/08/18 01:20 | CML | TAL DEN |
| TCLP | Leach | 1311 | | | 1.0 g | 1.0 mL | 436399 | 11/05/18 17:37 | DFB1 | TAL DEN |
| TCLP | Prep | 7470A | | | 30 mL | 50 mL | 436799 | 11/08/18 12:48 | MRJ | TAL DEN |
| TCLP | Analysis | 7470A | | 1 | | | 436972 | 11/08/18 20:08 | MRJ | TAL DEN |
| Total/NA | Analysis | 1010A | | 1 | 70 mL | 70 mL | 401121 | 11/16/18 01:16 | JCB | TAL SL |
| Soluble | Leach | DI Leach | | | 41.82 g | 40 mL | 436854 | 11/08/18 12:20 | SGB | TAL DEN |
| Soluble | Analysis | 9045D | | 1 | | | 436907 | 11/08/18 19:04 | JDR | TAL DEN |
| Total/NA | Analysis | Moisture | | 1 | | | 436543 | 11/06/18 16:30 | SVC | TAL DEN |

## Client Sample ID: FWGIDW-181001-WS
**Date Collected: 10/31/18 13:00**
**Date Received: 11/01/18 09:30**

## Lab Sample ID: 280-116404-1
**Matrix: Solid**
**Percent Solids: 81.1**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 15.3 g | 10 mL | 436527 | 11/06/18 15:55 | DWC | TAL DEN |
| Total/NA | Analysis | 8082A | | 10 | | | 438897 | 11/27/18 16:17 | BJP | TAL DEN |
| Total/NA | Prep | 9012B | | | 1.0179 g | 50 mL | 437593 | 11/14/18 12:51 | RK | TAL DEN |
| Total/NA | Analysis | 9012B | | 2 | 50 mL | 50 mL | 437647 | 11/14/18 20:40 | RK | TAL DEN |
| Total/NA | Prep | 9030B | | | 5.88 g | 50 mL | 436723 | 11/07/18 17:19 | EC | TAL DEN |
| Total/NA | Analysis | 9034 | | 1 | | | 436735 | 11/07/18 20:06 | EC | TAL DEN |
| Soluble | Leach | DI Leach | | | 10.64 g | 100 mL | 437455 | 11/13/18 17:44 | TLP | TAL DEN |
| Soluble | Analysis | 9056A | | 1 | 5 mL | 5 mL | 437376 | 11/14/18 01:34 | A1D | TAL DEN |

**Laboratory References:**

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

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

# Accreditation/Certification Summary

Client: Leidos, Inc. TestAmerica Job ID: 280-116404-1
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

## Laboratory: TestAmerica Denver

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

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-19 |

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

| Analysis Method | Prep Method | Matrix | Analyte |
|---|---|---|---|
| 7470A | 7470A | Solid | Mercury |
| 9045D | | Solid | Temperature |
| Moisture | | Solid | Percent Moisture |
| Moisture | | Solid | Percent Solids |

## Laboratory: TestAmerica St. Louis

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

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| Alaska | State Program | 10 | MO00054 | 06-30-19 |
| ANAB | DoD ELAP | | L2305 | 04-06-19 |
| Arizona | State Program | 9 | AZ0813 | 12-08-18 * |
| California | State Program | 9 | 2886 | 06-30-19 |
| Connecticut | State Program | 1 | PH-0241 | 03-31-19 |
| Florida | NELAP | 4 | E87689 | 06-30-19 |
| Illinois | NELAP | 5 | 200023 | 11-30-18 * |
| Iowa | State Program | 7 | 373 | 12-01-18 * |
| Kansas | NELAP | 7 | E-10236 | 10-31-19 |
| Kentucky (DW) | State Program | 4 | 90125 | 12-31-18 |
| Louisiana | NELAP | 6 | 04080 | 06-30-19 |
| Louisiana (DW) | NELAP | 6 | LA180017 | 12-31-18 * |
| Maryland | State Program | 3 | 310 | 09-30-19 |
| Michigan | State Program | 5 | 9005 | 06-30-19 |
| Missouri | State Program | 7 | 780 | 06-30-19 |
| Nevada | State Program | 9 | MO000542018-1 | 07-31-19 |
| New Jersey | NELAP | 2 | MO002 | 06-30-19 |
| New York | NELAP | 2 | 11616 | 03-31-19 |
| North Dakota | State Program | 8 | R207 | 06-30-19 |
| NRC | NRC | | 24-24817-01 | 12-31-22 |
| Oklahoma | State Program | 6 | 9997 | 08-31-19 |
| Pennsylvania | NELAP | 3 | 68-00540 | 02-28-19 |
| South Carolina | State Program | 4 | 85002001 | 06-30-19 |
| Texas | NELAP | 6 | T104704193-18-12 | 07-31-19 |
| US Fish & Wildlife | Federal | | 058448 | 07-31-19 |
| USDA | Federal | | P330-17-0028 | 02-02-20 |
| Utah | NELAP | 8 | MO000542018-10 | 07-31-19 |
| Virginia | NELAP | 3 | 460230 | 06-14-19 |
| Washington | State Program | 10 | C592 | 08-30-19 |
| West Virginia DEP | State Program | 3 | 381 | 08-31-19 |

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

# Method Summary

Client: Leidos, Inc. TestAmerica Job ID: 280-116404-1
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8260B | Volatile Organic Compounds (GC/MS) | SW846 | TAL DEN |
| 8270D | Semivolatile Organic Compounds (GC/MS) | SW846 | TAL DEN |
| 8081B | Organochlorine Pesticides (GC) | SW846 | TAL DEN |
| 8082A | Polychlorinated Biphenyls (PCBs) by Gas Chromatography | SW846 | TAL DEN |
| 8151A DOD | Herbicides (GC) | SW846 | TAL DEN |
| 6010C | Metals (ICP) | SW846 | TAL DEN |
| 7470A | Mercury (CVAA) | SW846 | TAL DEN |
| 1010A | Ignitability, Pensky-Martens Closed-Cup Method | SW846 | TAL SL |
| 9012B | Cyanide, Total and/or Amenable | EPA | TAL DEN |
| 9034 | Sulfide, Acid Soluble and Insoluble (Titrimetric) | SW846 | TAL DEN |
| 9045D | pH | SW846 | TAL DEN |
| 9056A | Anions, Ion Chromatography | SW846 | TAL DEN |
| Moisture | Percent Moisture | EPA | TAL DEN |
| 1311 | TCLP Extraction | SW846 | TAL DEN |
| 3010A | Preparation, Total Metals | SW846 | TAL DEN |
| 3510C | Liquid-Liquid Extraction (Separatory Funnel) | SW846 | TAL DEN |
| 3546 | Microwave Extraction | SW846 | TAL DEN |
| 5030B | Purge and Trap | SW846 | TAL DEN |
| 7470A | Preparation, Mercury | SW846 | TAL DEN |
| 8151A | Extraction (Herbicides) | SW846 | TAL DEN |
| 9012B | Cyanide, Total and/or Amenable, Distillation | SW846 | TAL DEN |
| 9030B | Sulfide, Distillation (Acid Soluble and Insoluble) | SW846 | TAL DEN |
| DI Leach | Deionized Water Leaching Procedure | ASTM | TAL 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:**

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

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

# Sample Summary

Client: Leidos, Inc.
TestAmerica Job ID: 280-116404-1
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 280-116404-1 | FWGIDW-181001-WS | Solid | 10/31/18 13:00 | 11/01/18 09:30 |

# Shipping and Receiving Documents

leidos

# Chain of Custody Record

COC No.: RVAAP-083

Page 1 of 1 Date: 10/31/2018

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

Sampler (Signature) (Printed Name)

Laboratory Name: Test America -Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Date | Time | Matrix | TCLP VOCs (1)(A) | TCLP SVOCs (2)(A), TCLP Pesticides (3)(A), TCLP Herbicides (5)(A), TCLP Metals (7)(A) | Total PCBs (12)(A) / (4)(A) | Ignitability (11)(A) | pH (13)(A) / (6)(A) | Total Sulfide (9)(A), Total Cyanide (8)(A), Nitrate, Nitrite (10)(A) | Total Cyanide (8)(D) | Total Sulfide (9)(E) | Nitrate and Nitrite (10)(A) | | | | | Temperature Blank | NO. OF CONTAINERS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FWGIDW-181001-WS | 10/31/18 | 1300 | S | 1 | 2 | 1 | 1 | 1 | 1 | | | | | | | | | 8 | PLUS ONE EXTRA VOLUME BOTTLE. |
| | ~~FWGIDW-181001-WW~~ | | | ~~W~~ | ~~3~~ | ~~2~~ | ~~2~~ | ~~2~~ | ~~1~~ | | ~~1~~ | ~~1~~ | ~~1~~ | | | | | | ~~13~~ | |

Total Number of Containers: ~~20~~ 8

| | | | |
|---|---|---|---|
| Relinquished by | Test America | Date | 10/31/2018 |
| Signature | RC Robison | | |
| Printed Name | Heather Adams | Time | 1600 |
| Leidos | Rick Robison | | |
| Company | | | |
| Relinquished by | TAi 2400 | Date | 11/1/18 |
| Signature | RC Robison | | |
| Printed Name | Joseph Rhoades | Time | 0930 |
| Company | Robison | | |

Notes:
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

1. SW 1311, 8260
2. SW 1311, 8270
3. SW 1311, 8081
4. SW 3510C/8082A (W)
5. SW 1311, 8151
6. SW 9040 (W)
7. SW 1311, 6010, 7470
8. SW 9012A
9. SW 9034
10. SW 9056
11. SW 1010
12. SW 3540C/8082A (S)
13. SW 9045 (S)

S=Soil / W=Water

Notes:

Shipment Method: Courier
HA 10/31/18

Temperature Blank
Lab:

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

280-116404 Chain of Custody

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

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# Chain of Custody Record

leidos

COC No.: RVAAP-083

Page 1 of 1 Date: 10/31/2018

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

Sampler (Signature) (Printed Name)

Laboratory Name: Test America -Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

| Laboratory No. | Sample ID | Date | Time | Matrix | TCLP VOCs (1)(A) | TCLP SVOCs (2)(A),TCLP Pesticides (3)(A), TCLP Herbicides (5)(A), TCLP Metals (7)(A) | Total PCBs (12)(A) / (4)(A) | Ignitability (11)(A) | pH (13)(A) / (6)(A) | Total Sulfide (9)(A), Total Cyanide (8)(A), Nitrate, Nitrite (10)(A) | Total Cyanide (8)(D) | Total Sulfide (9)(E) | Nitrate and Nitrite (10)(A) | Temperature Blank | No. of Containers |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FWGIDW-181001-WS | 10/31/18 | 1300 | S | 1 | 2 | 1 | 1 | 1 | 1 | | | | | 8 |
| | ~~FWGIDW-181001-WW~~ | | | ~~W~~ | ~~3~~ | ~~2~~ | ~~2~~ | ~~2~~ | ~~1~~ | | ~~1~~ | ~~1~~ | ~~1~~ | | ~~13~~ |
| | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | 8 |

PLUS ONE EXTRA VOLUME BOTTLE.

Total Number of Containers: 20

Relinquished by
Signature: [signature]
Printed Name: Heather Adams
Company: Leidos
Date: 10/31/2018
Time: 1600
Received by
Signature: [signature]
Printed Name: RICK ROBSON
Company: Test America

Relinquished by
Signature: [signature]
Printed Name: ROBISON
Company:
Date: 11/1/18
Time: 0930
Received by
Signature: [signature]
Printed Name: Joseph Rhoades
Company: TA Denver

Notes:
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

1. SW 1311, 8260
2. SW 1311, 8270
3. SW 1311, 8081
4. SW 3510C/8082A (W)
5. SW 1311, 8151
6. SW 9040 (W)
7. SW 1311, 6010, 7470
8. SW 9012A
9. SW 9034
10. SW 9056
11. SW 1010
12. SW 3540C/8082A (S)
13. SW 9045 (S)

S=Soil / W=Water

Notes:
0.3, 0.4
0.3 + 0.7
IR9 XFERED BY KO 10-01-18

Shipment Method: Courier
HA 10/31/18

Temperature Blank
Lab:

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

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

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280-116404 Chain of Custody

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: Rydberg, Donna R | Carrier Tracking No(s): | COC No: 280-460987.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: donna.rydberg@testamericainc.com | State of Origin: Ohio | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): DoD ELAP - A2LA | | Job #: 280-116404-1 |
| Address: 13715 Rider Trail North, , | Due Date Requested: 11/20/2018 | | | |
| City: Earth City | TAT Requested (days): | | | |
| State, Zip: MO, 63045 | | | | |
| Phone: 314-298-8566(Tel) 314-298-8757(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Leidos RFP# 001088 - Ravenna AAP-66 | Project #: 28018729 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

| | |
|---|---|
| A - HCL | M - Hexane |
| B - NaOH | N - None |
| C - Zn Acetate | O - AsNaO2 |
| D - Nitric Acid | P - Na2O4S |
| E - NaHSO4 | Q - Na2SO3 |
| F - MeOH | R - Na2S2O3 |
| G - Amchlor | S - H2SO4 |
| H - Ascorbic Acid | T - TSP Dodecahydrate |
| I - Ice | U - Acetone |
| J - DI Water | V - MCAA |
| K - EDTA | W - pH 4-5 |
| L - EDA | 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) | 1010A | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| FWGIDW-181001-WS (280-116404-1) | 10/31/18 | 13:00 Eastern | | Solid | | | X | 1 | Q5.0 |

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out 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 TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

| *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: |
|---|---|---|---|

| | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| Relinquished by: | 11-2-2018 1324 | TAL Den | Michael Heum | 11/3/18 0845 | TA SV |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: ∆ Yes ∆ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: |
|---|---|---|

Ver: 09/20/2016

# Login Sample Receipt Checklist

Client: Leidos, Inc.

Job Number: 280-116404-1

**Login Number: 116404**
**List Number: 1**
**Creator: Dunlap, Krista M**

**List Source: TestAmerica 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"). | N/A | |
| 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: 280-116404-1

**Login Number: 116404**
**List Number: 2**
**Creator: Hellm, Michael**

**List Source: TestAmerica St. Louis**
**List Creation: 11/03/18 12:18 PM**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | True | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | N/A | |
| 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 | 0.2 |
| 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? | N/A | |
| 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. | True | |
| 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. | N/A | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# ANALYTICAL REPORT

Job Number: 280-116538-2

Job Description: Leidos RFP# 001088 - Ravenna AAP-66

For:
Leidos, Inc.
Picatinny Arsenal
356 Ninth Avenue
Suite 106
Dover, NJ 07801

Attention: Rita Schmon-Stasik



Approved for release.
Donna R Rydberg
Senior Project Manager
12/12/2018 6:48 PM

Donna R Rydberg, Senior Project Manager
4955 Yarrow Street, Arvada, CO, 80002
(303)736-0192
donna.rydberg@testamericainc.com
12/12/2018
Revision: 1

The test results in this report relate only to the samples in this report and meet all requirements of NELAC, with any exceptions noted. Pursuant to NELAP, this report shall not be reproduced except in full, without the written approval of the laboratory. All questions regarding this report should be directed to the TestAmerica Denver Project Manager.

The Lab Certification ID# is 4025.

Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

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## Qualifiers

### GC Semi VOA

| Qualifier | Qualifier Description |
|---|---|
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| B | Compound was found in the blank and sample. |
| HF | Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| 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 |
| 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) |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| 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) |

# CASE NARRATIVE

## Client: Leidos, Inc.

## Project: Leidos RFP# 001088 - Ravenna AAP-66

## Report Number: 280-116538-2

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.

**REVISED REPORT**
The attached report was revised as the cyanide result for IDW sample (FWGIDW-181002-WW) was included in job 280-116538-1 and should have been included in this job 280-116538-2. No other changes were made.

**RECEIPT**
The samples were received on 11/3/2018 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 6 coolers at receipt time were 0.5º C, 2.1º C, 2.6º C, 2.6º C, 3.6º C and 4.8º C.

Received one bottle for sample ID FWGIDW-181001-WW labeled for cyanide analysis. Container is labeled with Zinc Acetate and NaOH preservative label; analysis requires NaOH preservative only.

**TCLP VOLATILE ORGANIC COMPOUNDS (GC-MS)**
Samples FWGIDW-181001-WW (280-116538-4) and FWGqc-015-TB (280-116538-5) were analyzed for TCLP volatile organic compounds (GC-MS) in accordance with 1311. The samples were leached on 11/09/2018 and analyzed on 11/23/2018.

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

**TCLP SEMIVOLATILE ORGANIC COMPOUNDS (GC-MS)**
Sample FWGIDW-181001-WW (280-116538-4) was analyzed for TCLP semivolatile organic compounds (GC-MS) in accordance with 8270D. The samples were leached on 11/07/2018, prepared on 11/12/2018 and analyzed on 11/16/2018.

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

**ORGANOCHLORINE PESTICIDES (GC)**
Sample FWGIDW-181001-WW (280-116538-4) was analyzed for Organochlorine Pesticides (GC) in accordance with EPA SW-846 Method 1311/8081B. The samples were leached on 11/07/2018, prepared on 11/12/2018 and analyzed on 11/21/2018.

The following sample required a mercury clean-up, via EPA Method 3660A, to reduce matrix interferences caused by sulfur: FWGIDW-181001-WW (280-116538-4). The reagent lot number used was: T31E034.

The continuing calibration verification (CCV) associated with batch 280-438443 recovered above the upper control limit for DCB Decachlorobiphenyl and Methoxychlor on the front column. The compounds were in control on the back column. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported from the back, in control, column.

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

**POLYCHLORINATED BIPHENYLS (PCBS)**
Sample FWGIDW-181001-WW (280-116538-4) was analyzed for polychlorinated biphenyls (PCBs) in accordance with SW-846 8082A. The samples were prepared on 11/13/2018 and analyzed on 11/28/2018.

The continuing calibration verification (CCV) associated to the following samples recovered below the lower limit for Tetrachloro-m-xylene on the confirmation column: (CCVIS 280-439075/4). The primary column was in control. The surrogate recoveries are in control; therefore, the data is being reported from the in control column.

The initial calibration verification (ICV) result for batch 280-439075 was above the upper control limit for surrogate DCB Decachlorobiphenyl, PCB-1248 and PCB-1262. This surrogate in the associated samples was in control. Sample results were non-detects, and have been reported as qualified data.

The following sample required a sulfuric acid clean-up, via EPA Method 3665A, to reduce matrix interferences: FWGIDW-181001-WW (280-116538-4). Acid Lot: 161554.

The following sample required a mercury clean-up, via EPA Method 3660A, to reduce matrix interferences caused by sulfur: FWGIDW-181001-WW (280-116538-4). The reagent lot number used was: T31E034

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

**TCLP CHLORINATED HERBICIDES**

Sample FWGIDW-181001-WW (280-116538-4) was analyzed for TCLP chlorinated herbicides in accordance with EPA SW-846 Methods 1311/8151A. The samples were leached on 11/07/2018, prepared on 11/08/2018 and analyzed on 11/13/2018.

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

**TCLP METALS**

Sample FWGIDW-181001-WW (280-116538-4) was analyzed for TCLP metals in accordance with EPA SW846 Methods 1311/6010C. The samples were leached on 11/07/2018, and prepared and analyzed on 11/13/2018.

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

**TCLP MERCURY**

Sample FWGIDW-181001-WW (280-116538-4) was analyzed for TCLP mercury in accordance with SW-846 1311/7470. The samples were leached on 11/07/2018, prepared on 11/14/2018 and analyzed on 11/15/2018.

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

**IGNITABILITY**

Sample FWGIDW-181001-WW (280-116538-4) was analyzed for ignitability in accordance with EPA SW-846 Method 1010. The samples were analyzed on 11/16/2018.

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

**CYANIDE, TOTAL**

Samples FWGIDW-181001-WW (280-116538-4) and FWIDW0181002-WW were analyzed for Cyanide, Total in accordance with 9012B.

Sample FWGIDW-181001-WW (280-116538-4) required a 5X dilution prior to analysis. The reporting limits have been adjusted accordingly.

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

**SULFIDE**

Sample FWGIDW-181001-WW (280-116538-4) was analyzed for sulfide in accordance with EPA SW-846 Method 9034. The samples were prepared and analyzed on 11/07/2018.

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

**CORROSIVITY (PH)**

Sample FWGIDW-181001-WW (280-116538-4) was analyzed for Corrosivity (pH) in accordance with EPA SW-846 9040C. The samples were analyzed on 11/19/2018.

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

**ANIONS (48 HOURS)**

Sample FWGIDW-181001-WW (280-116538-4) was analyzed for anions (48 hours) in accordance with 9056A. The samples were analyzed on 11/03/2018.

Nitrite as N was detected in method blank MB 280-436181/6 at a level that was less than one half the Reporting limits; therefore, corrective action was deemed unnecessary. The value should be considered an estimate, and has been flagged “J”. .

Sample FWGIDW-181001-WW (280-116538-4) required a 5X dilution prior to analysis. The reporting limits have been adjusted accordingly.

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

# Detection Summary

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116538-2

## Client Sample ID: FWGIDW-181001-WW — Lab Sample ID: 280-116538-4

| Analyte | Result | Qualifier | RL | | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 0.015 | J | 1.0 | | 0.0040 | mg/L | 1 | | 6010C | TCLP |
| Flashpoint | >60 | | 1.00 | | 1.00 | Degrees C | 1 | | 1010A | Total/NA |
| Cyanide, Total | 0.63 | | 0.050 | | 0.010 | mg/L | 5 | | 9012B | Total/NA |
| pH adj. to 25 deg C | 7.8 | HF | 0.1 | | 0.1 | SU | 1 | | 9040C | Total/NA |
| Temperature | 20.3 | HF | 1.0 | | 1.0 | Degrees C | 1 | | 9040C | Total/NA |
| Nitrate as N | 14 | | 2.5 | | 0.21 | mg/L | 5 | | 9056A | Total/NA |
| Nitrite as N | 0.52 | B | 0.50 | | 0.049 | mg/L | 1 | | 9056A | Total/NA |

## Client Sample ID: FWGqc-015-TB — Lab Sample ID: 280-116538-5

No Detections.

## Client Sample ID: FWIDW-181002-WW — Lab Sample ID: 280-116538-7

| Analyte | Result | Qualifier | RL | | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|---|
| Cyanide, Total | 0.27 | | 0.010 | 0.0050 | 0.0020 | mg/L | 1 | | 9012B | Total/NA |

This Detection Summary does not include radiochemical test results.

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

**Client Sample ID: FWGIDW-181001-WW** **Lab Sample ID: 280-116538-4**
**Date Collected: 11/02/18 15:30** **Matrix: Water**
**Date Received: 11/03/18 09:00**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Benzene | ND | | 0.010 | 0.0016 | mg/L | | 11/23/18 13:45 | 1 |
| 2-Butanone (MEK) | ND | | 0.10 | 0.020 | mg/L | | 11/23/18 13:45 | 1 |
| Carbon tetrachloride | ND | | 0.010 | 0.0019 | mg/L | | 11/23/18 13:45 | 1 |
| Chlorobenzene | ND | | 0.010 | 0.0017 | mg/L | | 11/23/18 13:45 | 1 |
| Chloroform | ND | | 0.010 | 0.0016 | mg/L | | 11/23/18 13:45 | 1 |
| 1,2-Dichloroethane | ND | | 0.010 | 0.0013 | mg/L | | 11/23/18 13:45 | 1 |
| 1,1-Dichloroethene | ND | | 0.010 | 0.0023 | mg/L | | 11/23/18 13:45 | 1 |
| Tetrachloroethene | ND | | 0.010 | 0.0020 | mg/L | | 11/23/18 13:45 | 1 |
| Trichloroethene | ND | | 0.010 | 0.0016 | mg/L | | 11/23/18 13:45 | 1 |
| Vinyl chloride | ND | | 0.010 | 0.0010 | mg/L | | 11/23/18 13:45 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Toluene-d8 (Surr)* | *99* | | *78 - 120* | | *11/23/18 13:45* | *1* |
| *1,2-Dichloroethane-d4 (Surr)* | *90* | | *64 - 129* | | *11/23/18 13:45* | *1* |
| *4-Bromofluorobenzene (Surr)* | *92* | | *78 - 121* | | *11/23/18 13:45* | *1* |
| *Dibromofluoromethane (Surr)* | *87* | | *79 - 119* | | *11/23/18 13:45* | *1* |

**Client Sample ID: FWGqc-015-TB** **Lab Sample ID: 280-116538-5**
**Date Collected: 11/02/18 15:30** **Matrix: Water**
**Date Received: 11/03/18 09:00**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Benzene | ND | | 0.010 | 0.0016 | mg/L | | 11/23/18 14:05 | 1 |
| 2-Butanone (MEK) | ND | | 0.10 | 0.020 | mg/L | | 11/23/18 14:05 | 1 |
| Carbon tetrachloride | ND | | 0.010 | 0.0019 | mg/L | | 11/23/18 14:05 | 1 |
| Chlorobenzene | ND | | 0.010 | 0.0017 | mg/L | | 11/23/18 14:05 | 1 |
| Chloroform | ND | | 0.010 | 0.0016 | mg/L | | 11/23/18 14:05 | 1 |
| 1,2-Dichloroethane | ND | | 0.010 | 0.0013 | mg/L | | 11/23/18 14:05 | 1 |
| 1,1-Dichloroethene | ND | | 0.010 | 0.0023 | mg/L | | 11/23/18 14:05 | 1 |
| Tetrachloroethene | ND | | 0.010 | 0.0020 | mg/L | | 11/23/18 14:05 | 1 |
| Trichloroethene | ND | | 0.010 | 0.0016 | mg/L | | 11/23/18 14:05 | 1 |
| Vinyl chloride | ND | | 0.010 | 0.0010 | mg/L | | 11/23/18 14:05 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Toluene-d8 (Surr)* | *99* | | *78 - 120* | | *11/23/18 14:05* | *1* |
| *1,2-Dichloroethane-d4 (Surr)* | *89* | | *64 - 129* | | *11/23/18 14:05* | *1* |
| *4-Bromofluorobenzene (Surr)* | *98* | | *78 - 121* | | *11/23/18 14:05* | *1* |
| *Dibromofluoromethane (Surr)* | *89* | | *79 - 119* | | *11/23/18 14:05* | *1* |

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

**Client Sample ID: FWGIDW-181001-WW** **Lab Sample ID: 280-116538-4**
**Date Collected: 11/02/18 15:30** **Matrix: Water**
**Date Received: 11/03/18 09:00**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| 2-Methylphenol | ND | | 0.050 | 0.0049 | mg/L | | 11/16/18 01:29 | 1 |
| 3 & 4 Methylphenol | ND | | 0.050 | 0.0013 | mg/L | | 11/16/18 01:29 | 1 |
| 1,4-Dichlorobenzene | ND | | 0.020 | 0.0016 | mg/L | | 11/16/18 01:29 | 1 |
| 2,4-Dinitrotoluene | ND | | 0.050 | 0.0083 | mg/L | | 11/16/18 01:29 | 1 |
| Hexachlorobenzene | ND | | 0.050 | 0.0033 | mg/L | | 11/16/18 01:29 | 1 |
| Hexachlorobutadiene | ND | | 0.050 | 0.017 | mg/L | | 11/16/18 01:29 | 1 |

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

**Client Sample ID: FWGIDW-181001-WW** **Lab Sample ID: 280-116538-4**
**Date Collected: 11/02/18 15:30** **Matrix: Water**
**Date Received: 11/03/18 09:00**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Hexachloroethane | ND | | 0.050 | 0.011 | mg/L | | 11/16/18 01:29 | 1 |
| Nitrobenzene | ND | | 0.050 | 0.0041 | mg/L | | 11/16/18 01:29 | 1 |
| Pentachlorophenol | ND | | 0.25 | 0.10 | mg/L | | 11/16/18 01:29 | 1 |
| Pyridine | ND | | 0.10 | 0.0057 | mg/L | | 11/16/18 01:29 | 1 |
| 2,4,5-Trichlorophenol | ND | | 0.050 | 0.0022 | mg/L | | 11/16/18 01:29 | 1 |
| 2,4,6-Trichlorophenol | ND | | 0.025 | 0.0014 | mg/L | | 11/16/18 01:29 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *73* | | *49 - 120* | *11/12/18 13:36* | *11/16/18 01:29* | *1* |
| *2-Fluorophenol (Surr)* | *60* | | *50 - 120* | *11/12/18 13:36* | *11/16/18 01:29* | *1* |
| *2,4,6-Tribromophenol (Surr)* | *77* | | *51 - 120* | *11/12/18 13:36* | *11/16/18 01:29* | *1* |
| *Nitrobenzene-d5 (Surr)* | *71* | | *51 - 120* | *11/12/18 13:36* | *11/16/18 01:29* | *1* |
| *Phenol-d5 (Surr)* | *51* | | *47 - 120* | *11/12/18 13:36* | *11/16/18 01:29* | *1* |
| *Terphenyl-d14 (Surr)* | *70* | | *56 - 120* | *11/12/18 13:36* | *11/16/18 01:29* | *1* |

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

**Client Sample ID: FWGIDW-181001-WW** **Lab Sample ID: 280-116538-4**
**Date Collected: 11/02/18 15:30** **Matrix: Water**
**Date Received: 11/03/18 09:00**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Endrin | ND | | 0.00050 | 0.000079 | mg/L | | 11/21/18 17:07 | 1 |
| Heptachlor | ND | | 0.00050 | 0.000077 | mg/L | | 11/21/18 17:07 | 1 |
| Heptachlor epoxide | ND | | 0.00050 | 0.000075 | mg/L | | 11/21/18 17:07 | 1 |
| gamma-BHC (Lindane) | ND | | 0.00050 | 0.000069 | mg/L | | 11/21/18 17:07 | 1 |
| Methoxychlor | ND | | 0.0010 | 0.00013 | mg/L | | 11/21/18 17:07 | 1 |
| Toxaphene | ND | | 0.020 | 0.0037 | mg/L | | 11/21/18 17:07 | 1 |
| Chlordane (technical) | ND | | 0.0050 | 0.0014 | mg/L | | 11/21/18 17:07 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Tetrachloro-m-xylene* | *87* | | *28 - 115* | *11/12/18 19:56* | *11/21/18 17:07* | *1* |
| *DCB Decachlorobiphenyl* | *87* | | *34 - 122* | *11/12/18 19:56* | *11/21/18 17:07* | *1* |

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

**Client Sample ID: FWGIDW-181001-WW** **Lab Sample ID: 280-116538-4**
**Date Collected: 11/02/18 15:30** **Matrix: Water**
**Date Received: 11/03/18 09:00**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| PCB-1016 | ND | | 1.1 | 0.14 | ug/L | | 11/28/18 20:29 | 1 |
| PCB-1221 | ND | | 1.1 | 0.24 | ug/L | | 11/28/18 20:29 | 1 |
| PCB-1232 | ND | | 1.1 | 0.18 | ug/L | | 11/28/18 20:29 | 1 |
| PCB-1242 | ND | | 1.1 | 0.12 | ug/L | | 11/28/18 20:29 | 1 |
| PCB-1248 | ND | | 1.1 | 0.10 | ug/L | | 11/28/18 20:29 | 1 |
| PCB-1254 | ND | | 1.1 | 0.13 | ug/L | | 11/28/18 20:29 | 1 |
| PCB-1260 | ND | | 1.1 | 0.18 | ug/L | | 11/28/18 20:29 | 1 |
| PCB-1262 | ND | | 1.1 | 0.094 | ug/L | | 11/28/18 20:29 | 1 |
| PCB-1268 | ND | | 1.1 | 0.40 | ug/L | | 11/28/18 20:29 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Tetrachloro-m-xylene* | *78* | | *25 - 120* | *11/13/18 18:28* | *11/28/18 20:29* | *1* |

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

**Client Sample ID: FWGIDW-181001-WW** **Lab Sample ID: 280-116538-4**
**Date Collected: 11/02/18 15:30** **Matrix: Water**
**Date Received: 11/03/18 09:00**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *DCB Decachlorobiphenyl* | *70* | | *30 - 136* | *11/13/18 18:28* | *11/28/18 20:29* | *1* |

## Method: 8151A DOD - Herbicides (GC) - TCLP

**Client Sample ID: FWGIDW-181001-WW** **Lab Sample ID: 280-116538-4**
**Date Collected: 11/02/18 15:30** **Matrix: Water**
**Date Received: 11/03/18 09:00**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| 2,4-D | ND | | 0.040 | 0.0021 | mg/L | | 11/13/18 18:57 | 1 |
| Silvex (2,4,5-TP) | ND | | 0.010 | 0.0017 | mg/L | | 11/13/18 18:57 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2,4-Dichlorophenylacetic acid* | *79* | | *10 - 131* | *11/08/18 07:48* | *11/13/18 18:57* | *1* |

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

**Client Sample ID: FWGIDW-181001-WW** **Lab Sample ID: 280-116538-4**
**Date Collected: 11/02/18 15:30** **Matrix: Water**
**Date Received: 11/03/18 09:00**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Arsenic | ND | | 0.50 | 0.022 | mg/L | | 11/13/18 14:56 | 1 |
| **Barium** | **0.015** | **J** | 1.0 | 0.0040 | mg/L | | 11/13/18 14:56 | 1 |
| Cadmium | ND | | 0.10 | 0.0020 | mg/L | | 11/13/18 14:56 | 1 |
| Chromium | ND | | 0.50 | 0.0030 | mg/L | | 11/13/18 14:56 | 1 |
| Lead | ND | | 0.50 | 0.014 | mg/L | | 11/13/18 14:56 | 1 |
| Selenium | ND | | 0.10 | 0.032 | mg/L | | 11/13/18 14:56 | 1 |
| Silver | ND | | 0.50 | 0.0040 | mg/L | | 11/13/18 14:56 | 1 |

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

**Client Sample ID: FWGIDW-181001-WW** **Lab Sample ID: 280-116538-4**
**Date Collected: 11/02/18 15:30** **Matrix: Water**
**Date Received: 11/03/18 09:00**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Mercury | ND | | 0.0020 | 0.000030 | mg/L | | 11/15/18 15:55 | 1 |

## General Chemistry

**Client Sample ID: FWGIDW-181001-WW** **Lab Sample ID: 280-116538-4**
**Date Collected: 11/02/18 15:30** **Matrix: Water**
**Date Received: 11/03/18 09:00**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| **Flashpoint** | **>60** | | 1.00 | 1.00 | Degrees C | | 11/16/18 01:31 | 1 |
| **Cyanide, Total** | **0.63** | | 0.050 | 0.010 | mg/L | | 11/15/18 19:28 | 5 |
| Sulfide | ND | | 4.0 | 0.79 | mg/L | | 11/07/18 20:06 | 1 |
| **pH adj. to 25 deg C** | **7.8** | **HF** | 0.1 | 0.1 | SU | | 11/19/18 13:46 | 1 |
| **Temperature** | **20.3** | **HF** | 1.0 | 1.0 | Degrees C | | 11/19/18 13:46 | 1 |
| **Nitrate as N** | **14** | | 2.5 | 0.21 | mg/L | | 11/03/18 16:36 | 5 |
| **Nitrite as N** | **0.52** | **B** | 0.50 | 0.049 | mg/L | | 11/03/18 14:16 | 1 |

## General Chemistry

**Client Sample ID: FWIDW-181002-WW** **Lab Sample ID: 280-116538-7**
**Date Collected: 11/14/18 15:55** **Matrix: Water**
**Date Received: 11/03/18 09:00**

| Analyte | Result | Qualifier | RL | | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Cyanide, Total** | **0.27** | | 0.010 | 0.0050 | 0.0020 | mg/L | | 11/21/18 11:07 | 1 |

# Default Detection Limits

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116538-2

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

### Leach: 1311

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| 1,1-Dichloroethene | 0.010 | 0.0023 | mg/L | 8260B |
| 1,2-Dichloroethane | 0.010 | 0.0013 | mg/L | 8260B |
| 2-Butanone (MEK) | 0.10 | 0.020 | mg/L | 8260B |
| Benzene | 0.010 | 0.0016 | mg/L | 8260B |
| Carbon tetrachloride | 0.010 | 0.0019 | mg/L | 8260B |
| Chlorobenzene | 0.010 | 0.0017 | mg/L | 8260B |
| Chloroform | 0.010 | 0.0016 | mg/L | 8260B |
| Tetrachloroethene | 0.010 | 0.0020 | mg/L | 8260B |
| Trichloroethene | 0.010 | 0.0016 | mg/L | 8260B |
| Vinyl chloride | 0.010 | 0.0010 | mg/L | 8260B |

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

### Prep: 3510C
### Leach: 1311

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| 1,4-Dichlorobenzene | 0.020 | 0.0016 | mg/L | 8270D |
| 2,4,5-Trichlorophenol | 0.050 | 0.0022 | mg/L | 8270D |
| 2,4,6-Trichlorophenol | 0.025 | 0.0014 | mg/L | 8270D |
| 2,4-Dinitrotoluene | 0.050 | 0.0083 | mg/L | 8270D |
| 2-Methylphenol | 0.050 | 0.0049 | mg/L | 8270D |
| 3 & 4 Methylphenol | 0.050 | 0.0013 | mg/L | 8270D |
| Hexachlorobenzene | 0.050 | 0.0033 | mg/L | 8270D |
| Hexachlorobutadiene | 0.050 | 0.017 | mg/L | 8270D |
| Hexachloroethane | 0.050 | 0.011 | mg/L | 8270D |
| Nitrobenzene | 0.050 | 0.0041 | mg/L | 8270D |
| Pentachlorophenol | 0.25 | 0.10 | mg/L | 8270D |
| Pyridine | 0.10 | 0.0057 | mg/L | 8270D |

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

### Prep: 3510C
### Leach: 1311

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| Chlordane (technical) | 0.0050 | 0.0014 | mg/L | 8081B |
| Endrin | 0.00050 | 0.000079 | mg/L | 8081B |
| gamma-BHC (Lindane) | 0.00050 | 0.000069 | mg/L | 8081B |
| Heptachlor | 0.00050 | 0.000077 | mg/L | 8081B |
| Heptachlor epoxide | 0.00050 | 0.000075 | mg/L | 8081B |
| Methoxychlor | 0.0010 | 0.00013 | mg/L | 8081B |
| Toxaphene | 0.020 | 0.0037 | mg/L | 8081B |

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

### Prep: 3510C

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| PCB-1016 | 1.0 | 0.12 | ug/L | 8082A |
| PCB-1221 | 1.0 | 0.21 | ug/L | 8082A |
| PCB-1232 | 1.0 | 0.17 | ug/L | 8082A |
| PCB-1242 | 1.0 | 0.10 | ug/L | 8082A |
| PCB-1248 | 1.0 | 0.092 | ug/L | 8082A |
| PCB-1254 | 1.0 | 0.11 | ug/L | 8082A |

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

### Prep: 3510C

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| PCB-1260 | 1.0 | 0.16 | ug/L | 8082A |
| PCB-1262 | 1.0 | 0.085 | ug/L | 8082A |
| PCB-1268 | 1.0 | 0.36 | ug/L | 8082A |

## Method: 8151A DOD - Herbicides (GC) - TCLP

### Prep: 8151A
### Leach: 1311

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| 2,4-D | 0.040 | 0.0021 | mg/L | 8151A DOD |
| Silvex (2,4,5-TP) | 0.010 | 0.0017 | mg/L | 8151A DOD |

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

### Prep: 3010A
### Leach: 1311

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| Arsenic | 0.50 | 0.022 | mg/L | 6010C |
| Barium | 1.0 | 0.0040 | mg/L | 6010C |
| Cadmium | 0.10 | 0.0020 | mg/L | 6010C |
| Chromium | 0.50 | 0.0030 | mg/L | 6010C |
| Lead | 0.50 | 0.014 | mg/L | 6010C |
| Selenium | 0.10 | 0.032 | mg/L | 6010C |
| Silver | 0.50 | 0.0040 | mg/L | 6010C |

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

### Prep: 7470A
### Leach: 1311

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| Mercury | 0.0020 | 0.000030 | mg/L | 7470A |

## General Chemistry

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| Flashpoint | 1.00 | 1.00 | Degrees C | 1010A |
| pH adj. to 25 deg C | 0.1 | 0.1 | SU | 9040C |
| Temperature | 1.0 | 1.0 | Degrees C | 9040C |
| Nitrate as N | 0.50 | 0.042 | mg/L | 9056A |
| Nitrite as N | 0.50 | 0.049 | mg/L | 9056A |

## General Chemistry

### Prep: 9012B

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| Cyanide, Total | 0.010 | 0.0020 | mg/L | 9012B |

## General Chemistry

### Prep: 9030B

| Analyte | RL | MDL | Units | Method |
|---|---|---|---|---|
| Sulfide | 4.0 | 0.79 | mg/L | 9034 |

# Surrogate Summary

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116538-2

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

**Matrix: Water** **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) |
| 280-116538-4 | FWGIDW-181001-WW | 99 | 90 | 92 | 87 |
| 280-116538-5 | FWGqc-015-TB | 99 | 89 | 98 | 89 |
| LB3 280-437096/1-A | Method Blank | 93 | 89 | 98 | 90 |
| LCS 280-437096/2-A | Lab Control Sample | 99 | 90 | 91 | 88 |

**Surrogate Legend**

TOL = Toluene-d8 (Surr)
DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (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 | (49-120) | (50-120) | (51-120) | (51-120) | (47-120) | (56-120) |
| 280-116538-4 | FWGIDW-181001-WW | 73 | 60 | 77 | 71 | 51 | 70 |
| 280-116538-4 MS | FWGIDW-181001-WW | 78 | 64 | 81 | 75 | 53 | 67 |
| 280-116538-4 MSD | FWGIDW-181001-WW | 89 | 70 | 89 | 83 | 61 | 70 |
| LB3 280-436732/1-G | Method Blank | 84 | 69 | 78 | 77 | 57 | 88 |
| LCS 280-436732/3-B | Lab Control Sample | 86 | 73 | 83 | 80 | 59 | 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: 8081B - Organochlorine Pesticides (GC)

**Matrix: Water** **Prep Type: TCLP**

| | | Percent Surrogate Recovery (Acceptance Limits) | |
|---|---|---|---|
| | | TCX2 | DCBP2 |
| Lab Sample ID | Client Sample ID | (28-115) | (34-122) |
| 280-116538-4 | FWGIDW-181001-WW | 87 | 87 |
| 280-116538-4 MS | FWGIDW-181001-WW | 89 | 92 |
| 280-116538-4 MS | FWGIDW-181001-WW | 88 | 106 |
| 280-116538-4 MSD | FWGIDW-181001-WW | 88 | 94 |
| 280-116538-4 MSD | FWGIDW-181001-WW | 82 | 100 |
| LB3 280-436732/1-I | Method Blank | 88 | 101 |
| LCS 280-436732/3-E | Lab Control Sample | 90 | 103 |
| LCS 280-436732/3-F | Lab Control Sample | 89 | 115 |

**Surrogate Legend**

TCX = Tetrachloro-m-xylene
DCBP = DCB Decachlorobiphenyl

# Surrogate Summary

Client: Leidos, Inc.
TestAmerica Job ID: 280-116538-2
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

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

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

| | | Percent Surrogate Recovery (Acceptance Limits) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lab Sample ID | Client Sample ID | TCX2 (25-120) | DCBP2 (30-136) | | | | | | | | |
| 280-116538-4 | FWGIDW-181001-WW | 78 | 70 | | | | | | | | |
| LCS 280-437451/4-A | Lab Control Sample | 86 | 93 | | | | | | | | |
| LCSD 280-437451/5-A | Lab Control Sample Dup | 87 | 97 | | | | | | | | |
| MB 280-437451/1-A | Method Blank | 85 | 94 | | | | | | | | |

**Surrogate Legend**

TCX = Tetrachloro-m-xylene

DCBP = DCB Decachlorobiphenyl

## Method: 8151A DOD - Herbicides (GC)

**Matrix: Water** **Prep Type: TCLP**

| | | Percent Surrogate Recovery (Acceptance Limits) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lab Sample ID | Client Sample ID | DCPAA1 (10-131) | | | | | | | | | |
| 280-116538-4 | FWGIDW-181001-WW | 79 | | | | | | | | | |
| 280-116538-4 MS | FWGIDW-181001-WW | 83 | | | | | | | | | |
| 280-116538-4 MSD | FWGIDW-181001-WW | 78 | | | | | | | | | |
| LB3 280-436732/1-B | Method Blank | 76 | | | | | | | | | |
| LCS 280-436732/2-B | Lab Control Sample | 78 | | | | | | | | | |

**Surrogate Legend**

DCPAA = 2,4-Dichlorophenylacetic acid

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

**Lab Sample ID: LB3 280-437096/1-A**
**Matrix: Water**
**Analysis Batch: 438589**

**Client Sample ID: Method Blank**
**Prep Type: TCLP**

| Analyte | LB3 Result | LB3 Qualifier | RL | | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Benzene | ND | | 0.010 | | 0.0016 | mg/L | | 11/23/18 13:07 | 1 |
| 2-Butanone (MEK) | ND | | 0.10 | | 0.020 | mg/L | | 11/23/18 13:07 | 1 |
| Carbon tetrachloride | ND | | 0.010 | | 0.0019 | mg/L | | 11/23/18 13:07 | 1 |
| Chlorobenzene | ND | | 0.010 | | 0.0017 | mg/L | | 11/23/18 13:07 | 1 |
| Chloroform | ND | | 0.010 | | 0.0016 | mg/L | | 11/23/18 13:07 | 1 |
| 1,2-Dichloroethane | ND | | 0.010 | | 0.0013 | mg/L | | 11/23/18 13:07 | 1 |
| 1,1-Dichloroethene | ND | | 0.010 | | 0.0023 | mg/L | | 11/23/18 13:07 | 1 |
| Tetrachloroethene | ND | | 0.010 | | 0.0020 | mg/L | | 11/23/18 13:07 | 1 |
| Trichloroethene | ND | | 0.010 | | 0.0016 | mg/L | | 11/23/18 13:07 | 1 |
| Vinyl chloride | ND | | 0.010 | | 0.0010 | mg/L | | 11/23/18 13:07 | 1 |

| *Surrogate* | *LB3 %Recovery* | *LB3 Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Toluene-d8 (Surr)* | *93* | | *78 - 120* | | *11/23/18 13:07* | *1* |
| *1,2-Dichloroethane-d4 (Surr)* | *89* | | *64 - 129* | | *11/23/18 13:07* | *1* |
| *4-Bromofluorobenzene (Surr)* | *98* | | *78 - 121* | | *11/23/18 13:07* | *1* |
| *Dibromofluoromethane (Surr)* | *90* | | *79 - 119* | | *11/23/18 13:07* | *1* |

**Lab Sample ID: LCS 280-437096/2-A**
**Matrix: Water**
**Analysis Batch: 438589**

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

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzene | | | 0.0500 | 0.0496 | | mg/L | | 99 | 74 - 135 | | |
| 2-Butanone (MEK) | | | 0.200 | 0.170 | | mg/L | | 85 | 44 - 150 | | |
| Carbon tetrachloride | | | 0.0500 | 0.0504 | | mg/L | | 101 | 67 - 135 | | |
| Chlorobenzene | | | 0.0500 | 0.0488 | | mg/L | | 98 | 76 - 135 | | |
| Chloroform | | | 0.0500 | 0.0503 | | mg/L | | 101 | 76 - 120 | | |
| 1,2-Dichloroethane | | | 0.0500 | 0.0469 | | mg/L | | 94 | 70 - 135 | | |
| 1,1-Dichloroethene | | | 0.0500 | 0.0498 | | mg/L | | 100 | 71 - 136 | | |
| Tetrachloroethene | | | 0.0500 | 0.0520 | | mg/L | | 104 | 70 - 135 | | |
| Trichloroethene | | | 0.0500 | 0.0498 | | mg/L | | 100 | 73 - 135 | | |
| Vinyl chloride | | | 0.0500 | 0.0481 | | mg/L | | 96 | 40 - 144 | | |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *Toluene-d8 (Surr)* | *99* | | *78 - 120* |
| *1,2-Dichloroethane-d4 (Surr)* | *90* | | *64 - 129* |
| *4-Bromofluorobenzene (Surr)* | *91* | | *78 - 121* |
| *Dibromofluoromethane (Surr)* | *88* | | *79 - 119* |

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

**Lab Sample ID: LB3 280-436732/1-G**
**Matrix: Water**
**Analysis Batch: 437797**

**Client Sample ID: Method Blank**
**Prep Type: TCLP**
**Prep Batch: 437243**

| Analyte | LB3 Result | LB3 Qualifier | RL | | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2-Methylphenol | ND | | 0.050 | | 0.0049 | mg/L | | 11/15/18 19:52 | 1 |

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

**Lab Sample ID: LB3 280-436732/1-G** **Client Sample ID: Method Blank**
**Matrix: Water** **Prep Type: TCLP**
**Analysis Batch: 437797** **Prep Batch: 437243**

| Analyte | LB3 Result | LB3 Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| 3 & 4 Methylphenol | ND | | 0.050 | 0.0013 | mg/L | | 11/15/18 19:52 | 1 |
| 1,4-Dichlorobenzene | ND | | 0.020 | 0.0016 | mg/L | | 11/15/18 19:52 | 1 |
| 2,4-Dinitrotoluene | ND | | 0.050 | 0.0083 | mg/L | | 11/15/18 19:52 | 1 |
| Hexachlorobenzene | ND | | 0.050 | 0.0033 | mg/L | | 11/15/18 19:52 | 1 |
| Hexachlorobutadiene | ND | | 0.050 | 0.017 | mg/L | | 11/15/18 19:52 | 1 |
| Hexachloroethane | ND | | 0.050 | 0.011 | mg/L | | 11/15/18 19:52 | 1 |
| Nitrobenzene | ND | | 0.050 | 0.0041 | mg/L | | 11/15/18 19:52 | 1 |
| Pentachlorophenol | ND | | 0.25 | 0.10 | mg/L | | 11/15/18 19:52 | 1 |
| Pyridine | ND | | 0.10 | 0.0057 | mg/L | | 11/15/18 19:52 | 1 |
| 2,4,5-Trichlorophenol | ND | | 0.050 | 0.0022 | mg/L | | 11/15/18 19:52 | 1 |
| 2,4,6-Trichlorophenol | ND | | 0.025 | 0.0014 | mg/L | | 11/15/18 19:52 | 1 |

| *Surrogate* | *LB3 %Recovery* | *LB3 Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *84* | | *49 - 120* | *11/12/18 13:36* | *11/15/18 19:52* | *1* |
| *2-Fluorophenol (Surr)* | *69* | | *50 - 120* | *11/12/18 13:36* | *11/15/18 19:52* | *1* |
| *2,4,6-Tribromophenol (Surr)* | *78* | | *51 - 120* | *11/12/18 13:36* | *11/15/18 19:52* | *1* |
| *Nitrobenzene-d5 (Surr)* | *77* | | *51 - 120* | *11/12/18 13:36* | *11/15/18 19:52* | *1* |
| *Phenol-d5 (Surr)* | *57* | | *47 - 120* | *11/12/18 13:36* | *11/15/18 19:52* | *1* |
| *Terphenyl-d14 (Surr)* | *88* | | *56 - 120* | *11/12/18 13:36* | *11/15/18 19:52* | *1* |

**Lab Sample ID: LCS 280-436732/3-B** **Client Sample ID: Lab Control Sample**
**Matrix: Water** **Prep Type: TCLP**
**Analysis Batch: 437797** **Prep Batch: 437243**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| 2-Methylphenol | 0.250 | 0.176 | | mg/L | | 70 | 45 - 120 |
| 3 & 4 Methylphenol | 0.500 | 0.350 | | mg/L | | 70 | 44 - 120 |
| 1,4-Dichlorobenzene | 0.250 | 0.174 | | mg/L | | 69 | 36 - 120 |
| 2,4-Dinitrotoluene | 0.100 | 0.0694 | | mg/L | | 69 | 36 - 120 |
| Hexachlorobenzene | 0.100 | 0.0778 | | mg/L | | 78 | 52 - 120 |
| Hexachlorobutadiene | 0.250 | 0.168 | | mg/L | | 67 | 35 - 120 |
| Hexachloroethane | 0.250 | 0.169 | | mg/L | | 68 | 35 - 120 |
| Nitrobenzene | 0.250 | 0.189 | | mg/L | | 75 | 50 - 120 |
| Pentachlorophenol | 0.500 | 0.256 | | mg/L | | 51 | 39 - 120 |
| Pyridine | 0.250 | 0.102 | | mg/L | | 41 | 10 - 121 |
| 2,4,5-Trichlorophenol | 0.250 | 0.191 | | mg/L | | 76 | 46 - 120 |
| 2,4,6-Trichlorophenol | 0.250 | 0.194 | | mg/L | | 77 | 43 - 120 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *86* | | *49 - 120* |
| *2-Fluorophenol (Surr)* | *73* | | *50 - 120* |
| *2,4,6-Tribromophenol (Surr)* | *83* | | *51 - 120* |
| *Nitrobenzene-d5 (Surr)* | *80* | | *51 - 120* |
| *Phenol-d5 (Surr)* | *59* | | *47 - 120* |
| *Terphenyl-d14 (Surr)* | *88* | | *56 - 120* |

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

**Lab Sample ID: 280-116538-4 MS** **Client Sample ID: FWGIDW-181001-WW**
**Matrix: Water** **Prep Type: TCLP**
**Analysis Batch: 437797** **Prep Batch: 437243**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| 2-Methylphenol | ND | | 0.250 | 0.160 | | mg/L | | 64 | 45 - 120 |
| 3 & 4 Methylphenol | ND | | 0.500 | 0.328 | | mg/L | | 66 | 44 - 120 |
| 1,4-Dichlorobenzene | ND | | 0.250 | 0.161 | | mg/L | | 64 | 36 - 120 |
| 2,4-Dinitrotoluene | ND | | 0.100 | 0.0693 | | mg/L | | 69 | 36 - 120 |
| Hexachlorobenzene | ND | | 0.100 | 0.0676 | | mg/L | | 68 | 52 - 120 |
| Hexachlorobutadiene | ND | | 0.250 | 0.152 | | mg/L | | 61 | 35 - 120 |
| Hexachloroethane | ND | | 0.250 | 0.156 | | mg/L | | 62 | 35 - 120 |
| Nitrobenzene | ND | | 0.250 | 0.177 | | mg/L | | 71 | 50 - 120 |
| Pentachlorophenol | ND | | 0.500 | 0.299 | | mg/L | | 60 | 39 - 120 |
| Pyridine | ND | | 0.250 | 0.127 | | mg/L | | 51 | 10 - 121 |
| 2,4,5-Trichlorophenol | ND | | 0.250 | 0.184 | | mg/L | | 74 | 46 - 120 |
| 2,4,6-Trichlorophenol | ND | | 0.250 | 0.179 | | mg/L | | 72 | 43 - 120 |

| *Surrogate* | *MS %Recovery* | *MS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *78* | | *49 - 120* |
| *2-Fluorophenol (Surr)* | *64* | | *50 - 120* |
| *2,4,6-Tribromophenol (Surr)* | *81* | | *51 - 120* |
| *Nitrobenzene-d5 (Surr)* | *75* | | *51 - 120* |
| *Phenol-d5 (Surr)* | *53* | | *47 - 120* |
| *Terphenyl-d14 (Surr)* | *67* | | *56 - 120* |

**Lab Sample ID: 280-116538-4 MSD** **Client Sample ID: FWGIDW-181001-WW**
**Matrix: Water** **Prep Type: TCLP**
**Analysis Batch: 437797** **Prep Batch: 437243**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-Methylphenol | ND | | 0.250 | 0.185 | | mg/L | | 74 | 45 - 120 | 15 | 30 |
| 3 & 4 Methylphenol | ND | | 0.500 | 0.374 | | mg/L | | 75 | 44 - 120 | 13 | 30 |
| 1,4-Dichlorobenzene | ND | | 0.250 | 0.174 | | mg/L | | 70 | 36 - 120 | 8 | 30 |
| 2,4-Dinitrotoluene | ND | | 0.100 | 0.0751 | | mg/L | | 75 | 36 - 120 | 8 | 30 |
| Hexachlorobenzene | ND | | 0.100 | 0.0736 | | mg/L | | 74 | 52 - 120 | 9 | 30 |
| Hexachlorobutadiene | ND | | 0.250 | 0.168 | | mg/L | | 67 | 35 - 120 | 10 | 30 |
| Hexachloroethane | ND | | 0.250 | 0.167 | | mg/L | | 67 | 35 - 120 | 7 | 30 |
| Nitrobenzene | ND | | 0.250 | 0.199 | | mg/L | | 80 | 50 - 120 | 11 | 30 |
| Pentachlorophenol | ND | | 0.500 | 0.330 | | mg/L | | 66 | 39 - 120 | 10 | 30 |
| Pyridine | ND | | 0.250 | 0.136 | | mg/L | | 54 | 10 - 121 | 7 | 30 |
| 2,4,5-Trichlorophenol | ND | | 0.250 | 0.204 | | mg/L | | 82 | 46 - 120 | 10 | 30 |
| 2,4,6-Trichlorophenol | ND | | 0.250 | 0.207 | | mg/L | | 83 | 43 - 120 | 15 | 30 |

| *Surrogate* | *MSD %Recovery* | *MSD Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *89* | | *49 - 120* |
| *2-Fluorophenol (Surr)* | *70* | | *50 - 120* |
| *2,4,6-Tribromophenol (Surr)* | *89* | | *51 - 120* |
| *Nitrobenzene-d5 (Surr)* | *83* | | *51 - 120* |
| *Phenol-d5 (Surr)* | *61* | | *47 - 120* |
| *Terphenyl-d14 (Surr)* | *70* | | *56 - 120* |

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

**Lab Sample ID: LB3 280-436732/1-I**
**Matrix: Water**
**Analysis Batch: 438443**

**Client Sample ID: Method Blank**
**Prep Type: TCLP**
**Prep Batch: 437290**

| Analyte | LB3 Result | LB3 Qualifier | RL | | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Endrin | ND | | 0.00050 | | 0.000079 | mg/L | | 11/21/18 15:57 | 1 |
| Heptachlor | ND | | 0.00050 | | 0.000077 | mg/L | | 11/21/18 15:57 | 1 |
| Heptachlor epoxide | ND | | 0.00050 | | 0.000075 | mg/L | | 11/21/18 15:57 | 1 |
| gamma-BHC (Lindane) | ND | | 0.00050 | | 0.000069 | mg/L | | 11/21/18 15:57 | 1 |
| Methoxychlor | ND | | 0.0010 | | 0.00013 | mg/L | | 11/21/18 15:57 | 1 |
| Toxaphene | ND | | 0.020 | | 0.0037 | mg/L | | 11/21/18 15:57 | 1 |
| Chlordane (technical) | ND | | 0.0050 | | 0.0014 | mg/L | | 11/21/18 15:57 | 1 |

| *Surrogate* | *LB3 %Recovery* | *LB3 Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Tetrachloro-m-xylene* | *88* | | *28 - 115* | *11/12/18 19:56* | *11/21/18 15:57* | *1* |
| *DCB Decachlorobiphenyl* | *101* | | *34 - 122* | *11/12/18 19:56* | *11/21/18 15:57* | *1* |

**Lab Sample ID: LCS 280-436732/3-E**
**Matrix: Water**
**Analysis Batch: 438443**

**Client Sample ID: Lab Control Sample**
**Prep Type: TCLP**
**Prep Batch: 437290**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Endrin | | | 0.00500 | 0.00514 | | mg/L | | 103 | 66 - 143 | | |
| Heptachlor | | | 0.00500 | 0.00484 | | mg/L | | 97 | 59 - 143 | | |
| Heptachlor epoxide | | | 0.00500 | 0.00481 | | mg/L | | 96 | 37 - 142 | | |
| gamma-BHC (Lindane) | | | 0.00500 | 0.00474 | | mg/L | | 95 | 68 - 142 | | |
| Methoxychlor | | | 0.00500 | 0.00560 | | mg/L | | 112 | 30 - 150 | | |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *Tetrachloro-m-xylene* | *90* | | *28 - 115* |
| *DCB Decachlorobiphenyl* | *103* | | *34 - 122* |

**Lab Sample ID: LCS 280-436732/3-F**
**Matrix: Water**
**Analysis Batch: 438443**

**Client Sample ID: Lab Control Sample**
**Prep Type: TCLP**
**Prep Batch: 437290**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Toxaphene | | | 0.200 | 0.219 | | mg/L | | 109 | 63 - 142 | | |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *Tetrachloro-m-xylene* | *89* | | *28 - 115* |
| *DCB Decachlorobiphenyl* | *115* | | *34 - 122* |

**Lab Sample ID: 280-116538-4 MS**
**Matrix: Water**
**Analysis Batch: 438443**

**Client Sample ID: FWGIDW-181001-WW**
**Prep Type: TCLP**
**Prep Batch: 437290**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Endrin | ND | | 0.00500 | 0.00505 | | mg/L | | 101 | 66 - 143 | | |
| Heptachlor | ND | | 0.00500 | 0.00494 | | mg/L | | 99 | 59 - 143 | | |
| Heptachlor epoxide | ND | | 0.00500 | 0.00481 | | mg/L | | 96 | 37 - 142 | | |
| gamma-BHC (Lindane) | ND | | 0.00500 | 0.00484 | | mg/L | | 97 | 68 - 142 | | |

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

**Lab Sample ID: 280-116538-4 MS** — **Client Sample ID: FWGIDW-181001-WW**
**Matrix: Water** — **Prep Type: TCLP**
**Analysis Batch: 438443** — **Prep Batch: 437290**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Methoxychlor | ND | | 0.00500 | 0.00532 | | mg/L | | 106 | 30 - 150 |

| *Surrogate* | *MS %Recovery* | *MS Qualifier* | *Limits* |
|---|---|---|---|
| *Tetrachloro-m-xylene* | *89* | | *28 - 115* |
| *DCB Decachlorobiphenyl* | *92* | | *34 - 122* |

**Lab Sample ID: 280-116538-4 MS** — **Client Sample ID: FWGIDW-181001-WW**
**Matrix: Water** — **Prep Type: TCLP**
**Analysis Batch: 438443** — **Prep Batch: 437290**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Toxaphene | ND | | 0.200 | 0.205 | | mg/L | | 102 | 63 - 142 |

| *Surrogate* | *MS %Recovery* | *MS Qualifier* | *Limits* |
|---|---|---|---|
| *Tetrachloro-m-xylene* | *88* | | *28 - 115* |
| *DCB Decachlorobiphenyl* | *106* | | *34 - 122* |

**Lab Sample ID: 280-116538-4 MSD** — **Client Sample ID: FWGIDW-181001-WW**
**Matrix: Water** — **Prep Type: TCLP**
**Analysis Batch: 438443** — **Prep Batch: 437290**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Endrin | ND | | 0.00500 | 0.00490 | | mg/L | | 98 | 66 - 143 | 3 | 30 |
| Heptachlor | ND | | 0.00500 | 0.00489 | | mg/L | | 98 | 59 - 143 | 1 | 30 |
| Heptachlor epoxide | ND | | 0.00500 | 0.00468 | | mg/L | | 94 | 37 - 142 | 3 | 30 |
| gamma-BHC (Lindane) | ND | | 0.00500 | 0.00474 | | mg/L | | 95 | 68 - 142 | 2 | 30 |
| Methoxychlor | ND | | 0.00500 | 0.00535 | | mg/L | | 107 | 30 - 150 | 1 | 30 |

| *Surrogate* | *MSD %Recovery* | *MSD Qualifier* | *Limits* |
|---|---|---|---|
| *Tetrachloro-m-xylene* | *88* | | *28 - 115* |
| *DCB Decachlorobiphenyl* | *94* | | *34 - 122* |

**Lab Sample ID: 280-116538-4 MSD** — **Client Sample ID: FWGIDW-181001-WW**
**Matrix: Water** — **Prep Type: TCLP**
**Analysis Batch: 438443** — **Prep Batch: 437290**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Toxaphene | ND | | 0.200 | 0.200 | | mg/L | | 100 | 63 - 142 | 2 | 30 |

| *Surrogate* | *MSD %Recovery* | *MSD Qualifier* | *Limits* |
|---|---|---|---|
| *Tetrachloro-m-xylene* | *82* | | *28 - 115* |
| *DCB Decachlorobiphenyl* | *100* | | *34 - 122* |

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

**Lab Sample ID: MB 280-437451/1-A**
**Matrix: Water**
**Analysis Batch: 439075**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 437451**

| Analyte | MB Result | MB Qualifier | RL | | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | ND | | 1.0 | | 0.12 | ug/L | | 11/28/18 18:43 | 1 |
| PCB-1221 | ND | | 1.0 | | 0.21 | ug/L | | 11/28/18 18:43 | 1 |
| PCB-1232 | ND | | 1.0 | | 0.17 | ug/L | | 11/28/18 18:43 | 1 |
| PCB-1242 | ND | | 1.0 | | 0.10 | ug/L | | 11/28/18 18:43 | 1 |
| PCB-1248 | ND | | 1.0 | | 0.092 | ug/L | | 11/28/18 18:43 | 1 |
| PCB-1254 | ND | | 1.0 | | 0.11 | ug/L | | 11/28/18 18:43 | 1 |
| PCB-1260 | ND | | 1.0 | | 0.16 | ug/L | | 11/28/18 18:43 | 1 |
| PCB-1262 | ND | | 1.0 | | 0.085 | ug/L | | 11/28/18 18:43 | 1 |
| PCB-1268 | ND | | 1.0 | | 0.36 | ug/L | | 11/28/18 18:43 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Tetrachloro-m-xylene* | *85* | | *25 - 120* | *11/13/18 18:28* | *11/28/18 18:43* | *1* |
| *DCB Decachlorobiphenyl* | *94* | | *30 - 136* | *11/13/18 18:28* | *11/28/18 18:43* | *1* |

**Lab Sample ID: LCS 280-437451/4-A**
**Matrix: Water**
**Analysis Batch: 439075**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 437451**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | | | 2.00 | 2.12 | | ug/L | | 106 | 46 - 129 | | |
| PCB-1260 | | | 2.00 | 2.16 | | ug/L | | 108 | 45 - 134 | | |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *Tetrachloro-m-xylene* | *86* | | *25 - 120* |
| *DCB Decachlorobiphenyl* | *93* | | *30 - 136* |

**Lab Sample ID: LCSD 280-437451/5-A**
**Matrix: Water**
**Analysis Batch: 439075**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**
**Prep Batch: 437451**

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PCB-1016 | | | 2.00 | 2.10 | | ug/L | | 105 | 46 - 129 | 1 | 30 |
| PCB-1260 | | | 2.00 | 2.34 | | ug/L | | 117 | 45 - 134 | 8 | 30 |

| *Surrogate* | *LCSD %Recovery* | *LCSD Qualifier* | *Limits* |
|---|---|---|---|
| *Tetrachloro-m-xylene* | *87* | | *25 - 120* |
| *DCB Decachlorobiphenyl* | *97* | | *30 - 136* |

## Method: 8151A DOD - Herbicides (GC)

**Lab Sample ID: LB3 280-436732/1-B**
**Matrix: Water**
**Analysis Batch: 437382**

**Client Sample ID: Method Blank**
**Prep Type: TCLP**
**Prep Batch: 436773**

| Analyte | LB3 Result | LB3 Qualifier | RL | | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2,4-D | ND | | 0.040 | | 0.0021 | mg/L | | 11/13/18 18:24 | 1 |
| Silvex (2,4,5-TP) | ND | | 0.010 | | 0.0017 | mg/L | | 11/13/18 18:24 | 1 |

| Surrogate | LB3 %Recovery | LB3 Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 76 | | 10 - 131 | 11/08/18 07:48 | 11/13/18 18:24 | 1 |

**Lab Sample ID: LCS 280-436732/2-B** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: TCLP**
**Analysis Batch: 437382** — **Prep Batch: 436773**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| 2,4-D | 0.0500 | 0.0376 | J | mg/L | | 75 | 13 - 115 |
| Silvex (2,4,5-TP) | 0.0500 | 0.0403 | | mg/L | | 81 | 10 - 158 |

| Surrogate | LCS %Recovery | LCS Qualifier | Limits |
|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 78 | | 10 - 131 |

**Lab Sample ID: 280-116538-4 MS** — **Client Sample ID: FWGIDW-181001-WW**
**Matrix: Water** — **Prep Type: TCLP**
**Analysis Batch: 437382** — **Prep Batch: 436773**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| 2,4-D | ND | | 0.0500 | 0.0389 | J | mg/L | | 78 | 13 - 115 |
| Silvex (2,4,5-TP) | ND | | 0.0500 | 0.0392 | | mg/L | | 78 | 10 - 158 |

| Surrogate | MS %Recovery | MS Qualifier | Limits |
|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 83 | | 10 - 131 |

**Lab Sample ID: 280-116538-4 MSD** — **Client Sample ID: FWGIDW-181001-WW**
**Matrix: Water** — **Prep Type: TCLP**
**Analysis Batch: 437382** — **Prep Batch: 436773**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,4-D | ND | | 0.0500 | 0.0372 | J | mg/L | | 74 | 13 - 115 | 5 | 30 |
| Silvex (2,4,5-TP) | ND | | 0.0500 | 0.0374 | | mg/L | | 75 | 10 - 158 | 5 | 30 |

| Surrogate | MSD %Recovery | MSD Qualifier | Limits |
|---|---|---|---|
| 2,4-Dichlorophenylacetic acid | 78 | | 10 - 131 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: LB3 280-436732/1-F** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: TCLP**
**Analysis Batch: 437502** — **Prep Batch: 437152**

| Analyte | LB3 Result | LB3 Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Arsenic | ND | | 0.50 | 0.022 | mg/L | | 11/13/18 14:46 | 1 |
| Barium | ND | | 1.0 | 0.0040 | mg/L | | 11/13/18 14:46 | 1 |
| Cadmium | ND | | 0.10 | 0.0020 | mg/L | | 11/13/18 14:46 | 1 |
| Chromium | ND | | 0.50 | 0.0030 | mg/L | | 11/13/18 14:46 | 1 |
| Lead | ND | | 0.50 | 0.014 | mg/L | | 11/13/18 14:46 | 1 |
| Selenium | ND | | 0.10 | 0.032 | mg/L | | 11/13/18 14:46 | 1 |
| Silver | ND | | 0.50 | 0.0040 | mg/L | | 11/13/18 14:46 | 1 |

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

**Lab Sample ID: LCS 280-436732/2-F**
**Matrix: Water**
**Analysis Batch: 437502**

**Client Sample ID: Lab Control Sample**
**Prep Type: TCLP**
**Prep Batch: 437152**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 4.00 | 3.57 | | mg/L | | 89 | 80 - 120 |
| Barium | 12.0 | 11.0 | | mg/L | | 92 | 80 - 120 |
| Cadmium | 1.10 | 1.01 | | mg/L | | 92 | 80 - 120 |
| Chromium | 5.20 | 4.80 | | mg/L | | 92 | 80 - 120 |
| Lead | 5.50 | 5.12 | | mg/L | | 93 | 80 - 120 |
| Selenium | 3.00 | 2.61 | | mg/L | | 87 | 80 - 120 |
| Silver | 1.05 | 0.940 | | mg/L | | 90 | 80 - 120 |

**Lab Sample ID: LCSD 280-436732/13-B**
**Matrix: Water**
**Analysis Batch: 437502**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: TCLP**
**Prep Batch: 437152**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 4.00 | 3.86 | | mg/L | | 97 | 80 - 120 | 8 | 20 |
| Barium | 12.0 | 11.9 | | mg/L | | 99 | 80 - 120 | 8 | 20 |
| Cadmium | 1.10 | 1.09 | | mg/L | | 99 | 80 - 120 | 7 | 20 |
| Chromium | 5.20 | 5.21 | | mg/L | | 100 | 80 - 120 | 8 | 20 |
| Lead | 5.50 | 5.53 | | mg/L | | 100 | 80 - 120 | 8 | 20 |
| Selenium | 3.00 | 2.82 | | mg/L | | 94 | 80 - 120 | 8 | 20 |
| Silver | 1.05 | 1.01 | | mg/L | | 96 | 80 - 120 | 7 | 20 |

**Lab Sample ID: 280-116538-4 MS**
**Matrix: Water**
**Analysis Batch: 437502**

**Client Sample ID: FWGIDW-181001-WW**
**Prep Type: TCLP**
**Prep Batch: 437152**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | ND | | 4.00 | 3.98 | | mg/L | | 99 | 80 - 120 |
| Barium | 0.015 | J | 12.0 | 12.2 | | mg/L | | 102 | 80 - 120 |
| Cadmium | ND | | 1.10 | 1.09 | | mg/L | | 99 | 80 - 120 |
| Chromium | ND | | 5.20 | 5.27 | | mg/L | | 101 | 80 - 120 |
| Lead | ND | | 5.50 | 5.61 | | mg/L | | 102 | 80 - 120 |
| Selenium | ND | | 3.00 | 2.88 | | mg/L | | 96 | 80 - 120 |
| Silver | ND | | 1.05 | 1.06 | | mg/L | | 101 | 80 - 120 |

**Lab Sample ID: 280-116538-4 MSD**
**Matrix: Water**
**Analysis Batch: 437502**

**Client Sample ID: FWGIDW-181001-WW**
**Prep Type: TCLP**
**Prep Batch: 437152**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | ND | | 4.00 | 3.99 | | mg/L | | 100 | 80 - 120 | 0 | 20 |
| Barium | 0.015 | J | 12.0 | 12.1 | | mg/L | | 101 | 80 - 120 | 1 | 20 |
| Cadmium | ND | | 1.10 | 1.11 | | mg/L | | 100 | 80 - 120 | 1 | 20 |
| Chromium | ND | | 5.20 | 5.29 | | mg/L | | 102 | 80 - 120 | 0 | 20 |
| Lead | ND | | 5.50 | 5.63 | | mg/L | | 102 | 80 - 120 | 0 | 20 |
| Selenium | ND | | 3.00 | 2.90 | | mg/L | | 97 | 80 - 120 | 1 | 20 |
| Silver | ND | | 1.05 | 1.04 | | mg/L | | 99 | 80 - 120 | 1 | 20 |

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: LB3 280-436732/1-J**
**Matrix: Water**
**Analysis Batch: 437814**

**Client Sample ID: Method Blank**
**Prep Type: TCLP**
**Prep Batch: 437496**

| Analyte | LB3 Result | LB3 Qualifier | RL | | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | ND | | 0.0020 | | 0.000030 | mg/L | | 11/15/18 14:15 | 1 |

**Lab Sample ID: LCS 280-436732/2-G**
**Matrix: Water**
**Analysis Batch: 437814**

**Client Sample ID: Lab Control Sample**
**Prep Type: TCLP**
**Prep Batch: 437496**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | | | 0.00500 | 0.00495 | | mg/L | | 99 | 90 - 116 | | |

**Lab Sample ID: LCSD 280-436732/13-D**
**Matrix: Water**
**Analysis Batch: 437814**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: TCLP**
**Prep Batch: 437496**

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | | | 0.00500 | 0.00482 | | mg/L | | 96 | 90 - 116 | 3 | 10 |

**Lab Sample ID: 280-116538-4 MS**
**Matrix: Water**
**Analysis Batch: 437814**

**Client Sample ID: FWGIDW-181001-WW**
**Prep Type: TCLP**
**Prep Batch: 437496**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | ND | | 0.00500 | 0.00497 | | mg/L | | 99 | 90 - 116 | | |

**Lab Sample ID: 280-116538-4 MSD**
**Matrix: Water**
**Analysis Batch: 437814**

**Client Sample ID: FWGIDW-181001-WW**
**Prep Type: TCLP**
**Prep Batch: 437496**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | ND | | 0.00500 | 0.00514 | | mg/L | | 103 | 90 - 116 | 3 | 10 |

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

**Lab Sample ID: MB 160-401121/1**
**Matrix: Water**
**Analysis Batch: 401121**

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

| Analyte | MB Result | MB Qualifier | RL | | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Flashpoint | >60 | | 1.00 | | 1.00 | Degrees C | | 11/15/18 23:43 | 1 |

**Lab Sample ID: LCS 160-401121/2**
**Matrix: Water**
**Analysis Batch: 401121**

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

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Flashpoint | | | 25.0 | 27.00 | | Degrees C | | 108 | 90 - 110 | | |

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

**Lab Sample ID: MB 280-437763/5-A**
**Matrix: Water**
**Analysis Batch: 437833**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 437763**

| Analyte | MB Result | MB Qualifier | RL | | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Cyanide, Total | ND | | 0.010 | | 0.0020 | mg/L | | 11/15/18 18:00 | 1 |

**Lab Sample ID: HLCS 280-437763/1-A**
**Matrix: Water**
**Analysis Batch: 437833**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 437763**

| Analyte | | | Spike Added | HLCS Result | HLCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cyanide, Total | | | 0.350 | 0.342 | | mg/L | | 98 | 90 - 110 | | |

**Lab Sample ID: LCS 280-437763/3-A**
**Matrix: Water**
**Analysis Batch: 437833**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 437763**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cyanide, Total | | | 0.100 | 0.102 | | mg/L | | 102 | 83 - 116 | | |

**Lab Sample ID: LCSD 280-437763/4-A**
**Matrix: Water**
**Analysis Batch: 437833**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**
**Prep Batch: 437763**

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cyanide, Total | | | 0.100 | 0.0973 | | mg/L | | 97 | 83 - 116 | 4 | 20 |

**Lab Sample ID: LLCS 280-437763/2-A**
**Matrix: Water**
**Analysis Batch: 437833**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 437763**

| Analyte | | | Spike Added | LLCS Result | LLCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cyanide, Total | | | 0.100 | 0.0970 | | mg/L | | 97 | 44 - 167 | | |

**Lab Sample ID: MB 280-438264/5-A**
**Matrix: Water**
**Analysis Batch: 438452**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 438264**

| Analyte | MB Result | MB Qualifier | RL | | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Cyanide, Total | 0.0050 | U | 0.010 | 0.0050 | 0.0020 | mg/L | | 11/21/18 10:41 | 1 |

**Lab Sample ID: HLCS 280-438264/1-A**
**Matrix: Water**
**Analysis Batch: 438452**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 438264**

| 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 280-438264/3-A**
**Matrix: Water**
**Analysis Batch: 438452**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 438264**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cyanide, Total | | | 0.100 | 0.110 | | mg/L | | 110 | 83 - 116 | | |

**Lab Sample ID: LCSD 280-438264/4-A** **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** **Prep Type: Total/NA**
**Analysis Batch: 438452** **Prep Batch: 438264**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Cyanide, Total | 0.100 | 0.105 | | mg/L | | 105 | 83 - 116 | 5 | 20 |

**Lab Sample ID: LLCS 280-438264/2-A** **Client Sample ID: Lab Control Sample**
**Matrix: Water** **Prep Type: Total/NA**
**Analysis Batch: 438452** **Prep Batch: 438264**

| Analyte | Spike Added | LLCS Result | LLCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Cyanide, Total | 0.100 | 0.0979 | | mg/L | | 98 | 44 - 167 |

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

**Lab Sample ID: MB 280-436723/1-A** **Client Sample ID: Method Blank**
**Matrix: Water** **Prep Type: Total/NA**
**Analysis Batch: 436735** **Prep Batch: 436723**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Sulfide | ND | | 4.0 | 0.79 | mg/L | | 11/07/18 20:06 | 1 |

**Lab Sample ID: LCS 280-436723/3-A** **Client Sample ID: Lab Control Sample**
**Matrix: Water** **Prep Type: Total/NA**
**Analysis Batch: 436735** **Prep Batch: 436723**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sulfide | 22.3 | 16.0 | | mg/L | | 72 | 50 - 106 |

## Method: 9040C - pH

**Lab Sample ID: LCS 280-438182/4** **Client Sample ID: Lab Control Sample**
**Matrix: Water** **Prep Type: Total/NA**
**Analysis Batch: 438182**

| 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 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 280-436181/6** **Client Sample ID: Method Blank**
**Matrix: Water** **Prep Type: Total/NA**
**Analysis Batch: 436181**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|
| Nitrate as N | ND | | 0.50 | 0.042 | mg/L | | 11/03/18 12:07 | 1 |
| Nitrite as N | 0.0961 | J | 0.50 | 0.049 | mg/L | | 11/03/18 12:07 | 1 |

**Lab Sample ID: LCS 280-436181/4** **Client Sample ID: Lab Control Sample**
**Matrix: Water** **Prep Type: Total/NA**
**Analysis Batch: 436181**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Nitrate as N | 5.00 | 4.96 | | mg/L | | 99 | 88 - 111 |
| Nitrite as N | 5.00 | 5.06 | | mg/L | | 101 | 87 - 111 |

**Lab Sample ID: LCSD 280-436181/5**
**Matrix: Water**
**Analysis Batch: 436181**

**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 | | | 5.00 | 4.97 | | mg/L | | 99 | 88 - 111 | 0 | 10 |
| Nitrite as N | | | 5.00 | 5.13 | | mg/L | | 103 | 87 - 111 | 1 | 10 |

**Lab Sample ID: MRL 280-436181/3**
**Matrix: Water**
**Analysis Batch: 436181**

**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 | | | 0.200 | 0.241 | J | mg/L | | 120 | 50 - 150 | | |
| Nitrite as N | | | 0.200 | 0.234 | J | mg/L | | 117 | 50 - 150 | | |

## GC/MS VOA

### Leach Batch: 437096

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | TCLP | Water | 1311 | |
| 280-116538-5 | FWGqc-015-TB | TCLP | Water | 1311 | |
| LB3 280-437096/1-A | Method Blank | TCLP | Water | 1311 | |
| LCS 280-437096/2-A | Lab Control Sample | TCLP | Water | 1311 | |

### Analysis Batch: 438589

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | TCLP | Water | 8260B | 437096 |
| 280-116538-5 | FWGqc-015-TB | TCLP | Water | 8260B | 437096 |
| LB3 280-437096/1-A | Method Blank | TCLP | Water | 8260B | 437096 |
| LCS 280-437096/2-A | Lab Control Sample | TCLP | Water | 8260B | 437096 |

## GC/MS Semi VOA

### Leach Batch: 436732

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | TCLP | Water | 1311 | |
| LB3 280-436732/1-G | Method Blank | TCLP | Water | 1311 | |
| LCS 280-436732/3-B | Lab Control Sample | TCLP | Water | 1311 | |
| 280-116538-4 MS | FWGIDW-181001-WW | TCLP | Water | 1311 | |
| 280-116538-4 MSD | FWGIDW-181001-WW | TCLP | Water | 1311 | |

### Prep Batch: 437243

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | TCLP | Water | 3510C | 436732 |
| LB3 280-436732/1-G | Method Blank | TCLP | Water | 3510C | 436732 |
| LCS 280-436732/3-B | Lab Control Sample | TCLP | Water | 3510C | 436732 |
| 280-116538-4 MS | FWGIDW-181001-WW | TCLP | Water | 3510C | 436732 |
| 280-116538-4 MSD | FWGIDW-181001-WW | TCLP | Water | 3510C | 436732 |

### Analysis Batch: 437797

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | TCLP | Water | 8270D | 437243 |
| LB3 280-436732/1-G | Method Blank | TCLP | Water | 8270D | 437243 |
| LCS 280-436732/3-B | Lab Control Sample | TCLP | Water | 8270D | 437243 |
| 280-116538-4 MS | FWGIDW-181001-WW | TCLP | Water | 8270D | 437243 |
| 280-116538-4 MSD | FWGIDW-181001-WW | TCLP | Water | 8270D | 437243 |

## GC Semi VOA

### Leach Batch: 436732

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | TCLP | Water | 1311 | |
| LB3 280-436732/1-B | Method Blank | TCLP | Water | 1311 | |
| LB3 280-436732/1-I | Method Blank | TCLP | Water | 1311 | |
| LCS 280-436732/2-B | Lab Control Sample | TCLP | Water | 1311 | |
| LCS 280-436732/3-E | Lab Control Sample | TCLP | Water | 1311 | |
| LCS 280-436732/3-F | Lab Control Sample | TCLP | Water | 1311 | |
| 280-116538-4 MS | FWGIDW-181001-WW | TCLP | Water | 1311 | |
| 280-116538-4 MSD | FWGIDW-181001-WW | TCLP | Water | 1311 | |

## GC Semi VOA (Continued)

### Prep Batch: 436773

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | TCLP | Water | 8151A | 436732 |
| LB3 280-436732/1-B | Method Blank | TCLP | Water | 8151A | 436732 |
| LCS 280-436732/2-B | Lab Control Sample | TCLP | Water | 8151A | 436732 |
| 280-116538-4 MS | FWGIDW-181001-WW | TCLP | Water | 8151A | 436732 |
| 280-116538-4 MSD | FWGIDW-181001-WW | TCLP | Water | 8151A | 436732 |

### Prep Batch: 437290

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | TCLP | Water | 3510C | 436732 |
| LB3 280-436732/1-I | Method Blank | TCLP | Water | 3510C | 436732 |
| LCS 280-436732/3-E | Lab Control Sample | TCLP | Water | 3510C | 436732 |
| LCS 280-436732/3-F | Lab Control Sample | TCLP | Water | 3510C | 436732 |
| 280-116538-4 MS | FWGIDW-181001-WW | TCLP | Water | 3510C | 436732 |
| 280-116538-4 MS | FWGIDW-181001-WW | TCLP | Water | 3510C | 436732 |
| 280-116538-4 MSD | FWGIDW-181001-WW | TCLP | Water | 3510C | 436732 |
| 280-116538-4 MSD | FWGIDW-181001-WW | TCLP | Water | 3510C | 436732 |

### Analysis Batch: 437382

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | TCLP | Water | 8151A DOD | 436773 |
| LB3 280-436732/1-B | Method Blank | TCLP | Water | 8151A DOD | 436773 |
| LCS 280-436732/2-B | Lab Control Sample | TCLP | Water | 8151A DOD | 436773 |
| 280-116538-4 MS | FWGIDW-181001-WW | TCLP | Water | 8151A DOD | 436773 |
| 280-116538-4 MSD | FWGIDW-181001-WW | TCLP | Water | 8151A DOD | 436773 |

### Prep Batch: 437451

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | Total/NA | Water | 3510C | |
| MB 280-437451/1-A | Method Blank | Total/NA | Water | 3510C | |
| LCS 280-437451/4-A | Lab Control Sample | Total/NA | Water | 3510C | |
| LCSD 280-437451/5-A | Lab Control Sample Dup | Total/NA | Water | 3510C | |

### Analysis Batch: 438443

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | TCLP | Water | 8081B | 437290 |
| LB3 280-436732/1-I | Method Blank | TCLP | Water | 8081B | 437290 |
| LCS 280-436732/3-E | Lab Control Sample | TCLP | Water | 8081B | 437290 |
| LCS 280-436732/3-F | Lab Control Sample | TCLP | Water | 8081B | 437290 |
| 280-116538-4 MS | FWGIDW-181001-WW | TCLP | Water | 8081B | 437290 |
| 280-116538-4 MS | FWGIDW-181001-WW | TCLP | Water | 8081B | 437290 |
| 280-116538-4 MSD | FWGIDW-181001-WW | TCLP | Water | 8081B | 437290 |
| 280-116538-4 MSD | FWGIDW-181001-WW | TCLP | Water | 8081B | 437290 |

### Analysis Batch: 439075

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | Total/NA | Water | 8082A | 437451 |
| MB 280-437451/1-A | Method Blank | Total/NA | Water | 8082A | 437451 |
| LCS 280-437451/4-A | Lab Control Sample | Total/NA | Water | 8082A | 437451 |
| LCSD 280-437451/5-A | Lab Control Sample Dup | Total/NA | Water | 8082A | 437451 |

# QC Association Summary

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116538-2

## Metals

### Leach Batch: 436732

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | TCLP | Water | 1311 | |
| LB3 280-436732/1-F | Method Blank | TCLP | Water | 1311 | |
| LB3 280-436732/1-J | Method Blank | TCLP | Water | 1311 | |
| LCS 280-436732/2-F | Lab Control Sample | TCLP | Water | 1311 | |
| LCS 280-436732/2-G | Lab Control Sample | TCLP | Water | 1311 | |
| LCSD 280-436732/13-B | Lab Control Sample Dup | TCLP | Water | 1311 | |
| LCSD 280-436732/13-D | Lab Control Sample Dup | TCLP | Water | 1311 | |
| 280-116538-4 MS | FWGIDW-181001-WW | TCLP | Water | 1311 | |
| 280-116538-4 MSD | FWGIDW-181001-WW | TCLP | Water | 1311 | |

### Prep Batch: 437152

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | TCLP | Water | 3010A | 436732 |
| LB3 280-436732/1-F | Method Blank | TCLP | Water | 3010A | 436732 |
| LCS 280-436732/2-F | Lab Control Sample | TCLP | Water | 3010A | 436732 |
| LCSD 280-436732/13-B | Lab Control Sample Dup | TCLP | Water | 3010A | 436732 |
| 280-116538-4 MS | FWGIDW-181001-WW | TCLP | Water | 3010A | 436732 |
| 280-116538-4 MSD | FWGIDW-181001-WW | TCLP | Water | 3010A | 436732 |

### Prep Batch: 437496

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | TCLP | Water | 7470A | 436732 |
| LB3 280-436732/1-J | Method Blank | TCLP | Water | 7470A | 436732 |
| LCS 280-436732/2-G | Lab Control Sample | TCLP | Water | 7470A | 436732 |
| LCSD 280-436732/13-D | Lab Control Sample Dup | TCLP | Water | 7470A | 436732 |
| 280-116538-4 MS | FWGIDW-181001-WW | TCLP | Water | 7470A | 436732 |
| 280-116538-4 MSD | FWGIDW-181001-WW | TCLP | Water | 7470A | 436732 |

### Analysis Batch: 437502

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | TCLP | Water | 6010C | 437152 |
| LB3 280-436732/1-F | Method Blank | TCLP | Water | 6010C | 437152 |
| LCS 280-436732/2-F | Lab Control Sample | TCLP | Water | 6010C | 437152 |
| LCSD 280-436732/13-B | Lab Control Sample Dup | TCLP | Water | 6010C | 437152 |
| 280-116538-4 MS | FWGIDW-181001-WW | TCLP | Water | 6010C | 437152 |
| 280-116538-4 MSD | FWGIDW-181001-WW | TCLP | Water | 6010C | 437152 |

### Analysis Batch: 437814

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | TCLP | Water | 7470A | 437496 |
| LB3 280-436732/1-J | Method Blank | TCLP | Water | 7470A | 437496 |
| LCS 280-436732/2-G | Lab Control Sample | TCLP | Water | 7470A | 437496 |
| LCSD 280-436732/13-D | Lab Control Sample Dup | TCLP | Water | 7470A | 437496 |
| 280-116538-4 MS | FWGIDW-181001-WW | TCLP | Water | 7470A | 437496 |
| 280-116538-4 MSD | FWGIDW-181001-WW | TCLP | Water | 7470A | 437496 |

## General Chemistry

### Analysis Batch: 401121

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | Total/NA | Water | 1010A | |
| MB 160-401121/1 | Method Blank | Total/NA | Water | 1010A | |
| LCS 160-401121/2 | Lab Control Sample | Total/NA | Water | 1010A | |

### Analysis Batch: 436181

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | Total/NA | Water | 9056A | |
| 280-116538-4 | FWGIDW-181001-WW | Total/NA | Water | 9056A | |
| MB 280-436181/6 | Method Blank | Total/NA | Water | 9056A | |
| LCS 280-436181/4 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 280-436181/5 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| MRL 280-436181/3 | Lab Control Sample | Total/NA | Water | 9056A | |

### Prep Batch: 436723

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | Total/NA | Water | 9030B | |
| MB 280-436723/1-A | Method Blank | Total/NA | Water | 9030B | |
| LCS 280-436723/3-A | Lab Control Sample | Total/NA | Water | 9030B | |

### Analysis Batch: 436735

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | Total/NA | Water | 9034 | 436723 |
| MB 280-436723/1-A | Method Blank | Total/NA | Water | 9034 | 436723 |
| LCS 280-436723/3-A | Lab Control Sample | Total/NA | Water | 9034 | 436723 |

### Prep Batch: 437763

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | Total/NA | Water | 9012B | |
| MB 280-437763/5-A | Method Blank | Total/NA | Water | 9012B | |
| HLCS 280-437763/1-A | Lab Control Sample | Total/NA | Water | 9012B | |
| LCS 280-437763/3-A | Lab Control Sample | Total/NA | Water | 9012B | |
| LCSD 280-437763/4-A | Lab Control Sample Dup | Total/NA | Water | 9012B | |
| LLCS 280-437763/2-A | Lab Control Sample | Total/NA | Water | 9012B | |

### Analysis Batch: 437833

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | Total/NA | Water | 9012B | 437763 |
| MB 280-437763/5-A | Method Blank | Total/NA | Water | 9012B | 437763 |
| HLCS 280-437763/1-A | Lab Control Sample | Total/NA | Water | 9012B | 437763 |
| LCS 280-437763/3-A | Lab Control Sample | Total/NA | Water | 9012B | 437763 |
| LCSD 280-437763/4-A | Lab Control Sample Dup | Total/NA | Water | 9012B | 437763 |
| LLCS 280-437763/2-A | Lab Control Sample | Total/NA | Water | 9012B | 437763 |

### Analysis Batch: 438182

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | Total/NA | Water | 9040C | |
| LCS 280-438182/4 | Lab Control Sample | Total/NA | Water | 9040C | |

### Prep Batch: 438264

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-7 | FWIDW-181002-WW | Total/NA | Water | 9012B | |

## General Chemistry (Continued)

### Prep Batch: 438264 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| MB 280-438264/5-A | Method Blank | Total/NA | Water | 9012B | |
| HLCS 280-438264/1-A | Lab Control Sample | Total/NA | Water | 9012B | |
| LCS 280-438264/3-A | Lab Control Sample | Total/NA | Water | 9012B | |
| LCSD 280-438264/4-A | Lab Control Sample Dup | Total/NA | Water | 9012B | |
| LLCS 280-438264/2-A | Lab Control Sample | Total/NA | Water | 9012B | |

### Analysis Batch: 438452

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-116538-7 | FWIDW-181002-WW | Total/NA | Water | 9012B | 438264 |
| MB 280-438264/5-A | Method Blank | Total/NA | Water | 9012B | 438264 |
| HLCS 280-438264/1-A | Lab Control Sample | Total/NA | Water | 9012B | 438264 |
| LCS 280-438264/3-A | Lab Control Sample | Total/NA | Water | 9012B | 438264 |
| LCSD 280-438264/4-A | Lab Control Sample Dup | Total/NA | Water | 9012B | 438264 |
| LLCS 280-438264/2-A | Lab Control Sample | Total/NA | Water | 9012B | 438264 |

## Client Sample ID: FWGIDW-181001-WW — Lab Sample ID: 280-116538-4

**Date Collected: 11/02/18 15:30** **Matrix: Water**
**Date Received: 11/03/18 09:00**

| 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 | 437096 | 11/09/18 15:44 | DFB1 | TAL DEN |
| TCLP | Analysis | 8260B | | 1 | 2 mL | 20 mL | 438589 | 11/23/18 13:45 | GPM | TAL DEN |
| TCLP | Leach | 1311 | | | 1.0 g | 1.0 mL | 436732 | 11/07/18 09:48 | DFB1 | TAL DEN |
| TCLP | Prep | 3510C | | | 200 mL | 1 mL | 437243 | 11/12/18 13:36 | KJS | TAL DEN |
| TCLP | Analysis | 8270D | | 1 | | | 437797 | 11/16/18 01:29 | AFH | TAL DEN |
| TCLP | Leach | 1311 | | | 1.0 g | 1.0 mL | 436732 | 11/07/18 09:48 | DFB1 | TAL DEN |
| TCLP | Prep | 3510C | | | 100 mL | 10 mL | 437290 | 11/12/18 19:56 | AJE | TAL DEN |
| TCLP | Analysis | 8081B | | 1 | | | 438443 | 11/21/18 17:07 | TEM | TAL DEN |
| Total/NA | Prep | 3510C | | | 897.7 mL | 10 mL | 437451 | 11/13/18 18:28 | AJE | TAL DEN |
| Total/NA | Analysis | 8082A | | 1 | | | 439075 | 11/28/18 20:29 | BJP | TAL DEN |
| TCLP | Leach | 1311 | | | 1.0 g | 1.0 mL | 436732 | 11/07/18 09:48 | DFB1 | TAL DEN |
| TCLP | Prep | 8151A | | | 100 mL | 10 mL | 436773 | 11/08/18 07:48 | JZ | TAL DEN |
| TCLP | Analysis | 8151A DOD | | 1 | | | 437382 | 11/13/18 18:57 | AMB1 | TAL DEN |
| TCLP | Leach | 1311 | | | 1.0 g | 1.0 mL | 436732 | 11/07/18 09:48 | DFB1 | TAL DEN |
| TCLP | Prep | 3010A | | | 10 mL | 50 mL | 437152 | 11/13/18 07:00 | LLB | TAL DEN |
| TCLP | Analysis | 6010C | | 1 | | | 437502 | 11/13/18 14:56 | CML | TAL DEN |
| TCLP | Leach | 1311 | | | 1.0 g | 1.0 mL | 436732 | 11/07/18 09:48 | DFB1 | TAL DEN |
| TCLP | Prep | 7470A | | | 30 mL | 50 mL | 437496 | 11/14/18 12:30 | THP | TAL DEN |
| TCLP | Analysis | 7470A | | 1 | | | 437814 | 11/15/18 15:55 | THP | TAL DEN |
| Total/NA | Analysis | 1010A | | 1 | 70 mL | 70 mL | 401121 | 11/16/18 01:31 | JCB | TAL SL |
| Total/NA | Prep | 9012B | | | 50 mL | 50 mL | 437763 | 11/15/18 11:37 | RK | TAL DEN |
| Total/NA | Analysis | 9012B | | 5 | 50 mL | 50 mL | 437833 | 11/15/18 19:28 | RK | TAL DEN |
| Total/NA | Prep | 9030B | | | 50 mL | 50 mL | 436723 | 11/07/18 17:19 | EC | TAL DEN |
| Total/NA | Analysis | 9034 | | 1 | | | 436735 | 11/07/18 20:06 | EC | TAL DEN |
| Total/NA | Analysis | 9040C | | 1 | | | 438182 | 11/19/18 13:46 | SGB | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 436181 | 11/03/18 14:16 | A1D | TAL DEN |
| Total/NA | Analysis | 9056A | | 5 | 5 mL | 5 mL | 436181 | 11/03/18 16:36 | A1D | TAL DEN |

## Client Sample ID: FWGqc-015-TB — Lab Sample ID: 280-116538-5

**Date Collected: 11/02/18 15:30** **Matrix: Water**
**Date Received: 11/03/18 09:00**

| 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 | 437096 | 11/09/18 15:44 | DFB1 | TAL DEN |
| TCLP | Analysis | 8260B | | 1 | 2 mL | 20 mL | 438589 | 11/23/18 14:05 | GPM | TAL DEN |

## Client Sample ID: FWIDW-181002-WW — Lab Sample ID: 280-116538-7

**Date Collected: 11/14/18 15:55** **Matrix: Water**
**Date Received: 11/03/18 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 9012B | | | 50 mL | 50 mL | 438264 | 11/20/18 10:20 | AML | TAL DEN |
| Total/NA | Analysis | 9012B | | 1 | 50 mL | 50 mL | 438452 | 11/21/18 11:07 | AJA | TAL DEN |

# Lab Chronicle

Client: Leidos, Inc.
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

TestAmerica Job ID: 280-116538-2

**Laboratory References:**

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

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

# Accreditation/Certification Summary

Client: Leidos, Inc. TestAmerica Job ID: 280-116538-2
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

## Laboratory: TestAmerica Denver

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

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-19 |

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

| Analysis Method | Prep Method | Matrix | Analyte |
|---|---|---|---|
| 9040C | | Water | Temperature |

## Laboratory: TestAmerica St. Louis

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

| Authority | Program | EPA Region | Identification Number | Expiration Date |
|---|---|---|---|---|
| Alaska | State Program | 10 | MO00054 | 06-30-19 |
| ANAB | DoD ELAP | | L2305 | 04-06-19 |
| Arizona | State Program | 9 | AZ0813 | 12-08-18 * |
| California | State Program | 9 | 2886 | 06-30-19 |
| Connecticut | State Program | 1 | PH-0241 | 03-31-19 |
| Florida | NELAP | 4 | E87689 | 06-30-19 |
| Illinois | NELAP | 5 | 200023 | 11-30-18 * |
| Iowa | State Program | 7 | 373 | 12-01-18 * |
| Kansas | NELAP | 7 | E-10236 | 10-31-19 |
| Kentucky (DW) | State Program | 4 | 90125 | 12-31-18 |
| Louisiana | NELAP | 6 | 04080 | 06-30-19 |
| Louisiana (DW) | NELAP | 6 | LA180017 | 12-31-18 * |
| Maryland | State Program | 3 | 310 | 09-30-19 |
| Michigan | State Program | 5 | 9005 | 06-30-19 |
| Missouri | State Program | 7 | 780 | 06-30-19 |
| Nevada | State Program | 9 | MO000542018-1 | 07-31-19 |
| New Jersey | NELAP | 2 | MO002 | 06-30-19 |
| New York | NELAP | 2 | 11616 | 03-31-19 |
| North Dakota | State Program | 8 | R207 | 06-30-19 |
| NRC | NRC | | 24-24817-01 | 12-31-22 |
| Oklahoma | State Program | 6 | 9997 | 08-31-19 |
| Pennsylvania | NELAP | 3 | 68-00540 | 02-28-19 |
| South Carolina | State Program | 4 | 85002001 | 06-30-19 |
| Texas | NELAP | 6 | T104704193-18-12 | 07-31-19 |
| US Fish & Wildlife | Federal | | 058448 | 07-31-19 |
| USDA | Federal | | P330-17-0028 | 02-02-20 |
| Utah | NELAP | 8 | MO000542018-10 | 07-31-19 |
| Virginia | NELAP | 3 | 460230 | 06-14-19 |
| Washington | State Program | 10 | C592 | 08-30-19 |
| West Virginia DEP | State Program | 3 | 381 | 08-31-19 |

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

# Method Summary

Client: Leidos, Inc. TestAmerica Job ID: 280-116538-2
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8260B | Volatile Organic Compounds (GC/MS) | SW846 | TAL DEN |
| 8270D | Semivolatile Organic Compounds (GC/MS) | SW846 | TAL DEN |
| 8081B | Organochlorine Pesticides (GC) | SW846 | TAL DEN |
| 8082A | Polychlorinated Biphenyls (PCBs) by Gas Chromatography | SW846 | TAL DEN |
| 8151A DOD | Herbicides (GC) | SW846 | TAL DEN |
| 6010C | Metals (ICP) | SW846 | TAL DEN |
| 7470A | Mercury (CVAA) | SW846 | TAL DEN |
| 1010A | Ignitability, Pensky-Martens Closed-Cup Method | SW846 | TAL SL |
| 9012B | Cyanide, Total and/or Amenable | EPA | TAL DEN |
| 9034 | Sulfide, Acid Soluble and Insoluble (Titrimetric) | SW846 | TAL DEN |
| 9040C | pH | SW846 | TAL DEN |
| 9056A | Anions, Ion Chromatography | SW846 | TAL DEN |
| 1311 | TCLP Extraction | SW846 | TAL DEN |
| 3010A | Preparation, Total Metals | SW846 | TAL DEN |
| 3510C | Liquid-Liquid Extraction (Separatory Funnel) | SW846 | TAL DEN |
| 5030B | Purge and Trap | SW846 | TAL DEN |
| 7470A | Preparation, Mercury | SW846 | TAL DEN |
| 8151A | Extraction (Herbicides) | SW846 | TAL DEN |
| 9012B | Cyanide, Total and/or Amenable, Distillation | SW846 | TAL DEN |
| 9030B | Sulfide, Distillation (Acid Soluble and Insoluble) | SW846 | TAL DEN |

**Protocol References:**

EPA = US Environmental Protection Agency

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

**Laboratory References:**

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

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

# Sample Summary

Client: Leidos, Inc.
TestAmerica Job ID: 280-116538-2
Project/Site: Leidos RFP# 001088 - Ravenna AAP-66

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 280-116538-4 | FWGIDW-181001-WW | Water | 11/02/18 15:30 | 11/03/18 09:00 |
| 280-116538-5 | FWGqc-015-TB | Water | 11/02/18 15:30 | 11/03/18 09:00 |
| 280-116538-7 | FWIDW-181002-WW | Water | 11/14/18 15:55 | 11/03/18 09:00 |

# Shipping and Receiving Documents

leidos

# Chain of Custody Record

COC No.: RVAAP-083

Page 1 of 1 Date: 11/2/2018

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

Sampler (Signature) (Printed Name)

Laboratory Name: Test America -Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-8396
Fax:
Contact:

Requested Parameters

| Laboratory No. | Sample ID | Date | Time | Matrix | TCLP VOCs (1)(A) | TCLP SVOCs (2)(A), TCLP Pesticides (3)(A), TCLP Herbicides (5)(A), TCLP Metals (7)(A) | Total PCBs (12)(A) / (4)(A) | Ignitability (11)(A) | pH (10)(A) / (6)(A) | Total Sulfide (9)(A), Total Cyanide (8)(A), Nitrate, Nitrite (10)(A) | Total Cyanide (8)(D) | Total Sulfide (9)(E) | Nitrate and Nitrite (10)(A) | | | | | Temperature Blank | NO. OF CONTAINERS | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ~~FWGIDW-181001-WS~~ | | | S | 1 | 2 | 1 | 1 | 1 | 1 | | | | | | | | | 7 | |
| | FWGIDW-181001-WW | 11/2/18 | 1530 | W | 3 | 2 | 2 | 2 | 1 | | 1 | 1 | 1 | | | | | | 13 | |
| | FWGQA-015-TB | 11/2/18 | 1530 | W | 2 | | | | | | | | | | | | | | 2 | TRIP BLANK |

Total Number of Containers: 20 15

Shipment Method: Courier

| Relinquished by | | Date | Time |
|---|---|---|---|
| [signature] | Test America | 11/2/2018 | 1000 |
| Signature | | | |
| Heather L. Adams | RC Robison | | |
| Printed Name | | | |
| Leidos | Rick Robison | | |
| Company | | | |

| Relinquished by | | Date | Time |
|---|---|---|---|
| Test America | [signature] | 11-03-18 | 0900 |
| Signature | | | |
| R Robison | Krista Dunlap | | |
| Printed Name | | | |
| Rick Robison | TADEN | | |
| Company | | | |

Notes:
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

1. SW 1311, 8260
2. SW 1311, 8270
3. SW 1311, 8081
4. SW 3510C/8082A (W)
5. SW 1311, 8151
6. SW 9040 (W)
7. SW 1311, 6010, 7470
8. SW 9012A
9. SW 9034
10. SW 9056
11. SW 1010
12. SW 3540C/8082A (S)
13. SW 9045 (S)

S=Soil / W=Water

Notes:

Temperature Blank
Lab:

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

Leidos White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

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# Chain of Custody Record

leidos

COC No.: RVAAP-084

Page 1 of 1 Date: 11/14/18

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

Sampler (Signature) Jed Thomas (Printed Name) Jed Thomas

Requested Parameters

| Laboratory No. | Sample ID | Date | Time | Matrix | TCLP VOCs (1)(A) | TCLP SVOCs (2)(A),TCLP Pesticides (3)(A), TCLP Herbicides (5)(A), TCLP Metals (7)(A) | Total PCBs (12)(A) / (4)(A) | Ignitability (11)(A) | pH (13)(A) / (6)(A) | Total Sulfide (9)(A), Total Cyanide (8)(A), Nitrate, Nitrite (10)(A) | Total Cyanide (8)(D) | Total Sulfide (8)(E) | Nitrate and Nitrite (10)(A) | Temperature Blank | NO. OF CONTAINERS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FWGIDW-181002-WW | 11/14/18 | 1555 | W | | | | | | | 1 | | | | 1 |

280-116538 Chain of Custody

Laboratory Name: Test America -Canton
Address: 4101 Shuffel St NW
North Canton, OH 44720
Phone: (330) 497-9396
Fax:
Contact:

10-day TAT

OBSERVATIONS, COMMENTS SPECIAL INSTRUCTIONS

Total Number of Containers: 1

Relinquished by: Jed Thomas — Signature: Jed Thomas — Printed Name: Jed Thomas — Company: Leidos — Date: 11/15/18 — Time: 1345 — to UPS Shipping

Relinquished by — Signature — Printed Name — Company — Date — Time — See above

Notes:
A. Cool, 4C
B. HCl, pH<2, Cool, 4C
C. HNO3, pH<2, Cool, 4C
D. NaOH, pH>12, Cool 4C
E. NaOH/Zn Acetate, pH>9, Cool 4C

1. SW 1311, 8260
2. SW 1311, 8270
3. SW 1311, 8081
4. SW 3510C/8082A (W)
5. SW 1311, 8151
6. SW 9040 (W)
7. SW 1311, 6010, 7470
8. SW 9012A
9. SW 9034
10. SW 9056
11. SW 1010
12. SW 3540C/8082A (S)
13. SW 9045 (S)

S=Soil / W=Water

Notes:

Shipment Method: Courier

**Temperature Blank**
Lab:

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

Leidos

White: Laboratory Pink: Project Manager Yellow: Project QAO Goldenrod: Field Project Manager

Amp re TA DEN 11/16/18 0920
1.6 5 +1.0 by AP 11/16/18

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**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: Rydberg, Donna R | Carrier Tracking No(s): | COC No: 280-461228.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: donna.rydberg@testamericainc.com | State of Origin: Ohio | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Accreditations Required (See note): DoD ELAP - A2LA | | Job #: 280-116538-2 |
| Address: 13715 Rider Trail North, , | Due Date Requested: 11/21/2018 | | | |
| City: Earth City | TAT Requested (days): | | | |
| State, Zip: MO, 63045 | | | | |
| Phone: 314-298-8566(Tel) 314-298-8757(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: Leidos RFP# 001088 - Ravenna AAP-66 | 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, 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) | 1010A | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| FWGIDW-181001-WW (280-116538-4) | 11/2/18 | 15:30 Eastern | | Water | | | X | 1 | Q5.0 |

Note: Since laboratory accreditations are subject to change, TestAmerica Laboratories, Inc. places the ownership of method, analyte & accreditation compliance upon out 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 TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to TestAmerica Laboratories, Inc. attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to TestAmerica Laboratories, Inc.

| 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: |
|---|---|---|---|

| | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| Relinquished by: Jamie Castro | 11-5-18 1545 | TA Den | Received by: Michael Allen | 11/6/18 0900 | TA-STL |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: ∆ Yes ∆ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: |
|---|---|---|

Ver: 09/20/2016

# Login Sample Receipt Checklist

Client: Leidos, Inc.

Job Number: 280-116538-2

**Login Number: 116538**
**List Number: 1**
**Creator: Dunlap, Krista M**

**List Source: TestAmerica 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: 280-116538-2

**Login Number: 116538**
**List Number: 4**
**Creator: Paul, Amanda E**

**List Source: TestAmerica 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 | |
| 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 sample IDs on the containers and the COC. | True | |
| Samples are received within Holding Time. | 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 | |
| If necessary, staff have been informed of any short hold time or quick TAT needs | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |

# Login Sample Receipt Checklist

Client: Leidos, Inc.

Job Number: 280-116538-2

**Login Number: 116538**
**List Number: 2**
**Creator: Hellm, Michael**

**List Source: TestAmerica St. Louis**
**List Creation: 11/06/18 03:12 PM**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | True | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | N/A | |
| 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 | 0.1 |
| 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? | N/A | |
| 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. | N/A | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

ATTACHMENT 2.
Waste Material Profile Sheet
Clean Harbors Profile No. CH1784679

# WASTE MATERIAL PROFILE SHEET

## Clean Harbors Profile No. CH1784679

**A. GENERAL INFORMATION**

GENERATOR EPA ID #/REGISTRATION # *OH5210020736* GENERATOR NAME: *Former Ravenna Army Ammunition Plant*

GENERATOR CODE (Assigned by Clean Harbors) *FO23255* CITY *Ravenna* STATE/PROVINCE *OH* ZIP/POSTAL CODE *44266*

ADDRESS *8451 State Route 5* PHONE: *(614) 336-6136*

CUSTOMER CODE (Assigned by Clean Harbors) *LE18366* CUSTOMER NAME: *Leidos*

ADDRESS *8866 Commons Boulevard* CITY *Twinsburg* STATE/PROVINCE *OH* ZIP/POSTAL CODE *44087*

**B. WASTE DESCRIPTION**

WASTE DESCRIPTION: *Groundwater Sampling - Liquid IDW*

PROCESS GENERATING WASTE: **Environmental Sampling**

IS THIS WASTE CONTAINED IN SMALL PACKAGING CONTAINED WITHIN A LARGER SHIPPING CONTAINER ? **No**

**C. PHYSICAL PROPERTIES (at 25C or 77F)**

**PHYSICAL STATE**
- SOLID WITHOUT FREE LIQUID
- POWDER
- MONOLITHIC SOLID
- [x] LIQUID WITH NO SOLIDS
- LIQUID/SOLID MIXTURE
- % FREE LIQUID
- % SETTLED SOLID
- % TOTAL SUSPENDED SOLID
- SLUDGE
- GAS/AEROSOL

**NUMBER OF PHASES/LAYERS**

[x] 1 2 3

% BY VOLUME (Approx.)

TOP *0.00*

MIDDLE *0.00*

BOTTOM *0.00*

**VISCOSITY (If liquid present)**
- [x] 1 - 100 (e.g. Water)
- 101 - 500 (e.g. Motor Oil)
- 501 - 10,000 (e.g. Molasses)
- > 10,000

**COLOR**

*Cloudy/Brown*

**ODOR**
- [x] NONE
- MILD
- STRONG

Describe:

**BOILING POINT °F (°C)**
- <= 95 (<=35)
- 95 - 100 (35-38)
- 101 - 129 (38-54)
- [x] >= 130 (>54)

**MELTING POINT °F (°C)**
- < 140 (<60)
- 140-200 (60-93)
- > 200 (>93)

**TOTAL ORGANIC CARBON**
- [x] <= 1%
- 1-9%
- >= 10%

**FLASH POINT °F (°C)**
- < 73 (<23)
- 73 - 100 (23-38)
- 101 -140 (38-60)
- 141 -200 (60-93)
- > 200 (>93)

**pH**
- <= 2
- 2.1 - 6.9
- 7 (Neutral)
- [x] 7.1 - 12.4
- >= 12.5

**SPECIFIC GRAVITY**
- < 0.8 (e.g. Gasoline)
- 0.8-1.0 (e.g. Ethanol)
- [x] 1.0 (e.g. Water)
- 1.0-1.2 (e.g. Antifreeze)
- > 1.2 (e.g. Methylene Chloride)

**ASH**
- < 0.1
- 0.1 - 1.0
- 1.1 - 5.0
- 5.1 - 20.0
- > 20
- [x] Unknown

**BTU/LB (MJ/kg)**
- [x] < 2,000 (<4.6)
- 2,000-5,000 (4.6-11.6)
- 5,000-10,000 (11.6-23.2)
- > 10,000 (>23.2)

Actual:

**D. COMPOSITION** (List the complete composition of the waste, include any inert components and/or debris. Ranges for individual components are acceptable. If a trade name is used, please supply an MSDS. Please do not use abbreviations.)

| CHEMICAL | MIN | -- | MAX | UOM |
|---|---|---|---|---|
| DEIONIZED WATER | 0.2500000 | -- | 0.5000000 | % |
| GROUNDWATER | 99.0000000 | -- | 100.0000000 | % |
| ISOPROPYL ALCOHOL | 0.2500000 | -- | 0.5000000 | % |
| NITRIC ACID | 0.2500000 | -- | 0.5000000 | % |
| SOAP | 0.2500000 | -- | 0.5000000 | % |

DOES THIS WASTE CONTAIN ANY HEAVY GAUGE METAL DEBRIS OR OTHER LARGE OBJECTS (EX., METAL PLATE OR PIPING >1/4" THICK OR >12" LONG, METAL REINFORCED HOSE >12" LONG, METAL WIRE >12" LONG, METAL VALVES, PIPE FITTINGS, CONCRETE REINFORCING BAR OR PIECES OF CONCRETE >3")? YES NO

If yes, describe, including dimensions:

DOES THIS WASTE CONTAIN ANY METALS IN POWDERED OR OTHER FINELY DIVIDED FORM? YES [x] NO

DOES THIS WASTE CONTAIN OR HAS IT CONTACTED ANY OF THE FOLLOWING; ANIMAL WASTES, HUMAN BLOOD, BLOOD PRODUCTS, BODY FLUIDS, MICROBIOLOGICAL WASTE, PATHOLOGICAL WASTE, HUMAN OR ANIMAL DERIVED SERUMS OR PROTEINS OR ANY OTHER POTENTIALLY INFECTIOUS MATERIAL? YES [x] NO

I acknowledge that this waste material is neither infectious nor does it contain any organism known to be a threat to human health. This certification is based on my knowledge of the material. Select the answer below that applies:

The waste was never exposed to potentially infectious material. YES NO

Chemical disinfection or some other form of sterilization has been applied to the waste. YES NO

I ACKNOWLEDGE THAT THIS PROFILE MEETS THE CLEAN HARBORS BATTERY PACKAGING REQUIREMENTS. YES NO

I ACKNOWLEDGE THAT MY FRIABLE ASBESTOS WASTE IS DOUBLE BAGGED AND WETTED. YES NO

SPECIFY THE SOURCE CODE ASSOCIATED WITH THE WASTE. *G09*

SPECIFY THE FORM CODE ASSOCIATED WITH THE WASTE. *W113*

**E. CONSTITUENTS**

Are these values based on testing or knowledge? Knowledge ☑ Testing

If constituent concentrations are based on analytical testing, analysis must be provided. Please attach document(s) using the link on the Submit tab.

**Please indicate which constituents below apply. Concentrations must be entered when applicable to assist in accurate review and expedited approval of your waste profile. Please note that the total regulated metals and other constituents sections require answers.**

| RCRA | REGULATED METALS | REGULATORY LEVEL (mg/l) | TCLP mg/l | TOTAL | UOM | NOT APPLICABLE |
|---|---|---|---|---|---|---|
| D004 | ARSENIC | 5.0 | *0.0000* | | | |
| D005 | BARIUM | 100.0 | *0.0150* | | | |
| D006 | CADMIUM | 1.0 | *0.0000* | | | |
| D007 | CHROMIUM | 5.0 | *0.0000* | | | |
| D008 | LEAD | 5.0 | *0.0000* | | | |
| D009 | MERCURY | 0.2 | *0.0000* | | | |
| D010 | SELENIUM | 1.0 | *0.0000* | | | |
| D011 | SILVER | 5.0 | *0.0000* | | | |
| | **VOLATILE COMPOUNDS** | | | | | |
| D018 | BENZENE | 0.5 | *0* | | | |
| D019 | CARBON TETRACHLORIDE | 0.5 | *0* | | | |
| D021 | CHLOROBENZENE | 100.0 | *0* | | | |
| D022 | CHLOROFORM | 6.0 | *0* | | | |
| D028 | 1,2-DICHLOROETHANE | 0.5 | *0* | | | |
| D029 | 1,1-DICHLOROETHYLENE | 0.7 | *0* | | | |
| D035 | METHYL ETHYL KETONE | 200.0 | *0* | | | |
| D039 | TETRACHLOROETHYLENE | 0.7 | *0* | | | |
| D040 | TRICHLOROETHYLENE | 0.5 | *0* | | | |
| D043 | VINYL CHLORIDE | 0.2 | *0* | | | |
| | **SEMI-VOLATILE COMPOUNDS** | | | | | |
| D023 | o-CRESOL | 200.0 | *0* | | | |
| D024 | m-CRESOL | 200.0 | *0* | | | |
| D025 | p-CRESOL | 200.0 | *0* | | | |
| D026 | CRESOL (TOTAL) | 200.0 | *0* | | | |
| D027 | 1,4-DICHLOROBENZENE | 7.5 | *0* | | | |
| D030 | 2,4-DINITROTOLUENE | 0.13 | *0* | | | |
| D032 | HEXACHLOROBENZENE | 0.13 | *0* | | | |
| D033 | HEXACHLOROBUTADIENE | 0.5 | *0* | | | |
| D034 | HEXACHLOROETHANE | 3.0 | *0* | | | |
| D036 | NITROBENZENE | 2.0 | *0* | | | |
| D037 | PENTACHLOROPHENOL | 100.0 | *0* | | | |
| D038 | PYRIDINE | 5.0 | *0* | | | |
| D041 | 2,4,5-TRICHLOROPHENOL | 400.0 | *0* | | | |
| D042 | 2,4,6-TRICHLOROPHENOL | 2.0 | *0* | | | |
| | **PESTICIDES AND HERBICIDES** | | | | | |
| D012 | ENDRIN | 0.02 | *0* | | | |
| D013 | LINDANE | 0.4 | *0* | | | |
| D014 | METHOXYCHLOR | 10.0 | *0* | | | |
| D015 | TOXAPHENE | 0.5 | *0* | | | |
| D016 | 2,4-D | 10.0 | *0* | | | |
| D017 | 2,4,5-TP (SILVEX) | 1.0 | *0* | | | |
| D020 | CHLORDANE | 0.03 | *0* | | | |
| D031 | HEPTACHLOR (AND ITS EPOXIDE) | 0.008 | *0* | | | |

| OTHER CONSTITUENTS | MAX | UOM | NOT APPLICABLE |
|---|---|---|---|
| BROMINE | | | ☑ |
| CHLORINE | | | ☑ |
| FLUORINE | | | ☑ |
| IODINE | | | ☑ |
| SULFUR | | | ☑ |
| POTASSIUM | | | ☑ |
| SODIUM | | | ☑ |
| AMMONIA | | | ☑ |
| CYANIDE AMENABLE | | | ☑ |
| CYANIDE REACTIVE | | | ☑ |
| CYANIDE TOTAL | *0.2700* | *PPM* | |
| SULFIDE REACTIVE | | | ☑ |

**HOCs**

☑ NONE
< 1000 PPM
>= 1000 PPM

**PCBs**

☑ NONE
< 50 PPM
>=50 PPM

IF PCBS ARE PRESENT, IS THE WASTE REGULATED BY TSCA 40 CFR 761?

YES ☑ NO

**ADDITIONAL HAZARDS**

DOES THIS WASTE HAVE ANY UNDISCLOSED HAZARDS OR PRIOR INCIDENTS ASSOCIATED WITH IT, WHICH COULD AFFECT THE WAY IT SHOULD BE HANDLED?

YES ☑ NO (If yes, explain)

**CHOOSE ALL THAT APPLY**

| | | | |
|---|---|---|---|
| DEA REGULATED SUBSTANCES | EXPLOSIVE | FUMING | OSHA REGULATED CARCINOGENS |
| POLYMERIZABLE | RADIOACTIVE | REACTIVE MATERIAL | ☑ NONE OF THE ABOVE |

**F. REGULATORY STATUS**

YES ☑ NO USEPA HAZARDOUS WASTE?

YES ☑ NO DO ANY STATE WASTE CODES APPLY?

Texas Waste Code

YES ☑ NO DO ANY CANADIAN PROVINCIAL WASTE CODES APPLY?

YES ☑ NO IS THIS WASTE PROHIBITED FROM LAND DISPOSAL WITHOUT FURTHER TREATMENT PER 40 CFR PART 268?

LDR CATEGORY: ***Not subject to LDR***
VARIANCE INFO:

YES ☑ NO IS THIS A UNIVERSAL WASTE?

YES ☑ NO IS THE GENERATOR OF THE WASTE CLASSIFIED AS VERY SMALL QUANTITY GENERATOR (VSQG) OR A STATE EQUIVALENT DESIGNATION?

YES NO IS THIS MATERIAL GOING TO BE MANAGED AS A RCRA EXEMPT COMMERCIAL PRODUCT, WHICH IS FUEL (40 CFR 261.2 (C)(2)(II))?

YES ☑ NO DOES TREATMENT OF THIS WASTE GENERATE A F006 OR F019 SLUDGE?

YES NO IS THIS WASTE STREAM SUBJECT TO THE INORGANIC METAL BEARING WASTE PROHIBITION FOUND AT 40 CFR 268.3(C)?

YES ☑ NO DOES THIS WASTE CONTAIN VOC'S IN CONCENTRATIONS >=500 PPM?

YES NO DOES THE WASTE CONTAIN GREATER THAN 20% OF ORGANIC CONSTITUENTS WITH A VAPOR PRESSURE >= .3KPA (.044 PSIA)?

YES ☑ NO DOES THIS WASTE CONTAIN AN ORGANIC CONSTITUENT WHICH IN ITS PURE FORM HAS A VAPOR PRESSURE > 77 KPA (11.2 PSIA)?

☑ YES NO IS THIS CERCLA REGULATED (SUPERFUND ) WASTE ?

YES ☑ NO IS THE WASTE SUBJECT TO ONE OF THE FOLLOWING NESHAP RULES?

Hazardous Organic NESHAP (HON) rule (subpart G) Pharmaceuticals production (subpart GGG)

YES NO IF THIS IS A US EPA HAZARDOUS WASTE, DOES THIS WASTE STREAM CONTAIN BENZENE?

YES NO Does the waste stream come from a facility with one of the SIC codes listed under benzene NESHAP or is this waste regulated under the benzene NESHAP rules because the original source of the waste is from a chemical manufacturing, coke by-product recovery, or petroleum refinery process?

YES NO Is the generating source of this waste stream a facility with Total Annual Benzene (TAB) >10 Mg/year?

What is the TAB quantity for your facility? Megagram/year (1 Mg = 2,200 lbs)

The basis for this determination is: Knowledge of the Waste Or Test Data Knowledge Testing

Describe the knowledge :

**G. DOT/TDG INFORMATION**

DOT/TDG PROPER SHIPPING NAME:

**NON DOT REGULATED MATERIAL, LIQUID IDW**

**H. TRANSPORTATION REQUIREMENTS**

ESTIMATED SHIPMENT FREQUENCY ☑ ONE TIME WEEKLY MONTHLY QUARTERLY YEARLY OTHER

☑ **CONTAINERIZED**

***11-15*** CONTAINERS/SHIPMENT

STORAGE CAPACITY:
CONTAINER TYPE:

PORTABLE TOTE TANK BOX|CARTON|CASE
CUBIC YARD BOX ☑ DRUM
OTHER: DRUM SIZE:

**BULK LIQUID**

GALLONS/SHIPMENT: ***0 Min -0 Max*** GAL.

**BULK SOLID**

SHIPMENT UOM: TON YARD

TONS/YARDS/SHIPMENT: ***0 Min - 0 Max***

**I. SPECIAL REQUEST**

COMMENTS OR REQUESTS:

**GENERATOR'S CERTIFICATION**

I certify that I am authorized to execute this document as an authorized agent. I hereby certify that all information submitted in this and attached documents is correct to the best of my knowledge.I also certify that any samples submitted are representative of the actual waste.If Clean Harbors discovers a discrepancy during the approval process, Generator grants Clean Harbors the authority to amend the profile, as Clean Harbors deems necessary, to reflect the discrepancy.

| AUTHORIZED SIGNATURE | NAME (PRINT) | TITLE | DATE |
|---|---|---|---|
| Kathryn S Tait | Kathryn S. Tait | Envntl Specialist 2 | 28 January 2019 |

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# E.2 Straight Bill of Lading

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Site Address : 8451 State Route 5
Ravenna,OH 44266

SC PPW 3/12/2019

WORK ORDER NO. DS1902838047

DOCUMENT NO. 682328

**STRAIGHT BILL OF LADING**

TRANSPORTER 1 Clean Harbors Environmental Services, Inc. VEHICLE ID # 5701

EPA ID # MAD039322250 TRANS. 1 PHONE (781) 792-5000

TRANSPORTER 2 _____ VEHICLE ID # _____

EPA ID # _____ TRANS. 2 PHONE _____

| DESIGNATED FACILITY | | | SHIPPER | | |
|---|---|---|---|---|---|
| Spring Grove Resource Recovery Inc. | | | ATTN:Katie Tait<br>Former Ravenna Army Ammunition Plant | | |
| FACILITY EPA ID # | | | SHIPPER EPA ID # | | |
| OHD000816629 | | | OH5210020736 | | |
| ADDRESS | | | ADDRESS | | |
| 4879 Spring Grove Avenue | | | 1438 State Route 534 SW | | |
| CITY | STATE | ZIP | CITY | STATE | ZIP |
| Cincinnati | OH | 45232 | Newton Falls | OH | 44444 |

| CONTAINERS NO. & SIZE | TYPE | HM | DESCRIPTION OF MATERIALS | TOTAL QUANTITY | UNIT WT/VOL |
|---|---|---|---|---|---|
| 4X55 | DM | | A NON DOT REGULATED MATERIAL, LIQUID IDW | 1765 | P |
| | | | B. | | |
| | | | C. | | |
| | | | D. | | |
| | | | E. | | |
| | | | F. | | |
| | | | G. | | |
| | | | H. | | |

SPECIAL HANDLING INSTRUCTIONS A.CH1784679 EMERGENCY PHONE #: (800) 483-3718 GENERATOR: Former Ravenna Army Ammunition Plant

SHIPPERS CERTIFICATION: This is to certify that the above named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

| | PRINT | SIGN | DATE |
|---|---|---|---|
| SHIPPER | Kathryn S Tait | Kathryn S Tait | 6/13/2019 |
| TRANSPORTER 1 | ALEX VASU | VAS | 06/13/19 |
| TRANSPORTER 2 | | | |
| RECEIVED BY | Brandy Prowitt | [signature] | 06/20/19 |

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# APPENDIX F

## Laboratory Analytical Results and Screening

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# F.1 Spring 2019 Analytical Results

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**Appendix F.1 Spring 2019 Analytical Results**

| Station | | CBPmw-008 | CBPmw-009 | DA2mw-115 | DA2mw-115 | DET-3 | DET-3 | DET-4 | EBGmw-125 | EBGmw-131 | FBQmw-171 | FBQmw-172 | FBQmw-172 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | CBPmw-008-190401-GW | CBPmw-009-190401-GW | DA2mw-115-190402-GW | DA2mw-115-190401-GW | DET-003-190402-GW | DET-003-190401-GW | DET-004-190401-GW | EBGmw-125-190401-GW | EBGmw-131-190401-GW | FBQmw-171-190401-GW | FBQmw-172-190402-GW | FBQmw-172-190401-GW |
| Date | | 05/08/19 | 05/09/19 | 04/29/19 | 04/29/19 | 04/29/19 | 04/29/19 | 04/29/19 | 05/07/19 | 05/07/19 | 04/30/19 | 04/30/19 | 04/30/19 |
| Sample Type | | GR | GR | FD | GR | FD | GR | GR | GR | GR | GR | FD | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Unconsolidated | Upper Sharon | Upper Sharon | Upper Sharon | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon | Homewood | Homewood | Homewood |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Metals | | | | | | | | | | | | | |
| Aluminum | 7429-90-5 | NA | NA | <0.07 U | 0.021 J | <0.07 U | <0.07 U | <0.07 U | NA | NA | NA | NA | NA |
| Antimony | 7440-36-0 | NA | NA | <0.001 U | <0.001 U | <0.001 U | <0.001 U | <0.001 U | NA | NA | NA | NA | NA |
| Arsenic | 7440-38-2 | NA | NA | <0.001 U | 0.0017 J | 0.0093 | 0.0092 | <0.001 U | NA | NA | NA | NA | NA |
| Barium | 7440-39-3 | NA | NA | <0.00095 U | 0.023 | 0.042 | 0.043 | 0.058 | NA | NA | NA | NA | NA |
| Beryllium | 7440-41-7 | NA | NA | 0.00018 J | <0.0003 U | <0.0003 U | <0.0003 U | <0.0003 U | NA | NA | NA | NA | NA |
| Cadmium | 7440-43-9 | NA | NA | <0.001 U | <0.001 U | <0.001 U | <0.001 U | <0.001 U | NA | NA | NA | NA | NA |
| Calcium | 7440-70-2 | NA | NA | 100 | 100 | 91 | 90 | 120 | NA | NA | NA | NA | NA |
| Chromium | 7440-47-3 | NA | NA | <0.0018 U | <0.0018 U | <0.0018 U | <0.0018 U | 0.00055 J | NA | NA | NA | NA | NA |
| Cobalt | 7440-48-4 | NA | NA | <0.0002 U | <0.0002 U | 0.00024 J | 0.00029 J | <0.0002 U | NA | NA | NA | NA | NA |
| Copper | 7440-50-8 | NA | NA | <0.0018 U | <0.0018 U | <0.0018 U | <0.0018 U | 0.0015 J | NA | NA | NA | NA | NA |
| Iron | 7439-89-6 | NA | NA | 0.82 | 0.84 | 1.9 | 1.9 | <0.085 U | NA | NA | NA | NA | NA |
| Lead | 7439-92-1 | NA | NA | <0.0007 U | <0.0007 U | <0.0007 U | <0.0007 U | <0.0007 U | NA | NA | NA | NA | NA |
| Magnesium | 7439-95-4 | NA | NA | 28 | 28 | 33 | 33 | 24 | NA | NA | NA | NA | NA |
| Manganese | 7439-96-5 | NA | NA | <0.00095 U | 0.099 | 0.24 | 0.24 | 0.00063 J | NA | NA | NA | NA | NA |
| Mercury | 7439-97-6 | NA | NA | <0.00008 U | <0.00008 UJ | <0.00008 U | <0.00008 U | <0.00008 U | NA | NA | NA | NA | NA |
| Nickel | 7440-02-0 | NA | NA | <0.001 U | <0.001 U | <0.001 U | <0.001 U | <0.001 U | NA | NA | NA | NA | NA |
| Potassium | 7440-09-7 | NA | NA | 3.4 | 3.3 | 1.9 J | 1.9 J | 1.2 J | NA | NA | NA | NA | NA |
| Selenium | 7782-49-2 | NA | NA | <0.001 U | <0.001 U | <0.001 U | <0.001 U | <0.001 U | NA | NA | NA | NA | NA |
| Silver | 7440-22-4 | NA | NA | <0.0001 U | <0.0001 U | <0.0001 U | <0.0001 U | <0.0001 U | NA | NA | NA | NA | NA |
| Sodium | 7440-23-5 | NA | NA | 12 | 12 | 12 | 12 | 2.2 J | NA | NA | NA | NA | NA |
| Thallium | 7440-28-0 | NA | NA | <0.0002 U | <0.0002 U | <0.0002 U | <0.0002 U | <0.0002 U | NA | NA | NA | NA | NA |
| Vanadium | 7440-62-2 | NA | NA | <0.003 U | <0.003 U | <0.003 U | <0.003 U | <0.003 U | NA | NA | NA | NA | NA |
| Zinc | 7440-66-6 | NA | NA | <0.008 U | <0.008 U | <0.008 U | <0.008 U | 0.014 J | NA | NA | NA | NA | NA |
| Anions | | | | | | | | | | | | | |
| Nitrate | 14797-55-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.33 J | NA | NA |
| Nitrite | 14797-65-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.1 UJ | NA | NA |
| Sulfate | 14808-79-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | 24 | NA | NA |
| Sulfide | 18496-25-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | <1.9 U | NA | NA |
| Miscellaneous | | | | | | | | | | | | | |
| Alkalinity | N33 | NA | NA | NA | NA | NA | NA | NA | NA | NA | 41 | NA | NA |
| Chromium, hexavalent | 18540-29-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cyanide | 57-12-5 | <0.01 U | <0.01 U | NA | NA | <0.01 U | <0.01 U | <0.01 U | 0.011 | <0.01 U | <0.01 U | <0.01 U | <0.01 U |
| Perchlorate | 14797-73-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Total Phosphorus as P | 7723-14-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Explosives/Propellants | | | | | | | | | | | | | |
| 1,3,5-Trinitrobenzene | 99-35-4 | NA | NA | NA | NA | <0.00044 U | <0.00045 U | <0.00041 U | NA | NA | NA | NA | NA |
| 1,3-Dinitrobenzene | 99-65-0 | NA | NA | NA | NA | <0.00022 U | <0.00022 U | <0.00021 U | NA | NA | NA | NA | NA |
| 2,4,6-Trinitrotoluene | 118-96-7 | NA | NA | NA | NA | <0.00044 U | <0.00045 U | <0.00041 U | NA | NA | NA | NA | NA |
| 2,4-Dinitrotoluene | 121-14-2 | NA | NA | NA | NA | <0.00022 U | <0.00022 U | <0.00021 U | NA | NA | NA | NA | NA |
| 2,6-Dinitrotoluene | 606-20-2 | NA | NA | NA | NA | <0.00022 U | <0.00022 U | <0.00021 U | NA | NA | NA | NA | NA |
| 2-Amino-4,6-Dinitrotoluene | 35572-78-2 | NA | NA | NA | NA | <0.00013 U | <0.00013 U | <0.00012 U | NA | NA | NA | NA | NA |
| 2-Nitrotoluene | 88-72-2 | NA | NA | NA | NA | <0.00022 UJ | <0.00022 UJ | <0.00021 UJ | NA | NA | NA | NA | NA |
| 3-Nitrotoluene | 99-08-1 | NA | NA | NA | NA | <0.00044 U | <0.00045 UJ | <0.00041 U | NA | NA | NA | NA | NA |
| 4-Amino-2,6-Dinitrotoluene | 19406-51-0 | NA | NA | NA | NA | <0.00013 U | <0.00013 U | <0.00012 U | NA | NA | NA | NA | NA |
| 4-Nitrotoluene | 99-99-0 | NA | NA | NA | NA | <0.00044 U | <0.00045 U | <0.00041 U | NA | NA | NA | NA | NA |

| Station | | CBPmw-008 | CBPmw-009 | DA2mw-115 | DA2mw-115 | DET-3 | DET-3 | DET-4 | EBGmw-125 | EBGmw-131 | FBQmw-171 | FBQmw-172 | FBQmw-172 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | CBPmw-008-190401-GW | CBPmw-009-190401-GW | DA2mw-115-190402-GW | DA2mw-115-190401-GW | DET-003-190402-GW | DET-003-190401-GW | DET-004-190401-GW | EBGmw-125-190401-GW | EBGmw-131-190401-GW | FBQmw-171-190401-GW | FBQmw-172-190402-GW | FBQmw-172-190401-GW |
| Date | | 05/08/19 | 05/09/19 | 04/29/19 | 04/29/19 | 04/29/19 | 04/29/19 | 04/29/19 | 05/07/19 | 05/07/19 | 04/30/19 | 04/30/19 | 04/30/19 |
| Sample Type | | GR | GR | FD | GR | FD | GR | GR | GR | GR | GR | FD | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Unconsolidated | Upper Sharon | Upper Sharon | Upper Sharon | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon | Homewood | Homewood | Homewood |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| HMX | 2691-41-0 | NA | NA | NA | NA | <0.00022 U | <0.00022 U | 0.0016 | NA | NA | NA | NA | NA |
| Nitrobenzene | 98-95-3 | NA | NA | NA | NA | <0.00022 U | <0.00022 U | <0.00021 U | NA | NA | NA | NA | NA |
| Nitrocellulose | 9004-70-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Nitroglycerin | 55-63-0 | NA | NA | NA | NA | <0.0022 U | <0.0022 U | <0.0021 U | NA | NA | NA | NA | NA |
| Nitroguanidine | 556-88-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PETN | 78-11-5 | NA | NA | NA | NA | <0.0044 U | <0.0045 U | <0.0041 U | NA | NA | NA | NA | NA |
| RDX | 121-82-4 | NA | NA | NA | NA | <0.00044 U | <0.00045 U | 0.0014 | NA | NA | NA | NA | NA |
| Tetryl | 479-45-8 | NA | NA | NA | NA | <0.00022 U | <0.00022 U | <0.00021 U | NA | NA | NA | NA | NA |
| SVOCs | | | | | | | | | | | | | |
| 1,2,4-Trichlorobenzene | 120-82-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,2-Dichlorobenzene | 95-50-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,3-Dichlorobenzene | 541-73-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,4-Dichlorobenzene | 106-46-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,4-Dioxane | 123-91-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1-Methylnaphthalene | 90-12-0 | NA | NA | NA | NA | NA | <0.00004 U | <0.00004 U | NA | NA | NA | NA | NA |
| 2,4,5-Trichlorophenol | 95-95-4 | NA | NA | NA | NA | NA | <0.0044 U | <0.0044 U | NA | NA | NA | NA | NA |
| 2,4,6-Trichlorophenol | 88-06-2 | NA | NA | NA | NA | NA | <0.001 U | <0.00099 U | NA | NA | NA | NA | NA |
| 2,4-Dichlorophenol | 120-83-2 | NA | NA | NA | NA | NA | <0.002 U | <0.002 U | NA | NA | NA | NA | NA |
| 2,4-Dimethylphenol | 105-67-9 | NA | NA | NA | NA | NA | <0.002 U | <0.002 U | NA | NA | NA | NA | NA |
| 2,4-Dinitrophenol | 51-28-5 | NA | NA | NA | NA | NA | <0.03 U | <0.03 U | NA | NA | NA | NA | NA |
| 2,4-Dinitrotoluene | 121-14-2 | NA | NA | NA | NA | NA | <0.0044 U | <0.0044 U | NA | NA | NA | NA | NA |
| 2,6-Dinitrotoluene | 606-20-2 | NA | NA | NA | NA | NA | <0.0044 U | <0.0044 U | NA | NA | NA | NA | NA |
| 2-Chloronaphthalene | 91-58-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Chlorophenol | 95-57-8 | NA | NA | NA | NA | NA | <0.0044 U | <0.0044 U | NA | NA | NA | NA | NA |
| 2-Methyl-4,6-dinitrophenol | 534-52-1 | NA | NA | NA | NA | NA | <0.0089 U | <0.0087 U | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | 91-57-6 | NA | NA | NA | NA | NA | <0.00006 U | <0.00005 U | NA | NA | NA | NA | NA |
| 2-Methylphenol | 95-48-7 | NA | NA | NA | NA | NA | <0.002 U | <0.002 U | NA | NA | NA | NA | NA |
| 2-Nitrobenzenamine | 88-74-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Nitrophenol | 88-75-5 | NA | NA | NA | NA | NA | <0.001 U | <0.00099 U | NA | NA | NA | NA | NA |
| 3,3'-Dichlorobenzidine | 91-94-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 3-Nitrobenzenamine | 99-09-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Bromophenyl phenyl ether | 101-55-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Chloro-3-methylphenol | 59-50-7 | NA | NA | NA | NA | NA | <0.0051 U | <0.0049 U | NA | NA | NA | NA | NA |
| 4-Chlorobenzenamine | 106-47-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Chlorophenyl phenyl ether | 7005-72-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Nitrobenzenamine | 100-01-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Nitrophenol | 100-02-7 | NA | NA | NA | NA | NA | <0.004 U | <0.004 U | NA | NA | NA | NA | NA |
| Acenaphthene | 83-32-9 | NA | NA | NA | NA | NA | <0.00004 U | <0.00004 U | NA | NA | NA | NA | NA |
| Acenaphthylene | 208-96-8 | NA | NA | NA | NA | NA | <0.00004 U | <0.00004 U | NA | NA | NA | NA | NA |
| Anthracene | 120-12-7 | NA | NA | NA | NA | NA | <0.00011 U | <0.00011 U | NA | NA | NA | NA | NA |
| Benz(a)anthracene | 56-55-3 | NA | NA | NA | NA | NA | <0.00011 U | <0.00011 U | NA | NA | NA | NA | NA |
| Benzenemethanol | 100-51-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 50-32-8 | NA | NA | NA | NA | NA | <0.00006 U | <0.00005 U | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 205-99-2 | NA | NA | NA | NA | NA | <0.00011 U | <0.00011 U | NA | NA | NA | NA | NA |
| Benzo(ghi)perylene | 191-24-2 | NA | NA | NA | NA | NA | <0.00011 U | <0.00011 U | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | 207-08-9 | NA | NA | NA | NA | NA | <0.00006 U | <0.00005 U | NA | NA | NA | NA | NA |

| Station | | CBPmw-008 | CBPmw-009 | DA2mw-115 | DA2mw-115 | DET-3 | DET-3 | DET-4 | EBGmw-125 | EBGmw-131 | FBQmw-171 | FBQmw-172 | FBQmw-172 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | CBPmw-008-190401-GW | CBPmw-009-190401-GW | DA2mw-115-190402-GW | DA2mw-115-190401-GW | DET-003-190402-GW | DET-003-190401-GW | DET-004-190401-GW | EBGmw-125-190401-GW | EBGmw-131-190401-GW | FBQmw-171-190401-GW | FBQmw-172-190402-GW | FBQmw-172-190401-GW |
| Date | | 05/08/19 | 05/09/19 | 04/29/19 | 04/29/19 | 04/29/19 | 04/29/19 | 04/29/19 | 05/07/19 | 05/07/19 | 04/30/19 | 04/30/19 | 04/30/19 |
| Sample Type | | GR | GR | FD | GR | FD | GR | GR | GR | GR | GR | FD | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Unconsolidated | Upper Sharon | Upper Sharon | Upper Sharon | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon | Homewood | Homewood | Homewood |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Benzoic acid | 65-85-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-chloroethoxy)methane | 111-91-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-chloroethyl) ether | 111-44-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-chloroisopropyl) ether | 108-60-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | NA | NA | NA | NA | NA | <0.002 U | <0.002 U | NA | NA | NA | NA | NA |
| Butyl benzyl phthalate | 85-68-7 | NA | NA | NA | NA | NA | <0.002 U | <0.002 U | NA | NA | NA | NA | NA |
| Carbazole | 86-74-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | 218-01-9 | NA | NA | NA | NA | NA | <0.00011 U | <0.00011 U | NA | NA | NA | NA | NA |
| Di-n-butyl phthalate | 84-74-2 | NA | NA | NA | NA | NA | <0.0044 U | <0.0044 U | NA | NA | NA | NA | NA |
| Di-n-octylphthalate | 117-84-0 | NA | NA | NA | NA | NA | <0.001 U | <0.00099 U | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | 53-70-3 | NA | NA | NA | NA | NA | <0.00011 U | <0.00011 U | NA | NA | NA | NA | NA |
| Dibenzofuran | 132-64-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Diethyl phthalate | 84-66-2 | NA | NA | NA | NA | NA | <0.001 U | <0.00099 U | NA | NA | NA | NA | NA |
| Dimethyl phthalate | 131-11-3 | NA | NA | NA | NA | NA | <0.00051 U | <0.00049 U | NA | NA | NA | NA | NA |
| Fluoranthene | 206-44-0 | NA | NA | NA | NA | NA | <0.00011 U | <0.00011 U | NA | NA | NA | NA | NA |
| Fluorene | 86-73-7 | NA | NA | NA | NA | NA | <0.00004 U | <0.00004 U | NA | NA | NA | NA | NA |
| Hexachlorobenzene | 118-74-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorobutadiene | 87-68-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorocyclopentadiene | 77-47-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachloroethane | 67-72-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | NA | NA | NA | NA | NA | <0.00011 U | <0.00011 U | NA | NA | NA | NA | NA |
| Isophorone | 78-59-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N-Nitroso-di-n-propylamine | 621-64-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N-Nitrosodiphenylamine | 86-30-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 91-20-3 | NA | NA | NA | NA | NA | <0.00006 U | <0.00005 U | NA | NA | NA | NA | NA |
| Nitrobenzene | 98-95-3 | NA | NA | NA | NA | NA | <0.002 U | <0.002 U | NA | NA | NA | NA | NA |
| Pentachlorophenol | 87-86-5 | NA | NA | NA | NA | NA | <0.061 U | <0.059 U | NA | NA | NA | NA | NA |
| Phenanthrene | 85-01-8 | NA | NA | NA | NA | NA | <0.00011 U | <0.00011 U | NA | NA | NA | NA | NA |
| Phenol | 108-95-2 | NA | NA | NA | NA | NA | <0.0044 U | <0.0044 U | NA | NA | NA | NA | NA |
| Pyrene | 129-00-0 | NA | NA | NA | NA | NA | <0.00011 U | <0.00011 U | NA | NA | NA | NA | NA |
| Total Cresols | 1319-77-3 | NA | NA | NA | NA | NA | <0.00051 U | <0.00049 U | NA | NA | NA | NA | NA |
| PCBs | | | | | | | | | | | | | |
| PCB-1016 | 12674-11-2 | NA | NA | NA | NA | <0.00044 U | <0.00043 U | <0.0004 U | NA | NA | NA | NA | NA |
| PCB-1221 | 11104-28-2 | NA | NA | NA | NA | <0.00028 U | <0.00027 U | <0.00025 U | NA | NA | NA | NA | NA |
| PCB-1232 | 11141-16-5 | NA | NA | NA | NA | <0.00067 U | <0.00065 U | <0.0006 U | NA | NA | NA | NA | NA |
| PCB-1242 | 53469-21-9 | NA | NA | NA | NA | <0.0011 U | <0.0011 U | <0.001 U | NA | NA | NA | NA | NA |
| PCB-1248 | 12672-29-6 | NA | NA | NA | NA | <0.00033 U | <0.00032 U | <0.0003 U | NA | NA | NA | NA | NA |
| PCB-1254 | 11097-69-1 | NA | NA | NA | NA | <0.00028 U | <0.00027 U | <0.00025 U | NA | NA | NA | NA | NA |
| PCB-1260 | 11096-82-5 | NA | NA | NA | NA | <0.00044 U | <0.00043 U | <0.0004 U | NA | NA | NA | NA | NA |
| Pesticides | | | | | | | | | | | | | |
| 4,4'-DDD | 72-54-8 | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA | NA | NA | NA | NA |
| 4,4'-DDE | 72-55-9 | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA | NA | NA | NA | NA |
| 4,4'-DDT | 50-29-3 | NA | NA | NA | NA | <0.00006 U | <0.00005 U | <0.00005 U | NA | NA | NA | NA | NA |
| Aldrin | 309-00-2 | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA | NA | NA | NA | NA |
| Dieldrin | 60-57-1 | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA | NA | NA | NA | NA |
| Endosulfan I | 959-98-8 | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA | NA | NA | NA | NA |

| Station | | CBPmw-008 | CBPmw-009 | DA2mw-115 | DA2mw-115 | DET-3 | DET-3 | DET-4 | EBGmw-125 | EBGmw-131 | FBQmw-171 | FBQmw-172 | FBQmw-172 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | CBPmw-008-190401-GW | CBPmw-009-190401-GW | DA2mw-115-190402-GW | DA2mw-115-190401-GW | DET-003-190402-GW | DET-003-190401-GW | DET-004-190401-GW | EBGmw-125-190401-GW | EBGmw-131-190401-GW | FBQmw-171-190401-GW | FBQmw-172-190402-GW | FBQmw-172-190401-GW |
| Date | | 05/08/19 | 05/09/19 | 04/29/19 | 04/29/19 | 04/29/19 | 04/29/19 | 04/29/19 | 05/07/19 | 05/07/19 | 04/30/19 | 04/30/19 | 04/30/19 |
| Sample Type | | GR | GR | FD | GR | FD | GR | GR | GR | GR | GR | FD | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Unconsolidated | Upper Sharon | Upper Sharon | Upper Sharon | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon | Homewood | Homewood | Homewood |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Endosulfan II | 33213-65-9 | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA | NA | NA | NA | NA |
| Endosulfan sulfate | 1031-07-8 | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA | NA | NA | NA | NA |
| Endrin | 72-20-8 | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA | NA | NA | NA | NA |
| Endrin aldehyde | 7421-93-4 | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA | NA | NA | NA | NA |
| Endrin ketone | 53494-70-5 | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA | NA | NA | NA | NA |
| Heptachlor | 76-44-8 | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA | NA | NA | NA | NA |
| Heptachlor epoxide | 1024-57-3 | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA | NA | NA | NA | NA |
| Lindane | 58-89-9 | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA | NA | NA | NA | NA |
| Methoxychlor | 72-43-5 | NA | NA | NA | NA | <0.00006 U | <0.00005 U | <0.00005 U | NA | NA | NA | NA | NA |
| Toxaphene | 8001-35-2 | NA | NA | NA | NA | <0.00089 U | <0.00086 U | <0.0008 U | NA | NA | NA | NA | NA |
| alpha-BHC | 319-84-6 | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA | NA | NA | NA | NA |
| alpha-Chlordane | 5103-71-9 | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA | NA | NA | NA | NA |
| beta-BHC | 319-85-7 | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA | NA | NA | NA | NA |
| delta-BHC | 319-86-8 | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA | NA | NA | NA | NA |
| gamma-Chlordane | 5103-74-2 | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA | NA | NA | NA | NA |
| VOCs | | | | | | | | | | | | | |
| 1,1,1-Trichloroethane | 71-55-6 | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA | NA | NA | NA | NA |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | NA | NA | NA | NA | <0.0008 U | <0.0008 U | <0.0008 U | NA | NA | NA | NA | NA |
| 1,1,2-Trichloroethane | 79-00-5 | NA | NA | NA | NA | <0.0008 U | <0.0008 U | <0.0008 U | NA | NA | NA | NA | NA |
| 1,1-Dichloroethane | 75-34-3 | NA | NA | NA | NA | <0.0008 U | <0.0008 U | <0.0008 U | NA | NA | NA | NA | NA |
| 1,1-Dichloroethene | 75-35-4 | NA | NA | NA | NA | <0.0008 U | <0.0008 U | <0.0008 U | NA | NA | NA | NA | NA |
| 1,2-Dibromoethane | 106-93-4 | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA | NA | NA | NA | NA |
| 1,2-Dichloroethane | 107-06-2 | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA | NA | NA | NA | NA |
| 1,2-Dichloroethene | 540-59-0 | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA | NA | NA | NA | NA |
| 1,2-Dichloropropane | 78-87-5 | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA | NA | NA | NA | NA |
| 2-Butanone | 78-93-3 | NA | NA | NA | NA | <0.004 U | <0.004 U | <0.004 U | NA | NA | NA | NA | NA |
| 2-Hexanone | 591-78-6 | NA | NA | NA | NA | <0.004 U | <0.004 U | <0.004 U | NA | NA | NA | NA | NA |
| 4-Methyl-2-pentanone | 108-10-1 | NA | NA | NA | NA | <0.0032 U | <0.0032 U | <0.0032 U | NA | NA | NA | NA | NA |
| Acetone | 67-64-1 | NA | NA | NA | NA | 0.0024 J | 0.0028 J | 0.0051 J | NA | NA | NA | NA | NA |
| Benzene | 71-43-2 | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA | NA | NA | NA | NA |
| Bromobenzene | 108-86-1 | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA | NA | NA | NA | NA |
| Bromochloromethane | 74-97-5 | NA | NA | NA | NA | <0.0002 U | <0.0002 U | <0.0002 U | NA | NA | NA | NA | NA |
| Bromodichloromethane | 75-27-4 | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA | NA | NA | NA | NA |
| Bromoform | 75-25-2 | NA | NA | NA | NA | <0.001 U | <0.001 U | <0.001 U | NA | NA | NA | NA | NA |
| Bromomethane | 74-83-9 | NA | NA | NA | NA | <0.0008 U | <0.0008 U | <0.0008 U | NA | NA | NA | NA | NA |
| Carbon disulfide | 75-15-0 | NA | NA | NA | NA | <0.0008 U | <0.0008 U | <0.0008 U | NA | NA | NA | NA | NA |
| Carbon tetrachloride | 56-23-5 | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA | NA | NA | NA | NA |
| Chlorobenzene | 108-90-7 | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA | NA | NA | NA | NA |
| Chloroethane | 75-00-3 | NA | NA | NA | NA | <0.0016 U | <0.0016 U | <0.0016 U | NA | NA | NA | NA | NA |
| Chloroform | 67-66-3 | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA | NA | NA | NA | NA |
| Chloromethane | 74-87-3 | NA | NA | NA | NA | <0.0008 U | <0.0008 U | <0.0008 U | NA | NA | NA | NA | NA |
| Dibromochloromethane | 124-48-1 | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA | NA | NA | NA | NA |
| Ethylbenzene | 100-41-4 | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA | NA | NA | NA | NA |
| Methylene chloride | 75-09-2 | NA | NA | NA | NA | <0.002 U | <0.002 U | <0.002 U | NA | NA | NA | NA | NA |
| Styrene | 100-42-5 | NA | NA | NA | NA | <0.0008 U | <0.0008 U | <0.0008 U | NA | NA | NA | NA | NA |
| Tetrachloroethene | 127-18-4 | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA | NA | NA | NA | NA |

| Station | | CBPmw-008 | CBPmw-009 | DA2mw-115 | DA2mw-115 | DET-3 | DET-3 | DET-4 | EBGmw-125 | EBGmw-131 | FBQmw-171 | FBQmw-172 | FBQmw-172 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | CBPmw-008-190401-GW | CBPmw-009-190401-GW | DA2mw-115-190402-GW | DA2mw-115-190401-GW | DET-003-190402-GW | DET-003-190401-GW | DET-004-190401-GW | EBGmw-125-190401-GW | EBGmw-131-190401-GW | FBQmw-171-190401-GW | FBQmw-172-190402-GW | FBQmw-172-190401-GW |
| Date | | 05/08/19 | 05/09/19 | 04/29/19 | 04/29/19 | 04/29/19 | 04/29/19 | 04/29/19 | 05/07/19 | 05/07/19 | 04/30/19 | 04/30/19 | 04/30/19 |
| Sample Type | | GR | GR | FD | GR | FD | GR | GR | GR | GR | GR | FD | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Unconsolidated | Upper Sharon | Upper Sharon | Upper Sharon | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon | Homewood | Homewood | Homewood |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Toluene | 108-88-3 | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA | NA | NA | NA | NA |
| Trichloroethene | 79-01-6 | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA | NA | NA | NA | NA |
| Vinyl chloride | 75-01-4 | NA | NA | NA | NA | <0.0002 U | <0.0002 U | <0.0002 U | NA | NA | NA | NA | NA |
| Xylenes, total | 1330-20-7 | NA | NA | NA | NA | <0.0008 U | <0.0008 U | <0.0008 U | NA | NA | NA | NA | NA |
| cis-1,3-Dichloropropene | 10061-01-5 | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA | NA | NA | NA | NA |
| trans-1,3-Dichloropropene | 10061-02-6 | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA | NA | NA | NA | NA |

| Station | | FBQmw-174 | FBQmw-175 | FBQmw-175 | FBQmw-176 | FWGmw-004 | FWGmw-007 | FWGmw-011 | FWGmw-012 | FWGmw-015 | FWGmw-016 | FWGmw-018 | FWGmw-019 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | FBQmw-174-190401-GW | FBQmw-175-190402-GW | FBQmw-175-190401-GW | FBQmw-176-190401-GW | FWGmw-004-190401-GW | FWGmw-007-190401-GW | FWGmw-011-190401-GW | FWGmw-012-190401-GW | FWGmw-015-190401-GW | FWGmw-016-190401-GW | FWGmw-018-190401-GW | FWGmw-019-190401-GW |
| Date | | 04/30/19 | 05/07/19 | 05/07/19 | 05/07/19 | 05/08/19 | 04/30/19 | 05/07/19 | 05/07/19 | 05/08/19 | 04/29/19 | 05/09/19 | 05/02/19 |
| Sample Type | | GR | FD | GR | GR | GR | GR | GR | GR | GR | GR | GR | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Homewood | Homewood | Homewood | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon | Unconsolidated | Upper Sharon | Basal Sharon Congl | Basal Sharon Congl |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Metals | | | | | | | | | | | | | |
| Aluminum | 7429-90-5 | NA | NA | NA | NA | 0.023 J | 0.032 J | 0.55 | <0.07 U | <0.07 U | <0.07 U | <0.07 U | NA |
| Antimony | 7440-36-0 | NA | NA | NA | NA | <0.001 U | <0.001 U | <0.001 U | <0.001 U | <0.001 U | <0.001 U | 0.00041 J | NA |
| Arsenic | 7440-38-2 | NA | NA | NA | NA | <0.001 U | <0.001 U | 0.0042 J | 0.0011 J | 0.00038 J | 0.0045 J | 0.02 | NA |
| Barium | 7440-39-3 | NA | NA | NA | NA | 0.022 J | 0.02 | 0.029 J | 0.026 J | 0.01 J | 0.059 | 0.07 | NA |
| Beryllium | 7440-41-7 | NA | NA | NA | NA | <0.0003 U | <0.0003 U | <0.0003 U | <0.0003 U | <0.0003 U | <0.0003 U | <0.0003 U | NA |
| Cadmium | 7440-43-9 | NA | NA | NA | NA | <0.001 U | <0.001 U | <0.001 U | <0.001 U | <0.001 U | <0.001 U | <0.001 U | NA |
| Calcium | 7440-70-2 | NA | NA | NA | NA | 96 | 130 | 50 | 25 | 280 | 110 | 82 | NA |
| Chromium | 7440-47-3 | NA | NA | NA | NA | <0.0018 U | 0.00051 J | 0.0009 J | <0.0018 U | <0.0018 U | <0.0018 U | <0.0018 U | NA |
| Cobalt | 7440-48-4 | NA | NA | NA | NA | <0.0002 U | <0.00042 U | 0.0015 | 0.0015 | 0.00007 J | <0.0002 U | 0.0023 | NA |
| Copper | 7440-50-8 | NA | NA | NA | NA | <0.0018 U | <0.0018 U | <0.0018 U | <0.0018 U | 0.00087 J | <0.0018 U | <0.0018 U | NA |
| Iron | 7439-89-6 | NA | NA | NA | NA | 0.05 J | 0.16 | 8.2 | 2.4 | 0.045 J | 0.63 | 0.44 | NA |
| Lead | 7439-92-1 | NA | NA | NA | NA | <0.0007 U | 0.00022 J | 0.00037 J | <0.0007 U | <0.0007 U | <0.0007 U | <0.0007 U | NA |
| Magnesium | 7439-95-4 | NA | NA | NA | NA | 50 | 66 | 12 | 5.8 | 290 | 28 | 25 | NA |
| Manganese | 7439-96-5 | NA | NA | NA | NA | <0.0031 U | 0.13 | 0.29 | 0.1 | 0.07 | 0.22 | 0.15 | NA |
| Mercury | 7439-97-6 | NA | NA | NA | NA | <0.00008 U | <0.00008 U | <0.00008 U | <0.00008 U | <0.00008 U | <0.00008 U | <0.00008 U | NA |
| Nickel | 7440-02-0 | NA | NA | NA | NA | 0.00043 J | 0.0012 J | 0.0015 J | 0.0011 J | 0.00097 J | <0.001 U | 0.0037 | NA |
| Potassium | 7440-09-7 | NA | NA | NA | NA | 0.7 J | 2.5 J | 1.2 J | 3.6 | 3.5 | 2.4 J | 1.9 J | NA |
| Selenium | 7782-49-2 | NA | NA | NA | NA | 0.0011 J | <0.001 U | <0.001 U | <0.001 U | <0.001 U | <0.001 U | <0.001 U | NA |
| Silver | 7440-22-4 | NA | NA | NA | NA | <0.0001 U | <0.0001 U | <0.0001 U | <0.0001 U | <0.0001 U | <0.0001 U | <0.0001 U | NA |
| Sodium | 7440-23-5 | NA | NA | NA | NA | 4.6 J | 11 | 5.7 J | 6.7 J | 44 J | 11 | 15 | NA |
| Thallium | 7440-28-0 | NA | NA | NA | NA | <0.0002 U | <0.0002 U | <0.0002 U | <0.0002 U | <0.0002 U | <0.0002 U | <0.0002 U | NA |
| Vanadium | 7440-62-2 | NA | NA | NA | NA | <0.003 U | <0.003 U | <0.003 U | <0.003 U | <0.003 U | <0.003 U | <0.003 U | NA |
| Zinc | 7440-66-6 | NA | NA | NA | NA | <0.008 U | 0.0027 J | 0.0039 J | <0.008 U | 0.0039 J | <0.008 U | <0.008 U | NA |
| Anions | | | | | | | | | | | | | |
| Nitrate | 14797-55-8 | 1.2 | 1.6 | 1.6 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Nitrite | 14797-65-0 | <0.1 U | <0.1 U | <0.1 U | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Sulfate | 14808-79-8 | 15 | 18 | 20 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Sulfide | 18496-25-8 | <1.9 U | <1.9 U | <1.9 U | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Miscellaneous | | | | | | | | | | | | | |
| Alkalinity | N33 | 4.8 J | 12 | 13 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chromium, hexavalent | 18540-29-9 | NA | <0.003 U | <0.003 U | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cyanide | 57-12-5 | NA | NA | NA | <0.01 U | NA | NA | NA | NA | NA | NA | 0.0065 J | NA |
| Perchlorate | 14797-73-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Total Phosphorus as P | 7723-14-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Explosives/Propellants | | | | | | | | | | | | | |
| 1,3,5-Trinitrobenzene | 99-35-4 | <0.00042 U | NA | NA | NA | <0.0004 U | <0.00044 U | <0.00042 U | <0.00042 U | <0.00044 U | <0.0004 U | NA | NA |
| 1,3-Dinitrobenzene | 99-65-0 | <0.00021 U | NA | NA | NA | <0.0002 U | <0.00022 U | <0.00021 U | <0.00021 U | <0.00022 U | <0.0002 U | NA | NA |
| 2,4,6-Trinitrotoluene | 118-96-7 | 0.01 | NA | NA | NA | <0.0004 U | <0.00044 U | <0.00042 U | <0.00042 U | <0.00044 U | <0.0004 U | NA | NA |
| 2,4-Dinitrotoluene | 121-14-2 | 0.00067 | NA | NA | NA | <0.0002 U | <0.00022 U | <0.00021 U | <0.00021 U | <0.00022 U | <0.0002 U | NA | NA |
| 2,6-Dinitrotoluene | 606-20-2 | <0.00021 U | NA | NA | NA | <0.0002 U | <0.00022 U | <0.00021 U | <0.00021 U | <0.00022 U | <0.0002 U | NA | NA |
| 2-Amino-4,6-Dinitrotoluene | 35572-78-2 | 0.015 | NA | NA | NA | <0.00012 U | <0.00013 U | <0.00012 U | <0.00013 U | <0.00013 U | <0.00012 U | NA | NA |
| 2-Nitrotoluene | 88-72-2 | <0.00021 U | NA | NA | NA | <0.0002 U | <0.00022 UJ | <0.00021 U | <0.00021 U | <0.00022 U | <0.0002 UJ | NA | NA |
| 3-Nitrotoluene | 99-08-1 | <0.00042 U | NA | NA | NA | <0.0004 U | <0.00044 U | <0.00042 U | <0.00042 U | <0.00044 U | <0.0004 U | NA | NA |
| 4-Amino-2,6-Dinitrotoluene | 19406-51-0 | 0.014 | NA | NA | NA | <0.00012 U | <0.00013 U | <0.00012 U | <0.00013 U | <0.00013 U | <0.00012 U | NA | NA |
| 4-Nitrotoluene | 99-99-0 | <0.00042 U | NA | NA | NA | <0.0004 U | <0.00044 U | <0.00042 U | <0.00042 U | <0.00044 U | <0.0004 U | NA | NA |

| Station | | FBQmw-174 | FBQmw-175 | FBQmw-175 | FBQmw-176 | FWGmw-004 | FWGmw-007 | FWGmw-011 | FWGmw-012 | FWGmw-015 | FWGmw-016 | FWGmw-018 | FWGmw-019 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | FBQmw-174-190401-GW | FBQmw-175-190402-GW | FBQmw-175-190401-GW | FBQmw-176-190401-GW | FWGmw-004-190401-GW | FWGmw-007-190401-GW | FWGmw-011-190401-GW | FWGmw-012-190401-GW | FWGmw-015-190401-GW | FWGmw-016-190401-GW | FWGmw-018-190401-GW | FWGmw-019-190401-GW |
| Date | | 04/30/19 | 05/07/19 | 05/07/19 | 05/07/19 | 05/08/19 | 04/30/19 | 05/07/19 | 05/07/19 | 05/08/19 | 04/29/19 | 05/09/19 | 05/02/19 |
| Sample Type | | GR | FD | GR | GR | GR | GR | GR | GR | GR | GR | GR | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Homewood | Homewood | Homewood | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon | Unconsolidated | Upper Sharon | Basal Sharon Congl | Basal Sharon Congl |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| HMX | 2691-41-0 | <0.00021 U | NA | NA | NA | <0.0002 U | <0.00022 U | <0.00021 U | <0.00021 U | <0.00022 U | <0.0002 U | NA | NA |
| Nitrobenzene | 98-95-3 | <0.00021 U | NA | NA | NA | <0.0002 U | <0.00022 U | <0.00021 U | <0.00021 U | <0.00022 U | <0.0002 U | NA | NA |
| Nitrocellulose | 9004-70-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <1 U |
| Nitroglycerin | 55-63-0 | <0.0021 U | NA | NA | NA | <0.002 U | <0.0022 U | <0.0021 U | <0.0021 U | <0.0022 U | <0.002 U | NA | NA |
| Nitroguanidine | 556-88-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.006 U |
| PETN | 78-11-5 | <0.0042 U | NA | NA | NA | <0.004 U | <0.0044 U | <0.0042 U | <0.0042 U | <0.0044 U | <0.004 U | NA | NA |
| RDX | 121-82-4 | 0.0012 J | NA | NA | NA | <0.0004 U | <0.00044 U | <0.00042 U | <0.00042 U | <0.00044 U | <0.0004 U | NA | NA |
| Tetryl | 479-45-8 | <0.00021 U | NA | NA | NA | <0.0002 U | <0.00022 U | <0.00021 U | <0.00021 U | <0.00022 U | <0.0002 U | NA | NA |
| SVOCs | | | | | | | | | | | | | |
| 1,2,4-Trichlorobenzene | 120-82-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,2-Dichlorobenzene | 95-50-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,3-Dichlorobenzene | 541-73-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,4-Dichlorobenzene | 106-46-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,4-Dioxane | 123-91-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1-Methylnaphthalene | 90-12-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4,5-Trichlorophenol | 95-95-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4,6-Trichlorophenol | 88-06-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4-Dichlorophenol | 120-83-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4-Dimethylphenol | 105-67-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4-Dinitrophenol | 51-28-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4-Dinitrotoluene | 121-14-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,6-Dinitrotoluene | 606-20-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Chloronaphthalene | 91-58-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Chlorophenol | 95-57-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methyl-4,6-dinitrophenol | 534-52-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | 91-57-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylphenol | 95-48-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Nitrobenzenamine | 88-74-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Nitrophenol | 88-75-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 3,3'-Dichlorobenzidine | 91-94-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 3-Nitrobenzenamine | 99-09-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Bromophenyl phenyl ether | 101-55-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Chloro-3-methylphenol | 59-50-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Chlorobenzenamine | 106-47-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Chlorophenyl phenyl ether | 7005-72-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Nitrobenzenamine | 100-01-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Nitrophenol | 100-02-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthene | 83-32-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | 208-96-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | 120-12-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benz(a)anthracene | 56-55-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzenemethanol | 100-51-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 50-32-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 205-99-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(ghi)perylene | 191-24-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | 207-08-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

| Station | | FBQmw-174 | FBQmw-175 | FBQmw-175 | FBQmw-176 | FWGmw-004 | FWGmw-007 | FWGmw-011 | FWGmw-012 | FWGmw-015 | FWGmw-016 | FWGmw-018 | FWGmw-019 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | FBQmw-174-190401-GW | FBQmw-175-190402-GW | FBQmw-175-190401-GW | FBQmw-176-190401-GW | FWGmw-004-190401-GW | FWGmw-007-190401-GW | FWGmw-011-190401-GW | FWGmw-012-190401-GW | FWGmw-015-190401-GW | FWGmw-016-190401-GW | FWGmw-018-190401-GW | FWGmw-019-190401-GW |
| Date | | 04/30/19 | 05/07/19 | 05/07/19 | 05/07/19 | 05/08/19 | 04/30/19 | 05/07/19 | 05/07/19 | 05/08/19 | 04/29/19 | 05/09/19 | 05/02/19 |
| Sample Type | | GR | FD | GR | GR | GR | GR | GR | GR | GR | GR | GR | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Homewood | Homewood | Homewood | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon | Unconsolidated | Upper Sharon | Basal Sharon Congl | Basal Sharon Congl |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Benzoic acid | 65-85-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-chloroethoxy)methane | 111-91-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-chloroethyl) ether | 111-44-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-chloroisopropyl) ether | 108-60-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Butyl benzyl phthalate | 85-68-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Carbazole | 86-74-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | 218-01-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Di-n-butyl phthalate | 84-74-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Di-n-octylphthalate | 117-84-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | 53-70-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenzofuran | 132-64-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Diethyl phthalate | 84-66-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dimethyl phthalate | 131-11-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | 206-44-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | 86-73-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorobenzene | 118-74-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorobutadiene | 87-68-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorocyclopentadiene | 77-47-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachloroethane | 67-72-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Isophorone | 78-59-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N-Nitroso-di-n-propylamine | 621-64-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N-Nitrosodiphenylamine | 86-30-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 91-20-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Nitrobenzene | 98-95-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pentachlorophenol | 87-86-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | 85-01-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenol | 108-95-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | 129-00-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Total Cresols | 1319-77-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCBs | | | | | | | | | | | | | |
| PCB-1016 | 12674-11-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1221 | 11104-28-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1232 | 11141-16-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1242 | 53469-21-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1248 | 12672-29-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1254 | 11097-69-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1260 | 11096-82-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pesticides | | | | | | | | | | | | | |
| 4,4'-DDD | 72-54-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4,4'-DDE | 72-55-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4,4'-DDT | 50-29-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Aldrin | 309-00-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dieldrin | 60-57-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Endosulfan I | 959-98-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

| Station | | FBQmw-174 | FBQmw-175 | FBQmw-175 | FBQmw-176 | FWGmw-004 | FWGmw-007 | FWGmw-011 | FWGmw-012 | FWGmw-015 | FWGmw-016 | FWGmw-018 | FWGmw-019 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | FBQmw-174-190401-GW | FBQmw-175-190402-GW | FBQmw-175-190401-GW | FBQmw-176-190401-GW | FWGmw-004-190401-GW | FWGmw-007-190401-GW | FWGmw-011-190401-GW | FWGmw-012-190401-GW | FWGmw-015-190401-GW | FWGmw-016-190401-GW | FWGmw-018-190401-GW | FWGmw-019-190401-GW |
| Date | | 04/30/19 | 05/07/19 | 05/07/19 | 05/07/19 | 05/08/19 | 04/30/19 | 05/07/19 | 05/07/19 | 05/08/19 | 04/29/19 | 05/09/19 | 05/02/19 |
| Sample Type | | GR | FD | GR | GR | GR | GR | GR | GR | GR | GR | GR | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Homewood | Homewood | Homewood | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon | Unconsolidated | Upper Sharon | Basal Sharon Congl | Basal Sharon Congl |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Endosulfan II | 33213-65-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Endosulfan sulfate | 1031-07-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Endrin | 72-20-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Endrin aldehyde | 7421-93-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Endrin ketone | 53494-70-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Heptachlor | 76-44-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Heptachlor epoxide | 1024-57-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Lindane | 58-89-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methoxychlor | 72-43-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Toxaphene | 8001-35-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| alpha-BHC | 319-84-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| alpha-Chlordane | 5103-71-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| beta-BHC | 319-85-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| delta-BHC | 319-86-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| gamma-Chlordane | 5103-74-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| VOCs | | | | | | | | | | | | | |
| 1,1,1-Trichloroethane | 71-55-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | NA |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0008 U | NA |
| 1,1,2-Trichloroethane | 79-00-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0008 U | NA |
| 1,1-Dichloroethane | 75-34-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0008 U | NA |
| 1,1-Dichloroethene | 75-35-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0008 U | NA |
| 1,2-Dibromoethane | 106-93-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | NA |
| 1,2-Dichloroethane | 107-06-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | NA |
| 1,2-Dichloroethene | 540-59-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | NA |
| 1,2-Dichloropropane | 78-87-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | NA |
| 2-Butanone | 78-93-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.004 U | NA |
| 2-Hexanone | 591-78-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.004 U | NA |
| 4-Methyl-2-pentanone | 108-10-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0032 U | NA |
| Acetone | 67-64-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0064 U | NA |
| Benzene | 71-43-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | NA |
| Bromobenzene | 108-86-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | NA |
| Bromochloromethane | 74-97-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0002 U | NA |
| Bromodichloromethane | 75-27-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | NA |
| Bromoform | 75-25-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.001 U | NA |
| Bromomethane | 74-83-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0008 U | NA |
| Carbon disulfide | 75-15-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0008 U | NA |
| Carbon tetrachloride | 56-23-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | NA |
| Chlorobenzene | 108-90-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | NA |
| Chloroethane | 75-00-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0016 U | NA |
| Chloroform | 67-66-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | NA |
| Chloromethane | 74-87-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0008 U | NA |
| Dibromochloromethane | 124-48-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | NA |
| Ethylbenzene | 100-41-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | NA |
| Methylene chloride | 75-09-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.002 U | NA |
| Styrene | 100-42-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0008 U | NA |
| Tetrachloroethene | 127-18-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | NA |

| Station | | FBQmw-174 | FBQmw-175 | FBQmw-175 | FBQmw-176 | FWGmw-004 | FWGmw-007 | FWGmw-011 | FWGmw-012 | FWGmw-015 | FWGmw-016 | FWGmw-018 | FWGmw-019 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | FBQmw-174-190401-GW | FBQmw-175-190402-GW | FBQmw-175-190401-GW | FBQmw-176-190401-GW | FWGmw-004-190401-GW | FWGmw-007-190401-GW | FWGmw-011-190401-GW | FWGmw-012-190401-GW | FWGmw-015-190401-GW | FWGmw-016-190401-GW | FWGmw-018-190401-GW | FWGmw-019-190401-GW |
| Date | | 04/30/19 | 05/07/19 | 05/07/19 | 05/07/19 | 05/08/19 | 04/30/19 | 05/07/19 | 05/07/19 | 05/08/19 | 04/29/19 | 05/09/19 | 05/02/19 |
| Sample Type | | GR | FD | GR | GR | GR | GR | GR | GR | GR | GR | GR | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Homewood | Homewood | Homewood | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon | Unconsolidated | Upper Sharon | Basal Sharon Congl | Basal Sharon Congl |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Toluene | 108-88-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | NA |
| Trichloroethene | 79-01-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | NA |
| Vinyl chloride | 75-01-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0002 U | NA |
| Xylenes, total | 1330-20-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0008 U | NA |
| cis-1,3-Dichloropropene | 10061-01-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | NA |
| trans-1,3-Dichloropropene | 10061-02-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | NA |

| Station | | FWGmw-020 | FWGmw-021 | FWGmw-021 | FWGmw-022 | FWGmw-023 | FWGmw-024 | L10mw-003 | L10mw-003 | L10mw-005 | L12mw-183 | L12mw-185 | L12mw-187 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | FWGmw-020-190401-GW | FWGmw-021-190402-GW | FWGmw-021-190401-GW | FWGmw-022-190401-GW | FWGmw-023-190401-GW | FWGmw-024-190401-GW | LL10mw-003-190402-GW | LL10mw-003-190401-GW | LL10mw-005-190401-GW | LL12mw-183-190401-GW | LL12mw-185-190401-GW | LL12mw-187-190401-GW |
| Date | | 05/13/19 | 05/09/19 | 05/09/19 | 05/02/19 | 05/01/19 | 05/09/19 | 05/01/19 | 05/01/19 | 05/01/19 | 05/01/19 | 05/01/19 | 05/02/19 |
| Sample Type | | GR | FD | GR | GR | GR | GR | FD | GR | GR | GR | GR | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Homewood | Homewood | Homewood | Unconsolidated | Unconsolidated | Unconsolidated |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Metals | | | | | | | | | | | | | |
| Aluminum | 7429-90-5 | 0.031 J | <0.07 U | <0.07 U | NA | NA | <0.07 U | NA | NA | <0.07 U | NA | NA | <0.07 U |
| Antimony | 7440-36-0 | <0.001 U | 0.00099 J | 0.00051 J | NA | NA | 0.0007 J | NA | NA | <0.001 U | NA | NA | <0.001 U |
| Arsenic | 7440-38-2 | 0.023 | 0.00066 J | 0.00057 J | NA | NA | 0.0021 J | NA | NA | <0.001 U | NA | NA | 0.00056 J |
| Barium | 7440-39-3 | 0.084 J | 0.016 | 0.016 | NA | NA | 0.0093 | NA | NA | 0.0088 | NA | NA | 0.28 |
| Beryllium | 7440-41-7 | <0.0003 U | 0.00052 J | <0.0003 U | NA | NA | 0.00011 J | NA | NA | <0.0003 U | NA | NA | <0.0003 U |
| Cadmium | 7440-43-9 | <0.001 U | <0.001 U | <0.001 U | NA | NA | <0.001 U | NA | NA | <0.001 U | NA | NA | <0.001 U |
| Calcium | 7440-70-2 | 110 | 20 | 21 | NA | NA | 59 | NA | NA | 59 | NA | NA | 1000 |
| Chromium | 7440-47-3 | <0.0018 U | 0.00082 J | 0.00076 J | NA | NA | <0.0018 U | NA | NA | <0.0018 U | NA | NA | <0.0018 U |
| Cobalt | 7440-48-4 | 0.0041 | 0.00018 J | <0.0002 U | NA | NA | 0.0009 J | NA | NA | <0.0002 U | NA | NA | 0.011 |
| Copper | 7440-50-8 | <0.0018 U | 0.0011 J | 0.0012 J | NA | NA | <0.0018 U | NA | NA | <0.0018 U | NA | NA | 0.001 J |
| Iron | 7439-89-6 | 0.9 | 0.66 | 0.63 J | NA | NA | 1.6 J | NA | NA | 0.025 J | NA | NA | <0.085 U |
| Lead | 7439-92-1 | <0.0007 U | 0.00023 J | <0.0007 U | NA | NA | <0.0007 U | NA | NA | <0.0007 U | NA | NA | 0.0002 J |
| Magnesium | 7439-95-4 | 36 | 6.8 | 6.9 | NA | NA | 18 | NA | NA | 14 | NA | NA | 320 J |
| Manganese | 7439-96-5 | 0.066 | 0.0094 | 0.0099 | NA | NA | 0.33 | NA | NA | <0.68 U | NA | NA | 2.9 |
| Mercury | 7439-97-6 | <0.00008 U | <0.00008 U | <0.00008 U | NA | NA | <0.00008 U | NA | NA | <0.00008 U | NA | NA | <0.00008 U |
| Nickel | 7440-02-0 | 0.0041 | 0.0016 J | 0.0018 J | NA | NA | 0.0034 | NA | NA | 0.00057 J | NA | NA | 0.015 |
| Potassium | 7440-09-7 | 4.6 | 1.2 J | 1.2 J | NA | NA | 0.81 J | NA | NA | <0.63 U | NA | NA | 58 |
| Selenium | 7782-49-2 | <0.001 U | 0.00072 J | <0.001 U | NA | NA | <0.001 U | NA | NA | <0.001 U | NA | NA | <0.001 U |
| Silver | 7440-22-4 | <0.0001 U | <0.0001 U | <0.0001 U | NA | NA | <0.0001 U | NA | NA | <0.0001 U | NA | NA | <0.0001 U |
| Sodium | 7440-23-5 | 16 J | 2.9 J | 3 J | NA | NA | 4.9 J | NA | NA | 3.5 J | NA | NA | 44 J |
| Thallium | 7440-28-0 | <0.0002 U | 0.00011 J | <0.0002 U | NA | NA | <0.0002 U | NA | NA | <0.0002 U | NA | NA | 0.00075 J |
| Vanadium | 7440-62-2 | <0.003 U | <0.003 U | <0.003 U | NA | NA | <0.003 U | NA | NA | <0.003 U | NA | NA | <0.003 U |
| Zinc | 7440-66-6 | 0.0035 J | 0.0052 J | 0.0055 J | NA | NA | <0.008 U | NA | NA | <0.008 U | NA | NA | 0.0063 J |
| Anions | | | | | | | | | | | | | |
| Nitrate | 14797-55-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 92 | 1600 |
| Nitrite | 14797-65-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Sulfate | 14808-79-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Sulfide | 18496-25-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Miscellaneous | | | | | | | | | | | | | |
| Alkalinity | N33 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chromium, hexavalent | 18540-29-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cyanide | 57-12-5 | 0.011 | NA | NA | NA | NA | NA | NA | NA | NA | <0.01 U | NA | NA |
| Perchlorate | 14797-73-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Total Phosphorus as P | 7723-14-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Explosives/Propellants | | | | | | | | | | | | | |
| 1,3,5-Trinitrobenzene | 99-35-4 | NA | <0.00041 U | <0.00043 U | NA | NA | <0.00042 U | NA | NA | NA | NA | NA | NA |
| 1,3-Dinitrobenzene | 99-65-0 | NA | <0.0002 U | <0.00021 U | NA | NA | <0.00021 U | NA | NA | NA | NA | NA | NA |
| 2,4,6-Trinitrotoluene | 118-96-7 | NA | <0.00041 U | <0.00043 UJ | NA | NA | <0.00042 U | NA | NA | NA | NA | NA | NA |
| 2,4-Dinitrotoluene | 121-14-2 | NA | <0.0002 U | <0.00021 U | NA | NA | <0.00021 U | NA | NA | NA | NA | NA | NA |
| 2,6-Dinitrotoluene | 606-20-2 | NA | <0.0002 U | <0.00021 U | NA | NA | <0.00021 U | NA | NA | NA | NA | NA | NA |
| 2-Amino-4,6-Dinitrotoluene | 35572-78-2 | NA | 0.00038 | 0.00031 J | NA | NA | <0.00013 U | NA | NA | NA | NA | NA | NA |
| 2-Nitrotoluene | 88-72-2 | NA | <0.0002 U | <0.00021 UJ | NA | NA | <0.00021 U | NA | NA | NA | NA | NA | NA |
| 3-Nitrotoluene | 99-08-1 | NA | <0.00041 U | <0.00043 UJ | NA | NA | <0.00042 U | NA | NA | NA | NA | NA | NA |
| 4-Amino-2,6-Dinitrotoluene | 19406-51-0 | NA | 0.00031 | 0.00028 J | NA | NA | <0.00013 U | NA | NA | NA | NA | NA | NA |
| 4-Nitrotoluene | 99-99-0 | NA | <0.00041 U | <0.00043 UJ | NA | NA | <0.00042 U | NA | NA | NA | NA | NA | NA |

| Station | | FWGmw-020 | FWGmw-021 | FWGmw-021 | FWGmw-022 | FWGmw-023 | FWGmw-024 | L10mw-003 | L10mw-003 | L10mw-005 | L12mw-183 | L12mw-185 | L12mw-187 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | FWGmw-020-190401-GW | FWGmw-021-190402-GW | FWGmw-021-190401-GW | FWGmw-022-190401-GW | FWGmw-023-190401-GW | FWGmw-024-190401-GW | LL10mw-003-190402-GW | LL10mw-003-190401-GW | LL10mw-005-190401-GW | LL12mw-183-190401-GW | LL12mw-185-190401-GW | LL12mw-187-190401-GW |
| Date | | 05/13/19 | 05/09/19 | 05/09/19 | 05/02/19 | 05/01/19 | 05/09/19 | 05/01/19 | 05/01/19 | 05/01/19 | 05/01/19 | 05/01/19 | 05/02/19 |
| Sample Type | | GR | FD | GR | GR | GR | GR | FD | GR | GR | GR | GR | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Homewood | Homewood | Homewood | Unconsolidated | Unconsolidated | Unconsolidated |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| HMX | 2691-41-0 | NA | <0.0002 U | <0.00021 U | NA | NA | <0.00021 U | NA | NA | NA | NA | NA | NA |
| Nitrobenzene | 98-95-3 | NA | <0.0002 U | <0.00021 U | NA | NA | <0.00021 U | NA | NA | NA | NA | NA | NA |
| Nitrocellulose | 9004-70-0 | NA | NA | NA | <1 U | <1 U | NA | NA | NA | NA | NA | NA | NA |
| Nitroglycerin | 55-63-0 | NA | <0.002 U | <0.0021 U | NA | NA | <0.0021 U | NA | NA | NA | NA | NA | NA |
| Nitroguanidine | 556-88-7 | NA | NA | NA | <0.006 U | <0.006 U | NA | NA | NA | NA | NA | NA | NA |
| PETN | 78-11-5 | NA | <0.0041 U | <0.0043 U | NA | NA | <0.0042 U | NA | NA | NA | NA | NA | NA |
| RDX | 121-82-4 | NA | <0.00041 U | <0.00043 U | NA | NA | <0.00042 U | NA | NA | NA | NA | NA | NA |
| Tetryl | 479-45-8 | NA | <0.0002 U | <0.00021 U | NA | NA | <0.00021 U | NA | NA | NA | NA | NA | NA |
| SVOCs | | | | | | | | | | | | | |
| 1,2,4-Trichlorobenzene | 120-82-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,2-Dichlorobenzene | 95-50-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,3-Dichlorobenzene | 541-73-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,4-Dichlorobenzene | 106-46-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,4-Dioxane | 123-91-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1-Methylnaphthalene | 90-12-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4,5-Trichlorophenol | 95-95-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4,6-Trichlorophenol | 88-06-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4-Dichlorophenol | 120-83-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4-Dimethylphenol | 105-67-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4-Dinitrophenol | 51-28-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4-Dinitrotoluene | 121-14-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,6-Dinitrotoluene | 606-20-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Chloronaphthalene | 91-58-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Chlorophenol | 95-57-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methyl-4,6-dinitrophenol | 534-52-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | 91-57-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylphenol | 95-48-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Nitrobenzenamine | 88-74-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Nitrophenol | 88-75-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 3,3'-Dichlorobenzidine | 91-94-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 3-Nitrobenzenamine | 99-09-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Bromophenyl phenyl ether | 101-55-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Chloro-3-methylphenol | 59-50-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Chlorobenzenamine | 106-47-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Chlorophenyl phenyl ether | 7005-72-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Nitrobenzenamine | 100-01-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Nitrophenol | 100-02-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthene | 83-32-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | 208-96-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | 120-12-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benz(a)anthracene | 56-55-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzenemethanol | 100-51-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 50-32-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 205-99-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(ghi)perylene | 191-24-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | 207-08-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

| Station | | FWGmw-020 | FWGmw-021 | FWGmw-021 | FWGmw-022 | FWGmw-023 | FWGmw-024 | L10mw-003 | L10mw-003 | L10mw-005 | L12mw-183 | L12mw-185 | L12mw-187 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | FWGmw-020-190401-GW | FWGmw-021-190402-GW | FWGmw-021-190401-GW | FWGmw-022-190401-GW | FWGmw-023-190401-GW | FWGmw-024-190401-GW | LL10mw-003-190402-GW | LL10mw-003-190401-GW | LL10mw-005-190401-GW | LL12mw-183-190401-GW | LL12mw-185-190401-GW | LL12mw-187-190401-GW |
| Date | | 05/13/19 | 05/09/19 | 05/09/19 | 05/02/19 | 05/01/19 | 05/09/19 | 05/01/19 | 05/01/19 | 05/01/19 | 05/01/19 | 05/01/19 | 05/02/19 |
| Sample Type | | GR | FD | GR | GR | GR | GR | FD | GR | GR | GR | GR | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Homewood | Homewood | Homewood | Unconsolidated | Unconsolidated | Unconsolidated |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Benzoic acid | 65-85-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-chloroethoxy)methane | 111-91-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-chloroethyl) ether | 111-44-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-chloroisopropyl) ether | 108-60-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Butyl benzyl phthalate | 85-68-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Carbazole | 86-74-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | 218-01-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Di-n-butyl phthalate | 84-74-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Di-n-octylphthalate | 117-84-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | 53-70-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenzofuran | 132-64-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Diethyl phthalate | 84-66-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dimethyl phthalate | 131-11-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | 206-44-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | 86-73-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorobenzene | 118-74-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorobutadiene | 87-68-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorocyclopentadiene | 77-47-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachloroethane | 67-72-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Isophorone | 78-59-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N-Nitroso-di-n-propylamine | 621-64-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N-Nitrosodiphenylamine | 86-30-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 91-20-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Nitrobenzene | 98-95-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pentachlorophenol | 87-86-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | 85-01-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenol | 108-95-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | 129-00-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Total Cresols | 1319-77-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCBs | | | | | | | | | | | | | |
| PCB-1016 | 12674-11-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1221 | 11104-28-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1232 | 11141-16-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1242 | 53469-21-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1248 | 12672-29-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1254 | 11097-69-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1260 | 11096-82-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pesticides | | | | | | | | | | | | | |
| 4,4'-DDD | 72-54-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4,4'-DDE | 72-55-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4,4'-DDT | 50-29-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Aldrin | 309-00-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dieldrin | 60-57-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Endosulfan I | 959-98-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

| Station | | FWGmw-020 | FWGmw-021 | FWGmw-021 | FWGmw-022 | FWGmw-023 | FWGmw-024 | L10mw-003 | L10mw-003 | L10mw-005 | L12mw-183 | L12mw-185 | L12mw-187 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | FWGmw-020-190401-GW | FWGmw-021-190402-GW | FWGmw-021-190401-GW | FWGmw-022-190401-GW | FWGmw-023-190401-GW | FWGmw-024-190401-GW | LL10mw-003-190402-GW | LL10mw-003-190401-GW | LL10mw-005-190401-GW | LL12mw-183-190401-GW | LL12mw-185-190401-GW | LL12mw-187-190401-GW |
| Date | | 05/13/19 | 05/09/19 | 05/09/19 | 05/02/19 | 05/01/19 | 05/09/19 | 05/01/19 | 05/01/19 | 05/01/19 | 05/01/19 | 05/01/19 | 05/02/19 |
| Sample Type | | GR | FD | GR | GR | GR | GR | FD | GR | GR | GR | GR | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Homewood | Homewood | Homewood | Unconsolidated | Unconsolidated | Unconsolidated |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Endosulfan II | 33213-65-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Endosulfan sulfate | 1031-07-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Endrin | 72-20-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Endrin aldehyde | 7421-93-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Endrin ketone | 53494-70-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Heptachlor | 76-44-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Heptachlor epoxide | 1024-57-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Lindane | 58-89-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methoxychlor | 72-43-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Toxaphene | 8001-35-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| alpha-BHC | 319-84-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| alpha-Chlordane | 5103-71-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| beta-BHC | 319-85-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| delta-BHC | 319-86-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| gamma-Chlordane | 5103-74-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| VOCs | | | | | | | | | | | | | |
| 1,1,1-Trichloroethane | 71-55-6 | <0.0004 U | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | NA | NA | NA | NA |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | <0.0008 U | NA | NA | NA | NA | NA | <0.0008 U | <0.0008 U | NA | NA | NA | NA |
| 1,1,2-Trichloroethane | 79-00-5 | <0.0008 U | NA | NA | NA | NA | NA | <0.0008 U | <0.0008 U | NA | NA | NA | NA |
| 1,1-Dichloroethane | 75-34-3 | <0.0008 U | NA | NA | NA | NA | NA | <0.0008 U | <0.0008 U | NA | NA | NA | NA |
| 1,1-Dichloroethene | 75-35-4 | <0.0008 U | NA | NA | NA | NA | NA | <0.0008 U | <0.0008 U | NA | NA | NA | NA |
| 1,2-Dibromoethane | 106-93-4 | <0.0004 U | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | NA | NA | NA | NA |
| 1,2-Dichloroethane | 107-06-2 | <0.0004 U | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | NA | NA | NA | NA |
| 1,2-Dichloroethene | 540-59-0 | <0.0004 U | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | NA | NA | NA | NA |
| 1,2-Dichloropropane | 78-87-5 | <0.0004 U | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | NA | NA | NA | NA |
| 2-Butanone | 78-93-3 | <0.004 U | NA | NA | NA | NA | NA | <0.004 U | <0.004 U | NA | NA | NA | NA |
| 2-Hexanone | 591-78-6 | <0.004 U | NA | NA | NA | NA | NA | <0.004 U | <0.004 U | NA | NA | NA | NA |
| 4-Methyl-2-pentanone | 108-10-1 | <0.0032 U | NA | NA | NA | NA | NA | <0.0032 U | <0.0032 U | NA | NA | NA | NA |
| Acetone | 67-64-1 | <0.0058 U | NA | NA | NA | NA | NA | 0.0042 J | 0.0036 J | NA | NA | NA | NA |
| Benzene | 71-43-2 | <0.0004 U | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | NA | NA | NA | NA |
| Bromobenzene | 108-86-1 | <0.0004 U | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | NA | NA | NA | NA |
| Bromochloromethane | 74-97-5 | <0.0002 U | NA | NA | NA | NA | NA | <0.0002 U | <0.0002 U | NA | NA | NA | NA |
| Bromodichloromethane | 75-27-4 | <0.0004 U | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | NA | NA | NA | NA |
| Bromoform | 75-25-2 | <0.001 U | NA | NA | NA | NA | NA | <0.001 U | <0.001 U | NA | NA | NA | NA |
| Bromomethane | 74-83-9 | <0.0008 U | NA | NA | NA | NA | NA | <0.0008 U | <0.0008 U | NA | NA | NA | NA |
| Carbon disulfide | 75-15-0 | <0.0008 U | NA | NA | NA | NA | NA | <0.0008 U | <0.0008 U | NA | NA | NA | NA |
| Carbon tetrachloride | 56-23-5 | <0.0004 U | NA | NA | NA | NA | NA | 0.00086 J | 0.00063 J | NA | NA | NA | NA |
| Chlorobenzene | 108-90-7 | <0.0004 U | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | NA | NA | NA | NA |
| Chloroethane | 75-00-3 | <0.0016 U | NA | NA | NA | NA | NA | <0.0016 U | <0.0016 U | NA | NA | NA | NA |
| Chloroform | 67-66-3 | <0.0004 U | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | NA | NA | NA | NA |
| Chloromethane | 74-87-3 | <0.0008 U | NA | NA | NA | NA | NA | <0.0008 U | <0.0008 U | NA | NA | NA | NA |
| Dibromochloromethane | 124-48-1 | <0.0004 U | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | NA | NA | NA | NA |
| Ethylbenzene | 100-41-4 | <0.0004 U | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | NA | NA | NA | NA |
| Methylene chloride | 75-09-2 | <0.002 U | NA | NA | NA | NA | NA | <0.002 U | <0.002 U | NA | NA | NA | NA |
| Styrene | 100-42-5 | <0.0008 U | NA | NA | NA | NA | NA | <0.0008 U | <0.0008 U | NA | NA | NA | NA |
| Tetrachloroethene | 127-18-4 | <0.0004 U | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | NA | NA | NA | NA |

| Station | | FWGmw-020 | FWGmw-021 | FWGmw-021 | FWGmw-022 | FWGmw-023 | FWGmw-024 | L10mw-003 | L10mw-003 | L10mw-005 | L12mw-183 | L12mw-185 | L12mw-187 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | FWGmw-020-190401-GW | FWGmw-021-190402-GW | FWGmw-021-190401-GW | FWGmw-022-190401-GW | FWGmw-023-190401-GW | FWGmw-024-190401-GW | LL10mw-003-190402-GW | LL10mw-003-190401-GW | LL10mw-005-190401-GW | LL12mw-183-190401-GW | LL12mw-185-190401-GW | LL12mw-187-190401-GW |
| Date | | 05/13/19 | 05/09/19 | 05/09/19 | 05/02/19 | 05/01/19 | 05/09/19 | 05/01/19 | 05/01/19 | 05/01/19 | 05/01/19 | 05/01/19 | 05/02/19 |
| Sample Type | | GR | FD | GR | GR | GR | GR | FD | GR | GR | GR | GR | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Homewood | Homewood | Homewood | Unconsolidated | Unconsolidated | Unconsolidated |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Toluene | 108-88-3 | <0.0004 U | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | NA | NA | NA | NA |
| Trichloroethene | 79-01-6 | <0.0004 U | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | NA | NA | NA | NA |
| Vinyl chloride | 75-01-4 | <0.0002 U | NA | NA | NA | NA | NA | <0.0002 U | <0.0002 U | NA | NA | NA | NA |
| Xylenes, total | 1330-20-7 | <0.0008 U | NA | NA | NA | NA | NA | <0.0008 U | <0.0008 U | NA | NA | NA | NA |
| cis-1,3-Dichloropropene | 10061-01-5 | <0.0004 U | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | NA | NA | NA | NA |
| trans-1,3-Dichloropropene | 10061-02-6 | <0.0004 U | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | NA | NA | NA | NA |

| Station | | L12mw-242 | L12mw-242 | L12mw-245 | L12mw-247 | LL11mw-005 | LL1mw-064 | LL1mw-065 | LL1mw-080 | LL1mw-081 | LL1mw-083 | LL1mw-084 | LL1mw-086 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | LL12mw-242-190401-GW | LL12mw-242-190401-GW | LL12mw-245-190401-GW | LL12mw-247-190401-GW | LL11mw-005-190401-GW | LL1mw-064-190401-GW | LL1mw-065-190401-GW | LL1mw-080-190401-GW | LL1mw-081-190401-GW | LL1mw-083-190401-GW | LL1mw-084-190401-GW | LL1mw-086-190401-GW |
| Date | | 05/01/19 | 05/01/19 | 05/02/19 | 05/01/19 | 05/01/19 | 05/07/19 | 05/07/19 | 05/07/19 | 05/06/19 | 05/06/19 | 05/06/19 | 05/07/19 |
| Sample Type | | GR | GR | GR | GR | GR | GR | GR | GR | GR | GR | GR | GR |
| Filter Status | | Dissolved | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Dissolved |
| Aquifer | | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Unconsolidated |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Metals | | | | | | | | | | | | | |
| Aluminum | 7429-90-5 | NA | 1.5 | 0.031 J | 0.49 | NA | <0.07 U | <0.07 U | NA | NA | NA | 0.023 J | 0.053 J |
| Antimony | 7440-36-0 | 0.00087 J | <0.001 U | <0.001 U | <0.001 U | NA | <0.001 U | <0.001 U | NA | NA | NA | 0.00076 J | 0.00095 J |
| Arsenic | 7440-38-2 | 0.013 J | 0.022 | 0.012 | 0.009 | NA | 0.0049 J | <0.001 U | NA | NA | NA | <0.001 U | 0.0016 J |
| Barium | 7440-39-3 | 0.034 J | 0.037 | 0.028 | 0.029 | NA | 0.054 | 0.051 | NA | NA | NA | 0.003 J | 0.045 |
| Beryllium | 7440-41-7 | 0.00011 J | 0.00009 J | <0.0003 U | <0.0003 U | NA | <0.0003 U | <0.0003 U | NA | NA | NA | <0.0003 U | <0.0003 U |
| Cadmium | 7440-43-9 | <0.001 U | <0.001 U | <0.001 U | <0.001 U | NA | <0.001 U | <0.001 U | NA | NA | NA | <0.001 U | <0.001 U |
| Calcium | 7440-70-2 | 66 | 66 | 140 | 99 | NA | 63 | 86 | NA | NA | NA | 29 | 32 |
| Chromium | 7440-47-3 | 0.0024 J | 0.0031 J | <0.0018 U | 0.0011 J | NA | 0.00058 J | <0.0018 U | NA | NA | NA | <0.0018 U | <0.0018 U |
| Cobalt | 7440-48-4 | 0.00096 J | 0.002 | 0.0013 | <0.00075 U | NA | <0.0002 U | <0.0002 U | NA | NA | NA | 0.00035 J | 0.00056 J |
| Copper | 7440-50-8 | <0.0011 U | 0.0026 | 0.0013 J | 0.00059 J | NA | <0.0018 U | <0.0018 U | NA | NA | NA | <0.0018 U | <0.0018 U |
| Iron | 7439-89-6 | 2 | 3.8 | 0.75 | 1.6 | NA | 1.5 | <0.085 U | NA | NA | NA | 0.082 J | 0.12 |
| Lead | 7439-92-1 | 0.00067 J | 0.0017 J | 0.00032 J | 0.00038 J | NA | <0.0007 U | <0.0007 U | NA | NA | NA | <0.0007 U | <0.0007 U |
| Magnesium | 7439-95-4 | 41 | 40 | 67 | 52 | NA | 11 | 29 | NA | NA | NA | 13 | 28 |
| Manganese | 7439-96-5 | 0.074 J | NA | <0.11 U | 0.16 | NA | 0.12 | 0.036 | NA | NA | NA | 0.083 | 0.041 |
| Mercury | 7439-97-6 | <0.00008 U | <0.00008 U | <0.00008 U | <0.00008 U | NA | <0.00008 U | <0.00008 U | NA | NA | NA | <0.00008 U | <0.00008 U |
| Nickel | 7440-02-0 | 0.0021 J | 0.0043 | 0.0014 J | <0.0011 U | NA | <0.001 U | <0.001 U | NA | NA | NA | 0.0039 | 0.0018 J |
| Potassium | 7440-09-7 | 3.1 | <2.3 U | <3.4 U | 2.6 J | NA | 0.92 J | 1.4 J | NA | NA | NA | 0.88 J | 21 J |
| Selenium | 7782-49-2 | <0.001 U | <0.001 U | <0.001 U | <0.001 U | NA | <0.001 U | <0.001 U | NA | NA | NA | <0.001 U | <0.001 U |
| Silver | 7440-22-4 | <0.0001 U | <0.0001 U | <0.0001 U | <0.0001 U | NA | <0.0001 U | <0.0001 U | NA | NA | NA | <0.0001 U | <0.0001 U |
| Sodium | 7440-23-5 | 26 | 29 J | 25 J | 22 | NA | 5.5 J | 15 J | NA | NA | NA | 3.4 J | 13 |
| Thallium | 7440-28-0 | <0.0002 U | <0.0002 U | <0.0002 U | <0.0002 U | NA | <0.0002 U | <0.0002 U | NA | NA | NA | <0.0002 U | NA |
| Vanadium | 7440-62-2 | 0.0032 J | 0.0015 J | <0.003 U | <0.003 U | NA | <0.003 U | <0.003 U | NA | NA | NA | <0.003 U | <0.003 U |
| Zinc | 7440-66-6 | <0.0056 U | 0.0093 J | 0.0047 J | 0.0063 J | NA | <0.008 U | <0.008 U | NA | NA | NA | 0.0022 J | <0.008 U |
| Anions | | | | | | | | | | | | | |
| Nitrate | 14797-55-8 | NA | <0.1 U | 0.12 J | <0.1 U | NA | NA | NA | NA | NA | 0.44 | 0.33 | NA |
| Nitrite | 14797-65-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.1 U | <0.1 U | NA |
| Sulfate | 14808-79-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | 120 J | 140 J | NA |
| Sulfide | 18496-25-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | <1.9 U | 0.8 J | NA |
| Miscellaneous | | | | | | | | | | | | | |
| Alkalinity | N33 | NA | NA | NA | NA | NA | NA | NA | NA | NA | 44 | <10 U | NA |
| Chromium, hexavalent | 18540-29-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cyanide | 57-12-5 | NA | NA | NA | NA | <0.01 U | NA | NA | NA | <0.01 U | NA | NA | NA |
| Perchlorate | 14797-73-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Total Phosphorus as P | 7723-14-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Explosives/Propellants | | | | | | | | | | | | | |
| 1,3,5-Trinitrobenzene | 99-35-4 | NA | NA | <0.00042 U | NA | NA | NA | <0.00041 U | <0.00045 U | <0.00041 U | 0.0048 | 0.0014 | NA |
| 1,3-Dinitrobenzene | 99-65-0 | NA | NA | <0.00021 U | NA | NA | NA | <0.0002 U | <0.00023 U | <0.00021 U | 0.002 | 0.0024 | NA |
| 2,4,6-Trinitrotoluene | 118-96-7 | NA | NA | 0.00046 J | NA | NA | NA | <0.00041 U | <0.00045 U | <0.00041 U | 0.0019 | 0.0033 | NA |
| 2,4-Dinitrotoluene | 121-14-2 | NA | NA | <0.00021 U | NA | NA | NA | <0.0002 U | <0.00023 U | <0.00021 U | 0.0028 | 0.00087 | NA |
| 2,6-Dinitrotoluene | 606-20-2 | NA | NA | <0.00021 U | NA | NA | NA | <0.0002 U | <0.00023 U | <0.00021 U | <0.0002 U | <0.0002 U | NA |
| 2-Amino-4,6-Dinitrotoluene | 35572-78-2 | NA | NA | <0.00013 U | NA | NA | NA | <0.00012 U | 0.0012 | 0.00032 | 0.011 | 0.0079 | NA |
| 2-Nitrotoluene | 88-72-2 | NA | NA | <0.00021 U | NA | NA | NA | <0.0002 U | <0.00023 U | <0.00021 U | <0.0002 U | <0.0002 U | NA |
| 3-Nitrotoluene | 99-08-1 | NA | NA | <0.00042 U | NA | NA | NA | <0.00041 U | <0.00045 U | <0.00041 U | <0.00041 U | <0.0004 U | NA |
| 4-Amino-2,6-Dinitrotoluene | 19406-51-0 | NA | NA | <0.00013 U | NA | NA | NA | <0.00012 U | 0.0024 | 0.0003 | 0.014 | 0.018 | NA |
| 4-Nitrotoluene | 99-99-0 | NA | NA | <0.00042 U | NA | NA | NA | <0.00041 U | <0.00045 U | <0.00041 U | <0.00041 U | <0.0004 U | NA |

| Station | | L12mw-242 | L12mw-242 | L12mw-245 | L12mw-247 | LL11mw-005 | LL1mw-064 | LL1mw-065 | LL1mw-080 | LL1mw-081 | LL1mw-083 | LL1mw-084 | LL1mw-086 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | LL12mw-242-190401-GW | LL12mw-242-190401-GW | LL12mw-245-190401-GW | LL12mw-247-190401-GW | LL11mw-005-190401-GW | LL1mw-064-190401-GW | LL1mw-065-190401-GW | LL1mw-080-190401-GW | LL1mw-081-190401-GW | LL1mw-083-190401-GW | LL1mw-084-190401-GW | LL1mw-086-190401-GW |
| Date | | 05/01/19 | 05/01/19 | 05/02/19 | 05/01/19 | 05/01/19 | 05/07/19 | 05/07/19 | 05/07/19 | 05/06/19 | 05/06/19 | 05/06/19 | 05/07/19 |
| Sample Type | | GR | GR | GR | GR | GR | GR | GR | GR | GR | GR | GR | GR |
| Filter Status | | Dissolved | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Dissolved |
| Aquifer | | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Unconsolidated |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| HMX | 2691-41-0 | NA | NA | <0.00021 U | NA | NA | NA | <0.0002 U | 0.0023 | <0.00021 U | 0.0019 | <0.0002 U | NA |
| Nitrobenzene | 98-95-3 | NA | NA | <0.00021 U | NA | NA | NA | <0.0002 U | <0.00023 U | <0.00021 U | <0.0002 U | <0.0002 U | NA |
| Nitrocellulose | 9004-70-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Nitroglycerin | 55-63-0 | NA | NA | <0.0021 U | NA | NA | NA | <0.002 U | <0.0023 U | <0.0021 U | <0.002 U | <0.002 U | NA |
| Nitroguanidine | 556-88-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PETN | 78-11-5 | NA | NA | <0.0042 U | NA | NA | NA | <0.0041 U | <0.0045 U | <0.0041 U | <0.0041 U | <0.004 U | NA |
| RDX | 121-82-4 | NA | NA | 0.00072 J | NA | NA | NA | <0.00041 U | 0.013 | 0.00016 J | <0.00041 U | 0.002 | NA |
| Tetryl | 479-45-8 | NA | NA | <0.00021 U | NA | NA | NA | <0.0002 U | <0.00023 U | <0.00021 U | <0.0002 U | <0.0002 U | NA |
| SVOCs | | | | | | | | | | | | | |
| 1,2,4-Trichlorobenzene | 120-82-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,2-Dichlorobenzene | 95-50-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,3-Dichlorobenzene | 541-73-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,4-Dichlorobenzene | 106-46-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,4-Dioxane | 123-91-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1-Methylnaphthalene | 90-12-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4,5-Trichlorophenol | 95-95-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4,6-Trichlorophenol | 88-06-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4-Dichlorophenol | 120-83-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4-Dimethylphenol | 105-67-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4-Dinitrophenol | 51-28-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4-Dinitrotoluene | 121-14-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,6-Dinitrotoluene | 606-20-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Chloronaphthalene | 91-58-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Chlorophenol | 95-57-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methyl-4,6-dinitrophenol | 534-52-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | 91-57-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylphenol | 95-48-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Nitrobenzenamine | 88-74-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Nitrophenol | 88-75-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 3,3'-Dichlorobenzidine | 91-94-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 3-Nitrobenzenamine | 99-09-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Bromophenyl phenyl ether | 101-55-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Chloro-3-methylphenol | 59-50-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Chlorobenzenamine | 106-47-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Chlorophenyl phenyl ether | 7005-72-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Nitrobenzenamine | 100-01-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Nitrophenol | 100-02-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthene | 83-32-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | 208-96-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | 120-12-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benz(a)anthracene | 56-55-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzenemethanol | 100-51-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 50-32-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 205-99-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(ghi)perylene | 191-24-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | 207-08-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

| Station | | L12mw-242 | L12mw-242 | L12mw-245 | L12mw-247 | LL11mw-005 | LL1mw-064 | LL1mw-065 | LL1mw-080 | LL1mw-081 | LL1mw-083 | LL1mw-084 | LL1mw-086 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | LL12mw-242-190401-GW | LL12mw-242-190401-GW | LL12mw-245-190401-GW | LL12mw-247-190401-GW | LL11mw-005-190401-GW | LL1mw-064-190401-GW | LL1mw-065-190401-GW | LL1mw-080-190401-GW | LL1mw-081-190401-GW | LL1mw-083-190401-GW | LL1mw-084-190401-GW | LL1mw-086-190401-GW |
| Date | | 05/01/19 | 05/01/19 | 05/02/19 | 05/01/19 | 05/01/19 | 05/07/19 | 05/07/19 | 05/07/19 | 05/06/19 | 05/06/19 | 05/06/19 | 05/07/19 |
| Sample Type | | GR | GR | GR | GR | GR | GR | GR | GR | GR | GR | GR | GR |
| Filter Status | | Dissolved | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Dissolved |
| Aquifer | | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Unconsolidated |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Benzoic acid | 65-85-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-chloroethoxy)methane | 111-91-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-chloroethyl) ether | 111-44-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-chloroisopropyl) ether | 108-60-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Butyl benzyl phthalate | 85-68-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Carbazole | 86-74-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | 218-01-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Di-n-butyl phthalate | 84-74-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Di-n-octylphthalate | 117-84-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | 53-70-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenzofuran | 132-64-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Diethyl phthalate | 84-66-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dimethyl phthalate | 131-11-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | 206-44-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | 86-73-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorobenzene | 118-74-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorobutadiene | 87-68-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorocyclopentadiene | 77-47-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachloroethane | 67-72-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Isophorone | 78-59-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N-Nitroso-di-n-propylamine | 621-64-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N-Nitrosodiphenylamine | 86-30-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 91-20-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Nitrobenzene | 98-95-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pentachlorophenol | 87-86-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | 85-01-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenol | 108-95-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | 129-00-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Total Cresols | 1319-77-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCBs | | | | | | | | | | | | | |
| PCB-1016 | 12674-11-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1221 | 11104-28-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1232 | 11141-16-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1242 | 53469-21-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1248 | 12672-29-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1254 | 11097-69-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1260 | 11096-82-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pesticides | | | | | | | | | | | | | |
| 4,4'-DDD | 72-54-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4,4'-DDE | 72-55-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4,4'-DDT | 50-29-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Aldrin | 309-00-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dieldrin | 60-57-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Endosulfan I | 959-98-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

| Station | | L12mw-242 | L12mw-242 | L12mw-245 | L12mw-247 | LL11mw-005 | LL1mw-064 | LL1mw-065 | LL1mw-080 | LL1mw-081 | LL1mw-083 | LL1mw-084 | LL1mw-086 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | LL12mw-242-190401-GW | LL12mw-242-190401-GW | LL12mw-245-190401-GW | LL12mw-247-190401-GW | LL11mw-005-190401-GW | LL1mw-064-190401-GW | LL1mw-065-190401-GW | LL1mw-080-190401-GW | LL1mw-081-190401-GW | LL1mw-083-190401-GW | LL1mw-084-190401-GW | LL1mw-086-190401-GW |
| Date | | 05/01/19 | 05/01/19 | 05/02/19 | 05/01/19 | 05/01/19 | 05/07/19 | 05/07/19 | 05/07/19 | 05/06/19 | 05/06/19 | 05/06/19 | 05/07/19 |
| Sample Type | | GR | GR | GR | GR | GR | GR | GR | GR | GR | GR | GR | GR |
| Filter Status | | Dissolved | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Dissolved |
| Aquifer | | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Unconsolidated |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Endosulfan II | 33213-65-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Endosulfan sulfate | 1031-07-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Endrin | 72-20-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Endrin aldehyde | 7421-93-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Endrin ketone | 53494-70-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Heptachlor | 76-44-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Heptachlor epoxide | 1024-57-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Lindane | 58-89-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methoxychlor | 72-43-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Toxaphene | 8001-35-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| alpha-BHC | 319-84-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| alpha-Chlordane | 5103-71-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| beta-BHC | 319-85-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| delta-BHC | 319-86-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| gamma-Chlordane | 5103-74-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| VOCs | | | | | | | | | | | | | |
| 1,1,1-Trichloroethane | 71-55-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,1,2-Trichloroethane | 79-00-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,1-Dichloroethane | 75-34-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,1-Dichloroethene | 75-35-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,2-Dibromoethane | 106-93-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,2-Dichloroethane | 107-06-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,2-Dichloroethene | 540-59-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,2-Dichloropropane | 78-87-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Butanone | 78-93-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Hexanone | 591-78-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Methyl-2-pentanone | 108-10-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acetone | 67-64-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzene | 71-43-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromobenzene | 108-86-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromochloromethane | 74-97-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromodichloromethane | 75-27-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromoform | 75-25-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromomethane | 74-83-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Carbon disulfide | 75-15-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Carbon tetrachloride | 56-23-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chlorobenzene | 108-90-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chloroethane | 75-00-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chloroform | 67-66-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chloromethane | 74-87-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibromochloromethane | 124-48-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethylbenzene | 100-41-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methylene chloride | 75-09-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Styrene | 100-42-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Tetrachloroethene | 127-18-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

| Station | | L12mw-242 | L12mw-242 | L12mw-245 | L12mw-247 | LL11mw-005 | LL1mw-064 | LL1mw-065 | LL1mw-080 | LL1mw-081 | LL1mw-083 | LL1mw-084 | LL1mw-086 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | LL12mw-242-190401-GW | LL12mw-242-190401-GW | LL12mw-245-190401-GW | LL12mw-247-190401-GW | LL11mw-005-190401-GW | LL1mw-064-190401-GW | LL1mw-065-190401-GW | LL1mw-080-190401-GW | LL1mw-081-190401-GW | LL1mw-083-190401-GW | LL1mw-084-190401-GW | LL1mw-086-190401-GW |
| Date | | 05/01/19 | 05/01/19 | 05/02/19 | 05/01/19 | 05/01/19 | 05/07/19 | 05/07/19 | 05/07/19 | 05/06/19 | 05/06/19 | 05/06/19 | 05/07/19 |
| Sample Type | | GR | GR | GR | GR | GR | GR | GR | GR | GR | GR | GR | GR |
| Filter Status | | Dissolved | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Dissolved |
| Aquifer | | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Unconsolidated |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Toluene | 108-88-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Trichloroethene | 79-01-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Vinyl chloride | 75-01-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Xylenes, total | 1330-20-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| cis-1,3-Dichloropropene | 10061-01-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| trans-1,3-Dichloropropene | 10061-02-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

| Station | | LL1mw-086 | LL1mw-087 | LL1mw-088 | LL1mw-089 | LL1mw-089 | LL2mw-059 | LL2mw-264 | LL2mw-267 | LL2mw-272 | LL3mw-234 | LL3mw-237 | LL3mw-244 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | LL1mw-086-190401-GW | LL1mw-087-190401-GW | LL1mw-088-190401-GW | LL1mw-089-190402-GW | LL1mw-089-190401-GW | LL2mw-059-190401-GW | LL2mw-264-190401-GW | LL2mw-267-190401-GW | LL2mw-272-190401-GW | LL3mw-234-190401-GW | LL3mw-237-190401-GW | LL3mw-244-190401-GW |
| Date | | 05/07/19 | 05/02/19 | 05/08/19 | 05/07/19 | 05/07/19 | 05/06/19 | 05/02/19 | 05/02/19 | 05/06/19 | 05/06/19 | 05/06/19 | 05/06/19 |
| Sample Type | | GR | GR | GR | FD | GR | GR | GR | GR | GR | GR | GR | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Metals | | | | | | | | | | | | | |
| Aluminum | 7429-90-5 | 3.1 | 0.087 J | 0.31 | NA | NA | 0.033 J | NA | 0.1 J | NA | NA | NA | 0.24 J |
| Antimony | 7440-36-0 | <0.001 U | <0.001 U | <0.001 U | NA | NA | 0.00061 J | NA | <0.001 U | NA | NA | NA | <0.001 U |
| Arsenic | 7440-38-2 | 0.0042 J | 0.00036 J | 0.028 | NA | NA | <0.001 U | NA | 0.0021 J | NA | NA | NA | <0.001 U |
| Barium | 7440-39-3 | 0.14 | 0.018 | 0.039 | NA | NA | 0.015 J | NA | 0.017 | NA | NA | NA | 0.014 J |
| Beryllium | 7440-41-7 | 0.0001 J | <0.0003 U | <0.0003 U | NA | NA | <0.0003 U | NA | <0.0003 U | NA | NA | NA | 0.00012 J |
| Cadmium | 7440-43-9 | <0.001 U | <0.001 U | <0.001 U | NA | NA | <0.001 U | NA | <0.001 U | NA | NA | NA | 0.0012 |
| Calcium | 7440-70-2 | 71 | 79 | 75 | NA | NA | 24 | NA | 28 | NA | NA | NA | 60 |
| Chromium | 7440-47-3 | 0.0028 J | <0.0018 U | 0.0005 J | NA | NA | <0.0018 U | NA | 0.00079 J | NA | NA | NA | <0.0018 U |
| Cobalt | 7440-48-4 | 0.0026 | 0.00018 J | 0.00019 J | NA | NA | <0.0002 U | NA | 0.0044 | NA | NA | NA | 0.0088 |
| Copper | 7440-50-8 | 0.004 | 0.00094 J | <0.0018 U | NA | NA | <0.0018 U | NA | <0.0018 U | NA | NA | NA | 0.0035 |
| Iron | 7439-89-6 | 7.1 | 0.22 | 1.7 J | NA | NA | 0.046 J | NA | 2.5 | NA | NA | NA | <0.085 U |
| Lead | 7439-92-1 | 0.0022 J | <0.0007 U | 0.00018 J | NA | NA | <0.0007 U | NA | <0.0007 U | NA | NA | NA | 0.00033 J |
| Magnesium | 7439-95-4 | 39 | 19 | 33 | NA | NA | 7.9 | NA | 12 | NA | NA | NA | 3.1 |
| Manganese | 7439-96-5 | 0.36 | <0.037 U | 0.052 | NA | NA | <0.0012 U | NA | <0.59 U | NA | NA | NA | 0.085 |
| Mercury | 7439-97-6 | <0.00008 U | <0.00008 U | <0.00008 U | NA | NA | <0.00008 U | NA | <0.00008 U | NA | NA | NA | <0.00008 U |
| Nickel | 7440-02-0 | 0.006 | 0.00092 J | 0.00039 J | NA | NA | 0.0014 J | NA | 0.0031 | NA | NA | NA | 0.017 |
| Potassium | 7440-09-7 | 26 | 0.9 J | 2.4 J | NA | NA | 1.4 J | NA | 0.79 J | NA | NA | NA | 3.1 |
| Selenium | 7782-49-2 | <0.001 U | <0.001 U | <0.001 U | NA | NA | <0.001 U | NA | <0.001 U | NA | NA | NA | 0.0023 J |
| Silver | 7440-22-4 | <0.0001 UJ | <0.0001 U | <0.0001 U | NA | NA | <0.0001 U | NA | <0.0001 U | NA | NA | NA | <0.0001 U |
| Sodium | 7440-23-5 | 16 J | 10 J | 23 J | NA | NA | 3.3 J | NA | 8.1 J | NA | NA | NA | <2.8 UJ |
| Thallium | 7440-28-0 | <0.0002 U | <0.0002 U | <0.0002 U | NA | NA | <0.0002 U | NA | <0.0002 U | NA | NA | NA | 0.00027 J |
| Vanadium | 7440-62-2 | 0.0012 J | <0.003 U | <0.003 U | NA | NA | <0.003 U | NA | <0.003 U | NA | NA | NA | <0.003 U |
| Zinc | 7440-66-6 | 0.0093 J | <0.008 U | <0.008 U | NA | NA | 0.0021 J | NA | 0.0023 J | NA | NA | NA | 0.038 |
| Anions | | | | | | | | | | | | | |
| Nitrate | 14797-55-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Nitrite | 14797-65-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Sulfate | 14808-79-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Sulfide | 18496-25-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Miscellaneous | | | | | | | | | | | | | |
| Alkalinity | N33 | 110 | NA | 290 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chromium, hexavalent | 18540-29-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cyanide | 57-12-5 | <0.01 U | NA | NA | NA | NA | NA | 0.006 J | NA | <0.01 U | 0.0087 J | NA | NA |
| Perchlorate | 14797-73-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Total Phosphorus as P | 7723-14-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Explosives/Propellants | | | | | | | | | | | | | |
| 1,3,5-Trinitrobenzene | 99-35-4 | NA | <0.00041 U | <0.00044 U | <0.00042 U | <0.00047 U | 0.0023 | NA | <0.0004 U | NA | NA | <0.00041 U | <0.00044 U |
| 1,3-Dinitrobenzene | 99-65-0 | NA | <0.0002 U | <0.00022 U | <0.00021 U | <0.00024 U | 0.00027 J | NA | <0.0002 U | NA | NA | <0.0002 U | <0.00022 U |
| 2,4,6-Trinitrotoluene | 118-96-7 | NA | <0.00041 U | <0.00044 U | <0.00042 U | <0.00047 U | <0.00044 U | NA | <0.0004 U | NA | NA | 0.00042 | <0.00044 U |
| 2,4-Dinitrotoluene | 121-14-2 | NA | <0.0002 U | <0.00022 U | <0.00021 U | <0.00024 U | 0.00052 | NA | <0.0002 U | NA | NA | <0.0002 U | <0.00022 U |
| 2,6-Dinitrotoluene | 606-20-2 | NA | <0.0002 U | <0.00022 U | <0.00021 U | <0.00024 U | <0.00022 U | NA | <0.0002 U | NA | NA | <0.0002 U | <0.00022 U |
| 2-Amino-4,6-Dinitrotoluene | 35572-78-2 | NA | <0.00012 U | <0.00013 U | <0.00013 U | <0.00014 U | 0.00062 | NA | 0.00026 | NA | NA | 0.0023 | 0.0004 |
| 2-Nitrotoluene | 88-72-2 | NA | <0.0002 U | <0.00022 U | <0.00021 U | <0.00024 U | <0.00022 U | NA | <0.0002 U | NA | NA | <0.0002 U | <0.00022 U |
| 3-Nitrotoluene | 99-08-1 | NA | <0.00041 U | <0.00044 U | <0.00042 U | <0.00047 U | <0.00044 U | NA | <0.0004 U | NA | NA | <0.00041 U | <0.00044 U |
| 4-Amino-2,6-Dinitrotoluene | 19406-51-0 | NA | <0.00012 U | <0.00013 U | <0.00013 U | <0.00014 U | 0.00057 | NA | 0.00023 | NA | NA | 0.004 | 0.00035 |
| 4-Nitrotoluene | 99-99-0 | NA | <0.00041 U | <0.00044 U | <0.00042 U | <0.00047 U | <0.00044 U | NA | <0.0004 U | NA | NA | <0.00041 U | <0.00044 U |

| Station | | LL1mw-086 | LL1mw-087 | LL1mw-088 | LL1mw-089 | LL1mw-089 | LL2mw-059 | LL2mw-264 | LL2mw-267 | LL2mw-272 | LL3mw-234 | LL3mw-237 | LL3mw-244 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | LL1mw-086-190401-GW | LL1mw-087-190401-GW | LL1mw-088-190401-GW | LL1mw-089-190402-GW | LL1mw-089-190401-GW | LL2mw-059-190401-GW | LL2mw-264-190401-GW | LL2mw-267-190401-GW | LL2mw-272-190401-GW | LL3mw-234-190401-GW | LL3mw-237-190401-GW | LL3mw-244-190401-GW |
| Date | | 05/07/19 | 05/02/19 | 05/08/19 | 05/07/19 | 05/07/19 | 05/06/19 | 05/02/19 | 05/02/19 | 05/06/19 | 05/06/19 | 05/06/19 | 05/06/19 |
| Sample Type | | GR | GR | GR | FD | GR | GR | GR | GR | GR | GR | GR | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| HMX | 2691-41-0 | NA | <0.0002 U | <0.00022 U | <0.00021 U | <0.00024 U | <0.00022 U | NA | 0.00057 | NA | NA | <0.0002 U | <0.00022 U |
| Nitrobenzene | 98-95-3 | NA | <0.0002 U | <0.00022 U | <0.00021 U | <0.00024 U | <0.00022 U | NA | <0.0002 U | NA | NA | <0.0002 U | <0.00022 U |
| Nitrocellulose | 9004-70-0 | NA | NA | NA | 0.63 J | <1 U | NA | NA | NA | NA | NA | NA | NA |
| Nitroglycerin | 55-63-0 | NA | <0.002 U | <0.0022 U | <0.0021 U | <0.0024 U | <0.0022 U | NA | <0.002 U | NA | NA | <0.002 U | <0.0022 U |
| Nitroguanidine | 556-88-7 | NA | NA | NA | <0.006 U | <0.006 U | NA | NA | NA | NA | NA | NA | NA |
| PETN | 78-11-5 | NA | <0.0041 U | <0.0044 U | <0.0042 U | <0.0047 U | <0.0044 U | NA | <0.004 U | NA | NA | <0.0041 U | <0.0044 U |
| RDX | 121-82-4 | NA | <0.00041 U | <0.00044 U | <0.00042 U | <0.00047 U | <0.00044 U | NA | 0.00029 J | NA | NA | <0.00041 U | <0.00044 U |
| Tetryl | 479-45-8 | NA | <0.0002 U | <0.00022 U | <0.00021 U | <0.00024 U | <0.00022 U | NA | <0.0002 U | NA | NA | <0.0002 U | <0.00022 U |
| SVOCs | | | | | | | | | | | | | |
| 1,2,4-Trichlorobenzene | 120-82-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,2-Dichlorobenzene | 95-50-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,3-Dichlorobenzene | 541-73-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,4-Dichlorobenzene | 106-46-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,4-Dioxane | 123-91-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1-Methylnaphthalene | 90-12-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4,5-Trichlorophenol | 95-95-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4,6-Trichlorophenol | 88-06-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4-Dichlorophenol | 120-83-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4-Dimethylphenol | 105-67-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4-Dinitrophenol | 51-28-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,4-Dinitrotoluene | 121-14-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,6-Dinitrotoluene | 606-20-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Chloronaphthalene | 91-58-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Chlorophenol | 95-57-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methyl-4,6-dinitrophenol | 534-52-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylnaphthalene | 91-57-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Methylphenol | 95-48-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Nitrobenzenamine | 88-74-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Nitrophenol | 88-75-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 3,3'-Dichlorobenzidine | 91-94-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 3-Nitrobenzenamine | 99-09-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Bromophenyl phenyl ether | 101-55-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Chloro-3-methylphenol | 59-50-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Chlorobenzenamine | 106-47-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Chlorophenyl phenyl ether | 7005-72-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Nitrobenzenamine | 100-01-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Nitrophenol | 100-02-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthene | 83-32-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acenaphthylene | 208-96-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Anthracene | 120-12-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benz(a)anthracene | 56-55-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzenemethanol | 100-51-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 50-32-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | 205-99-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(ghi)perylene | 191-24-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | 207-08-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

| Station | | LL1mw-086 | LL1mw-087 | LL1mw-088 | LL1mw-089 | LL1mw-089 | LL2mw-059 | LL2mw-264 | LL2mw-267 | LL2mw-272 | LL3mw-234 | LL3mw-237 | LL3mw-244 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | LL1mw-086-190401-GW | LL1mw-087-190401-GW | LL1mw-088-190401-GW | LL1mw-089-190402-GW | LL1mw-089-190401-GW | LL2mw-059-190401-GW | LL2mw-264-190401-GW | LL2mw-267-190401-GW | LL2mw-272-190401-GW | LL3mw-234-190401-GW | LL3mw-237-190401-GW | LL3mw-244-190401-GW |
| Date | | 05/07/19 | 05/02/19 | 05/08/19 | 05/07/19 | 05/07/19 | 05/06/19 | 05/02/19 | 05/02/19 | 05/06/19 | 05/06/19 | 05/06/19 | 05/06/19 |
| Sample Type | | GR | GR | GR | FD | GR | GR | GR | GR | GR | GR | GR | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Benzoic acid | 65-85-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-chloroethoxy)methane | 111-91-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-chloroethyl) ether | 111-44-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-chloroisopropyl) ether | 108-60-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Butyl benzyl phthalate | 85-68-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Carbazole | 86-74-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | 218-01-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Di-n-butyl phthalate | 84-74-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Di-n-octylphthalate | 117-84-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenz(a,h)anthracene | 53-70-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenzofuran | 132-64-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Diethyl phthalate | 84-66-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dimethyl phthalate | 131-11-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoranthene | 206-44-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluorene | 86-73-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorobenzene | 118-74-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorobutadiene | 87-68-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorocyclopentadiene | 77-47-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachloroethane | 67-72-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Isophorone | 78-59-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N-Nitroso-di-n-propylamine | 621-64-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N-Nitrosodiphenylamine | 86-30-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 91-20-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Nitrobenzene | 98-95-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pentachlorophenol | 87-86-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | 85-01-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenol | 108-95-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pyrene | 129-00-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Total Cresols | 1319-77-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCBs | | | | | | | | | | | | | |
| PCB-1016 | 12674-11-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1221 | 11104-28-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1232 | 11141-16-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1242 | 53469-21-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1248 | 12672-29-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1254 | 11097-69-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PCB-1260 | 11096-82-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pesticides | | | | | | | | | | | | | |
| 4,4'-DDD | 72-54-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4,4'-DDE | 72-55-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4,4'-DDT | 50-29-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Aldrin | 309-00-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dieldrin | 60-57-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Endosulfan I | 959-98-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

| Station | | LL1mw-086 | LL1mw-087 | LL1mw-088 | LL1mw-089 | LL1mw-089 | LL2mw-059 | LL2mw-264 | LL2mw-267 | LL2mw-272 | LL3mw-234 | LL3mw-237 | LL3mw-244 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | LL1mw-086-190401-GW | LL1mw-087-190401-GW | LL1mw-088-190401-GW | LL1mw-089-190402-GW | LL1mw-089-190401-GW | LL2mw-059-190401-GW | LL2mw-264-190401-GW | LL2mw-267-190401-GW | LL2mw-272-190401-GW | LL3mw-234-190401-GW | LL3mw-237-190401-GW | LL3mw-244-190401-GW |
| Date | | 05/07/19 | 05/02/19 | 05/08/19 | 05/07/19 | 05/07/19 | 05/06/19 | 05/02/19 | 05/02/19 | 05/06/19 | 05/06/19 | 05/06/19 | 05/06/19 |
| Sample Type | | GR | GR | GR | FD | GR | GR | GR | GR | GR | GR | GR | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Endosulfan II | 33213-65-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Endosulfan sulfate | 1031-07-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Endrin | 72-20-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Endrin aldehyde | 7421-93-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Endrin ketone | 53494-70-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Heptachlor | 76-44-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Heptachlor epoxide | 1024-57-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Lindane | 58-89-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methoxychlor | 72-43-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Toxaphene | 8001-35-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| alpha-BHC | 319-84-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| alpha-Chlordane | 5103-71-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| beta-BHC | 319-85-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| delta-BHC | 319-86-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| gamma-Chlordane | 5103-74-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| VOCs | | | | | | | | | | | | | |
| 1,1,1-Trichloroethane | 71-55-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,1,2-Trichloroethane | 79-00-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,1-Dichloroethane | 75-34-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,1-Dichloroethene | 75-35-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,2-Dibromoethane | 106-93-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,2-Dichloroethane | 107-06-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,2-Dichloroethene | 540-59-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,2-Dichloropropane | 78-87-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Butanone | 78-93-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Hexanone | 591-78-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Methyl-2-pentanone | 108-10-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acetone | 67-64-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzene | 71-43-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromobenzene | 108-86-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromochloromethane | 74-97-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromodichloromethane | 75-27-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromoform | 75-25-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromomethane | 74-83-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Carbon disulfide | 75-15-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Carbon tetrachloride | 56-23-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chlorobenzene | 108-90-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chloroethane | 75-00-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chloroform | 67-66-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chloromethane | 74-87-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibromochloromethane | 124-48-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethylbenzene | 100-41-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methylene chloride | 75-09-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Styrene | 100-42-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Tetrachloroethene | 127-18-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

| Station | | LL1mw-086 | LL1mw-087 | LL1mw-088 | LL1mw-089 | LL1mw-089 | LL2mw-059 | LL2mw-264 | LL2mw-267 | LL2mw-272 | LL3mw-234 | LL3mw-237 | LL3mw-244 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | LL1mw-086-190401-GW | LL1mw-087-190401-GW | LL1mw-088-190401-GW | LL1mw-089-190402-GW | LL1mw-089-190401-GW | LL2mw-059-190401-GW | LL2mw-264-190401-GW | LL2mw-267-190401-GW | LL2mw-272-190401-GW | LL3mw-234-190401-GW | LL3mw-237-190401-GW | LL3mw-244-190401-GW |
| Date | | 05/07/19 | 05/02/19 | 05/08/19 | 05/07/19 | 05/07/19 | 05/06/19 | 05/02/19 | 05/02/19 | 05/06/19 | 05/06/19 | 05/06/19 | 05/06/19 |
| Sample Type | | GR | GR | GR | FD | GR | GR | GR | GR | GR | GR | GR | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Toluene | 108-88-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Trichloroethene | 79-01-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Vinyl chloride | 75-01-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Xylenes, total | 1330-20-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| cis-1,3-Dichloropropene | 10061-01-5 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| trans-1,3-Dichloropropene | 10061-02-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

| Station | | LL3mw-246 | LL3mw-246 | LL4mw-200 | LL7mw-001 | LL7mw-006 | NTAmw-119 | NTAmw-119 | NTAmw-120 | RQLmw-007 | RQLmw-008 | RQLmw-009 | RQLmw-011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | LL3mw-246-190402-GW | LL3mw-246-190401-GW | LL4mw-200-190401-GW | LL7mw-001-190401-GW | LL7mw-006-190401-GW | NTAmw-119-190402-GW | NTAmw-119-190401-GW | NTAmw-120-190401-GW | RQLmw-007-190401-GW | RQLmw-008-190401-GW | RQLmw-009-190401-GW | RQLmw-011-190402-GW |
| Date | | 05/09/19 | 05/09/19 | 05/02/19 | 05/01/19 | 05/01/19 | 04/30/19 | 04/30/19 | 04/30/19 | 05/09/19 | 05/09/19 | 05/09/19 | 05/09/19 |
| Sample Type | | FD | GR | GR | GR | GR | FD | GR | GR | GR | GR | GR | FD |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Upper Sharon | Upper Sharon | Unconsolidated | Homewood | Homewood | Unconsolidated | Unconsolidated | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Metals | | | | | | | | | | | | | |
| Aluminum | 7429-90-5 | <0.07 U | <0.07 U | NA | <0.07 U | NA | NA | 0.032 J | NA | 0.019 J | 0.025 J | 0.053 J | NA |
| Antimony | 7440-36-0 | 0.00056 J | 0.00059 J | NA | <0.001 U | NA | NA | <0.001 U | NA | <0.001 U | <0.001 U | <0.001 U | NA |
| Arsenic | 7440-38-2 | <0.001 U | <0.001 U | NA | 0.0017 J | NA | NA | 0.006 | NA | 0.0007 J | 0.011 | 0.0017 J | NA |
| Barium | 7440-39-3 | 0.015 | 0.015 | NA | 0.022 | NA | NA | 0.083 | NA | 0.025 | 0.057 | 0.021 | NA |
| Beryllium | 7440-41-7 | <0.0003 U | <0.0003 U | NA | <0.0003 U | NA | NA | <0.0003 U | NA | <0.0003 U | <0.0003 U | <0.0003 U | NA |
| Cadmium | 7440-43-9 | <0.001 U | <0.001 U | NA | <0.001 U | NA | NA | <0.001 U | NA | <0.001 U | <0.001 U | <0.001 U | NA |
| Calcium | 7440-70-2 | 20 | 20 | NA | 38 | NA | NA | 85 | NA | 58 | 41 | 18 | NA |
| Chromium | 7440-47-3 | <0.0018 U | <0.0018 U | NA | <0.0018 U | NA | NA | <0.0018 U | NA | <0.0018 U | <0.0018 U | <0.0018 U | NA |
| Cobalt | 7440-48-4 | <0.0002 U | <0.0002 U | NA | 0.0061 | NA | NA | <0.0002 U | NA | 0.0025 | 0.0024 | 0.00087 J | NA |
| Copper | 7440-50-8 | <0.0018 U | <0.0018 U | NA | <0.0018 U | NA | NA | <0.0018 U | NA | 0.003 | <0.0018 U | 0.002 | NA |
| Iron | 7439-89-6 | <0.085 U | 0.022 J | NA | 8.6 | NA | NA | 0.97 | NA | <0.075 U | 28 | 1.7 | NA |
| Lead | 7439-92-1 | <0.0007 U | <0.0007 U | NA | <0.0007 U | NA | NA | <0.0007 U | NA | 0.00028 J | <0.0007 U | 0.0014 J | NA |
| Magnesium | 7439-95-4 | 6.6 | 6.7 | NA | 12 | NA | NA | 21 | NA | 38 | 74 | 10 | NA |
| Manganese | 7439-96-5 | <0.0012 U | <0.0015 U | NA | 0.47 | NA | NA | 0.33 | NA | 0.49 | 0.46 | 0.3 | NA |
| Mercury | 7439-97-6 | <0.00008 U | <0.00008 U | NA | <0.00008 U | NA | NA | <0.00008 U | NA | <0.00008 U | <0.00008 U | <0.00008 U | NA |
| Nickel | 7440-02-0 | 0.0014 J | 0.0016 J | NA | 0.0088 | NA | NA | <0.001 U | NA | 0.032 | 0.004 | 0.0016 J | NA |
| Potassium | 7440-09-7 | 1.1 J | 1.2 J | NA | 1.1 J | NA | NA | 1.4 J | NA | 2.9 J | 2.1 J | 2.8 J | NA |
| Selenium | 7782-49-2 | <0.001 U | <0.001 U | NA | <0.001 U | NA | NA | <0.001 U | NA | <0.001 U | <0.001 U | <0.001 U | NA |
| Silver | 7440-22-4 | <0.0001 U | <0.0001 U | NA | <0.0001 U | NA | NA | <0.0001 U | NA | <0.0001 U | <0.0001 U | <0.0001 U | NA |
| Sodium | 7440-23-5 | 2.7 J | 2.8 J | NA | 5.4 | NA | NA | 6.4 | NA | <1.8 U | <2.2 U | <1.4 U | NA |
| Thallium | 7440-28-0 | <0.0002 U | <0.0002 U | NA | 0.00011 J | NA | NA | <0.0002 U | NA | <0.0002 U | <0.0002 U | <0.0002 U | NA |
| Vanadium | 7440-62-2 | <0.003 U | <0.003 U | NA | <0.003 U | NA | NA | <0.003 U | NA | <0.003 U | <0.003 U | <0.003 U | NA |
| Zinc | 7440-66-6 | 0.002 J | 0.0025 J | NA | 0.05 | NA | NA | <0.008 U | NA | 0.027 | 0.011 J | 0.0037 J | NA |
| Anions | | | | | | | | | | | | | |
| Nitrate | 14797-55-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.1 U |
| Nitrite | 14797-65-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.1 U |
| Sulfate | 14808-79-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 130 J |
| Sulfide | 18496-25-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <1.9 U |
| Miscellaneous | | | | | | | | | | | | | |
| Alkalinity | N33 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <10 U |
| Chromium, hexavalent | 18540-29-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cyanide | 57-12-5 | NA | NA | <0.01 U | <0.01 U | NA | NA | NA | NA | <0.01 U | 0.0053 J | 0.013 J | NA |
| Perchlorate | 14797-73-0 | 0.00006 J | 0.00005 J | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Total Phosphorus as P | 7723-14-0 | NA | NA | NA | NA | NA | NA | NA | NA | <0.05 U | NA | NA | NA |
| Explosives/Propellants | | | | | | | | | | | | | |
| 1,3,5-Trinitrobenzene | 99-35-4 | <0.00042 U | <0.00042 U | NA | NA | <0.0004 U | <0.00043 U | <0.00043 U | NA | <0.00045 U | <0.00045 U | <0.00042 U | NA |
| 1,3-Dinitrobenzene | 99-65-0 | <0.00021 U | <0.00021 U | NA | NA | <0.0002 U | <0.00021 U | <0.00022 U | NA | <0.00022 U | <0.00022 U | <0.00021 U | NA |
| 2,4,6-Trinitrotoluene | 118-96-7 | <0.00042 U | <0.00042 U | NA | NA | <0.0004 U | <0.00043 U | <0.00043 U | NA | <0.00045 U | <0.00045 U | <0.00042 U | NA |
| 2,4-Dinitrotoluene | 121-14-2 | <0.00021 U | <0.00021 U | NA | NA | <0.0002 U | <0.00021 U | <0.00022 U | NA | <0.00022 U | <0.00022 U | <0.00021 U | NA |
| 2,6-Dinitrotoluene | 606-20-2 | <0.00021 U | <0.00021 U | NA | NA | <0.0002 U | <0.00021 U | <0.00022 U | NA | <0.00022 U | <0.00022 U | <0.00021 U | NA |
| 2-Amino-4,6-Dinitrotoluene | 35572-78-2 | 0.0003 | 0.00031 | NA | NA | <0.00012 U | <0.00013 U | <0.00013 U | NA | <0.00013 U | <0.00013 U | <0.00013 U | NA |
| 2-Nitrotoluene | 88-72-2 | <0.00021 U | <0.00021 U | NA | NA | <0.0002 U | <0.00021 UJ | <0.00022 UJ | NA | <0.00022 U | <0.00022 U | <0.00021 U | NA |
| 3-Nitrotoluene | 99-08-1 | <0.00042 U | <0.00042 U | NA | NA | <0.0004 U | <0.00043 U | <0.00043 UJ | NA | <0.00045 U | <0.00045 U | <0.00042 U | NA |
| 4-Amino-2,6-Dinitrotoluene | 19406-51-0 | 0.00026 | 0.00027 | NA | NA | <0.00012 U | <0.00013 U | <0.00013 U | NA | <0.00013 U | <0.00013 U | <0.00013 U | NA |
| 4-Nitrotoluene | 99-99-0 | <0.00042 U | <0.00042 U | NA | NA | <0.0004 U | <0.00043 U | <0.00043 UJ | NA | <0.00045 U | <0.00045 U | <0.00042 U | NA |

| Station | | LL3mw-246 | LL3mw-246 | LL4mw-200 | LL7mw-001 | LL7mw-006 | NTAmw-119 | NTAmw-119 | NTAmw-120 | RQLmw-007 | RQLmw-008 | RQLmw-009 | RQLmw-011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | LL3mw-246-190402-GW | LL3mw-246-190401-GW | LL4mw-200-190401-GW | LL7mw-001-190401-GW | LL7mw-006-190401-GW | NTAmw-119-190402-GW | NTAmw-119-190401-GW | NTAmw-120-190401-GW | RQLmw-007-190401-GW | RQLmw-008-190401-GW | RQLmw-009-190401-GW | RQLmw-011-190402-GW |
| Date | | 05/09/19 | 05/09/19 | 05/02/19 | 05/01/19 | 05/01/19 | 04/30/19 | 04/30/19 | 04/30/19 | 05/09/19 | 05/09/19 | 05/09/19 | 05/09/19 |
| Sample Type | | FD | GR | GR | GR | GR | FD | GR | GR | GR | GR | GR | FD |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Upper Sharon | Upper Sharon | Unconsolidated | Homewood | Homewood | Unconsolidated | Unconsolidated | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| HMX | 2691-41-0 | <0.00021 U | <0.00021 U | NA | NA | 0.00017 J | <0.00021 U | <0.00022 U | NA | <0.00022 U | <0.00022 U | <0.00021 U | NA |
| Nitrobenzene | 98-95-3 | <0.00021 U | <0.00021 U | NA | NA | <0.0002 U | <0.00021 U | <0.00022 U | NA | <0.00022 U | <0.00022 U | <0.00021 U | NA |
| Nitrocellulose | 9004-70-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Nitroglycerin | 55-63-0 | <0.0021 U | <0.0021 U | NA | NA | <0.002 U | <0.0021 U | <0.0022 U | NA | <0.0022 U | <0.0022 U | <0.0021 U | NA |
| Nitroguanidine | 556-88-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| PETN | 78-11-5 | <0.0042 U | <0.0042 U | NA | NA | <0.004 U | <0.0043 U | <0.0043 U | NA | <0.0045 U | <0.0045 U | <0.0042 U | NA |
| RDX | 121-82-4 | <0.00042 U | <0.00042 U | NA | NA | 0.00042 | <0.00043 U | <0.00043 U | NA | <0.00045 U | <0.00045 U | <0.00042 U | NA |
| Tetryl | 479-45-8 | <0.00021 U | <0.00021 U | NA | NA | <0.0002 U | <0.00021 U | <0.00022 U | NA | <0.00022 U | <0.00022 U | <0.00021 U | NA |
| SVOCs | | | | | | | | | | | | | |
| 1,2,4-Trichlorobenzene | 120-82-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,2-Dichlorobenzene | 95-50-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,3-Dichlorobenzene | 541-73-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,4-Dichlorobenzene | 106-46-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,4-Dioxane | 123-91-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1-Methylnaphthalene | 90-12-0 | NA | NA | NA | NA | NA | NA | <0.00004 U | NA | <0.00004 U | <0.00004 U | <0.00004 U | NA |
| 2,4,5-Trichlorophenol | 95-95-4 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0046 U | <0.0046 U | <0.0048 U | NA |
| 2,4,6-Trichlorophenol | 88-06-2 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0011 U | <0.001 U | <0.0011 U | NA |
| 2,4-Dichlorophenol | 120-83-2 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0021 U | <0.0021 U | <0.0022 U | NA |
| 2,4-Dimethylphenol | 105-67-9 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0021 U | <0.0021 U | <0.0022 U | NA |
| 2,4-Dinitrophenol | 51-28-5 | NA | NA | NA | NA | NA | NA | NA | NA | <0.032 U | <0.031 U | <0.033 U | NA |
| 2,4-Dinitrotoluene | 121-14-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2,6-Dinitrotoluene | 606-20-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Chloronaphthalene | 91-58-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Chlorophenol | 95-57-8 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0046 U | <0.0046 U | <0.0048 U | NA |
| 2-Methyl-4,6-dinitrophenol | 534-52-1 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0093 U | <0.0092 U | <0.0096 U | NA |
| 2-Methylnaphthalene | 91-57-6 | NA | NA | NA | NA | NA | NA | <0.00006 U | NA | <0.00006 U | <0.00005 U | <0.00005 U | NA |
| 2-Methylphenol | 95-48-7 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0021 U | <0.0021 U | <0.0022 U | NA |
| 2-Nitrobenzenamine | 88-74-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Nitrophenol | 88-75-5 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0011 U | <0.001 U | <0.0011 U | NA |
| 3,3'-Dichlorobenzidine | 91-94-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 3-Nitrobenzenamine | 99-09-2 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Bromophenyl phenyl ether | 101-55-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Chloro-3-methylphenol | 59-50-7 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0053 U | <0.0052 U | <0.0055 U | NA |
| 4-Chlorobenzenamine | 106-47-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Chlorophenyl phenyl ether | 7005-72-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Nitrobenzenamine | 100-01-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Nitrophenol | 100-02-7 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0042 U | <0.0042 U | <0.0044 U | NA |
| Acenaphthene | 83-32-9 | NA | NA | NA | NA | NA | NA | <0.00004 U | NA | <0.00004 U | <0.00004 U | <0.00004 U | NA |
| Acenaphthylene | 208-96-8 | NA | NA | NA | NA | NA | NA | <0.00004 U | NA | <0.00004 U | <0.00004 U | <0.00004 U | NA |
| Anthracene | 120-12-7 | NA | NA | NA | NA | NA | NA | <0.00011 U | NA | <0.00011 U | <0.00011 U | <0.0001 U | NA |
| Benz(a)anthracene | 56-55-3 | NA | NA | NA | NA | NA | NA | <0.00011 U | NA | <0.00011 U | <0.00011 U | <0.0001 U | NA |
| Benzenemethanol | 100-51-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | 50-32-8 | NA | NA | NA | NA | NA | NA | <0.00006 U | NA | <0.00006 U | <0.00005 U | <0.00005 U | NA |
| Benzo(b)fluoranthene | 205-99-2 | NA | NA | NA | NA | NA | NA | <0.00011 U | NA | <0.00011 U | <0.00011 U | <0.0001 U | NA |
| Benzo(ghi)perylene | 191-24-2 | NA | NA | NA | NA | NA | NA | <0.00011 U | NA | <0.00011 U | <0.00011 U | <0.0001 U | NA |
| Benzo(k)fluoranthene | 207-08-9 | NA | NA | NA | NA | NA | NA | <0.00006 U | NA | <0.00006 U | <0.00005 U | <0.00005 U | NA |

| Station | | LL3mw-246 | LL3mw-246 | LL4mw-200 | LL7mw-001 | LL7mw-006 | NTAmw-119 | NTAmw-119 | NTAmw-120 | RQLmw-007 | RQLmw-008 | RQLmw-009 | RQLmw-011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | LL3mw-246-190402-GW | LL3mw-246-190401-GW | LL4mw-200-190401-GW | LL7mw-001-190401-GW | LL7mw-006-190401-GW | NTAmw-119-190402-GW | NTAmw-119-190401-GW | NTAmw-120-190401-GW | RQLmw-007-190401-GW | RQLmw-008-190401-GW | RQLmw-009-190401-GW | RQLmw-011-190402-GW |
| Date | | 05/09/19 | 05/09/19 | 05/02/19 | 05/01/19 | 05/01/19 | 04/30/19 | 04/30/19 | 04/30/19 | 05/09/19 | 05/09/19 | 05/09/19 | 05/09/19 |
| Sample Type | | FD | GR | GR | GR | GR | FD | GR | GR | GR | GR | GR | FD |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Upper Sharon | Upper Sharon | Unconsolidated | Homewood | Homewood | Unconsolidated | Unconsolidated | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Benzoic acid | 65-85-0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-chloroethoxy)methane | 111-91-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-chloroethyl) ether | 111-44-4 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-chloroisopropyl) ether | 108-60-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0021 U | <0.0021 U | <0.0022 U | NA |
| Butyl benzyl phthalate | 85-68-7 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0021 U | <0.0021 U | <0.0022 U | NA |
| Carbazole | 86-74-8 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | 218-01-9 | NA | NA | NA | NA | NA | NA | <0.00011 U | NA | <0.00011 U | <0.00011 U | <0.0001 U | NA |
| Di-n-butyl phthalate | 84-74-2 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0046 U | <0.0046 U | <0.0048 U | NA |
| Di-n-octylphthalate | 117-84-0 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0011 U | <0.001 U | <0.0011 U | NA |
| Dibenz(a,h)anthracene | 53-70-3 | NA | NA | NA | NA | NA | NA | <0.00011 U | NA | <0.00011 U | <0.00011 U | <0.0001 U | NA |
| Dibenzofuran | 132-64-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Diethyl phthalate | 84-66-2 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0011 U | <0.001 U | <0.0011 U | NA |
| Dimethyl phthalate | 131-11-3 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00053 U | <0.00052 U | <0.00055 U | NA |
| Fluoranthene | 206-44-0 | NA | NA | NA | NA | NA | NA | <0.00011 U | NA | <0.00011 U | <0.00011 U | <0.0001 U | NA |
| Fluorene | 86-73-7 | NA | NA | NA | NA | NA | NA | <0.00004 U | NA | <0.00004 U | <0.00004 U | <0.00004 U | NA |
| Hexachlorobenzene | 118-74-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorobutadiene | 87-68-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorocyclopentadiene | 77-47-4 | NA | NA | NA | NA | NA | NA | NA | <0.0098 U | NA | NA | NA | NA |
| Hexachloroethane | 67-72-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | NA | NA | NA | NA | NA | NA | <0.00011 U | NA | <0.00011 U | <0.00011 U | <0.0001 U | NA |
| Isophorone | 78-59-1 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N-Nitroso-di-n-propylamine | 621-64-7 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N-Nitrosodiphenylamine | 86-30-6 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Naphthalene | 91-20-3 | NA | NA | NA | NA | NA | NA | <0.00006 U | NA | <0.00006 U | <0.00005 U | <0.00005 U | NA |
| Nitrobenzene | 98-95-3 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pentachlorophenol | 87-86-5 | NA | NA | NA | NA | NA | NA | NA | NA | <0.063 U | <0.062 U | <0.065 U | NA |
| Phenanthrene | 85-01-8 | NA | NA | NA | NA | NA | NA | <0.00011 U | NA | <0.00011 U | <0.00011 U | <0.0001 U | NA |
| Phenol | 108-95-2 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0046 U | <0.0046 U | <0.0048 U | NA |
| Pyrene | 129-00-0 | NA | NA | NA | NA | NA | NA | <0.00011 U | NA | <0.00011 U | <0.00011 U | <0.0001 U | NA |
| Total Cresols | 1319-77-3 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00053 U | <0.00052 U | <0.00055 U | NA |
| PCBs | | | | | | | | | | | | | |
| PCB-1016 | 12674-11-2 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | <0.00042 U | <0.00043 U | NA |
| PCB-1221 | 11104-28-2 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00025 U | <0.00026 U | <0.00027 U | NA |
| PCB-1232 | 11141-16-5 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00061 U | <0.00063 U | <0.00065 U | NA |
| PCB-1242 | 53469-21-9 | NA | NA | NA | NA | NA | NA | NA | NA | <0.001 U | <0.0011 U | <0.0011 U | NA |
| PCB-1248 | 12672-29-6 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0003 U | <0.00032 U | <0.00032 U | NA |
| PCB-1254 | 11097-69-1 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00025 U | <0.00026 U | <0.00027 U | NA |
| PCB-1260 | 11096-82-5 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | <0.00042 U | <0.00043 U | NA |
| Pesticides | | | | | | | | | | | | | |
| 4,4'-DDD | 72-54-8 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA |
| 4,4'-DDE | 72-55-9 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00002 UJ | <0.00002 UJ | <0.00002 UJ | NA |
| 4,4'-DDT | 50-29-3 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00005 U | <0.00005 U | <0.00005 U | NA |
| Aldrin | 309-00-2 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00002 UJ | <0.00002 UJ | <0.00002 UJ | NA |
| Dieldrin | 60-57-1 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA |
| Endosulfan I | 959-98-8 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA |

| Station | | LL3mw-246 | LL3mw-246 | LL4mw-200 | LL7mw-001 | LL7mw-006 | NTAmw-119 | NTAmw-119 | NTAmw-120 | RQLmw-007 | RQLmw-008 | RQLmw-009 | RQLmw-011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | LL3mw-246-190402-GW | LL3mw-246-190401-GW | LL4mw-200-190401-GW | LL7mw-001-190401-GW | LL7mw-006-190401-GW | NTAmw-119-190402-GW | NTAmw-119-190401-GW | NTAmw-120-190401-GW | RQLmw-007-190401-GW | RQLmw-008-190401-GW | RQLmw-009-190401-GW | RQLmw-011-190402-GW |
| Date | | 05/09/19 | 05/09/19 | 05/02/19 | 05/01/19 | 05/01/19 | 04/30/19 | 04/30/19 | 04/30/19 | 05/09/19 | 05/09/19 | 05/09/19 | 05/09/19 |
| Sample Type | | FD | GR | GR | GR | GR | FD | GR | GR | GR | GR | GR | FD |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Upper Sharon | Upper Sharon | Unconsolidated | Homewood | Homewood | Unconsolidated | Unconsolidated | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Endosulfan II | 33213-65-9 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA |
| Endosulfan sulfate | 1031-07-8 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA |
| Endrin | 72-20-8 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA |
| Endrin aldehyde | 7421-93-4 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA |
| Endrin ketone | 53494-70-5 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA |
| Heptachlor | 76-44-8 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA |
| Heptachlor epoxide | 1024-57-3 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA |
| Lindane | 58-89-9 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA |
| Methoxychlor | 72-43-5 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00005 U | <0.00005 U | <0.00005 U | NA |
| Toxaphene | 8001-35-2 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00081 U | <0.00084 U | <0.00086 U | NA |
| alpha-BHC | 319-84-6 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA |
| alpha-Chlordane | 5103-71-9 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00002 UJ | <0.00002 UJ | <0.00002 UJ | NA |
| beta-BHC | 319-85-7 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA |
| delta-BHC | 319-86-8 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00002 U | <0.00002 U | <0.00002 U | NA |
| gamma-Chlordane | 5103-74-2 | NA | NA | NA | NA | NA | NA | NA | NA | <0.00002 UJ | <0.00002 UJ | <0.00002 UJ | NA |
| VOCs | | | | | | | | | | | | | |
| 1,1,1-Trichloroethane | 71-55-6 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0008 U | <0.0008 U | <0.0008 U | NA |
| 1,1,2-Trichloroethane | 79-00-5 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0008 U | <0.0008 U | <0.0008 U | NA |
| 1,1-Dichloroethane | 75-34-3 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0008 U | <0.0008 U | <0.0008 U | NA |
| 1,1-Dichloroethene | 75-35-4 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0008 U | <0.0008 U | <0.0008 U | NA |
| 1,2-Dibromoethane | 106-93-4 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA |
| 1,2-Dichloroethane | 107-06-2 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA |
| 1,2-Dichloroethene | 540-59-0 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA |
| 1,2-Dichloropropane | 78-87-5 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA |
| 2-Butanone | 78-93-3 | NA | NA | NA | NA | NA | NA | NA | NA | <0.004 U | <0.004 U | <0.004 U | NA |
| 2-Hexanone | 591-78-6 | NA | NA | NA | NA | NA | NA | NA | NA | <0.004 U | <0.004 U | <0.004 U | NA |
| 4-Methyl-2-pentanone | 108-10-1 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0032 U | <0.0032 U | <0.0032 U | NA |
| Acetone | 67-64-1 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0064 U | <0.0026 U | <0.0064 U | NA |
| Benzene | 71-43-2 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA |
| Bromobenzene | 108-86-1 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA |
| Bromochloromethane | 74-97-5 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0002 U | <0.0002 U | <0.0002 U | NA |
| Bromodichloromethane | 75-27-4 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA |
| Bromoform | 75-25-2 | NA | NA | NA | NA | NA | NA | NA | NA | <0.001 U | <0.001 U | <0.001 U | NA |
| Bromomethane | 74-83-9 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0008 U | <0.0008 U | <0.0008 U | NA |
| Carbon disulfide | 75-15-0 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0008 U | <0.0008 U | <0.0008 U | NA |
| Carbon tetrachloride | 56-23-5 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA |
| Chlorobenzene | 108-90-7 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA |
| Chloroethane | 75-00-3 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0016 U | <0.0016 U | <0.0016 U | NA |
| Chloroform | 67-66-3 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA |
| Chloromethane | 74-87-3 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0008 U | <0.0008 U | <0.0008 U | NA |
| Dibromochloromethane | 124-48-1 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA |
| Ethylbenzene | 100-41-4 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA |
| Methylene chloride | 75-09-2 | NA | NA | NA | NA | NA | NA | NA | NA | <0.002 U | <0.002 U | <0.002 U | NA |
| Styrene | 100-42-5 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0008 U | <0.0008 U | <0.0008 U | NA |
| Tetrachloroethene | 127-18-4 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA |

| Station | | LL3mw-246 | LL3mw-246 | LL4mw-200 | LL7mw-001 | LL7mw-006 | NTAmw-119 | NTAmw-119 | NTAmw-120 | RQLmw-007 | RQLmw-008 | RQLmw-009 | RQLmw-011 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | LL3mw-246-190402-GW | LL3mw-246-190401-GW | LL4mw-200-190401-GW | LL7mw-001-190401-GW | LL7mw-006-190401-GW | NTAmw-119-190402-GW | NTAmw-119-190401-GW | NTAmw-120-190401-GW | RQLmw-007-190401-GW | RQLmw-008-190401-GW | RQLmw-009-190401-GW | RQLmw-011-190402-GW |
| Date | | 05/09/19 | 05/09/19 | 05/02/19 | 05/01/19 | 05/01/19 | 04/30/19 | 04/30/19 | 04/30/19 | 05/09/19 | 05/09/19 | 05/09/19 | 05/09/19 |
| Sample Type | | FD | GR | GR | GR | GR | FD | GR | GR | GR | GR | GR | FD |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Upper Sharon | Upper Sharon | Unconsolidated | Homewood | Homewood | Unconsolidated | Unconsolidated | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Toluene | 108-88-3 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA |
| Trichloroethene | 79-01-6 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA |
| Vinyl chloride | 75-01-4 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0002 U | <0.0002 U | <0.0002 U | NA |
| Xylenes, total | 1330-20-7 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0008 U | <0.0008 U | <0.0008 U | NA |
| cis-1,3-Dichloropropene | 10061-01-5 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA |
| trans-1,3-Dichloropropene | 10061-02-6 | NA | NA | NA | NA | NA | NA | NA | NA | <0.0004 U | <0.0004 U | <0.0004 U | NA |

| Station | | RQLmw-011 | RQLmw-012 | RQLmw-013 | RQLmw-016 | SCFmw-004 | SCLmw-001 | SCLmw-002 | SCLmw-002 | SCLmw-003 | WBGmw-006 | WBGmw-009 | WBGmw-020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | RQLmw-011-190401-GW | RQLmw-012-190401-GW | RQLmw-013-190401-GW | RQLmw-016-190401-GW | SCFmw-004-190401-GW | SCLmw-001-190401-GW | SCLmw-002-190402-GW | SCLmw-002-190401-GW | SCLmw-003-190401-GW | WBGmw-006-190401-GW | WBGmw-009-190401-GW | WBGmw-020-190401-GW |
| Date | | 05/09/19 | 05/09/19 | 05/09/19 | 05/09/19 | 05/02/19 | 05/08/19 | 05/08/19 | 05/08/19 | 05/08/19 | 04/30/19 | 04/30/19 | 04/30/19 |
| Sample Type | | GR | GR | GR | GR | GR | GR | FD | GR | GR | GR | GR | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Basal Sharon Congl | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Metals | | | | | | | | | | | | | |
| Aluminum | 7429-90-5 | NA | NA | NA | NA | <0.07 U | 0.037 J | 0.018 J | 0.019 J | <0.07 U | 0.019 J | 0.019 J | <0.07 U |
| Antimony | 7440-36-0 | NA | NA | NA | NA | <0.001 U | 0.00053 J | 0.00059 J | <0.001 U | <0.001 U | <0.001 U | <0.001 U | <0.001 U |
| Arsenic | 7440-38-2 | NA | NA | NA | NA | <0.001 U | 0.0034 J | 0.001 J | 0.00086 J | 0.0046 J | <0.001 U | <0.001 U | 0.0012 J |
| Barium | 7440-39-3 | NA | NA | NA | NA | 0.059 | 0.053 J | 0.051 J | 0.051 J | 0.021 J | 0.021 | 0.03 | 0.015 |
| Beryllium | 7440-41-7 | NA | NA | NA | NA | <0.0003 U | <0.0003 U | 0.00056 J | <0.0003 U | <0.0003 U | <0.0003 U | <0.0003 U | 0.00008 J |
| Cadmium | 7440-43-9 | NA | NA | NA | NA | <0.001 U | <0.001 U | <0.001 U | <0.001 U | <0.001 U | <0.001 U | <0.001 U | <0.001 U |
| Calcium | 7440-70-2 | NA | NA | NA | NA | 150 | 130 | 190 | 190 | 160 | 79 | 49 | 31 |
| Chromium | 7440-47-3 | NA | NA | NA | NA | 0.0013 J | <0.0018 U | <0.0018 U | <0.0018 U | <0.0018 U | <0.0018 U | <0.0018 U | <0.0018 U |
| Cobalt | 7440-48-4 | NA | NA | NA | NA | 0.00014 J | 0.00067 J | 0.00011 J | 0.00006 J | 0.0027 | <0.00029 U | <0.00062 U | <0.00038 U |
| Copper | 7440-50-8 | NA | NA | NA | NA | 0.028 | <0.0018 U | <0.0018 U | <0.0018 U | <0.0018 U | <0.0018 U | <0.0018 U | <0.0018 U |
| Iron | 7439-89-6 | NA | NA | NA | NA | 0.081 J | 1.3 | 10 | 10 | 0.21 | 0.046 J | 0.058 J | 3.4 |
| Lead | 7439-92-1 | NA | NA | NA | NA | 0.0083 | 0.00021 J | <0.0007 U | <0.0007 U | <0.0007 U | <0.0007 U | <0.0007 U | <0.0007 U |
| Magnesium | 7439-95-4 | NA | NA | NA | NA | 58 | 42 | 16 | 16 | 67 | 26 | 12 | 10 |
| Manganese | 7439-96-5 | NA | NA | NA | NA | <0.84 U | 0.31 | 1 | 1.1 | 0.23 | 0.099 | 0.18 | 0.22 |
| Mercury | 7439-97-6 | NA | NA | NA | NA | <0.00008 U | <0.00008 U | <0.00008 U | <0.00008 U | <0.00008 U | <0.00008 U | <0.00008 U | <0.00008 U |
| Nickel | 7440-02-0 | NA | NA | NA | NA | 0.01 | 0.00071 J | <0.001 U | <0.001 U | 0.0029 J | 0.00033 J | 0.0027 J | 0.0022 J |
| Potassium | 7440-09-7 | NA | NA | NA | NA | 2.9 J | 3.8 | 4 | 4 | 6 | 0.86 J | 0.61 J | 0.8 J |
| Selenium | 7782-49-2 | NA | NA | NA | NA | <0.001 U | <0.001 U | 0.00048 J | <0.001 U | <0.001 U | <0.001 U | <0.001 U | <0.001 U |
| Silver | 7440-22-4 | NA | NA | NA | NA | <0.0001 U | 0.00018 J | 0.00004 J | <0.0001 U | <0.0001 U | <0.0001 U | <0.0001 U | <0.0001 U |
| Sodium | 7440-23-5 | NA | NA | NA | NA | 13 J | 19 | 3.3 J | 3.3 J | 38 J | 5.5 | 3.3 J | 3.9 J |
| Thallium | 7440-28-0 | NA | NA | NA | NA | <0.0002 U | <0.0002 U | 0.00009 J | <0.0002 U | <0.0002 U | <0.0002 U | <0.0002 U | <0.0002 U |
| Vanadium | 7440-62-2 | NA | NA | NA | NA | <0.003 U | <0.003 U | <0.003 U | <0.003 U | <0.003 U | <0.003 U | <0.003 U | <0.003 U |
| Zinc | 7440-66-6 | NA | NA | NA | NA | 0.39 | 0.0022 J | 0.002 J | 0.002 J | 0.0022 J | <0.008 U | <0.008 U | <0.008 U |
| Anions | | | | | | | | | | | | | |
| Nitrate | 14797-55-8 | <0.1 U | 0.61 | <0.1 U | NA | NA | <0.1 U | NA | <0.1 U | <0.1 U | NA | NA | NA |
| Nitrite | 14797-65-0 | <0.1 U | <0.1 UJ | <0.1 R | NA | NA | <0.1 U | NA | <0.1 U | <0.1 U | NA | NA | NA |
| Sulfate | 14808-79-8 | 130 J | 110 J | 160 J | NA | NA | 160 | NA | 190 | 240 | NA | NA | NA |
| Sulfide | 18496-25-8 | <1.9 U | <1.9 U | <1.9 U | NA | NA | <1.9 U | NA | <1.9 U | <1.9 U | NA | NA | NA |
| Miscellaneous | | | | | | | | | | | | | |
| Alkalinity | N33 | <10 U | 9.9 J | <10 U | NA | NA | 320 | NA | 300 | 390 | NA | NA | NA |
| Chromium, hexavalent | 18540-29-9 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cyanide | 57-12-5 | NA | 0.04 J | NA | <0.01 U | NA | 0.015 J | 0.0052 J | <0.01 U | <0.01 U | NA | NA | NA |
| Perchlorate | 14797-73-0 | NA | NA | NA | NA | NA | <0.00001 U | NA | <0.00001 U | <0.00001 U | NA | NA | NA |
| Total Phosphorus as P | 7723-14-0 | NA | NA | NA | NA | NA | 0.018 J | 0.11 J | 0.1 J | <0.05 U | NA | NA | NA |
| Explosives/Propellants | | | | | | | | | | | | | |
| 1,3,5-Trinitrobenzene | 99-35-4 | NA | NA | NA | NA | NA | <0.00042 U | NA | <0.00042 U | <0.00043 U | <0.00039 U | <0.00042 U | <0.00039 U |
| 1,3-Dinitrobenzene | 99-65-0 | NA | NA | NA | NA | NA | <0.00021 U | NA | <0.00021 U | <0.00022 U | <0.0002 U | <0.00021 U | <0.00019 U |
| 2,4,6-Trinitrotoluene | 118-96-7 | NA | NA | NA | NA | NA | <0.00042 U | NA | <0.00042 U | <0.00043 U | <0.00039 U | <0.00042 U | <0.00039 U |
| 2,4-Dinitrotoluene | 121-14-2 | NA | NA | NA | NA | NA | <0.00021 U | NA | <0.00021 U | <0.00022 U | <0.0002 U | <0.00021 U | <0.00019 U |
| 2,6-Dinitrotoluene | 606-20-2 | NA | NA | NA | NA | NA | <0.00021 U | NA | <0.00021 U | <0.00022 U | <0.0002 U | <0.00021 U | <0.00019 U |
| 2-Amino-4,6-Dinitrotoluene | 35572-78-2 | NA | NA | NA | NA | NA | <0.00013 U | NA | <0.00013 U | <0.00013 U | <0.00012 U | <0.00013 U | <0.00012 U |
| 2-Nitrotoluene | 88-72-2 | NA | NA | NA | NA | NA | <0.00021 U | NA | <0.00021 U | <0.00022 U | <0.0002 UJ | <0.00021 UJ | <0.00019 UJ |
| 3-Nitrotoluene | 99-08-1 | NA | NA | NA | NA | NA | <0.00042 U | NA | <0.00042 U | <0.00043 U | <0.00039 U | <0.00042 U | <0.00039 U |
| 4-Amino-2,6-Dinitrotoluene | 19406-51-0 | NA | NA | NA | NA | NA | <0.00013 U | NA | <0.00013 U | <0.00013 U | <0.00012 U | <0.00013 U | <0.00012 U |
| 4-Nitrotoluene | 99-99-0 | NA | NA | NA | NA | NA | <0.00042 U | NA | <0.00042 U | <0.00043 U | <0.00039 U | <0.00042 U | <0.00039 U |

| Station | | RQLmw-011 | RQLmw-012 | RQLmw-013 | RQLmw-016 | SCFmw-004 | SCLmw-001 | SCLmw-002 | SCLmw-002 | SCLmw-003 | WBGmw-006 | WBGmw-009 | WBGmw-020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | RQLmw-011-190401-GW | RQLmw-012-190401-GW | RQLmw-013-190401-GW | RQLmw-016-190401-GW | SCFmw-004-190401-GW | SCLmw-001-190401-GW | SCLmw-002-190402-GW | SCLmw-002-190401-GW | SCLmw-003-190401-GW | WBGmw-006-190401-GW | WBGmw-009-190401-GW | WBGmw-020-190401-GW |
| Date | | 05/09/19 | 05/09/19 | 05/09/19 | 05/09/19 | 05/02/19 | 05/08/19 | 05/08/19 | 05/08/19 | 05/08/19 | 04/30/19 | 04/30/19 | 04/30/19 |
| Sample Type | | GR | GR | GR | GR | GR | GR | FD | GR | GR | GR | GR | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Basal Sharon Congl | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| HMX | 2691-41-0 | NA | NA | NA | NA | NA | <0.00021 U | NA | <0.00021 U | <0.00022 U | 0.0034 | 0.00067 | <0.00019 U |
| Nitrobenzene | 98-95-3 | NA | NA | NA | NA | NA | <0.00021 U | NA | <0.00021 U | <0.00022 U | <0.0002 U | <0.00021 U | <0.00019 U |
| Nitrocellulose | 9004-70-0 | NA | NA | NA | NA | NA | <1 U | NA | <1 U | <1 U | NA | NA | NA |
| Nitroglycerin | 55-63-0 | NA | NA | NA | NA | NA | <0.0021 U | NA | <0.0021 U | <0.0022 U | <0.002 U | <0.0021 U | <0.0019 U |
| Nitroguanidine | 556-88-7 | NA | NA | NA | NA | NA | <0.006 U | NA | <0.006 U | <0.006 U | NA | NA | NA |
| PETN | 78-11-5 | NA | NA | NA | NA | NA | <0.0042 U | NA | <0.0042 U | <0.0043 U | <0.0039 U | <0.0042 U | <0.0039 U |
| RDX | 121-82-4 | NA | NA | NA | NA | NA | <0.00042 U | NA | <0.00042 U | <0.00043 U | 0.011 | 0.0016 | <0.00039 U |
| Tetryl | 479-45-8 | NA | NA | NA | NA | NA | <0.00021 U | NA | <0.00021 U | <0.00022 U | <0.0002 U | <0.00021 U | <0.00019 U |
| SVOCs | | | | | | | | | | | | | |
| 1,2,4-Trichlorobenzene | 120-82-1 | NA | NA | NA | NA | NA | <0.002 U | <0.0021 U | <0.002 U | <0.0021 U | NA | NA | NA |
| 1,2-Dichlorobenzene | 95-50-1 | NA | NA | NA | NA | NA | <0.0005 U | <0.00052 U | <0.00051 U | <0.00051 U | NA | NA | NA |
| 1,3-Dichlorobenzene | 541-73-1 | NA | NA | NA | NA | NA | <0.00099 U | <0.001 U | <0.001 U | <0.001 U | NA | NA | NA |
| 1,4-Dichlorobenzene | 106-46-7 | NA | NA | NA | NA | NA | <0.004 U | <0.0041 U | <0.0041 U | <0.0041 U | NA | NA | NA |
| 1,4-Dioxane | 123-91-1 | NA | NA | NA | NA | NA | <0.00099 U | <0.001 U | <0.001 U | <0.001 U | NA | NA | NA |
| 1-Methylnaphthalene | 90-12-0 | NA | NA | NA | NA | NA | <0.00004 U | <0.00004 U | <0.00004 U | <0.00004 U | NA | NA | NA |
| 2,4,5-Trichlorophenol | 95-95-4 | NA | NA | NA | NA | NA | <0.0044 U | <0.0045 U | <0.0045 U | <0.0045 U | NA | NA | NA |
| 2,4,6-Trichlorophenol | 88-06-2 | NA | NA | NA | NA | NA | <0.00099 U | <0.001 U | <0.001 U | <0.001 U | NA | NA | NA |
| 2,4-Dichlorophenol | 120-83-2 | NA | NA | NA | NA | NA | <0.002 U | <0.0021 U | <0.002 U | <0.0021 U | NA | NA | NA |
| 2,4-Dimethylphenol | 105-67-9 | NA | NA | NA | NA | NA | <0.002 U | <0.0021 U | <0.002 U | <0.0021 U | NA | NA | NA |
| 2,4-Dinitrophenol | 51-28-5 | NA | NA | NA | NA | NA | <0.03 U | <0.031 U | <0.03 U | <0.031 U | NA | NA | NA |
| 2,4-Dinitrotoluene | 121-14-2 | NA | NA | NA | NA | NA | <0.0044 U | <0.0045 U | <0.0045 U | <0.0045 U | NA | NA | NA |
| 2,6-Dinitrotoluene | 606-20-2 | NA | NA | NA | NA | NA | <0.0044 U | <0.0045 U | <0.0045 U | <0.0045 U | NA | NA | NA |
| 2-Chloronaphthalene | 91-58-7 | NA | NA | NA | NA | NA | <0.00099 U | <0.001 U | <0.001 U | <0.001 U | NA | NA | NA |
| 2-Chlorophenol | 95-57-8 | NA | NA | NA | NA | NA | <0.0044 U | <0.0045 U | <0.0045 U | <0.0045 U | NA | NA | NA |
| 2-Methyl-4,6-dinitrophenol | 534-52-1 | NA | NA | NA | NA | NA | <0.0087 U | <0.0091 U | <0.0089 U | <0.009 U | NA | NA | NA |
| 2-Methylnaphthalene | 91-57-6 | NA | NA | NA | NA | NA | <0.00005 U | <0.00005 U | <0.00005 U | <0.00005 U | NA | NA | NA |
| 2-Methylphenol | 95-48-7 | NA | NA | NA | NA | NA | <0.002 U | <0.0021 U | <0.002 U | <0.0021 U | NA | NA | NA |
| 2-Nitrobenzenamine | 88-74-4 | NA | NA | NA | NA | NA | <0.0044 U | <0.0045 U | <0.0045 U | <0.0045 U | NA | NA | NA |
| 2-Nitrophenol | 88-75-5 | NA | NA | NA | NA | NA | <0.00099 U | <0.001 U | <0.001 U | <0.001 U | NA | NA | NA |
| 3,3'-Dichlorobenzidine | 91-94-1 | NA | NA | NA | NA | NA | <0.0044 U | <0.0045 U | <0.0045 U | <0.0045 U | NA | NA | NA |
| 3-Nitrobenzenamine | 99-09-2 | NA | NA | NA | NA | NA | <0.0044 U | <0.0045 U | <0.0045 U | <0.0045 U | NA | NA | NA |
| 4-Bromophenyl phenyl ether | 101-55-3 | NA | NA | NA | NA | NA | <0.00099 U | <0.001 U | <0.001 U | <0.001 U | NA | NA | NA |
| 4-Chloro-3-methylphenol | 59-50-7 | NA | NA | NA | NA | NA | <0.005 U | <0.0052 U | <0.0051 U | <0.0051 U | NA | NA | NA |
| 4-Chlorobenzenamine | 106-47-8 | NA | NA | NA | NA | NA | <0.0044 U | <0.0045 U | <0.0045 U | <0.0045 U | NA | NA | NA |
| 4-Chlorophenyl phenyl ether | 7005-72-3 | NA | NA | NA | NA | NA | <0.0044 U | <0.0045 U | <0.0045 U | <0.0045 U | NA | NA | NA |
| 4-Nitrobenzenamine | 100-01-6 | NA | NA | NA | NA | NA | <0.0044 U | <0.0045 U | <0.0045 U | <0.0045 U | NA | NA | NA |
| 4-Nitrophenol | 100-02-7 | NA | NA | NA | NA | NA | <0.004 U | <0.0041 U | <0.0041 U | <0.0041 U | NA | NA | NA |
| Acenaphthene | 83-32-9 | NA | NA | NA | NA | NA | <0.00004 U | <0.00004 U | <0.00004 U | <0.00004 U | NA | NA | NA |
| Acenaphthylene | 208-96-8 | NA | NA | NA | NA | NA | <0.00004 U | <0.00004 U | <0.00004 U | <0.00004 U | NA | NA | NA |
| Anthracene | 120-12-7 | NA | NA | NA | NA | NA | <0.00011 U | <0.0001 U | <0.0001 U | <0.0001 U | NA | NA | NA |
| Benz(a)anthracene | 56-55-3 | NA | NA | NA | NA | NA | <0.00011 U | <0.0001 U | <0.0001 U | <0.0001 U | NA | NA | NA |
| Benzenemethanol | 100-51-6 | NA | NA | NA | NA | NA | <0.0005 U | <0.00052 U | <0.00051 U | <0.00051 U | NA | NA | NA |
| Benzo(a)pyrene | 50-32-8 | NA | NA | NA | NA | NA | <0.00005 U | <0.00005 U | <0.00005 U | <0.00005 U | NA | NA | NA |
| Benzo(b)fluoranthene | 205-99-2 | NA | NA | NA | NA | NA | <0.00011 U | <0.0001 U | <0.0001 U | <0.0001 U | NA | NA | NA |
| Benzo(ghi)perylene | 191-24-2 | NA | NA | NA | NA | NA | <0.00011 U | <0.0001 U | <0.0001 U | <0.0001 U | NA | NA | NA |
| Benzo(k)fluoranthene | 207-08-9 | NA | NA | NA | NA | NA | <0.00005 U | <0.00005 U | <0.00005 U | <0.00005 U | NA | NA | NA |

| Station | | RQLmw-011 | RQLmw-012 | RQLmw-013 | RQLmw-016 | SCFmw-004 | SCLmw-001 | SCLmw-002 | SCLmw-002 | SCLmw-003 | WBGmw-006 | WBGmw-009 | WBGmw-020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | RQLmw-011-190401-GW | RQLmw-012-190401-GW | RQLmw-013-190401-GW | RQLmw-016-190401-GW | SCFmw-004-190401-GW | SCLmw-001-190401-GW | SCLmw-002-190402-GW | SCLmw-002-190401-GW | SCLmw-003-190401-GW | WBGmw-006-190401-GW | WBGmw-009-190401-GW | WBGmw-020-190401-GW |
| Date | | 05/09/19 | 05/09/19 | 05/09/19 | 05/09/19 | 05/02/19 | 05/08/19 | 05/08/19 | 05/08/19 | 05/08/19 | 04/30/19 | 04/30/19 | 04/30/19 |
| Sample Type | | GR | GR | GR | GR | GR | GR | FD | GR | GR | GR | GR | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Basal Sharon Congl | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Benzoic acid | 65-85-0 | NA | NA | NA | NA | NA | <0.03 UJ | <0.031 UJ | <0.03 UJ | <0.031 UJ | NA | NA | NA |
| Bis(2-chloroethoxy)methane | 111-91-1 | NA | NA | NA | NA | NA | <0.002 U | <0.0021 U | <0.002 U | <0.0021 U | NA | NA | NA |
| Bis(2-chloroethyl) ether | 111-44-4 | NA | NA | NA | NA | NA | <0.002 U | <0.0021 U | <0.002 U | <0.0021 U | NA | NA | NA |
| Bis(2-chloroisopropyl) ether | 108-60-1 | NA | NA | NA | NA | NA | <0.00099 U | <0.001 U | <0.001 U | <0.001 U | NA | NA | NA |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | NA | NA | NA | NA | NA | <0.002 U | <0.0021 U | <0.002 U | <0.0021 U | NA | NA | NA |
| Butyl benzyl phthalate | 85-68-7 | NA | NA | NA | NA | NA | <0.002 U | <0.0021 U | <0.002 U | <0.0021 U | NA | NA | NA |
| Carbazole | 86-74-8 | NA | NA | NA | NA | NA | <0.00099 U | <0.001 U | <0.001 U | <0.001 U | NA | NA | NA |
| Chrysene | 218-01-9 | NA | NA | NA | NA | NA | <0.00011 U | <0.0001 U | <0.0001 U | <0.0001 U | NA | NA | NA |
| Di-n-butyl phthalate | 84-74-2 | NA | NA | NA | NA | NA | <0.0044 U | <0.0045 U | <0.0045 U | <0.0045 U | NA | NA | NA |
| Di-n-octylphthalate | 117-84-0 | NA | NA | NA | NA | NA | <0.00099 U | <0.001 U | <0.001 U | <0.001 U | NA | NA | NA |
| Dibenz(a,h)anthracene | 53-70-3 | NA | NA | NA | NA | NA | <0.00011 U | <0.0001 U | <0.0001 U | <0.0001 U | NA | NA | NA |
| Dibenzofuran | 132-64-9 | NA | NA | NA | NA | NA | <0.00099 U | <0.001 U | <0.001 U | <0.001 U | NA | NA | NA |
| Diethyl phthalate | 84-66-2 | NA | NA | NA | NA | NA | <0.00099 U | <0.001 U | <0.001 U | <0.001 U | NA | NA | NA |
| Dimethyl phthalate | 131-11-3 | NA | NA | NA | NA | NA | <0.0005 U | <0.00052 U | <0.00051 U | <0.00051 U | NA | NA | NA |
| Fluoranthene | 206-44-0 | NA | NA | NA | NA | NA | <0.00011 U | <0.0001 U | <0.0001 U | <0.0001 U | NA | NA | NA |
| Fluorene | 86-73-7 | NA | NA | NA | NA | NA | <0.00004 U | <0.00004 U | <0.00004 U | <0.00004 U | NA | NA | NA |
| Hexachlorobenzene | 118-74-1 | NA | NA | NA | NA | NA | <0.002 U | <0.0021 U | <0.002 U | <0.0021 U | NA | NA | NA |
| Hexachlorobutadiene | 87-68-3 | NA | NA | NA | NA | NA | <0.0099 U | <0.01 U | <0.01 U | <0.01 U | NA | NA | NA |
| Hexachlorocyclopentadiene | 77-47-4 | NA | NA | NA | NA | NA | <0.0099 UJ | <0.01 UJ | <0.01 UJ | <0.01 UJ | NA | NA | NA |
| Hexachloroethane | 67-72-1 | NA | NA | NA | NA | NA | <0.002 U | <0.0021 U | <0.002 U | <0.0021 U | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | NA | NA | NA | NA | NA | <0.00011 U | <0.0001 U | <0.0001 U | <0.0001 U | NA | NA | NA |
| Isophorone | 78-59-1 | NA | NA | NA | NA | NA | <0.0005 U | <0.00052 U | <0.00051 U | <0.00051 U | NA | NA | NA |
| N-Nitroso-di-n-propylamine | 621-64-7 | NA | NA | NA | NA | NA | <0.00099 U | <0.001 U | <0.001 U | <0.001 U | NA | NA | NA |
| N-Nitrosodiphenylamine | 86-30-6 | NA | NA | NA | NA | NA | <0.00099 U | <0.001 U | <0.001 UJ | <0.001 U | NA | NA | NA |
| Naphthalene | 91-20-3 | NA | NA | NA | NA | NA | <0.00005 U | <0.00005 U | <0.00005 U | <0.00005 U | NA | NA | NA |
| Nitrobenzene | 98-95-3 | NA | NA | NA | NA | NA | <0.002 U | <0.0021 U | <0.002 U | <0.0021 U | NA | NA | NA |
| Pentachlorophenol | 87-86-5 | NA | NA | NA | NA | NA | <0.06 U | <0.062 U | <0.061 U | <0.062 U | NA | NA | NA |
| Phenanthrene | 85-01-8 | NA | NA | NA | NA | NA | <0.00011 U | <0.0001 U | <0.0001 U | <0.0001 U | NA | NA | NA |
| Phenol | 108-95-2 | NA | NA | NA | NA | NA | <0.0044 U | <0.0045 U | <0.0045 U | <0.0045 U | NA | NA | NA |
| Pyrene | 129-00-0 | NA | NA | NA | NA | NA | <0.00011 U | <0.0001 U | <0.0001 U | <0.0001 U | NA | NA | NA |
| Total Cresols | 1319-77-3 | NA | NA | NA | NA | NA | <0.0005 U | <0.00052 U | <0.00051 U | <0.00051 U | NA | NA | NA |
| PCBs | | | | | | | | | | | | | |
| PCB-1016 | 12674-11-2 | NA | NA | NA | NA | NA | <0.00041 U | NA | <0.00044 U | <0.00042 U | NA | NA | NA |
| PCB-1221 | 11104-28-2 | NA | NA | NA | NA | NA | <0.00026 U | NA | <0.00027 U | <0.00026 U | NA | NA | NA |
| PCB-1232 | 11141-16-5 | NA | NA | NA | NA | NA | <0.00062 U | NA | <0.00065 U | <0.00063 U | NA | NA | NA |
| PCB-1242 | 53469-21-9 | NA | NA | NA | NA | NA | <0.001 U | NA | <0.0011 U | <0.0011 U | NA | NA | NA |
| PCB-1248 | 12672-29-6 | NA | NA | NA | NA | NA | <0.00031 U | NA | <0.00033 U | <0.00032 U | NA | NA | NA |
| PCB-1254 | 11097-69-1 | NA | NA | NA | NA | NA | <0.00026 U | NA | <0.00027 U | <0.00026 U | NA | NA | NA |
| PCB-1260 | 11096-82-5 | NA | NA | NA | NA | NA | <0.00041 U | NA | <0.00044 U | <0.00042 U | NA | NA | NA |
| Pesticides | | | | | | | | | | | | | |
| 4,4'-DDD | 72-54-8 | NA | NA | NA | NA | NA | <0.00002 U | NA | <0.00002 U | <0.00002 U | NA | NA | NA |
| 4,4'-DDE | 72-55-9 | NA | NA | NA | NA | NA | <0.00002 UJ | NA | <0.00002 UJ | <0.00002 UJ | NA | NA | NA |
| 4,4'-DDT | 50-29-3 | NA | NA | NA | NA | NA | <0.00005 U | NA | <0.00005 U | <0.00005 U | NA | NA | NA |
| Aldrin | 309-00-2 | NA | NA | NA | NA | NA | <0.00002 UJ | NA | <0.00002 UJ | <0.00002 UJ | NA | NA | NA |
| Dieldrin | 60-57-1 | NA | NA | NA | NA | NA | <0.00002 U | NA | <0.00002 U | <0.00002 U | NA | NA | NA |
| Endosulfan I | 959-98-8 | NA | NA | NA | NA | NA | <0.00002 U | NA | <0.00002 U | <0.00002 U | NA | NA | NA |

| Station | | RQLmw-011 | RQLmw-012 | RQLmw-013 | RQLmw-016 | SCFmw-004 | SCLmw-001 | SCLmw-002 | SCLmw-002 | SCLmw-003 | WBGmw-006 | WBGmw-009 | WBGmw-020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | RQLmw-011-190401-GW | RQLmw-012-190401-GW | RQLmw-013-190401-GW | RQLmw-016-190401-GW | SCFmw-004-190401-GW | SCLmw-001-190401-GW | SCLmw-002-190402-GW | SCLmw-002-190401-GW | SCLmw-003-190401-GW | WBGmw-006-190401-GW | WBGmw-009-190401-GW | WBGmw-020-190401-GW |
| Date | | 05/09/19 | 05/09/19 | 05/09/19 | 05/09/19 | 05/02/19 | 05/08/19 | 05/08/19 | 05/08/19 | 05/08/19 | 04/30/19 | 04/30/19 | 04/30/19 |
| Sample Type | | GR | GR | GR | GR | GR | GR | FD | GR | GR | GR | GR | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Basal Sharon Congl | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Endosulfan II | 33213-65-9 | NA | NA | NA | NA | NA | <0.00002 U | NA | <0.00002 U | <0.00002 U | NA | NA | NA |
| Endosulfan sulfate | 1031-07-8 | NA | NA | NA | NA | NA | <0.00002 U | NA | <0.00002 U | <0.00002 U | NA | NA | NA |
| Endrin | 72-20-8 | NA | NA | NA | NA | NA | <0.00002 U | NA | <0.00002 U | <0.00002 U | NA | NA | NA |
| Endrin aldehyde | 7421-93-4 | NA | NA | NA | NA | NA | <0.00002 U | NA | <0.00002 U | <0.00002 U | NA | NA | NA |
| Endrin ketone | 53494-70-5 | NA | NA | NA | NA | NA | <0.00002 U | NA | <0.00002 U | <0.00002 U | NA | NA | NA |
| Heptachlor | 76-44-8 | NA | NA | NA | NA | NA | <0.00002 U | NA | <0.00002 U | <0.00002 U | NA | NA | NA |
| Heptachlor epoxide | 1024-57-3 | NA | NA | NA | NA | NA | <0.00002 U | NA | <0.00002 U | <0.00002 U | NA | NA | NA |
| Lindane | 58-89-9 | NA | NA | NA | NA | NA | <0.00002 U | NA | <0.00002 U | <0.00002 U | NA | NA | NA |
| Methoxychlor | 72-43-5 | NA | NA | NA | NA | NA | <0.00005 U | NA | <0.00005 U | <0.00005 U | NA | NA | NA |
| Toxaphene | 8001-35-2 | NA | NA | NA | NA | NA | <0.00083 U | NA | <0.00087 U | <0.00085 U | NA | NA | NA |
| alpha-BHC | 319-84-6 | NA | NA | NA | NA | NA | <0.00002 U | NA | <0.00002 U | <0.00002 U | NA | NA | NA |
| alpha-Chlordane | 5103-71-9 | NA | NA | NA | NA | NA | <0.00002 UJ | NA | <0.00002 UJ | <0.00002 UJ | NA | NA | NA |
| beta-BHC | 319-85-7 | NA | NA | NA | NA | NA | <0.00002 U | NA | <0.00002 U | <0.00002 U | NA | NA | NA |
| delta-BHC | 319-86-8 | NA | NA | NA | NA | NA | <0.00002 U | NA | <0.00002 U | <0.00002 U | NA | NA | NA |
| gamma-Chlordane | 5103-74-2 | NA | NA | NA | NA | NA | <0.00002 UJ | NA | <0.00002 UJ | <0.00002 UJ | NA | NA | NA |
| VOCs | | | | | | | | | | | | | |
| 1,1,1-Trichloroethane | 71-55-6 | NA | NA | NA | NA | NA | <0.0004 UJ | NA | <0.0004 U | <0.0004 UJ | NA | NA | NA |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | NA | NA | NA | NA | NA | <0.0008 UJ | NA | <0.0008 U | <0.0008 UJ | NA | NA | NA |
| 1,1,2-Trichloroethane | 79-00-5 | NA | NA | NA | NA | NA | <0.0008 UJ | NA | <0.0008 U | <0.0008 UJ | NA | NA | NA |
| 1,1-Dichloroethane | 75-34-3 | NA | NA | NA | NA | NA | <0.0008 UJ | NA | <0.0008 U | <0.0008 UJ | NA | NA | NA |
| 1,1-Dichloroethene | 75-35-4 | NA | NA | NA | NA | NA | <0.0008 UJ | NA | <0.0008 U | <0.0008 UJ | NA | NA | NA |
| 1,2-Dibromoethane | 106-93-4 | NA | NA | NA | NA | NA | <0.0004 UJ | NA | <0.0004 U | <0.0004 UJ | NA | NA | NA |
| 1,2-Dichloroethane | 107-06-2 | NA | NA | NA | NA | NA | <0.00015 UJ | NA | <0.0004 U | <0.0004 UJ | NA | NA | NA |
| 1,2-Dichloroethene | 540-59-0 | NA | NA | NA | NA | NA | <0.0004 UJ | NA | <0.0004 U | <0.0004 UJ | NA | NA | NA |
| 1,2-Dichloropropane | 78-87-5 | NA | NA | NA | NA | NA | <0.0004 UJ | NA | <0.0004 U | <0.0004 UJ | NA | NA | NA |
| 2-Butanone | 78-93-3 | NA | NA | NA | NA | NA | <0.004 UJ | NA | <0.004 U | <0.004 UJ | NA | NA | NA |
| 2-Hexanone | 591-78-6 | NA | NA | NA | NA | NA | <0.004 UJ | NA | <0.004 U | <0.004 UJ | NA | NA | NA |
| 4-Methyl-2-pentanone | 108-10-1 | NA | NA | NA | NA | NA | <0.0032 UJ | NA | <0.0032 U | <0.0032 UJ | NA | NA | NA |
| Acetone | 67-64-1 | NA | NA | NA | NA | NA | <0.0064 UJ | NA | 0.0021 J | 0.0021 J | NA | NA | NA |
| Benzene | 71-43-2 | NA | NA | NA | NA | NA | <0.0004 UJ | NA | <0.0004 U | <0.0004 UJ | NA | NA | NA |
| Bromobenzene | 108-86-1 | NA | NA | NA | NA | NA | <0.0004 UJ | NA | <0.0004 U | <0.0004 UJ | NA | NA | NA |
| Bromochloromethane | 74-97-5 | NA | NA | NA | NA | NA | <0.0002 UJ | NA | <0.0002 U | <0.0002 UJ | NA | NA | NA |
| Bromodichloromethane | 75-27-4 | NA | NA | NA | NA | NA | <0.0004 UJ | NA | <0.0004 U | <0.0004 UJ | NA | NA | NA |
| Bromoform | 75-25-2 | NA | NA | NA | NA | NA | <0.001 UJ | NA | <0.001 U | <0.001 UJ | NA | NA | NA |
| Bromomethane | 74-83-9 | NA | NA | NA | NA | NA | <0.0008 UJ | NA | <0.0008 U | <0.0008 UJ | NA | NA | NA |
| Carbon disulfide | 75-15-0 | NA | NA | NA | NA | NA | <0.0008 UJ | NA | <0.0008 U | <0.00043 UJ | NA | NA | NA |
| Carbon tetrachloride | 56-23-5 | NA | NA | NA | NA | NA | <0.0004 UJ | NA | <0.0004 U | <0.0004 UJ | NA | NA | NA |
| Chlorobenzene | 108-90-7 | NA | NA | NA | NA | NA | <0.0004 UJ | NA | <0.0004 U | <0.0004 UJ | NA | NA | NA |
| Chloroethane | 75-00-3 | NA | NA | NA | NA | NA | <0.0016 UJ | NA | <0.0016 U | <0.0016 UJ | NA | NA | NA |
| Chloroform | 67-66-3 | NA | NA | NA | NA | NA | <0.0004 UJ | NA | <0.0004 U | <0.0004 UJ | NA | NA | NA |
| Chloromethane | 74-87-3 | NA | NA | NA | NA | NA | <0.0008 UJ | NA | <0.0008 U | <0.0008 UJ | NA | NA | NA |
| Dibromochloromethane | 124-48-1 | NA | NA | NA | NA | NA | <0.0004 UJ | NA | <0.0004 U | <0.0004 UJ | NA | NA | NA |
| Ethylbenzene | 100-41-4 | NA | NA | NA | NA | NA | <0.0004 UJ | NA | <0.0004 U | <0.0004 UJ | NA | NA | NA |
| Methylene chloride | 75-09-2 | NA | NA | NA | NA | NA | <0.002 UJ | NA | <0.002 U | <0.002 UJ | NA | NA | NA |
| Styrene | 100-42-5 | NA | NA | NA | NA | NA | <0.0008 UJ | NA | <0.0008 U | <0.0008 UJ | NA | NA | NA |
| Tetrachloroethene | 127-18-4 | NA | NA | NA | NA | NA | <0.0004 UJ | NA | <0.0004 U | <0.0004 UJ | NA | NA | NA |

| Station | | RQLmw-011 | RQLmw-012 | RQLmw-013 | RQLmw-016 | SCFmw-004 | SCLmw-001 | SCLmw-002 | SCLmw-002 | SCLmw-003 | WBGmw-006 | WBGmw-009 | WBGmw-020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Id | | RQLmw-011-190401-GW | RQLmw-012-190401-GW | RQLmw-013-190401-GW | RQLmw-016-190401-GW | SCFmw-004-190401-GW | SCLmw-001-190401-GW | SCLmw-002-190402-GW | SCLmw-002-190401-GW | SCLmw-003-190401-GW | WBGmw-006-190401-GW | WBGmw-009-190401-GW | WBGmw-020-190401-GW |
| Date | | 05/09/19 | 05/09/19 | 05/09/19 | 05/09/19 | 05/02/19 | 05/08/19 | 05/08/19 | 05/08/19 | 05/08/19 | 04/30/19 | 04/30/19 | 04/30/19 |
| Sample Type | | GR | GR | GR | GR | GR | GR | FD | GR | GR | GR | GR | GR |
| Filter Status | | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total | Total |
| Aquifer | | Upper Sharon | Upper Sharon | Upper Sharon | Upper Sharon | Basal Sharon Congl | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Unconsolidated | Upper Sharon |
| Analyte (mg/L) | CAS Number | | | | | | | | | | | | |
| Toluene | 108-88-3 | NA | NA | NA | NA | NA | <0.0004 UJ | NA | <0.0004 U | <0.0004 UJ | NA | NA | NA |
| Trichloroethene | 79-01-6 | NA | NA | NA | NA | NA | <0.0004 UJ | NA | <0.0004 U | <0.0004 UJ | NA | NA | NA |
| Vinyl chloride | 75-01-4 | NA | NA | NA | NA | NA | <0.0002 UJ | NA | <0.0002 U | <0.0002 UJ | NA | NA | NA |
| Xylenes, total | 1330-20-7 | NA | NA | NA | NA | NA | <0.0008 UJ | NA | <0.0008 U | <0.0008 UJ | NA | NA | NA |
| cis-1,3-Dichloropropene | 10061-01-5 | NA | NA | NA | NA | NA | <0.0004 UJ | NA | <0.0004 U | <0.0004 UJ | NA | NA | NA |
| trans-1,3-Dichloropropene | 10061-02-6 | NA | NA | NA | NA | NA | <0.0004 UJ | NA | <0.0004 U | <0.0004 UJ | NA | NA | NA |

| Station | | WBGmw-021 |
|---|---|---|
| Sample Id | | WBGmw-021-190401-GW |
| Date | | 04/30/19 |
| Sample Type | | GR |
| Filter Status | | Total |
| Aquifer | | Upper Sharon |
| Analyte (mg/L) | CAS Number | |
| Metals | | |
| Aluminum | 7429-90-5 | <0.07 U |
| Antimony | 7440-36-0 | <0.001 U |
| Arsenic | 7440-38-2 | 0.0068 |
| Barium | 7440-39-3 | 0.062 |
| Beryllium | 7440-41-7 | <0.0003 U |
| Cadmium | 7440-43-9 | <0.001 U |
| Calcium | 7440-70-2 | 77 |
| Chromium | 7440-47-3 | <0.0018 U |
| Cobalt | 7440-48-4 | <0.0002 U |
| Copper | 7440-50-8 | <0.0018 U |
| Iron | 7439-89-6 | 0.82 |
| Lead | 7439-92-1 | <0.0007 U |
| Magnesium | 7439-95-4 | 19 |
| Manganese | 7439-96-5 | 0.37 |
| Mercury | 7439-97-6 | <0.00008 U |
| Nickel | 7440-02-0 | 0.00036 J |
| Potassium | 7440-09-7 | 1.4 J |
| Selenium | 7782-49-2 | <0.001 U |
| Silver | 7440-22-4 | <0.0001 U |
| Sodium | 7440-23-5 | 4.8 J |
| Thallium | 7440-28-0 | <0.0002 U |
| Vanadium | 7440-62-2 | <0.003 U |
| Zinc | 7440-66-6 | <0.008 U |
| Anions | | |
| Nitrate | 14797-55-8 | NA |
| Nitrite | 14797-65-0 | NA |
| Sulfate | 14808-79-8 | NA |
| Sulfide | 18496-25-8 | NA |
| Miscellaneous | | |
| Alkalinity | N33 | NA |
| Chromium, hexavalent | 18540-29-9 | NA |
| Cyanide | 57-12-5 | NA |
| Perchlorate | 14797-73-0 | NA |
| Total Phosphorus as P | 7723-14-0 | NA |
| Explosives/Propellants | | |
| 1,3,5-Trinitrobenzene | 99-35-4 | <0.00044 U |
| 1,3-Dinitrobenzene | 99-65-0 | <0.00022 U |
| 2,4,6-Trinitrotoluene | 118-96-7 | <0.00044 U |
| 2,4-Dinitrotoluene | 121-14-2 | <0.00022 U |
| 2,6-Dinitrotoluene | 606-20-2 | <0.00022 U |
| 2-Amino-4,6-Dinitrotoluene | 35572-78-2 | <0.00013 U |
| 2-Nitrotoluene | 88-72-2 | <0.00022 UJ |
| 3-Nitrotoluene | 99-08-1 | <0.00044 U |
| 4-Amino-2,6-Dinitrotoluene | 19406-51-0 | <0.00013 U |
| 4-Nitrotoluene | 99-99-0 | <0.00044 U |

| Station | | WBGmw-021 |
|---|---|---|
| Sample Id | | WBGmw-021-190401-GW |
| Date | | 04/30/19 |
| Sample Type | | GR |
| Filter Status | | Total |
| Aquifer | | Upper Sharon |
| Analyte (mg/L) | CAS Number | |
| HMX | 2691-41-0 | <0.00022 U |
| Nitrobenzene | 98-95-3 | <0.00022 U |
| Nitrocellulose | 9004-70-0 | NA |
| Nitroglycerin | 55-63-0 | <0.0022 U |
| Nitroguanidine | 556-88-7 | NA |
| PETN | 78-11-5 | <0.0044 U |
| RDX | 121-82-4 | <0.00044 U |
| Tetryl | 479-45-8 | <0.00022 U |
| SVOCs | | |
| 1,2,4-Trichlorobenzene | 120-82-1 | NA |
| 1,2-Dichlorobenzene | 95-50-1 | NA |
| 1,3-Dichlorobenzene | 541-73-1 | NA |
| 1,4-Dichlorobenzene | 106-46-7 | NA |
| 1,4-Dioxane | 123-91-1 | NA |
| 1-Methylnaphthalene | 90-12-0 | NA |
| 2,4,5-Trichlorophenol | 95-95-4 | NA |
| 2,4,6-Trichlorophenol | 88-06-2 | NA |
| 2,4-Dichlorophenol | 120-83-2 | NA |
| 2,4-Dimethylphenol | 105-67-9 | NA |
| 2,4-Dinitrophenol | 51-28-5 | NA |
| 2,4-Dinitrotoluene | 121-14-2 | NA |
| 2,6-Dinitrotoluene | 606-20-2 | NA |
| 2-Chloronaphthalene | 91-58-7 | NA |
| 2-Chlorophenol | 95-57-8 | NA |
| 2-Methyl-4,6-dinitrophenol | 534-52-1 | NA |
| 2-Methylnaphthalene | 91-57-6 | NA |
| 2-Methylphenol | 95-48-7 | NA |
| 2-Nitrobenzenamine | 88-74-4 | NA |
| 2-Nitrophenol | 88-75-5 | NA |
| 3,3'-Dichlorobenzidine | 91-94-1 | NA |
| 3-Nitrobenzenamine | 99-09-2 | NA |
| 4-Bromophenyl phenyl ether | 101-55-3 | NA |
| 4-Chloro-3-methylphenol | 59-50-7 | NA |
| 4-Chlorobenzenamine | 106-47-8 | NA |
| 4-Chlorophenyl phenyl ether | 7005-72-3 | NA |
| 4-Nitrobenzenamine | 100-01-6 | NA |
| 4-Nitrophenol | 100-02-7 | NA |
| Acenaphthene | 83-32-9 | NA |
| Acenaphthylene | 208-96-8 | NA |
| Anthracene | 120-12-7 | NA |
| Benz(a)anthracene | 56-55-3 | NA |
| Benzenemethanol | 100-51-6 | NA |
| Benzo(a)pyrene | 50-32-8 | NA |
| Benzo(b)fluoranthene | 205-99-2 | NA |
| Benzo(ghi)perylene | 191-24-2 | NA |
| Benzo(k)fluoranthene | 207-08-9 | NA |

| | | |
|---|---|---|
| | Station | WBGmw-021 |
| | Sample Id | WBGmw-021-190401-GW |
| | Date | 04/30/19 |
| | Sample Type | GR |
| | Filter Status | Total |
| | Aquifer | Upper Sharon |
| Analyte (mg/L) | CAS Number | |
| Benzoic acid | 65-85-0 | NA |
| Bis(2-chloroethoxy)methane | 111-91-1 | NA |
| Bis(2-chloroethyl) ether | 111-44-4 | NA |
| Bis(2-chloroisopropyl) ether | 108-60-1 | NA |
| Bis(2-ethylhexyl)phthalate | 117-81-7 | NA |
| Butyl benzyl phthalate | 85-68-7 | NA |
| Carbazole | 86-74-8 | NA |
| Chrysene | 218-01-9 | NA |
| Di-n-butyl phthalate | 84-74-2 | NA |
| Di-n-octylphthalate | 117-84-0 | NA |
| Dibenz(a,h)anthracene | 53-70-3 | NA |
| Dibenzofuran | 132-64-9 | NA |
| Diethyl phthalate | 84-66-2 | NA |
| Dimethyl phthalate | 131-11-3 | NA |
| Fluoranthene | 206-44-0 | NA |
| Fluorene | 86-73-7 | NA |
| Hexachlorobenzene | 118-74-1 | NA |
| Hexachlorobutadiene | 87-68-3 | NA |
| Hexachlorocyclopentadiene | 77-47-4 | NA |
| Hexachloroethane | 67-72-1 | NA |
| Indeno(1,2,3-cd)pyrene | 193-39-5 | NA |
| Isophorone | 78-59-1 | NA |
| N-Nitroso-di-n-propylamine | 621-64-7 | NA |
| N-Nitrosodiphenylamine | 86-30-6 | NA |
| Naphthalene | 91-20-3 | NA |
| Nitrobenzene | 98-95-3 | NA |
| Pentachlorophenol | 87-86-5 | NA |
| Phenanthrene | 85-01-8 | NA |
| Phenol | 108-95-2 | NA |
| Pyrene | 129-00-0 | NA |
| Total Cresols | 1319-77-3 | NA |
| PCBs | | |
| PCB-1016 | 12674-11-2 | NA |
| PCB-1221 | 11104-28-2 | NA |
| PCB-1232 | 11141-16-5 | NA |
| PCB-1242 | 53469-21-9 | NA |
| PCB-1248 | 12672-29-6 | NA |
| PCB-1254 | 11097-69-1 | NA |
| PCB-1260 | 11096-82-5 | NA |
| Pesticides | | |
| 4,4'-DDD | 72-54-8 | NA |
| 4,4'-DDE | 72-55-9 | NA |
| 4,4'-DDT | 50-29-3 | NA |
| Aldrin | 309-00-2 | NA |
| Dieldrin | 60-57-1 | NA |
| Endosulfan I | 959-98-8 | NA |

| | | |
|---|---|---|
| | Station | WBGmw-021 |
| | Sample Id | WBGmw-021-190401-GW |
| | Date | 04/30/19 |
| | Sample Type | GR |
| | Filter Status | Total |
| | Aquifer | Upper Sharon |
| Analyte (mg/L) | CAS Number | |
| Endosulfan II | 33213-65-9 | NA |
| Endosulfan sulfate | 1031-07-8 | NA |
| Endrin | 72-20-8 | NA |
| Endrin aldehyde | 7421-93-4 | NA |
| Endrin ketone | 53494-70-5 | NA |
| Heptachlor | 76-44-8 | NA |
| Heptachlor epoxide | 1024-57-3 | NA |
| Lindane | 58-89-9 | NA |
| Methoxychlor | 72-43-5 | NA |
| Toxaphene | 8001-35-2 | NA |
| alpha-BHC | 319-84-6 | NA |
| alpha-Chlordane | 5103-71-9 | NA |
| beta-BHC | 319-85-7 | NA |
| delta-BHC | 319-86-8 | NA |
| gamma-Chlordane | 5103-74-2 | NA |
| VOCs | | |
| 1,1,1-Trichloroethane | 71-55-6 | NA |
| 1,1,2,2-Tetrachloroethane | 79-34-5 | NA |
| 1,1,2-Trichloroethane | 79-00-5 | NA |
| 1,1-Dichloroethane | 75-34-3 | NA |
| 1,1-Dichloroethene | 75-35-4 | NA |
| 1,2-Dibromoethane | 106-93-4 | NA |
| 1,2-Dichloroethane | 107-06-2 | NA |
| 1,2-Dichloroethene | 540-59-0 | NA |
| 1,2-Dichloropropane | 78-87-5 | NA |
| 2-Butanone | 78-93-3 | NA |
| 2-Hexanone | 591-78-6 | NA |
| 4-Methyl-2-pentanone | 108-10-1 | NA |
| Acetone | 67-64-1 | NA |
| Benzene | 71-43-2 | NA |
| Bromobenzene | 108-86-1 | NA |
| Bromochloromethane | 74-97-5 | NA |
| Bromodichloromethane | 75-27-4 | NA |
| Bromoform | 75-25-2 | NA |
| Bromomethane | 74-83-9 | NA |
| Carbon disulfide | 75-15-0 | NA |
| Carbon tetrachloride | 56-23-5 | NA |
| Chlorobenzene | 108-90-7 | NA |
| Chloroethane | 75-00-3 | NA |
| Chloroform | 67-66-3 | NA |
| Chloromethane | 74-87-3 | NA |
| Dibromochloromethane | 124-48-1 | NA |
| Ethylbenzene | 100-41-4 | NA |
| Methylene chloride | 75-09-2 | NA |
| Styrene | 100-42-5 | NA |
| Tetrachloroethene | 127-18-4 | NA |

| Station | | WBGmw-021 |
|---|---|---|
| Sample Id | | WBGmw-021-190401-GW |
| Date | | 04/30/19 |
| Sample Type | | GR |
| Filter Status | | Total |
| Aquifer | | Upper Sharon |
| Analyte (mg/L) | CAS Number | |
| Toluene | 108-88-3 | NA |
| Trichloroethene | 79-01-6 | NA |
| Vinyl chloride | 75-01-4 | NA |
| Xylenes, total | 1330-20-7 | NA |
| cis-1,3-Dichloropropene | 10061-01-5 | NA |
| trans-1,3-Dichloropropene | 10061-02-6 | NA |

# F.2 Chemical-Specific Screening Criteria

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**Appendix F.2 Chemical-Specific Screening Criteria**

| | | | Screening Criteria (mg/L) | | | | Selected Screening Criteria | | Background Concentration (mg/L) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Analysis Type | Chemical | CAS No | NGT CUG | Resident CUG | MCL | Tapwater RSL | Criteria (mg/L) | Source | Unconsolidated | Homewood | Upper Sharon | Basal Sharon Conglomerate |
| Anions | Nitrate | 14797-55-8 | 52.283 | 1.666 | 10 | 3.2 | 10 | MCL | --- | --- | --- | --- |
| Anions | Nitrite | 14797-65-0 | --- | --- | 1 | 0.2 | 1 | MCL | --- | --- | --- | --- |
| Anions | Sulfate | 14808-79-8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Anions | Sulfide | 18496-25-8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Explosives/Propellants | 1,3,5-Trinitrobenzene | 99-35-4 | --- | --- | --- | 0.059 | 0.059 | RSL | --- | --- | --- | --- |
| Explosives/Propellants | 1,3-Dinitrobenzene | 99-65-0 | 0.00328 | 0.000104 | --- | 0.0002 | 0.0002 | RSL | --- | --- | --- | --- |
| Explosives/Propellants | 2,4,6-Trinitrotoluene | 118-96-7 | 0.0164 | 0.000521 | --- | 0.00098 | 0.00098 | RSL | --- | --- | --- | --- |
| Explosives/Propellants | 2,4-Dinitrotoluene | 121-14-2 | 0.00129 | 0.00012 | --- | 0.00024 | 0.00024 | RSL | --- | --- | --- | --- |
| Explosives/Propellants | 2,6-Dinitrotoluene | 606-20-2 | 0.00131 | 0.000122 | --- | 0.000049 | 0.000122 | RA | --- | --- | --- | --- |
| Explosives/Propellants | 2-Amino-4,6-Dinitrotoluene | 35572-78-2 | 0.00655 | 0.000209 | --- | 0.0039 | 0.0039 | RSL | --- | --- | --- | --- |
| Explosives/Propellants | 2-Nitrotoluene | 88-72-2 | 0.00399 | 0.00037 | --- | 0.00031 | 0.00037 | RA | --- | --- | --- | --- |
| Explosives/Propellants | 3-Nitrotoluene | 99-08-1 | --- | --- | --- | 0.00017 | 0.00017 | RSL | --- | --- | --- | --- |
| Explosives/Propellants | 4-Amino-2,6-Dinitrotoluene | 19406-51-0 | 0.00655 | 0.000209 | --- | 0.0039 | 0.0039 | RSL | --- | --- | --- | --- |
| Explosives/Propellants | 4-Nitrotoluene | 99-99-0 | 0.054 | 0.00501 | --- | 0.0043 | 0.00501 | RA | --- | --- | --- | --- |
| Explosives/Propellants | HMX | 2691-41-0 | --- | --- | --- | 0.1 | 0.1 | RSL | --- | --- | --- | --- |
| Explosives/Propellants | Nitrobenzene | 98-95-3 | 0.0164 | 0.000521 | --- | 0.00014 | 0.000521 | RC | --- | --- | --- | --- |
| Explosives/Propellants | Nitrocellulose | 9004-70-0 | --- | --- | --- | 6000 | 6000 | RSL | --- | --- | --- | --- |
| Explosives/Propellants | Nitroglycerin | 55-63-0 | 0.054 | 0.00501 | --- | 0.0002 | 0.00501 | RA | --- | --- | --- | --- |
| Explosives/Propellants | Nitroguanidine | 556-88-7 | --- | --- | --- | 0.2 | 0.2 | RSL | --- | --- | --- | --- |
| Explosives/Propellants | PETN | 78-11-5 | --- | --- | --- | 0.0039 | 0.0039 | RSL | --- | --- | --- | --- |
| Explosives/Propellants | RDX | 121-82-4 | 0.00834 | 0.000774 | --- | 0.00097 | 0.00097 | RSL | --- | --- | --- | --- |
| Explosives/Propellants | Tetryl | 479-45-8 | --- | --- | --- | 0.0039 | 0.0039 | RSL | --- | --- | --- | --- |
| Metals, Filtered | Aluminum | 7429-90-5 | 31.981 | 1.028 | --- | 2 | 2 | RSL | 0.386 | 0.43 | 0.038 | 0.049 |
| Metals, Filtered | Antimony | 7440-36-0 | 0.0117 | 0.000389 | 0.006 | 0.00078 | 0.006 | MCL | 0 | 0 | 0 | 0.0006 |
| Metals, Filtered | Arsenic | 7440-38-2 | 0.000608 | 0.000056 | 0.01 | 0.000052 | 0.01 | MCL | 0.003 | 0.008 | 0.003 | 0.048 |
| Metals, Filtered | Barium | 7440-39-3 | 6.332 | 0.204 | 2 | 0.38 | 2 | MCL | 0.034 | 0.177 | 0.035 | 0.145 |
| Metals, Filtered | Beryllium | 7440-41-7 | --- | --- | 0.004 | 0.0025 | 0.004 | MCL | 0 | 0 | 0 | 0.00023 |
| Metals, Filtered | Cadmium | 7440-43-9 | 0.0132 | 0.000456 | 0.005 | 0.00092 | 0.005 | MCL | 0 | 0 | 0 | 0 |
| Metals, Filtered | Calcium | 7440-70-2 | --- | --- | --- | --- | --- | --- | 107 | 143 | 118 | 93 |
| Metals, Filtered | Chromium | 7440-47-3 | 33.087 | 1.214 | 0.1 | 2.2 | 0.1 | MCL | 0.002 | 0.007 | 0 | 0.00074 |
| Metals, Filtered | Cobalt | 7440-48-4 | 0.654 | 0.0208 | --- | 0.0006 | 0.0208 | RC | 0.00083 | 0.003 | 0.001 | 0.005 |
| Metals, Filtered | Copper | 7440-50-8 | --- | --- | 1.3 | 0.08 | 1.3 | MCL | 0.005 | 0.002 | 0.001 | 0.00069 |
| Metals, Filtered | Iron | 7439-89-6 | 9.671 | 0.31 | --- | 1.4 | 1.4 | RSL | 1.91 | 22.3 | 2.08 | 2.56 |
| Metals, Filtered | Lead | 7439-92-1 | --- | --- | 0.015 | 0.015 | 0.015 | MCL | 0.00099 | 0.00032 | 0.002 | 0.00022 |
| Metals, Filtered | Magnesium | 7439-95-4 | --- | --- | --- | --- | --- | --- | 55.3 | 37.5 | 38.9 | 30 |
| Metals, Filtered | Manganese | 7439-96-5 | 1.421 | 0.0463 | --- | 0.043 | 0.0463 | RC | 0.075 | 0.56 | 0.198 | 1.03 |
| Metals, Filtered | Mercury | 7439-97-6 | --- | --- | 0.002 | 0.000063 | 0.002 | MCL | 0 | 0 | 0 | 0 |
| Metals, Filtered | Nickel | 7440-02-0 | 0.654 | 0.0208 | --- | 0.039 | 0.039 | RSL | 0.002 | 0.005 | 0.002 | 0.014 |
| Metals, Filtered | Potassium | 7440-09-7 | --- | --- | --- | --- | --- | --- | 4.84 | 2.01 | 3.38 | 2.9 |
| Metals, Filtered | Selenium | 7782-49-2 | --- | --- | 0.05 | 0.01 | 0.05 | MCL | 0.00099 | 0 | 0.001 | 0 |
| Metals, Filtered | Silver | 7440-22-4 | --- | --- | --- | 0.0094 | 0.0094 | RSL | 0 | 0 | 0 | 0 |
| Metals, Filtered | Sodium | 7440-23-5 | --- | --- | --- | --- | --- | --- | 18.2 | 21 | 129 | 15.3 |
| Metals, Filtered | Thallium | 7440-28-0 | 0.00261 | 0.000083 | 0.002 | 0.00002 | 0.002 | MCL | 0 | 0 | 0 | 0.000097 |
| Metals, Filtered | Vanadium | 7440-62-2 | 0.185 | 0.00638 | --- | 0.0086 | 0.0086 | RSL | 0.0005 | 0.0007 | 0.00085 | 0 |
| Metals, Filtered | Zinc | 7440-66-6 | 9.756 | 0.312 | --- | 0.6 | 0.6 | RSL | 0.005 | 0.011 | 0.009 | 0.003 |
| Metals, Total | Aluminum | 7429-90-5 | 31.981 | 1.028 | --- | 2 | 2 | RSL | 0.386 | 0.43 | 0.038 | 0.049 |
| Metals, Total | Antimony | 7440-36-0 | 0.0117 | 0.000389 | 0.006 | 0.00078 | 0.006 | MCL | 0 | 0 | 0 | 0.0006 |
| Metals, Total | Arsenic | 7440-38-2 | 0.000608 | 0.000056 | 0.01 | 0.000052 | 0.01 | MCL | 0.003 | 0.008 | 0.003 | 0.048 |
| Metals, Total | Barium | 7440-39-3 | 6.332 | 0.204 | 2 | 0.38 | 2 | MCL | 0.034 | 0.177 | 0.035 | 0.145 |
| Metals, Total | Beryllium | 7440-41-7 | --- | --- | 0.004 | 0.0025 | 0.004 | MCL | 0 | 0 | 0 | 0.00023 |
| Metals, Total | Cadmium | 7440-43-9 | 0.0132 | 0.000456 | 0.005 | 0.00092 | 0.005 | MCL | 0 | 0 | 0 | 0 |
| Metals, Total | Calcium | 7440-70-2 | --- | --- | --- | --- | --- | --- | 107 | 143 | 118 | 93 |
| Metals, Total | Chromium | 7440-47-3 | 33.087 | 1.214 | 0.1 | 2.2 | 0.1 | MCL | 0.002 | 0.007 | 0 | 0.00074 |

**Appendix F.2 Chemical-Specific Screening Criteria (continued)**

| | | | Screening Criteria (mg/L) | | | | Selected Screening Criteria | | Background Concentration (mg/L) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Analysis Type | Chemical | CAS No | NGT CUG | Resident CUG | MCL | Tapwater RSL | Criteria (mg/L) | Source | Unconsolidated | Homewood | Upper Sharon | Basal Sharon Conglomerate |
| Metals, Total | Cobalt | 7440-48-4 | 0.654 | 0.0208 | --- | 0.0006 | 0.0208 | RC | 0.00083 | 0.003 | 0.001 | 0.005 |
| Metals, Total | Copper | 7440-50-8 | --- | --- | 1.3 | 0.08 | 1.3 | MCL | 0.005 | 0.002 | 0.001 | 0.00069 |
| Metals, Total | Iron | 7439-89-6 | 9.671 | 0.31 | --- | 1.4 | 1.4 | RSL | 1.91 | 22.3 | 2.08 | 2.56 |
| Metals, Total | Lead | 7439-92-1 | --- | --- | 0.015 | 0.015 | 0.015 | MCL | 0.00099 | 0.00032 | 0.002 | 0.00022 |
| Metals, Total | Magnesium | 7439-95-4 | --- | --- | --- | --- | --- | --- | 55.3 | 37.5 | 38.9 | 30 |
| Metals, Total | Manganese | 7439-96-5 | 1.421 | 0.0463 | --- | 0.043 | 0.0463 | RC | 0.075 | 0.56 | 0.198 | 1.03 |
| Metals, Total | Mercury | 7439-97-6 | --- | --- | 0.002 | 0.000063 | 0.002 | MCL | 0 | 0 | 0 | 0 |
| Metals, Total | Nickel | 7440-02-0 | 0.654 | 0.0208 | --- | 0.039 | 0.039 | RSL | 0.002 | 0.005 | 0.002 | 0.014 |
| Metals, Total | Potassium | 7440-09-7 | --- | --- | --- | --- | --- | --- | 4.84 | 2.01 | 3.38 | 2.9 |
| Metals, Total | Selenium | 7782-49-2 | --- | --- | 0.05 | 0.01 | 0.05 | MCL | 0.00099 | 0 | 0.001 | 0 |
| Metals, Total | Silver | 7440-22-4 | --- | --- | --- | 0.0094 | 0.0094 | RSL | 0 | 0 | 0 | 0 |
| Metals, Total | Sodium | 7440-23-5 | --- | --- | --- | --- | --- | --- | 18.2 | 21 | 129 | 15.3 |
| Metals, Total | Thallium | 7440-28-0 | 0.00261 | 0.000083 | 0.002 | 0.00002 | 0.002 | MCL | 0 | 0 | 0 | 0.000097 |
| Metals, Total | Vanadium | 7440-62-2 | 0.185 | 0.00638 | --- | 0.0086 | 0.0086 | RSL | 0.0005 | 0.0007 | 0.00085 | 0 |
| Metals, Total | Zinc | 7440-66-6 | 9.756 | 0.312 | --- | 0.6 | 0.6 | RSL | 0.005 | 0.011 | 0.009 | 0.003 |
| Miscellaneous | Alkalinity | N33 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Miscellaneous | Chromium, hexavalent | 18540-29-9 | --- | --- | --- | 0.000035 | 0.000035 | RSL | 0 | 0 | 0 | 0 |
| Miscellaneous | Cyanide | 57-12-5 | --- | --- | 0.2 | 0.00015 | 0.2 | MCL | --- | --- | --- | --- |
| Miscellaneous | Perchlorate | 14797-73-0 | --- | --- | --- | 0.0014 | 0.0014 | RSL | --- | --- | --- | --- |
| Miscellaneous | Total Phosphorus as P | 7723-14-0 | --- | --- | --- | 0.00004 | 0.00004 | RSL | --- | --- | --- | --- |
| PCBs | PCB-1016 | 12674-11-2 | --- | --- | --- | 0.00014 | 0.00014 | RSL | --- | --- | --- | --- |
| PCBs | PCB-1221 | 11104-28-2 | --- | --- | --- | 0.0000047 | 0.0000047 | RSL | --- | --- | --- | --- |
| PCBs | PCB-1232 | 11141-16-5 | --- | --- | --- | 0.0000047 | 0.0000047 | RSL | --- | --- | --- | --- |
| PCBs | PCB-1242 | 53469-21-9 | 0.00229 | 0.000213 | --- | 0.0000078 | 0.000213 | RA | --- | --- | --- | --- |
| PCBs | PCB-1248 | 12672-29-6 | --- | --- | --- | 0.0000078 | 0.0000078 | RSL | --- | --- | --- | --- |
| PCBs | PCB-1254 | 11097-69-1 | 0.000655 | 0.000021 | --- | 0.0000078 | 0.000021 | RC | --- | --- | --- | --- |
| PCBs | PCB-1260 | 11096-82-5 | 0.00229 | 0.000213 | --- | 0.0000078 | 0.000213 | RA | --- | --- | --- | --- |
| Pesticides | 4,4'-DDD | 72-54-8 | 0.000639 | 0.000059 | --- | 0.0000063 | 0.000059 | RA | --- | --- | --- | --- |
| Pesticides | 4,4'-DDE | 72-55-9 | 0.000503 | 0.000047 | --- | 0.000046 | 0.000047 | RA | --- | --- | --- | --- |
| Pesticides | 4,4'-DDT | 50-29-3 | 0.000294 | 0.000027 | --- | 0.00023 | 0.00023 | RSL | --- | --- | --- | --- |
| Pesticides | Aldrin | 309-00-2 | 0.000051 | 0.000005 | --- | 9.2E-07 | 0.000005 | RA | --- | --- | --- | --- |
| Pesticides | Dieldrin | 60-57-1 | 0.000038 | 0.000004 | --- | 0.0000018 | 0.000004 | RA | --- | --- | --- | --- |
| Pesticides | Endosulfan I | 959-98-8 | --- | --- | --- | 0.01 | 0.01 | RSL | --- | --- | --- | --- |
| Pesticides | Endosulfan II | 33213-65-9 | --- | --- | --- | 0.01 | 0.01 | RSL | --- | --- | --- | --- |
| Pesticides | Endosulfan sulfate | 1031-07-8 | --- | --- | --- | 0.01 | 0.01 | RSL | --- | --- | --- | --- |
| Pesticides | Endrin | 72-20-8 | --- | --- | 0.002 | 0.00023 | 0.002 | MCL | --- | --- | --- | --- |
| Pesticides | Endrin aldehyde | 7421-93-4 | --- | --- | --- | 0.00023 | 0.00023 | RSL | --- | --- | --- | --- |
| Pesticides | Endrin ketone | 53494-70-5 | --- | --- | --- | 0.00023 | 0.00023 | RSL | --- | --- | --- | --- |
| Pesticides | Heptachlor | 76-44-8 | 0.000153 | 0.000014 | 0.0004 | 0.0000014 | 0.0004 | MCL | --- | --- | --- | --- |
| Pesticides | Heptachlor epoxide | 1024-57-3 | 0.000101 | 0.000009 | 0.0002 | 0.0000014 | 0.0002 | MCL | --- | --- | --- | --- |
| Pesticides | Lindane | 58-89-9 | 0.00055 | 0.000051 | 0.0002 | 0.000042 | 0.0002 | MCL | --- | --- | --- | --- |
| Pesticides | Methoxychlor | 72-43-5 | --- | --- | 0.04 | 0.0037 | 0.04 | MCL | --- | --- | --- | --- |
| Pesticides | Toxaphene | 8001-35-2 | 0.000518 | 0.000048 | 0.003 | 0.000071 | 0.003 | MCL | --- | --- | --- | --- |
| Pesticides | alpha-BHC | 319-84-6 | 0.000146 | 0.000014 | --- | 0.0000072 | 0.000014 | RA | --- | --- | --- | --- |
| Pesticides | alpha-Chlordane | 5103-71-9 | --- | --- | --- | 0.00002 | 0.00002 | RSL | --- | --- | --- | --- |
| Pesticides | beta-BHC | 319-85-7 | 0.00051 | 0.000047 | --- | 0.000025 | 0.000047 | RA | --- | --- | --- | --- |
| Pesticides | delta-BHC | 319-86-8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Pesticides | gamma-Chlordane | 5103-74-2 | --- | --- | --- | 0.00002 | 0.00002 | RSL | --- | --- | --- | --- |
| SVOCs | 1,2,4-Trichlorobenzene | 120-82-1 | --- | --- | 0.07 | 0.0004 | 0.07 | MCL | --- | --- | --- | --- |
| SVOCs | 1,2-Dichlorobenzene | 95-50-1 | --- | --- | 0.6 | 0.03 | 0.6 | MCL | --- | --- | --- | --- |
| SVOCs | 1,3-Dichlorobenzene | 541-73-1 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SVOCs | 1,4-Dichlorobenzene | 106-46-7 | --- | --- | 0.075 | 0.00048 | 0.075 | MCL | --- | --- | --- | --- |
| SVOCs | 1,4-Dioxane | 123-91-1 | --- | --- | --- | 0.00046 | 0.00046 | RSL | --- | --- | --- | --- |

| | | | Screening Criteria (mg/L) | | | | Selected Screening Criteria | | Background Concentration (mg/L) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Analysis Type | Chemical | CAS No | NGT CUG | Resident CUG | MCL | Tapwater RSL | Criteria (mg/L) | Source | Unconsolidated | Homewood | Upper Sharon | Basal Sharon Conglomerate |
| SVOCs | 1-Methylnaphthalene | 90-12-0 | --- | --- | --- | 0.0011 | 0.0011 | RSL | --- | --- | --- | --- |
| SVOCs | 2,4,5-Trichlorophenol | 95-95-4 | --- | --- | --- | 0.12 | 0.12 | RSL | --- | --- | --- | --- |
| SVOCs | 2,4,6-Trichlorophenol | 88-06-2 | --- | --- | --- | 0.0012 | 0.0012 | RSL | --- | --- | --- | --- |
| SVOCs | 2,4-Dichlorophenol | 120-83-2 | --- | --- | --- | 0.0046 | 0.0046 | RSL | --- | --- | --- | --- |
| SVOCs | 2,4-Dimethylphenol | 105-67-9 | --- | --- | --- | 0.036 | 0.036 | RSL | --- | --- | --- | --- |
| SVOCs | 2,4-Dinitrophenol | 51-28-5 | --- | --- | --- | 0.0039 | 0.0039 | RSL | --- | --- | --- | --- |
| SVOCs | 2,4-Dinitrotoluene | 121-14-2 | 0.00129 | 0.00012 | --- | 0.00024 | 0.00024 | RSL | --- | --- | --- | --- |
| SVOCs | 2,6-Dinitrotoluene | 606-20-2 | 0.00131 | 0.000122 | --- | 0.000049 | 0.000122 | RA | --- | --- | --- | --- |
| SVOCs | 2-Chloronaphthalene | 91-58-7 | --- | --- | --- | 0.075 | 0.075 | RSL | --- | --- | --- | --- |
| SVOCs | 2-Chlorophenol | 95-57-8 | --- | --- | --- | 0.0091 | 0.0091 | RSL | --- | --- | --- | --- |
| SVOCs | 2-Methyl-4,6-dinitrophenol | 534-52-1 | --- | --- | --- | 0.00015 | 0.00015 | RSL | --- | --- | --- | --- |
| SVOCs | 2-Methylnaphthalene | 91-57-6 | --- | --- | --- | 0.0036 | 0.0036 | RSL | --- | --- | --- | --- |
| SVOCs | 2-Methylphenol | 95-48-7 | --- | --- | --- | 0.093 | 0.093 | RSL | --- | --- | --- | --- |
| SVOCs | 2-Nitrobenzenamine | 88-74-4 | --- | --- | --- | 0.019 | 0.019 | RSL | --- | --- | --- | --- |
| SVOCs | 2-Nitrophenol | 88-75-5 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SVOCs | 3,3'-Dichlorobenzidine | 91-94-1 | --- | --- | --- | 0.00013 | 0.00013 | RSL | --- | --- | --- | --- |
| SVOCs | 3-Nitrobenzenamine | 99-09-2 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SVOCs | 4-Bromophenyl phenyl ether | 101-55-3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SVOCs | 4-Chloro-3-methylphenol | 59-50-7 | --- | --- | --- | 0.14 | 0.14 | RSL | --- | --- | --- | --- |
| SVOCs | 4-Chlorobenzenamine | 106-47-8 | --- | --- | --- | 0.00037 | 0.00037 | RSL | --- | --- | --- | --- |
| SVOCs | 4-Chlorophenyl phenyl ether | 7005-72-3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SVOCs | 4-Nitrobenzenamine | 100-01-6 | 0.0437 | 0.00313 | --- | 0.0038 | 0.0038 | RSL | --- | --- | --- | --- |
| SVOCs | 4-Nitrophenol | 100-02-7 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SVOCs | Acenaphthene | 83-32-9 | --- | --- | --- | 0.053 | 0.053 | RSL | --- | --- | --- | --- |
| SVOCs | Acenaphthylene | 208-96-8 | --- | --- | --- | 0.012 | 0.012 | RSL | --- | --- | --- | --- |
| SVOCs | Anthracene | 120-12-7 | --- | --- | --- | 0.18 | 0.18 | RSL | --- | --- | --- | --- |
| SVOCs | Benz(a)anthracene | 56-55-3 | 0.000042 | 0.000004 | --- | 0.00003 | 0.00003 | RSL | --- | --- | --- | --- |
| SVOCs | Benzenemethanol | 100-51-6 | --- | --- | --- | 0.2 | 0.2 | RSL | --- | --- | --- | --- |
| SVOCs | Benzo(a)pyrene | 50-32-8 | 0.000002 | 0.00000023 | 0.0002 | 0.000025 | 0.0002 | MCL | --- | --- | --- | --- |
| SVOCs | Benzo(b)fluoranthene | 205-99-2 | 0.000024 | 0.000002 | --- | 0.00025 | 0.00025 | RSL | --- | --- | --- | --- |
| SVOCs | Benzo(ghi)perylene | 191-24-2 | --- | --- | --- | 0.012 | 0.012 | RSL | --- | --- | --- | --- |
| SVOCs | Benzo(k)fluoranthene | 207-08-9 | --- | --- | --- | 0.0025 | 0.0025 | RSL | --- | --- | --- | --- |
| SVOCs | Benzoic acid | 65-85-0 | --- | --- | --- | 7.5 | 7.5 | RSL | --- | --- | --- | --- |
| SVOCs | Bis(2-chloroethoxy)methane | 111-91-1 | --- | --- | --- | 0.0059 | 0.0059 | RSL | --- | --- | --- | --- |
| SVOCs | Bis(2-chloroethyl) ether | 111-44-4 | --- | --- | --- | 0.000014 | 0.000014 | RSL | --- | --- | --- | --- |
| SVOCs | Bis(2-chloroisopropyl) ether | 108-60-1 | --- | --- | --- | 0.071 | 0.071 | RSL | --- | --- | --- | --- |
| SVOCs | Bis(2-ethylhexyl)phthalate | 117-81-7 | 0.0097 | 0.0009 | 0.006 | 0.0056 | 0.006 | MCL | --- | --- | --- | --- |
| SVOCs | Butyl benzyl phthalate | 85-68-7 | --- | --- | --- | 0.016 | 0.016 | RSL | --- | --- | --- | --- |
| SVOCs | Carbazole | 86-74-8 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SVOCs | Chrysene | 218-01-9 | --- | --- | --- | 0.025 | 0.025 | RSL | --- | --- | --- | --- |
| SVOCs | Di-n-butyl phthalate | 84-74-2 | --- | --- | --- | 0.09 | 0.09 | RSL | --- | --- | --- | --- |
| SVOCs | Di-n-octylphthalate | 117-84-0 | --- | --- | --- | 0.02 | 0.02 | RSL | --- | --- | --- | --- |
| SVOCs | Dibenz(a,h)anthracene | 53-70-3 | 0.000002 | 0.00000015 | --- | 0.000025 | 0.000025 | RSL | --- | --- | --- | --- |
| SVOCs | Dibenzofuran | 132-64-9 | --- | --- | --- | 0.00079 | 0.00079 | RSL | --- | --- | --- | --- |
| SVOCs | Diethyl phthalate | 84-66-2 | --- | --- | --- | 1.5 | 1.5 | RSL | --- | --- | --- | --- |
| SVOCs | Dimethyl phthalate | 131-11-3 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SVOCs | Fluoranthene | 206-44-0 | --- | --- | --- | 0.08 | 0.08 | RSL | --- | --- | --- | --- |
| SVOCs | Fluorene | 86-73-7 | --- | --- | --- | 0.029 | 0.029 | RSL | --- | --- | --- | --- |
| SVOCs | Hexachlorobenzene | 118-74-1 | --- | --- | 0.001 | 0.0000098 | 0.001 | MCL | --- | --- | --- | --- |
| SVOCs | Hexachlorobutadiene | 87-68-3 | --- | --- | --- | 0.00014 | 0.00014 | RSL | --- | --- | --- | --- |
| SVOCs | Hexachlorocyclopentadiene | 77-47-4 | --- | --- | 0.05 | 0.000041 | 0.05 | MCL | --- | --- | --- | --- |
| SVOCs | Hexachloroethane | 67-72-1 | --- | --- | --- | 0.00033 | 0.00033 | RSL | --- | --- | --- | --- |
| SVOCs | Indeno(1,2,3-cd)pyrene | 193-39-5 | 0.000024 | 0.000002 | --- | 0.00025 | 0.00025 | RSL | --- | --- | --- | --- |

**Appendix F.2 Chemical-Specific Screening Criteria (continued)**

| | | | Screening Criteria (mg/L) | | | | Selected Screening Criteria | | Background Concentration (mg/L) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Analysis Type | Chemical | CAS No | NGT CUG | Resident CUG | MCL | Tapwater RSL | Criteria (mg/L) | Source | Unconsolidated | Homewood | Upper Sharon | Basal Sharon Conglomerate |
| SVOCs | Isophorone | 78-59-1 | --- | --- | --- | 0.078 | 0.078 | RSL | --- | --- | --- | --- |
| SVOCs | N-Nitroso-di-n-propylamine | 621-64-7 | --- | --- | --- | 0.000011 | 0.000011 | RSL | --- | --- | --- | --- |
| SVOCs | N-Nitrosodiphenylamine | 86-30-6 | --- | --- | --- | 0.012 | 0.012 | RSL | --- | --- | --- | --- |
| SVOCs | Naphthalene | 91-20-3 | --- | --- | --- | 0.00017 | 0.00017 | RSL | --- | --- | --- | --- |
| SVOCs | Nitrobenzene | 98-95-3 | 0.0164 | 0.000521 | --- | 0.00014 | 0.000521 | RC | --- | --- | --- | --- |
| SVOCs | Pentachlorophenol | 87-86-5 | 0.000797 | 0.000074 | 0.001 | 0.000041 | 0.001 | MCL | --- | --- | --- | --- |
| SVOCs | Phenanthrene | 85-01-8 | --- | --- | --- | 0.012 | 0.012 | RSL | --- | --- | --- | --- |
| SVOCs | Phenol | 108-95-2 | --- | --- | --- | 0.58 | 0.58 | RSL | --- | --- | --- | --- |
| SVOCs | Pyrene | 129-00-0 | --- | --- | --- | 0.012 | 0.012 | RSL | --- | --- | --- | --- |
| SVOCs | Total Cresols | 1319-77-3 | --- | --- | --- | 0.15 | 0.15 | RSL | --- | --- | --- | --- |
| VOCs | 1,1,1-Trichloroethane | 71-55-6 | --- | --- | 0.2 | 0.8 | 0.2 | MCL | --- | --- | --- | --- |
| VOCs | 1,1,2,2-Tetrachloroethane | 79-34-5 | 0.000744 | 0.000069 | --- | 0.000076 | 0.000076 | RSL | --- | --- | --- | --- |
| VOCs | 1,1,2-Trichloroethane | 79-00-5 | --- | --- | 0.005 | 0.000041 | 0.005 | MCL | --- | --- | --- | --- |
| VOCs | 1,1-Dichloroethane | 75-34-3 | --- | --- | --- | 0.0028 | 0.0028 | RSL | --- | --- | --- | --- |
| VOCs | 1,1-Dichloroethene | 75-35-4 | --- | --- | 0.007 | 0.028 | 0.007 | MCL | --- | --- | --- | --- |
| VOCs | 1,2-Dibromoethane | 106-93-4 | --- | --- | 0.00005 | 0.0000075 | 0.00005 | MCL | --- | --- | --- | --- |
| VOCs | 1,2-Dichloroethane | 107-06-2 | 0.00167 | 0.000155 | 0.005 | 0.00017 | 0.005 | MCL | --- | --- | --- | --- |
| VOCs | 1,2-Dichloroethene | 540-59-0 | --- | --- | 0.07 | 0.0036 | 0.07 | MCL | --- | --- | --- | --- |
| VOCs | 1,2-Dichloropropane | 78-87-5 | --- | --- | 0.005 | 0.00082 | 0.005 | MCL | --- | --- | --- | --- |
| VOCs | 2-Butanone | 78-93-3 | --- | --- | --- | 0.56 | 0.56 | RSL | --- | --- | --- | --- |
| VOCs | 2-Hexanone | 591-78-6 | --- | --- | --- | 0.0038 | 0.0038 | RSL | --- | --- | --- | --- |
| VOCs | 4-Methyl-2-pentanone | 108-10-1 | --- | --- | --- | 0.63 | 0.63 | RSL | --- | --- | --- | --- |
| VOCs | Acetone | 67-64-1 | --- | --- | --- | 1.4 | 1.4 | RSL | --- | --- | --- | --- |
| VOCs | Benzene | 71-43-2 | 0.00464 | 0.000431 | 0.005 | 0.00046 | 0.005 | MCL | --- | --- | --- | --- |
| VOCs | Bromobenzene | 108-86-1 | --- | --- | --- | 0.0062 | 0.0062 | RSL | --- | --- | --- | --- |
| VOCs | Bromochloromethane | 74-97-5 | --- | --- | --- | 0.0083 | 0.0083 | RSL | --- | --- | --- | --- |
| VOCs | Bromodichloromethane | 75-27-4 | --- | --- | --- | 0.00013 | 0.00013 | RSL | --- | --- | --- | --- |
| VOCs | Bromoform | 75-25-2 | --- | --- | --- | 0.0033 | 0.0033 | RSL | --- | --- | --- | --- |
| VOCs | Bromomethane | 74-83-9 | --- | --- | --- | 0.00075 | 0.00075 | RSL | --- | --- | --- | --- |
| VOCs | Carbon disulfide | 75-15-0 | --- | --- | --- | 0.081 | 0.081 | RSL | --- | --- | --- | --- |
| VOCs | Carbon tetrachloride | 56-23-5 | 0.0022 | 0.000204 | 0.005 | 0.00046 | 0.005 | MCL | --- | --- | --- | --- |
| VOCs | Chlorobenzene | 108-90-7 | --- | --- | 0.1 | 0.0078 | 0.1 | MCL | --- | --- | --- | --- |
| VOCs | Chloroethane | 75-00-3 | --- | --- | --- | 2.1 | 2.1 | RSL | --- | --- | --- | --- |
| VOCs | Chloroform | 67-66-3 | 0.00223 | 0.000207 | 0.08 | 0.00022 | 0.08 | MCL | --- | --- | --- | --- |
| VOCs | Chloromethane | 74-87-3 | --- | --- | --- | 0.019 | 0.019 | RSL | --- | --- | --- | --- |
| VOCs | Dibromochloromethane | 124-48-1 | --- | --- | --- | 0.00087 | 0.00087 | RSL | --- | --- | --- | --- |
| VOCs | Ethylbenzene | 100-41-4 | --- | --- | 0.7 | 0.0015 | 0.7 | MCL | --- | --- | --- | --- |
| VOCs | Methylene chloride | 75-09-2 | 0.0575 | 0.00534 | 0.005 | 0.011 | 0.005 | MCL | --- | --- | --- | --- |
| VOCs | Styrene | 100-42-5 | --- | --- | 0.1 | 0.12 | 0.1 | MCL | --- | --- | --- | --- |
| VOCs | Tetrachloroethene | 127-18-4 | 0.00105 | 0.000098 | 0.005 | 0.0041 | 0.005 | MCL | --- | --- | --- | --- |
| VOCs | Toluene | 108-88-3 | --- | --- | 1 | 0.11 | 1 | MCL | --- | --- | --- | --- |
| VOCs | Trichloroethene | 79-01-6 | 0.000336 | 0.000031 | 0.005 | 0.00028 | 0.005 | MCL | --- | --- | --- | --- |
| VOCs | Vinyl chloride | 75-01-4 | --- | --- | 0.002 | 0.000019 | 0.002 | MCL | --- | --- | --- | --- |
| VOCs | Xylenes, total | 1330-20-7 | --- | --- | 10 | 0.019 | 10 | MCL | --- | --- | --- | --- |
| VOCs | cis-1,3-Dichloropropene | 10061-01-5 | --- | --- | --- | 0.00047 | 0.00047 | RSL | --- | --- | --- | --- |
| VOCs | trans-1,3-Dichloropropene | 10061-02-6 | --- | --- | --- | 0.00047 | 0.00047 | RSL | --- | --- | --- | --- |

# F.3 Spring 2019 Results that Exceed Screening Criteria

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**Appendix F.3 Spring 2019 Results that Exceed Screening Criteria**

| Zone | Well | Date Collected | Sample ID | Sample Type | Analysis Type | Chemical | Result (mg/L) | Validation Qual | GW Screening Criteria (mg/L) | GW Screening Criteria Source | Background Criteria |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Sharon | DA2mw-115 | 4/29/2019 | DA2mw-115-190402-GW | Field Duplicate | Metals, Total | Potassium | 3.4 | | | | 3.38 |
| Unconsolidated | DET-3 | 4/29/2019 | DET-003-190401-GW | Grab | Metals, Total | Manganese | 0.24 | | 0.0463 | RC | 0.075 |
| Unconsolidated | DET-3 | 4/29/2019 | DET-003-190402-GW | Field Duplicate | Metals, Total | Manganese | 0.24 | | 0.0463 | RC | 0.075 |
| Unconsolidated | DET-4 | 4/29/2019 | DET-004-190401-GW | Grab | Explosives/Propellants | RDX | 0.0014 | | 0.00097 | RSL | |
| Unconsolidated | DET-4 | 4/29/2019 | DET-004-190401-GW | Grab | Metals, Total | Calcium | 120 | | | | 107 |
| Homewood | FBQmw-171 | 4/30/2019 | FBQmw-171-190401-GW | Grab | Anions | Sulfate | 24 | | | | |
| Homewood | FBQmw-171 | 4/30/2019 | FBQmw-171-190401-GW | Grab | Miscellaneous | Alkalinity | 41 | | | | |
| Homewood | FBQmw-174 | 4/30/2019 | FBQmw-174-190401-GW | Grab | Anions | Sulfate | 15 | | | | |
| Homewood | FBQmw-174 | 4/30/2019 | FBQmw-174-190401-GW | Grab | Explosives/Propellants | 2,4,6-Trinitrotoluene | 0.01 | | 0.00098 | RSL | |
| Homewood | FBQmw-174 | 4/30/2019 | FBQmw-174-190401-GW | Grab | Explosives/Propellants | 2,4-Dinitrotoluene | 0.00067 | | 0.00024 | RSL | |
| Homewood | FBQmw-174 | 4/30/2019 | FBQmw-174-190401-GW | Grab | Explosives/Propellants | 2-Amino-4,6-Dinitrotoluene | 0.015 | | 0.0039 | RSL | |
| Homewood | FBQmw-174 | 4/30/2019 | FBQmw-174-190401-GW | Grab | Explosives/Propellants | 4-Amino-2,6-Dinitrotoluene | 0.014 | | 0.0039 | RSL | |
| Homewood | FBQmw-174 | 4/30/2019 | FBQmw-174-190401-GW | Grab | Explosives/Propellants | RDX | 0.0012 | J | 0.00097 | RSL | |
| Homewood | FBQmw-174 | 4/30/2019 | FBQmw-174-190401-GW | Grab | Miscellaneous | Alkalinity | 4.8 | J | | | |
| Homewood | FBQmw-175 | 5/7/2019 | FBQmw-175-190401-GW | Grab | Anions | Sulfate | 20 | | | | |
| Homewood | FBQmw-175 | 5/7/2019 | FBQmw-175-190401-GW | Grab | Miscellaneous | Alkalinity | 13 | | | | |
| Homewood | FBQmw-175 | 5/7/2019 | FBQmw-175-190402-GW | Field Duplicate | Anions | Sulfate | 18 | | | | |
| Homewood | FBQmw-175 | 5/7/2019 | FBQmw-175-190402-GW | Field Duplicate | Miscellaneous | Alkalinity | 12 | | | | |
| Unconsolidated | FWGmw-007 | 4/30/2019 | FWGmw-007-190401-GW | Grab | Metals, Total | Calcium | 130 | | | | 107 |
| Unconsolidated | FWGmw-007 | 4/30/2019 | FWGmw-007-190401-GW | Grab | Metals, Total | Magnesium | 66 | | | | 55.3 |
| Unconsolidated | FWGmw-007 | 4/30/2019 | FWGmw-007-190401-GW | Grab | Metals, Total | Manganese | 0.13 | | 0.0463 | RC | 0.075 |
| Unconsolidated | FWGmw-011 | 5/7/2019 | FWGmw-011-190401-GW | Grab | Metals, Total | Iron | 8.2 | | 1.4 | RSL | 1.91 |
| Unconsolidated | FWGmw-011 | 5/7/2019 | FWGmw-011-190401-GW | Grab | Metals, Total | Manganese | 0.29 | | 0.0463 | RC | 0.075 |
| Upper Sharon | FWGmw-012 | 5/7/2019 | FWGmw-012-190401-GW | Grab | Metals, Total | Iron | 2.4 | | 1.4 | RSL | 2.08 |
| Upper Sharon | FWGmw-012 | 5/7/2019 | FWGmw-012-190401-GW | Grab | Metals, Total | Potassium | 3.6 | | | | 3.38 |
| Unconsolidated | FWGmw-015 | 5/8/2019 | FWGmw-015-190401-GW | Grab | Metals, Total | Calcium | 280 | | | | 107 |
| Unconsolidated | FWGmw-015 | 5/8/2019 | FWGmw-015-190401-GW | Grab | Metals, Total | Magnesium | 290 | | | | 55.3 |
| Unconsolidated | FWGmw-015 | 5/8/2019 | FWGmw-015-190401-GW | Grab | Metals, Total | Sodium | 44 | J | | | 18.2 |
| Upper Sharon | FWGmw-016 | 4/29/2019 | FWGmw-016-190401-GW | Grab | Metals, Total | Manganese | 0.22 | | 0.0463 | RC | 0.198 |
| Upper Sharon | FWGmw-020 | 5/13/2019 | FWGmw-020-190401-GW | Grab | Metals, Total | Arsenic | 0.023 | | 0.01 | MCL | 0.003 |
| Upper Sharon | FWGmw-020 | 5/13/2019 | FWGmw-020-190401-GW | Grab | Metals, Total | Potassium | 4.6 | | | | 3.38 |
| Upper Sharon | FWGmw-024 | 5/9/2019 | FWGmw-024-190401-GW | Grab | Metals, Total | Manganese | 0.33 | | 0.0463 | RC | 0.198 |
| Unconsolidated | L12mw-185 | 5/1/2019 | LL12mw-185-190401-GW | Grab | Anions | Nitrate | 92 | | 10 | MCL | |
| Unconsolidated | L12mw-187 | 5/2/2019 | LL12mw-187-190401-GW | Grab | Anions | Nitrate | 1600 | | 10 | MCL | |
| Unconsolidated | L12mw-187 | 5/2/2019 | LL12mw-187-190401-GW | Grab | Metals, Total | Calcium | 1000 | | | | 107 |
| Unconsolidated | L12mw-187 | 5/2/2019 | LL12mw-187-190401-GW | Grab | Metals, Total | Magnesium | 320 | J | | | 55.3 |
| Unconsolidated | L12mw-187 | 5/2/2019 | LL12mw-187-190401-GW | Grab | Metals, Total | Manganese | 2.9 | | 0.0463 | RC | 0.075 |
| Unconsolidated | L12mw-187 | 5/2/2019 | LL12mw-187-190401-GW | Grab | Metals, Total | Potassium | 58 | | | | 4.84 |
| Unconsolidated | L12mw-187 | 5/2/2019 | LL12mw-187-190401-GW | Grab | Metals, Total | Sodium | 44 | J | | | 18.2 |
| Unconsolidated | L12mw-242 | 5/1/2019 | LL12mw-242-190401-GW | Grab | Metals, Filtered | Arsenic | 0.013 | J | 0.01 | MCL | 0.003 |
| Unconsolidated | L12mw-242 | 5/1/2019 | LL12mw-242-190401-GW | Grab | Metals, Filtered | Iron | 2 | | 1.4 | RSL | 1.91 |
| Unconsolidated | L12mw-242 | 5/1/2019 | LL12mw-242-190401-GW | Grab | Metals, Filtered | Sodium | 26 | | | | 18.2 |
| Unconsolidated | L12mw-242 | 5/1/2019 | LL12mw-242-190401-GW | Grab | Metals, Total | Arsenic | 0.022 | | 0.01 | MCL | 0.003 |
| Unconsolidated | L12mw-242 | 5/1/2019 | LL12mw-242-190401-GW | Grab | Metals, Total | Iron | 3.8 | | 1.4 | RSL | 1.91 |
| Unconsolidated | L12mw-242 | 5/1/2019 | LL12mw-242-190401-GW | Grab | Metals, Total | Sodium | 29 | J | | | 18.2 |
| Unconsolidated | L12mw-245 | 5/2/2019 | LL12mw-245-190401-GW | Grab | Metals, Total | Arsenic | 0.012 | | 0.01 | MCL | 0.003 |
| Unconsolidated | L12mw-245 | 5/2/2019 | LL12mw-245-190401-GW | Grab | Metals, Total | Calcium | 140 | | | | 107 |
| Unconsolidated | L12mw-245 | 5/2/2019 | LL12mw-245-190401-GW | Grab | Metals, Total | Magnesium | 67 | | | | 55.3 |
| Unconsolidated | L12mw-245 | 5/2/2019 | LL12mw-245-190401-GW | Grab | Metals, Total | Sodium | 25 | J | | | 18.2 |
| Unconsolidated | L12mw-247 | 5/1/2019 | LL12mw-247-190401-GW | Grab | Metals, Total | Manganese | 0.16 | | 0.0463 | RC | 0.075 |
| Unconsolidated | L12mw-247 | 5/1/2019 | LL12mw-247-190401-GW | Grab | Metals, Total | Sodium | 22 | | | | 18.2 |

**Appendix F.3 Spring 2019 Results that Exceed Screening Criteria (continued)**

| Zone | Well | Date Collected | Sample ID | Sample Type | Analysis Type | Chemical | Result (mg/L) | Validation Qual | GW Screening Criteria (mg/L) | GW Screening Criteria Source | Background Criteria |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Unconsolidated | LL1mw-064 | 5/7/2019 | LL1mw-064-190401-GW | Grab | Metals, Total | Manganese | 0.12 | | 0.0463 | RC | 0.075 |
| Upper Sharon | LL1mw-080 | 5/7/2019 | LL1mw-080-190401-GW | Grab | Explosives/Propellants | RDX | 0.013 | | 0.00097 | RSL | |
| Upper Sharon | LL1mw-083 | 5/6/2019 | LL1mw-083-190401-GW | Grab | Anions | Sulfate | 120 | J | | | |
| Upper Sharon | LL1mw-083 | 5/6/2019 | LL1mw-083-190401-GW | Grab | Explosives/Propellants | 1,3-Dinitrobenzene | 0.002 | | 0.0002 | RSL | |
| Upper Sharon | LL1mw-083 | 5/6/2019 | LL1mw-083-190401-GW | Grab | Explosives/Propellants | 2,4,6-Trinitrotoluene | 0.0019 | | 0.00098 | RSL | |
| Upper Sharon | LL1mw-083 | 5/6/2019 | LL1mw-083-190401-GW | Grab | Explosives/Propellants | 2,4-Dinitrotoluene | 0.0028 | | 0.00024 | RSL | |
| Upper Sharon | LL1mw-083 | 5/6/2019 | LL1mw-083-190401-GW | Grab | Explosives/Propellants | 2-Amino-4,6-Dinitrotoluene | 0.011 | | 0.0039 | RSL | |
| Upper Sharon | LL1mw-083 | 5/6/2019 | LL1mw-083-190401-GW | Grab | Explosives/Propellants | 4-Amino-2,6-Dinitrotoluene | 0.014 | | 0.0039 | RSL | |
| Upper Sharon | LL1mw-083 | 5/6/2019 | LL1mw-083-190401-GW | Grab | Miscellaneous | Alkalinity | 44 | | | | |
| Upper Sharon | LL1mw-084 | 5/6/2019 | LL1mw-084-190401-GW | Grab | Anions | Sulfate | 140 | J | | | |
| Upper Sharon | LL1mw-084 | 5/6/2019 | LL1mw-084-190401-GW | Grab | Anions | Sulfide | 0.8 | J | | | |
| Upper Sharon | LL1mw-084 | 5/6/2019 | LL1mw-084-190401-GW | Grab | Explosives/Propellants | 1,3-Dinitrobenzene | 0.0024 | | 0.0002 | RSL | |
| Upper Sharon | LL1mw-084 | 5/6/2019 | LL1mw-084-190401-GW | Grab | Explosives/Propellants | 2,4,6-Trinitrotoluene | 0.0033 | | 0.00098 | RSL | |
| Upper Sharon | LL1mw-084 | 5/6/2019 | LL1mw-084-190401-GW | Grab | Explosives/Propellants | 2,4-Dinitrotoluene | 0.00087 | | 0.00024 | RSL | |
| Upper Sharon | LL1mw-084 | 5/6/2019 | LL1mw-084-190401-GW | Grab | Explosives/Propellants | 2-Amino-4,6-Dinitrotoluene | 0.0079 | | 0.0039 | RSL | |
| Upper Sharon | LL1mw-084 | 5/6/2019 | LL1mw-084-190401-GW | Grab | Explosives/Propellants | 4-Amino-2,6-Dinitrotoluene | 0.018 | | 0.0039 | RSL | |
| Upper Sharon | LL1mw-084 | 5/6/2019 | LL1mw-084-190401-GW | Grab | Explosives/Propellants | RDX | 0.002 | | 0.00097 | RSL | |
| Unconsolidated | LL1mw-086 | 5/7/2019 | LL1mw-086-190401-GW | Grab | Metals, Filtered | Potassium | 21 | J | | | 4.84 |
| Unconsolidated | LL1mw-086 | 5/7/2019 | LL1mw-086-190401-GW | Grab | Metals, Total | Aluminum | 3.1 | | 2 | RSL | 0.386 |
| Unconsolidated | LL1mw-086 | 5/7/2019 | LL1mw-086-190401-GW | Grab | Metals, Total | Iron | 7.1 | | 1.4 | RSL | 1.91 |
| Unconsolidated | LL1mw-086 | 5/7/2019 | LL1mw-086-190401-GW | Grab | Metals, Total | Manganese | 0.36 | | 0.0463 | RC | 0.075 |
| Unconsolidated | LL1mw-086 | 5/7/2019 | LL1mw-086-190401-GW | Grab | Metals, Total | Potassium | 26 | | | | 4.84 |
| Unconsolidated | LL1mw-086 | 5/7/2019 | LL1mw-086-190401-GW | Grab | Miscellaneous | Alkalinity | 110 | | | | |
| Unconsolidated | LL1mw-088 | 5/8/2019 | LL1mw-088-190401-GW | Grab | Metals, Total | Arsenic | 0.028 | | 0.01 | MCL | 0.003 |
| Unconsolidated | LL1mw-088 | 5/8/2019 | LL1mw-088-190401-GW | Grab | Metals, Total | Sodium | 23 | J | | | 18.2 |
| Unconsolidated | LL1mw-088 | 5/8/2019 | LL1mw-088-190401-GW | Grab | Miscellaneous | Alkalinity | 290 | | | | |
| Upper Sharon | LL2mw-059 | 5/6/2019 | LL2mw-059-190401-GW | Grab | Explosives/Propellants | 1,3-Dinitrobenzene | 0.00027 | J | 0.0002 | RSL | |
| Upper Sharon | LL2mw-059 | 5/6/2019 | LL2mw-059-190401-GW | Grab | Explosives/Propellants | 2,4-Dinitrotoluene | 0.00052 | | 0.00024 | RSL | |
| Upper Sharon | LL2mw-267 | 5/2/2019 | LL2mw-267-190401-GW | Grab | Metals, Total | Iron | 2.5 | | 1.4 | RSL | 2.08 |
| Upper Sharon | LL3mw-237 | 5/6/2019 | LL3mw-237-190401-GW | Grab | Explosives/Propellants | 4-Amino-2,6-Dinitrotoluene | 0.004 | | 0.0039 | RSL | |
| Unconsolidated | NTAmw-119 | 4/30/2019 | NTAmw-119-190401-GW | Grab | Metals, Total | Manganese | 0.33 | | 0.0463 | RC | 0.075 |
| Upper Sharon | RQLmw-007 | 5/9/2019 | RQLmw-007-190401-GW | Grab | Metals, Total | Manganese | 0.49 | | 0.0463 | RC | 0.198 |
| Upper Sharon | RQLmw-008 | 5/9/2019 | RQLmw-008-190401-GW | Grab | Metals, Total | Arsenic | 0.011 | | 0.01 | MCL | 0.003 |
| Upper Sharon | RQLmw-008 | 5/9/2019 | RQLmw-008-190401-GW | Grab | Metals, Total | Iron | 28 | | 1.4 | RSL | 2.08 |
| Upper Sharon | RQLmw-008 | 5/9/2019 | RQLmw-008-190401-GW | Grab | Metals, Total | Magnesium | 74 | | | | 38.9 |
| Upper Sharon | RQLmw-008 | 5/9/2019 | RQLmw-008-190401-GW | Grab | Metals, Total | Manganese | 0.46 | | 0.0463 | RC | 0.198 |
| Upper Sharon | RQLmw-009 | 5/9/2019 | RQLmw-009-190401-GW | Grab | Metals, Total | Manganese | 0.3 | | 0.0463 | RC | 0.198 |
| Upper Sharon | RQLmw-011 | 5/9/2019 | RQLmw-011-190401-GW | Grab | Anions | Sulfate | 130 | J | | | |
| Upper Sharon | RQLmw-011 | 5/9/2019 | RQLmw-011-190402-GW | Field Duplicate | Anions | Sulfate | 130 | J | | | |
| Upper Sharon | RQLmw-012 | 5/9/2019 | RQLmw-012-190401-GW | Grab | Anions | Sulfate | 110 | J | | | |
| Upper Sharon | RQLmw-012 | 5/9/2019 | RQLmw-012-190401-GW | Grab | Miscellaneous | Alkalinity | 9.9 | J | | | |
| Upper Sharon | RQLmw-013 | 5/9/2019 | RQLmw-013-190401-GW | Grab | Anions | Sulfate | 160 | J | | | |
| Basal Sharon Congl | SCFmw-004 | 5/2/2019 | SCFmw-004-190401-GW | Grab | Metals, Total | Calcium | 150 | | | | 93 |
| Basal Sharon Congl | SCFmw-004 | 5/2/2019 | SCFmw-004-190401-GW | Grab | Metals, Total | Magnesium | 58 | | | | 30 |
| Basal Sharon Congl | SCFmw-004 | 5/2/2019 | SCFmw-004-190401-GW | Grab | Metals, Total | Potassium | 2.9 | J | | | 2.9 |
| Unconsolidated | SCLmw-001 | 5/8/2019 | SCLmw-001-190401-GW | Grab | Anions | Sulfate | 160 | | | | |
| Unconsolidated | SCLmw-001 | 5/8/2019 | SCLmw-001-190401-GW | Grab | Metals, Total | Calcium | 130 | | | | 107 |
| Unconsolidated | SCLmw-001 | 5/8/2019 | SCLmw-001-190401-GW | Grab | Metals, Total | Manganese | 0.31 | | 0.0463 | RC | 0.075 |
| Unconsolidated | SCLmw-001 | 5/8/2019 | SCLmw-001-190401-GW | Grab | Metals, Total | Sodium | 19 | | | | 18.2 |
| Unconsolidated | SCLmw-001 | 5/8/2019 | SCLmw-001-190401-GW | Grab | Miscellaneous | Alkalinity | 320 | | | | |
| Unconsolidated | SCLmw-001 | 5/8/2019 | SCLmw-001-190401-GW | Grab | Miscellaneous | Total Phosphorus as P | 0.018 | J | 0.00004 | RSL | |

**Appendix F.3 Spring 2019 Results that Exceed Screening Criteria (continued)**

| Zone | Well | Date Collected | Sample ID | Sample Type | Analysis Type | Chemical | Result (mg/L) | Validation Qual | GW Screening Criteria (mg/L) | GW Screening Criteria Source | Background Criteria |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Unconsolidated | SCLmw-002 | 5/8/2019 | SCLmw-002-190401-GW | Grab | Anions | Sulfate | 190 | | | | |
| Unconsolidated | SCLmw-002 | 5/8/2019 | SCLmw-002-190401-GW | Grab | Metals, Total | Calcium | 190 | | | | 107 |
| Unconsolidated | SCLmw-002 | 5/8/2019 | SCLmw-002-190401-GW | Grab | Metals, Total | Iron | 10 | | 1.4 | RSL | 1.91 |
| Unconsolidated | SCLmw-002 | 5/8/2019 | SCLmw-002-190401-GW | Grab | Metals, Total | Manganese | 1.1 | | 0.0463 | RC | 0.075 |
| Unconsolidated | SCLmw-002 | 5/8/2019 | SCLmw-002-190401-GW | Grab | Miscellaneous | Alkalinity | 300 | | | | |
| Unconsolidated | SCLmw-002 | 5/8/2019 | SCLmw-002-190401-GW | Grab | Miscellaneous | Total Phosphorus as P | 0.1 | J | 0.00004 | RSL | |
| Unconsolidated | SCLmw-002 | 5/8/2019 | SCLmw-002-190402-GW | Field Duplicate | Metals, Total | Calcium | 190 | | | | 107 |
| Unconsolidated | SCLmw-002 | 5/8/2019 | SCLmw-002-190402-GW | Field Duplicate | Metals, Total | Iron | 10 | | 1.4 | RSL | 1.91 |
| Unconsolidated | SCLmw-002 | 5/8/2019 | SCLmw-002-190402-GW | Field Duplicate | Metals, Total | Manganese | 1 | | 0.0463 | RC | 0.075 |
| Unconsolidated | SCLmw-002 | 5/8/2019 | SCLmw-002-190402-GW | Field Duplicate | Miscellaneous | Total Phosphorus as P | 0.11 | J | 0.00004 | RSL | |
| Unconsolidated | SCLmw-003 | 5/8/2019 | SCLmw-003-190401-GW | Grab | Anions | Sulfate | 240 | | | | |
| Unconsolidated | SCLmw-003 | 5/8/2019 | SCLmw-003-190401-GW | Grab | Metals, Total | Calcium | 160 | | | | 107 |
| Unconsolidated | SCLmw-003 | 5/8/2019 | SCLmw-003-190401-GW | Grab | Metals, Total | Magnesium | 67 | | | | 55.3 |
| Unconsolidated | SCLmw-003 | 5/8/2019 | SCLmw-003-190401-GW | Grab | Metals, Total | Manganese | 0.23 | | 0.0463 | RC | 0.075 |
| Unconsolidated | SCLmw-003 | 5/8/2019 | SCLmw-003-190401-GW | Grab | Metals, Total | Potassium | 6 | | | | 4.84 |
| Unconsolidated | SCLmw-003 | 5/8/2019 | SCLmw-003-190401-GW | Grab | Metals, Total | Sodium | 38 | J | | | 18.2 |
| Unconsolidated | SCLmw-003 | 5/8/2019 | SCLmw-003-190401-GW | Grab | Miscellaneous | Alkalinity | 390 | | | | |
| Unconsolidated | WBGmw-006 | 4/30/2019 | WBGmw-006-190401-GW | Grab | Explosives/Propellants | RDX | 0.011 | | 0.00097 | RSL | |
| Unconsolidated | WBGmw-006 | 4/30/2019 | WBGmw-006-190401-GW | Grab | Metals, Total | Manganese | 0.099 | | 0.0463 | RC | 0.075 |
| Unconsolidated | WBGmw-009 | 4/30/2019 | WBGmw-009-190401-GW | Grab | Explosives/Propellants | RDX | 0.0016 | | 0.00097 | RSL | |
| Unconsolidated | WBGmw-009 | 4/30/2019 | WBGmw-009-190401-GW | Grab | Metals, Total | Manganese | 0.18 | | 0.0463 | RC | 0.075 |
| Upper Sharon | WBGmw-020 | 4/30/2019 | WBGmw-020-190401-GW | Grab | Metals, Total | Iron | 3.4 | | 1.4 | RSL | 2.08 |
| Upper Sharon | WBGmw-020 | 4/30/2019 | WBGmw-020-190401-GW | Grab | Metals, Total | Manganese | 0.22 | | 0.0463 | RC | 0.198 |
| Upper Sharon | WBGmw-021 | 4/30/2019 | WBGmw-021-190401-GW | Grab | Metals, Total | Manganese | 0.37 | | 0.0463 | RC | 0.198 |

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# APPENDIX G

## Laboratory Data Packages
## (Provided as separate files on Compact Disc)

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# APPENDIX H

# Data Quality Assessment Report

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# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| ADR | Automated Data Review |
| AOC | Area of Concern |
| CCV | Continuing Calibration Verification |
| DoD | U.S. Department of Defense |
| DQA | Data Quality Assessment |
| DQO | Data Quality Objective |
| EDD | Electronic Data Deliverable |
| FCR | Field Change Request |
| FWGWMP | Facility-wide Groundwater Monitoring Program |
| ICV | Initial Calibration Verification |
| LCS | Laboratory Control Sample |
| LOD | Level of Detection |
| LOQ | Level of Quantitation |
| MDL | Method Detection Level |
| MPC | Measurement Performance Criteria |
| MPR | Monthly Progress Report |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| PAH | Polycyclic Aromatic Hydrocarbon |
| PARCC | Precision, Accuracy, Representativeness, Comparability, and Completeness |
| PCB | Polychlorinated Biphenyl |
| QA | Quality Assurance |
| QAPP | Quality Assurance Project Plan |
| QC | Quality Control |
| QSM | Quality Systems Manual |
| REIMS | RVAAP Environmental Information Management System |
| RI | Remedial Investigation |
| RIWP | Remedial Investigation Work Plan |
| RPD | Relative Percent Difference |
| RVAAP | Ravenna Army Ammunition Plant |
| SVOC | Semi-volatile Organic Compound |
| TestAmerica | TestAmerica Laboratories, Inc. |
| USACE | U.S. Army Corps of Engineers |
| USEPA | U.S. Environmental Protection Agency |
| VOC | Volatile Organic Compound |

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# H. PROJECT QUALITY ASSURANCE SUMMARY

## H.1 PURPOSE OF THIS REPORT

Environmental data must be evaluated relative to their known limitations and intended use. As can be expected in environmental media, some analytical results and data points require the user to be cautioned relative to the quality of the project information presented. The data verification/validation process and this data quality assessment (DQA) are performed to assist current and future data users in interpreting these data.

The purpose of this DQA report is to document the following:

- The quality control (QC) procedures followed to ensure data generated by Leidos, during the implementation of the spring 2019 sampling event to support the Facility-wide Groundwater Monitoring Program (FWGWMP) at the former Ravenna Army Ammunition Plant (RVAAP), meet project requirements;
- The quality of the data collected; and
- Any problems encountered during the course of the study and their solutions.

This DQA report provides an assessment of the analytical information generated during the implementation of the *Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Addendum for 2019* (Leidos 2019; herein referred to as the 2019 Addendum). Implementation of the 2019 Addendum was done in accordance with the *Remedial Investigation Work Plan for Groundwater and Environmental Services for RVAAP-66 Facility-wide Groundwater* (TEC-Weston 2016; herein referred to as the Remedial Investigation Work Plan [RIWP]), Appendix A.2 Quality Assurance Project Plan (QAPP).

This DQA documents the quality of the data collected during the spring 2019 sampling event and assesses if quality assurance (QA)/QC objectives were met. The primary intent of this assessment is to document that, except as noted, data generated for this investigation can withstand scientific scrutiny; are appropriate for their intended purpose; are technically defensible; and are of known and adequate quality (i.e., sensitivity, precision, accuracy, representativeness, comparability, and completeness [PARCC]).

Multiple activities were performed to achieve the required data quality for this project. Data quality objectives (DQOs) along with a QA program were established to guide the implementation of the field sampling and laboratory analysis per the 2019 Addendum (Leidos 2019). The QA program was established to standardize procedures and document activities per the FWGWMP Plan (Portage Environmental 2004) and RIWP. This program provided a means to detect and correct any deficiencies in the process. Upon receipt by the project team, results provided in the electronic data deliverable (EDD) were subjected to electronic review by an automated data review (ADR) process to identify and qualify problems related to the analysis. This was followed by manual verification/validation of QC results not included in the EDD/ADR review. These combined verification/validation results are

summarized in this DQA to document that data used in the remedial investigation (RI) are identified as having met the criteria and are being utilized appropriately.

## H.2 QUALITY ASSURANCE PROGRAM

The QAPP within the RIWP (TEC-Weston 2016) and field change request (FCR) LEIDOS_FWGW_004 were developed to enumerate the quantity and type of environmental samples needed and to define the quantity and type of QA/QC samples to be used to evaluate data quality. These documents established requirements for field and laboratory QC procedures. In general, field QC duplicate samples were required at a frequency of 10%; volatile organic compound (VOC) trip blanks were to accompany each cooler containing water samples for VOC determinations; field blanks and equipment blanks were collected to demonstrate equipment decontamination and clean ambient field conditions; and analytical laboratory QC samples, including duplicates, matrix spikes (MSs), laboratory control samples (LCSs), and method blanks, were required for each preparation batch of 20 samples or less for each parameter.

A primary goal of the QA program is to ensure that the quality of results for all environmental measurements is appropriate for their intended use and that standardized field procedures guide the investigation. Through the process of readiness review, training, equipment calibration, QC implementation, and detailed documentation, the project has successfully accomplished the goals set for the QA program.

### *H.2.1 Monthly Progress Reports*

Monthly Progress Reports (MPRs) were completed by the Leidos Project Manager for the duration of the project. The MPRs contained information on work completed, a summary of anticipated upcoming work, discussion of any health and safety issues, and a summary of investigation-derived waste staged at the facility. These reports were issued to the U.S. Army Corps of Engineers (USACE) Louisville District Contracting Officer's Representative and Project Manager by email.

### *H.2.2 Daily Activity Logs*

The Field Manager completed Daily Activity Logs. These include information such as, but not limited to, on-site sub-tier contractors, on-site equipment, work performed summaries, QC activities, health and safety activities, problems encountered, and corrective actions.

### *H.2.3 Laboratory "Definitive" Level Data Reporting*

The QAPP for this project identified requirements for laboratory data reporting. White Water Associates of Amasa, Michigan, and their subcontracted partner TestAmerica Laboratories, Inc. (TestAmerica) of Denver, Colorado, performed the analysis of the samples. The TestAmerica facility in Denver, Colorado, performed all analyses, except nitroguanidine and nitrocellulose, which were performed at the TestAmerica facility in Sacramento, California, and hexavalent chromium, which was performed at the Test America facility in North Canton, Ohio. TestAmerica Denver and Sacramento

are accredited by the U.S. Department of Defense (DoD) for the analyses they performed. Test America in North Canton, Ohio, is not DoD accredited for hexavalent chromium; due to the short holding time associated with this analysis, an FCR (FCR No. 08, June 8, 2017) was sought and approved to use the North Canton laboratory due to its proximity to the site, which eliminated the delay of shipping samples to the laboratory. All analytical procedures were completed in accordance with U.S. Environmental Protection Agency (USEPA) requirements; the DoD Quality Systems Manual (QSM), Version 5.0 (DoD 2017); and the QAPP. USEPA "definitive" data have been reported, including laboratory-level IV data packages meeting QSM Appendix A guidance.

This information from the laboratory, along with field information, provides the basis for subsequent data evaluation relative to sensitivity and PARCC.

### *H.2.4 Field Change Requests*

Three FCRs are pertinent to the spring 2019 sampling events:

- LEIDOS_FWGW_001 – Specifies that, due to the permanent bladder pumps, total depths of wells will not be collected during the facility-wide comprehensive water level measurements.
- LEIDOS_FWGW_004 – Specifies the field QC sampling frequency.
- LEIDOS_FWGW_006 – Documents the micro-purge procedure to be implemented during groundwater sampling collected by micro-purging with dedicated bladder pumps.

## H.3 DATA VERIFICATION/VALIDATION

The objective when evaluating the project data quality is to determine its usability. The evaluation is based on the interpretation of laboratory QC measures, field QC measures, and project DQOs. This project implemented ADR software to facilitate laboratory data review. The ADR output was reviewed by the project-designated verification staff, as discussed below.

### *H.3.1 Field Data Verification*

Field-generated documents, such as sampling logs, boring logs, daily health and safety summaries, daily safety inspections, equipment calibration and maintenance logs, and sample management logs, were peer-reviewed on site.

### *H.3.2 Laboratory Data Verification/Validation*

Analytical data generated for this project have been subjected to a process of automated and manual data verification, validation, and review. Criteria and protocols were established in the following documents:

- 2019 Addendum (Leidos 2019);
- RIWP, including Appendix A.2 QAPP (TEC-Weston 2016);
- DoD QSM, Version 5.0 (DoD 2017);

- USEPA *Contract Laboratory Program National Functional Guidelines for Organic Data Review*, EPA-540/R-99/008 (USEPA 1999);
- USEPA *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, EPA-540/R-04/004(USEPA 2004); and
- Leidos Technical Support Contractor QA Standard Operating Procedure (ESE-DM-05), *Data Verification and Validation* (Leidos 2015).

Upon receipt of analytical data, QA staff performed a systematic examination of 100% of the reports, including ADR outputs. Discrepancies identified during this process were recorded and documented. Any discrepancies were resolved prior to database flag entry. QA Program Nonconformance Report and Corrective Action systems were implemented as required.

During the verification phase of the review and evaluation process, data were subjected to a systematic technical review by examining all field sample and analytical QC results against the measurement performance criteria (MPC) specified in the QAPP, following USEPA functional guidelines, DoD QSM criteria, and Leidos internal procedures for laboratory data review. These guidelines describe methods for evaluating the review criteria and actions to be taken resulting from the review of these criteria. The primary objectives of this phase were to assess and summarize the quality and reliability of the data for the intended use and to document factors that may affect the usability of the data. This data verification/validation and analytical review process included, but was not necessarily limited to, the following parameters:

- Data completeness;
- Analytical holding times and sample preservation;
- Calibration (initial and continuing);
- Method blanks and calibration blanks;
- Sample results verification;
- Surrogate recovery (organics);
- LCS analysis;
- Internal standard performance;
- MS/matrix spike duplicate (MSD) recovery;
- Serial dilution/post digestion spike, interference check standards (inorganics);
- Field duplicate analysis comparison;
- Reported detection limits; and
- Secondary dilutions.

As a result of this review, data were qualified based on the technical evaluations of QC sample results compared to MPC specified in the QAPP. Qualifiers were applied as needed to field and analytical results to indicate the usability of the data for its intended purpose.

### *H.3.3 Definitions of Data Qualifiers (Flags)*

During the data verification/validation process, laboratory data were assigned appropriate data qualification flags with reason codes. Qualification flags are defined as follows:

- "U" Indicates the analyte was analyzed for, but not detected above, the level of the associated value.
- "J" Indicates the analyte was positively identified; however, the associated numerical value is an approximate concentration of the analyte in the sample.
- "UJ" Indicates the analyte was analyzed for, but not detected above, the associated value; however, the reported value is an estimate and demonstrates a decreased knowledge of its accuracy or precision.
- "R" Indicates the analyte value reported is unusable due to significant noncompliant QC results. One Nitrite result (RQLmw-013-190401-GW) was qualified "R" due to missed holding time.

### *H.3.4 Data Compliance*

A total of 92 environmental groundwater samples were collected with approximately 4,689 discrete data points (i.e., analytes) obtained, reviewed, and integrated into the assessment (these totals do not include field measurements, field QC blanks, and field descriptions). During the project, samples were successfully collected and produced usable results for more than 99.9% of the sample analyses performed during the spring 2019 sampling event. No data were rejected.

Table H-1 summarizes the number of environmental and QA split samples collected during the spring 2019 sampling event. Cross-references for field duplicates and field QC samples and the associated primary samples are presented in Table H-2 along with the requested parameters for each sample. Table H-3 summarizes the qualified analyses grouped by parameter, and Table H-4 details the individual results qualified during review. The majority of the estimated values were based on concentrations between the laboratory method detection levels (MDLs) and the sample level of quantitation (LOQ) (i.e., values determined in this region have an inherently higher variability and are considered to be estimated concentrations); qualifiers also were assigned based on noncompliant MS recoveries, holding times, blank contamination, and LCS recoveries, as well as professional judgment.

During the spring 2019 sampling event, 11 field duplicates were collected and analyzed with primary samples. QA split samples were collected and sent to an independent laboratory (CT Laboratories in Baraboo, Wisconsin); these results were provided directly to USACE and are not included in this DQA. Six trip blanks were collected and analyzed. Equipment rinsate blanks were not required since samples were collected via the use of dedicated sampling equipment. The project goal for blanks is to achieve concentrations less than the reporting levels. Table H-5 summarizes analytes that were detected in the trip blanks. In general, trip blank results indicate that the potential for sample contamination due to cross contamination is very low.

## H.4 DATA QUALITY EVALUATION

### *H.4.1 Volatile Organic Groundwater Analysis*

Analytical holding times were met for all VOC samples Initial calibrations and continuing calibration criteria were achieved. Surrogate recoveries and internal area counts were within control limits for all analyses. Method blanks associated with three samples resulted in four data points being qualified as "U" or "UJ". All LCS and MS/MSD recoveries were within criteria. MS/MSD relative percent difference (RPD) values met control criteria. No samples required dilutions. Two samples contained significant headspace that developed during sample storage and results (72) were qualified as "J" or "UJ" based on professional judgment due to sample condition at the time of analysis. No data were rejected for any reason. Although some analyses were qualified as estimated, the deviations observed should not have a significant impact on the results, and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix F and can be found in the RVAP Environmental Information Management System (REIMS).

### *H.4.2 Semi-volatile Organic Groundwater Analysis*

Extraction and analytical holding times were met for all samples. Initial and continuing calibration criteria were met. Surrogate recoveries met criteria. Internal standard area counts and compound retention times met criteria throughout the data analyses. Method blanks were free of contamination. LCS and/or MS/MSD recoveries outside criteria resulted in nine data points being qualified as estimated "UJ". MSD RPD values met control criteria. No semi-volatile organic compound (SVOC) samples required dilutions. No data were estimated or rejected for any reason, and the results are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix F and can be found in REIMS.

### *H.4.3 Polycyclic Aromatic Hydrocarbon Groundwater Analysis*

Extraction and analytical holding times were met for all samples. Initial and continuing calibration criteria were met. Surrogate recoveries, internal standard area counts and compound retention times met criteria throughout the data analyses. Method blanks were free from contamination. LCS and MS/MSD recoveries and RPD values met criteria. No PAH samples required dilutions. No data were rejected for any reason. All values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix F and can be found in REIMS.

### *H.4.4 Pesticide Analysis Groundwater Analysis*

Analytical holding times were met for all samples; as needed, clean-up protocols (SW3660A and SW3665A) were used to reduce matrix interferences in the sample extracts. Surrogate recoveries met control criteria for all samples. Initial and continuing calibrations met criteria for all pesticide compounds. Pesticide method blanks were free of contamination. LCS recoveries associated with four compounds were outside acceptance criteria for six samples resulting in 24 data points qualified as "J" or "UJ." MS/MSD recoveries and RPD values were within criteria. No pesticide samples required

dilutions. Column comparison criteria were met. No pesticide data were rejected for any reason. Although some analyses were qualified as estimated, the deviations observed should not have a significant impact on the results, and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix F and can be found in REIMS.

### *H.4.5 Polychlorinated Biphenyl Analysis Groundwater Analysis*

Analytical holding times were met for all samples; as needed, clean-up protocols (SW3660A and SW3665A) were used to reduce matrix interferences in the sample extracts. Surrogate recoveries met control limits. Initial and continuing calibration criteria were met for all polychlorinated biphenyl (PCB) compounds. PCB method blanks were free from contamination. LCS recoveries were within acceptance criteria. MS/MSD recoveries and RPD values met criteria. No PCB data were estimated or rejected for any reason. No PCB samples required a dilution. All PCB values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix F and can be found in REIMS.

### *H.4.6 Explosives and Nitroglycerin Groundwater Analysis*

Analytical holding times were met for all samples. Surrogate recoveries met control limits in all samples. Initial and continuing calibration criteria were met. All method blanks were free of contamination. LCS recovery for one compound exceeded criteria resulting in 11 results being qualified as "UJ." MS/MSD recoveries exceeded criteria for six compounds which caused 11 sample results to be qualified as "J" or "UJ". Column comparison criteria were exceeded for three results, which caused these data points to be qualified as "J" based on professional judgment. No explosives samples required dilutions. No data were rejected for any reason. Although some analyses were qualified as estimated, the deviations observed should not have a significant impact on the results, and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix F and can be found in REIMS.

### *H.4.7 Metals and Phosphorus Groundwater Analysis*

Analytical holding times were met for all samples. Initial and continuing calibration criteria were achieved for all elements. Sample results associated with calibration standard exceedances were qualified as follows: if ICV or CCV results were above criteria, detects were qualified as "J"; if ICV/CCV results were below criteria, detects were qualified as "J" and non-detects as "UJ." Method blank contamination resulted in eight results being qualified as non-detect "U"; initial and continuing calibration blank contamination resulted in six data points being qualified as "U" or "UJ." LCS recoveries met criteria. MS/MSD recoveries exceeded criteria for metal compounds in four samples, which resulted in nine sample results qualified as "J" or "UJ." MS/MSD RPD values were within control limits. Professional judgment was used to qualify 55 results, based on ICV/CCV results per above, as well as serial dilution and post digestion spike results. Reporting levels are considered consistent with QAPP goals. No data were rejected for any reason. No dilutions were required. Although some analyses were qualified as estimated, the deviations observed should not have a

significant impact on the results, and the reported values were considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix F and can be found in REIMS.

### *H.4.8 Propellants Groundwater Analysis*

Analytical holding times were met for all samples. Initial and continuing calibration criteria were met for all compounds. Method blanks were free from contamination. LCS and MS/MSD recoveries were within criteria; RPD values were within control limits. No dilutions were required. No data were rejected for any reason. Although some analyses were qualified as estimated, the deviations observed should not have a significant impact on the results, and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix F and can be found in REIMS.

### *H.4.9 Anions*

Results for one nitrate and two nitrite results were qualified as estimated "J" or "UJ" due to missed holding times and one nitrite result was rejected due to analysis performed more than 2x the hold time. Initial and continuing calibration criteria were met for all compounds. Method and calibration blank were free from contamination that impacted sample results. MS/MSD recoveries were outside criteria for sulfate which resulted in six results qualified as estimated "J". MS/MSD RPD results met criteria. Laboratory duplicate RPD results met criteria. No groundwater samples required a dilution. The nitrite data point that was rejected was not used in evaluating project objectives. Analyses that were qualified as estimated, should not have a significant impact on the results, and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix F and can be found in REIMS.

### *H.4.10 Cyanide*

Analytical holding times were met for all samples. Initial and continuing calibration criteria were met for all compounds. Method blanks were free from contamination. LCS recoveries were within criteria. MS/MSD recoveries were outside criteria and resulted in the qualification of six data points as estimated; RPD values met criteria. No dilutions were required. No data were rejected for any reason. Although some analyses were qualified as estimated, the deviations observed should not have a significant impact on the results, and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix F and can be found in REIMS.

### *H.4.11 Perchlorate*

Analytical holding times were met for all samples. Initial and continuing calibration criteria were met for all compounds. Method blanks were free from contamination. LCS recoveries were within criteria. MS/MSD recoveries exceeded criteria resulting in two samples qualified as estimated; RPD values met criteria. No dilutions were required. No data were rejected for any reason. Although some analyses

were qualified as estimated, the deviations observed should not have a significant impact on the results, and the values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix F and can be found in REIMS.

### *H.4.12 Alkalinity*

Analytical holding times were met for all samples. Initial and continuing calibration criteria were met for alkalinity. Method blanks were free from contamination. LCS recoveries were within criteria. MS/MSD recoveries and RPD values met criteria for alkalinity. No dilutions were required. No data were rejected for any reason. Complete data summary tables, with associated qualifiers, are provided in Appendix F and can be found in REIMS.

### *H.4.13 Hexavalent Chromium*

Analytical holding times were met for all samples. Initial and continuing calibration criteria were met for all compounds. Method blanks were free from contamination. LCS recoveries were within criteria. MS/MSD recoveries and RPD values met criteria. No dilutions were required. No data were rejected for any reason. Reported values are considered technically sound and defensible. Complete data summary tables, with associated qualifiers, are provided in Appendix F and can be found in REIMS.

### *H.4.14 Precision*

Field duplicate samples were collected to assess the combined variability (i.e., precision) due to environmental media, sampling reproducibility, and analytical precision. Field duplicate samples were collected from the same spatial and temporal conditions as the primary environmental sample.

Field duplicate comparison information is presented in Table H-6. If a given analyte was not detected in both the regular and field duplicate sample, precision was considered within limits and results were not included in the table. The RPD was calculated only when both samples had reported concentrations greater than five times the LOQ. When one or both sample values were between the LOQ and five times the LOQ, the absolute difference was evaluated. Tables 12-1 through 12-17 of the QAPP set the RPD criteria, while the absolute difference is set at one times the reporting limit. Two metals results in one field duplicate pair exceeded criteria (parent samples having detected concentration and the field duplicate having nondetects); all other field duplicate comparisons met criteria.

### *H.4.15 Sensitivity*

Determining minimum detectable values allows the investigation to assess the confidence that can be placed in a value relative to the magnitude of analyte concentration observed. The closer a measured value comes to the minimum detectable concentration, the less confidence and more variation the measurement may have. Project sensitivity goals were expressed relative to the project action limits in the QAPP, as presented in Tables 15-1 through 15-19; these tables identified compounds for which the expected LOD was greater than the project action limit. These levels were further evaluated relative to the applicable screening criteria, and LODs were at or below screening criteria, with the exceptions

previously noted in the QAPP tables; in addition, two compounds (benzo[a]anthracene and Aroclor 1016) were reported with LODs greater than the screening criteria but with an MDL below the applicable criteria. In general, LODs are considered adequate for their intended use and have been considered during data interpretation and statistical applications.

Method blank determinations were performed with each analytical sample batch for each analyte under investigation. These blanks were evaluated to determine their potential impact on individual data points. Action levels are set at 5 times the blank concentration for all analytes, except those designated as common laboratory contaminants (i.e., methylene chloride, acetone, toluene, 2-butanone, and phthalate compounds) for which the action level is 10 times the blank concentration. Action limits for inorganics were set as 10 times the blank concentration. Reported sample concentrations are evaluated against blank action levels, and the following qualifications are made when reportable quantities of analytes were observed in the associated method blank:

- When the sample analyte concentration is above the action level (5–10 times the blank concentration), the data are not qualified and it is considered a positive value.
- If the sample concentration is below the action level, the data are considered impacted by the method blank. If the sample result is greater than the LOQ, the result is qualified as a non-detectable concentration at the analyte value reported and these data are qualified as "U." If the sample result is greater than the level of detection (LOD) but less than the LOQ, the result is qualified as a non-detectable concentration at the analyte value reported and these data are qualified as "UJ." If the sample result is less than the LOD (an estimated value), the result is qualified as non-detectable at the concentration of the LOD and qualified as "U."

No data were rejected as a result of method blank contamination; however, various analytes were qualified as a non-detectable concentration "U," as summarized in Table H-4.

Table H-5 summarizes analytes that were detected in trip blanks. Six trip blanks were collected. One compound was detected in one trip blank, as listed in Table 3-5. The concentration observed was less than the reporting level. The transportation and sample storage process, and the procedures and precautions employed, were effective in preserving the integrity of the sample analysis.

### *H.4.16 Representativeness and Comparability*

Representativeness expresses the degree to which data accurately reflect the analyte or parameter of interest for the environmental media being studied and is the qualitative term most concerned with the proper design of the sampling program. Factors that affect the representativeness of analytical data include proper preservation, holding times, and use of standard sampling and analytical methods. Samples were picked up on site by the TestAmerica courier, then delivered or shipped to the appropriate laboratory location; samples were received within temperature specifications and in good condition. Holding times were exceeded as discussed above; with one exception, samples were analyzed within two times the holding time, and the data are therefore considered usable but estimated ("J," "UJ"); one nitrite value was rejected due to hold time per the above discussion.

Comparability, like representativeness, is a qualitative term relative to an individual project data set. The RI employed appropriate sampling methodologies, sample containers and preservation, and site surveillance; used standard sampling devices and uniform training; and documented sampling procedures, standard analytical protocols/procedures, QC checks with standard control limits, and universally accepted data reporting units to ensure comparability to other data sets. Through the proper implementation and documentation of these standard practices, the project has established the confidence that the data will be comparable to other project and programmatic information.

### *H.4.17 Completeness*

Usable data are defined as those data that pass individual scrutiny during the verification and validation process. These data, including estimated data, have been determined to be usable for RVAAP restoration program objectives.

The completeness goal for analytical data is 95%, as defined in Tables 12-1 through 12-17 of the FWGWMP Plan. All samples specified in the 2019 Addendum (Leidos 2019) were collected as planned, and usable results were generated for >99.9% of sample analyses performed.

## H.5 DATA QUALITY ASSESSMENT SUMMARY

The overall quality of the spring 2019 sampling event meets established project objectives. Through implementation of the project data verification, validation, and assessment process, project information has been determined to be acceptable for use.

Data, as presented, have been qualified as usable; some data have been qualified estimated, "J" or "UJ." One data point was rejected. Data that have been qualified as estimated indicate accuracy, precision, or sensitivity did not meet all requirements, but results are considered adequate for interpretation. All undetected analytes were reported at detection levels that were adequate for use during data interpretation and statistical applications.

Data produced for this project demonstrate they can withstand scientific scrutiny; are appropriate for its intended purpose; are technically defensible; and are of known and acceptable sensitivity, precision, and accuracy. Data integrity has been documented through proper implementation of QA and QC measures. The environmental information presented has an established confidence that allows utilization for the project objectives and provides data for future needs.

## H.6 REFERENCES

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USEPA (U.S. Environmental Protection Agency) 1994. *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*. EPA-540/R-04/004. April 2004.

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**Table H-1. Number of Samples Collected – Spring 2019 Sampling Event**

| Media | Environmental Samples | Field Duplicates | USACE Split Samples | Trip Blanks | Equipment Rinse Blanks | Source Water Blanks | Field Blanks |
|---|---|---|---|---|---|---|---|
| Groundwater | 72 | 11 | 11 | 6 | 0 | 0 | 0 |

USACE = U.S. Army Corps of Engineers.

**Table H-2. Identification of Regular and QC Samples Taken – Spring 2019 Sampling Event**

| Media | Environmental Samples | Lab SDG | Field Duplicates | Trip Blanks | Metals | Chromium, hexavalent | Explosives | Propellants | SVOCs | PAHs | VOCs | Pesticides | PCBs | Cyanide | Perchlorate | Anions | Alkalinity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater | CBPmw-008-190401-GW | 280-123584-1 | | | | | | | | | | | | X | | | |
| Groundwater | CBPmw-009-190401-GW | 280-123656-1 | | | | | | | | | | | | X | | | |
| Groundwater | DA2mw-115-190401-GW | 280-123183-1 | DA2mw-115-190402-GW | | X | | | | | | | | | | | | |
| Groundwater | DET-003-190401-GW | 280-123221-1 | DET-003-190402-GW | FWGTB-191001-TB | X | | X | | X | X | X | X | X | X | | | |
| Groundwater | DET-004-190401-GW | 280-123221-1 | | FWGTB-191001-TB | X | | X | | X | X | X | X | X | X | | | |
| Groundwater | EBGmw-125-190401-GW | 280-123467-1 | | | | | | | | | | | | X | | | |
| Groundwater | EBGmw-131-190401-GW | 280-123467-1 | | | | | | | | | | | | X | | | |
| Groundwater | FBQmw-171-190401-GW | 280-123261-1 | | | | | | | | | | | | X | | X | X |
| Groundwater | FBQmw-172-190401-GW | 280-123261-1 | FBQmw-172-190402-GW | | | | | | | | | | | X | | | |
| Groundwater | FBQmw-174-190401-GW | 280-123261-1 | | | | | X | | | | | | | | | X | X |
| Groundwater | FBQmw-175-190401-GW | 280-123467-1 | FBQmw-175-190402-GW | | | X | | | | | | | | | | X | X |
| Groundwater | FBQmw-176-190401-GW | 280-123584-1 | | | | | | | | | | | | X | | | |
| Groundwater | FWGmw-004-190401-GW | 280-123584-1 | | | X | | X | | | | | | | | | | |
| Groundwater | FWGmw-007-190401-GW | 280-123221-1 | | | X | | X | | | | | | | | | | |
| Groundwater | FWGmw-011-190401-GW | 280-123584-1 | | | X | | X | | | | | | | | | | |
| Groundwater | FWGmw-012-190401-GW | 280-123584-1 | | | X | | X | | | | | | | | | | |
| Groundwater | FWGmw-015-190401-GW | 280-123584-1 | | | X | | X | | | | | | | | | | |
| Groundwater | FWGmw-016-190401-GW | 280-123221-1 | | | X | | X | | | | | | | | | | |
| Groundwater | FWGmw-018-190401-GW | 280-123656-1 | | FWGTB-191004-TB | X | | | | | | X | | | X | | | |
| Groundwater | FWGmw-019-190401-GW | 280-123330-1 | | | | | | X | | | | | | | | | |
| Groundwater | FWGmw-020-190401-GW | 280-123802-1 | | FWGTB-191006-TB | X | | | | | | X | | | X | | | |
| Groundwater | FWGmw-021-190401-GW | 280-123656-1 | FWGmw-021-190402-GW | | X | | X | | | | | | | | | | |
| Groundwater | FWGmw-022-190401-GW | 280-123330-1 | | | | | | X | | | | | | | | | |
| Groundwater | FWGmw-023-190401-GW | 280-123261-1 | | | | | | X | | | | | | | | | |
| Groundwater | FWGmw-024-190401-GW | 280-123656-1 | | | X | | X | | | | | | | | | | |
| Groundwater | LL10mw-003-190401-GW | 280-123261-1 | LL10mw-003-190402-GW | FWGTB-191002-TB | | | | | | | X | | | | | | |
| Groundwater | LL10mw-005-190401-GW | 280-123330-1 | | | X | | | | | | | | | | | | |
| Groundwater | LL11mw-005-190401-GW | 280-123261-1 | | | | | | | | | | | | X | | | |
| Groundwater | LL12mw-183-190401-GW | 280-123261-1 | | | | | | | | | | | | X | | | |
| Groundwater | LL12mw-185-190401-GW | 280-123261-1 | | | | | | | | | | | | | | | |
| Groundwater | LL12mw-187-190401-GW | 280-123330-1 | | | X | | | | | | | | | | X | | |
| | | | | | | | | | | | | | | | X | | |

**Table H-3. Identification of Regular and QC Samples Taken – Spring 2019 Sampling Event (continued)**

| Media | Environmental Samples | Lab SDG | Field Duplicates | Trip Blanks | Metals | Chromium, hexavalent | Explosives | Propellants | SVOCs | PAHs | VOCs | Pesticides | PCBs | Cyanide | Perchlorate | Anions | Alkalinity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater | LL12mw-242-190401-GW | 280-123330-1 | | | X | | | | | | | | | | | | |
| Groundwater | LL12mw-245-190401-GW | 280-123330-1 | | | X | | X | | | | | | | | X | | |
| Groundwater | LL12mw-247-190401-GW | 280-123261-1 | | | X | | | | | | | | | | X | | |
| Groundwater | LL1mw-064-190401-GW | 280-123467-1 | | | X | | | | | | | | | | X | | |
| Groundwater | LL1mw-065-190401-GW | 280-123467-1 | | | X | | X | | | | | | | | | | |
| Groundwater | LL1mw-080-190401-GW | 280-123584-1 | | | | | X | | | | | | | | | | |
| Groundwater | LL1mw-081-190401-GW | 280-123467-1 | | | | | X | | | | | | | X | | | |
| Groundwater | LL1mw-083-190401-GW | 280-123457-1 | | | | | X | X | | | | | | | | X | X |
| Groundwater | LL1mw-084-190401-GW | 280-123457-1 | | | X | | X | X | | | | | | | | X | X |
| Groundwater | LL1mw-086-190401-GW | 280-123467-1 | | | X | | | | | | | | | X | | | X |
| Groundwater | LL1mw-087-190401-GW | 280-123330-1 | | | X | | X | | | | | | | | | | |
| Groundwater | LL1mw-088-190401-GW | 280-123656-1 | | | X | | X | | | | | | | | | | X |
| Groundwater | LL1mw-089-190401-GW | 280-123467-1 | LL1mw-089-190402-GW | | | | X | X | | | | | | | | | |
| Groundwater | LL2mw-059-190401-GW | 280-123457-1 | | | X | | X | | | | | | | | | | |
| Groundwater | LL2mw-264-190401-GW | 280-123330-1 | | | | | | | | | | | | X | | | |
| Groundwater | LL2mw-267-190401-GW | 280-123330-1 | | | X | | X | | | | | | | | | | |
| Groundwater | LL2mw-272-190401-GW | 280-123457-1 | | | | | | | | | | | | X | | | |
| Groundwater | LL3mw-234-190401-GW | 280-123467-1 | | | | | | | | | | | | X | | | |
| Groundwater | LL3mw-237-190401-GW | 280-123457-1 | | | | | X | | | | | | | | | | |
| Groundwater | LL3mw-244-190401-GW | 280-123457-1 | | | X | | X | | | | | | | | | | |
| Groundwater | LL3mw-246-190401-GW | 280-123656-1 | LL3mw-246-190402-GW | | X | | X | | | | | | | | X | | |
| Groundwater | LL4mw-200-190401-GW | 280-123330-1 | | | | | | | | | | | | X | | | |
| Groundwater | LL7mw-001-190401-GW | 280-123261-1 | | | X | | | | | | | | | X | | | |
| Groundwater | LL7mw-006-190401-GW | 280-123261-1 | | | | | X | | | | | | | | | | |
| Groundwater | NTAmw-119-190401-GW | 280-123221-1 | NTAmw-119-190402-GW | | X | | X | | | X | | | | | | | |
| Groundwater | NTAmw-120-190401-GW | 280-123221-1 | | | | | | | X | | | | | | | | |
| Groundwater | RQLmw-007-190401-GW | 280-123656-1 | | FWGTB-191008-TB | X | | X | | X | X | X | X | X | X | | | |
| Groundwater | RQLmw-008-190401-GW | 280-123656-1 | | FWGTB-191008-TB | X | | X | | X | X | X | X | X | X | | | |
| Groundwater | RQLmw-009-190401-GW | 280-123656-1 | | FWGTB-191008-TB | X | | X | | X | X | X | X | X | X | | | |
| Groundwater | RQLmw-011-190401-GW | 280-123656-1 | RQLmw-011-190402-GW | | | | | | | | | | | | | X | X |
| Groundwater | RQLmw-012-190401-GW | 280-123656-1 | | | | | | | | | | | | X | | X | X |

**Table H-3. Identification of Regular and QC Samples Taken – Spring 2019 Sampling Event (continued)**

| Media | Environmental Samples | Lab SDG | Field Duplicates | Trip Blanks | Metals | Chromium, hexavalent | Explosives | Propellants | SVOCs | PAHs | VOCs | Pesticides | PCBs | Cyanide | Perchlorate | Anions | Alkalinity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Groundwater | RQLmw-013-190401-GW | 280-123656-1 | | | | | | | | | | | | | | X | X |
| Groundwater | RQLmw-016-190401-GW | 280-123656-1 | | | | | | | | | | | | X | | | |
| Groundwater | SCFmw-004-190401-GW | 280-123330-1 | | | X | | | | | | | | | | | | |
| Groundwater | SCLmw-001-190401-GW | 280-123584-1 | | FWGTB-191005-TB | X | | X | X | X | X | X | X | X | X | X | X | X |
| Groundwater | SCLmw-002-190401-GW | 280-123584-1 | SCLmw-002-190402-GW | FWGTB-191005-TB | X | | X | X | X | X | X | X | X | X | X | X | X |
| Groundwater | SCLmw-003-190401-GW | 280-123584-1 | | FWGTB-191005-TB | X | | X | X | X | X | X | X | X | X | X | X | X |
| Groundwater | WBGmw-006-190401-GW | 280-123221-1 | | | X | | X | | | | | | | | | | |
| Groundwater | WBGmw-009-190401-GW | 280-123221-1 | | | X | | X | | | | | | | | | | |
| Groundwater | WBGmw-020-190401-GW | 280-123221-1 | | | X | | X | | | | | | | | | | |
| Groundwater | WBGmw-021-190401-GW | 280-123221-1 | | | X | | X | | | | | | | | | | |

Trip blanks only accompany samples for VOCs in water.
Propellants include nitrocellulose and nitroguanidine.
PAH = Polycyclic aromatic hydrocarbon.
PCB = Polychlorinated biphenyl.
QC = Quality control.
SDG = Sample delivery group.
SVOC = Semi-volatile organic compound.
TB = Trip blank.
VOC = Volatile organic compound.

**Table H-3. Summary of Qualified Results for Samples – Spring 2019 Sampling Event**

| Analysis Group | Val. Qual | Validation Code | Number Qualified | Total Number of Analyses | Percent Qualified |
|---|---|---|---|---|---|
| All Analyses | R | | 1 | 3114 | 0 |
| All Analyses | J | | 307 | 3114 | 10 |
| All Analyses | UJ | | 127 | 3114 | 4 |
| All Analyses | U | | 29 | 3114 | 1 |
| All Analyses | None | | 2650 | 3114 | 85 |
| Metals | J | MS-J | 4 | 1109 | 0 |
| Metals | J | MS-J,RepLimit-J | 4 | 1109 | 0 |
| Metals | J | ProJudge-J | 31 | 1109 | 3 |
| Metals | J | RepLimit-J | 220 | 1109 | 20 |
| Metals | J | RepLimit-J,ProJudge-J | 8 | 1109 | 1 |
| Metals | UJ | MS-UJ | 1 | 1109 | 0 |
| Metals | UJ | ProJudge-UJ | 1 | 1109 | 0 |
| Metals | UJ | RepLimit-J,CalBlk-U,ProJudge-J | 1 | 1109 | 0 |
| Metals | U | MB-U,RepLimit-J | 8 | 1109 | 1 |
| Metals | U | ProJudge-U | 7 | 1109 | 1 |
| Metals | U | RepLimit-J,CalBlk-U | 5 | 1109 | 0 |
| Metals | U | RepLimit-J,ProJudge-U | 7 | 1109 | 1 |
| Metals | None | None | 812 | 1109 | 73 |
| Explosives | J | MS-J | 2 | 672 | 0 |
| Explosives | J | ProJudge-J | 3 | 672 | 0 |
| Explosives | J | RepLimit-J | 4 | 672 | 1 |
| Explosives | UJ | LCS-UJ | 9 | 672 | 1 |
| Explosives | UJ | MS-UJ | 7 | 672 | 1 |
| Explosives | UJ | MS-UJ,LCS-UJ | 2 | 672 | 0 |
| Explosives | None | None | 645 | 672 | 96 |
| Propellants | J | RepLimit-J | 1 | 20 | 5 |
| Propellants | None | None | 19 | 20 | 95 |
| SVOCs | UJ | LCS-UJ | 7 | 307 | 2 |
| SVOCs | UJ | MS-UJ | 1 | 307 | 0 |
| SVOCs | UJ | MS-UJ,LCS-UJ | 1 | 307 | 0 |
| SVOCs | None | None | 298 | 307 | 97 |
| PAHs | None | None | 180 | 180 | 100 |
| VOCs | J | RepLimit-J | 8 | 468 | 2 |
| VOCs | J | RepLimit-J,ProJudge-J | 1 | 468 | 0 |
| VOCs | UJ | MB-U,RepLimit-J,ProJudge-J | 2 | 468 | 0 |
| VOCs | UJ | ProJudge-UJ | 69 | 468 | 15 |
| VOCs | U | MB-U,RepLimit-J | 2 | 468 | 0 |
| VOCs | None | None | 386 | 468 | 82 |
| Pesticides | UJ | LCS-UJ | 24 | 189 | 13 |
| Pesticides | None | None | 165 | 189 | 87 |
| PCBs | None | None | 63 | 63 | 100 |
| Cyanide | J | MS-J | 3 | 31 | 10 |
| Cyanide | J | MS-J,RepLimit-J | 3 | 31 | 10 |
| Cyanide | J | RepLimit-J | 2 | 31 | 7 |
| Cyanide | None | None | 23 | 31 | 74 |

**Table H-3. Summary of Qualified Results for Samples – Spring 2019 Sampling Event (continued)**

| Analysis Group | Val. Qual | Validation Code | Number Qualified | Total Number of Analyses | Percent Qualified |
|---|---|---|---|---|---|
| Perchlorate | J | MS-J | 2 | 5 | 40 |
| Perchlorate | None | None | 3 | 5 | 60 |
| Anions | R | HT-R | 1 | 53 | 2 |
| Anions | J | HT-J,RepLimit-J | 1 | 53 | 2 |
| Anions | J | MS-J | 6 | 53 | 11 |
| Anions | J | RepLimit-J | 2 | 53 | 4 |
| Anions | UJ | HT-UJ | 2 | 53 | 4 |
| Anions | None | None | 41 | 53 | 77 |
| Alkalinity | J | RepLimit-J | 2 | 15 | 13 |
| Alkalinity | None | None | 13 | 15 | 87 |
| Hex Chromium | None | None | 2 | 2 | 100 |

Validation Qualifiers: J = estimated, U = not detected, UJ = not detected and reporting limit estimated.
Validation Reason Codes: CalBlk = calibration blank, CCV = continuing calibration verification, FldQC = field quality control, HT = holding time, IntStd = internal standard, LCS = laboratory control sample, MB = method blank, MS = matrix spike, ProJudge = professional judgment, RptLimit = reporting limit, Surr = surrogate recovery.
PAH = Polycyclic aromatic hydrocarbon.
PCB = Polychlorinated biphenyl.
SVOC = Semi-volatile organic compound.
VOC = Volatile organic compound.
-- = No data qualifier.

**Table H-4. Detailed Listing of Qualified Results – Spring 2019 Sampling Event**

| Analysis Type | Media | Chemical | Sample Delivery Group | Sample ID | Results | Det. Limit (LOQ) | Lab Qual | Val. Qual | Validation Code |
|---|---|---|---|---|---|---|---|---|---|
| Metals | Groundwater | ALUMINUM | 280-123183-1 | DA2mw-115-190401-GW | 21 | 300 | J | J | RepLimit-J |
| Metals | Groundwater | ALUMINUM | 280-123584-1 | FWGmw-004-190401-GW | 23 | 300 | J | J | RepLimit-J |
| Metals | Groundwater | ALUMINUM | 280-123221-1 | FWGmw-007-190401-GW | 32 | 300 | J | J | RepLimit-J |
| Metals | Groundwater | ALUMINUM | 280-123802-1 | FWGmw-020-190401-GW | 31 | 300 | J | J | RepLimit-J |
| Metals | Groundwater | ALUMINUM | 280-123330-1 | LL12mw-245-190401-GW | 31 | 300 | J | J | RepLimit-J |
| Metals | Groundwater | ALUMINUM | 280-123457-1 | LL1mw-084-190401-GW | 23 | 300 | J | J | RepLimit-J |
| Metals | Groundwater | ALUMINUM | 280-123467-1 | LL1mw-086-190401-GW | 53 | 300 | J | J | RepLimit-J |
| Metals | Groundwater | ALUMINUM | 280-123330-1 | LL1mw-087-190401-GW | 87 | 300 | J | J | RepLimit-J |
| Metals | Groundwater | ALUMINUM | 280-123457-1 | LL2mw-059-190401-GW | 33 | 300 | J | J | RepLimit-J |
| Metals | Groundwater | ALUMINUM | 280-123330-1 | LL2mw-267-190401-GW | 100 | 300 | J | J | RepLimit-J |
| Metals | Groundwater | ALUMINUM | 280-123457-1 | LL3mw-244-190401-GW | 240 | 300 | J | J | RepLimit-J |
| Metals | Groundwater | ALUMINUM | 280-123221-1 | NTAmw-119-190401-GW | 32 | 300 | J | J | RepLimit-J |
| Metals | Groundwater | ALUMINUM | 280-123656-1 | RQLmw-007-190401-GW | 19 | 300 | J | J | RepLimit-J |
| Metals | Groundwater | ALUMINUM | 280-123656-1 | RQLmw-008-190401-GW | 25 | 300 | J | J | RepLimit-J |
| Metals | Groundwater | ALUMINUM | 280-123656-1 | RQLmw-009-190401-GW | 53 | 300 | J | J | RepLimit-J |
| Metals | Groundwater | ALUMINUM | 280-123584-1 | SCLmw-001-190401-GW | 37 | 300 | J | J | RepLimit-J |
| Metals | Groundwater | ALUMINUM | 280-123584-1 | SCLmw-002-190401-GW | 19 | 300 | J | J | RepLimit-J |
| Metals | Groundwater | ALUMINUM | 280-123584-1 | SCLmw-002-190402-GW | 18 | 300 | J | J | RepLimit-J |
| Metals | Groundwater | ALUMINUM | 280-123221-1 | WBGmw-006-190401-GW | 19 | 300 | J | J | RepLimit-J |
| Metals | Groundwater | ALUMINUM | 280-123221-1 | WBGmw-009-190401-GW | 19 | 300 | J | J | RepLimit-J |
| Metals | Groundwater | ANTIMONY | 280-123656-1 | FWGmw-018-190401-GW | 0.41 | 6.0 | J | J | RepLimit-J |
| Metals | Groundwater | ANTIMONY | 280-123656-1 | FWGmw-021-190401-GW | 0.51 | 6.0 | J | J | RepLimit-J |
| Metals | Groundwater | ANTIMONY | 280-123656-1 | FWGmw-021-190402-GW | 0.99 | 6.0 | J | J | RepLimit-J |
| Metals | Groundwater | ANTIMONY | 280-123656-1 | FWGmw-024-190401-GW | 0.70 | 6.0 | J | J | RepLimit-J |
| Metals | Groundwater | ANTIMONY | 280-123330-1 | LL12mw-242-190401-GW | 0.87 | 6.0 | J J1 | J | MS-J,RepLimit-J |
| Metals | Groundwater | ANTIMONY | 280-123457-1 | LL1mw-084-190401-GW | 0.76 | 6.0 | J | J | RepLimit-J |
| Metals | Groundwater | ANTIMONY | 280-123467-1 | LL1mw-086-190401-GW | 0.95 | 6.0 | J | J | RepLimit-J |
| Metals | Groundwater | ANTIMONY | 280-123457-1 | LL2mw-059-190401-GW | 0.61 | 6.0 | J | J | RepLimit-J |
| Metals | Groundwater | ANTIMONY | 280-123656-1 | LL3mw-246-190401-GW | 0.59 | 6.0 | J | J | RepLimit-J |

**Table H-4. Detailed Listing of Qualified Results – Spring 2019 Sampling Event (continued)**

| Analysis Type | Media | Chemical | Sample Delivery Group | Sample ID | Results | Det. Limit (LOQ) | Lab Qual | Val. Qual | Validation Code |
|---|---|---|---|---|---|---|---|---|---|
| Metals | Groundwater | ANTIMONY | 280-123656-1 | LL3mw-246-190402-GW | 0.56 | 6.0 | J | J | RepLimit-J |
| Metals | Groundwater | ANTIMONY | 280-123584-1 | SCLmw-001-190401-GW | 0.53 | 6.0 | J | J | RepLimit-J |
| Metals | Groundwater | ANTIMONY | 280-123584-1 | SCLmw-002-190402-GW | 0.59 | 6.0 | J | J | RepLimit-J |
| Metals | Groundwater | ARSENIC | 280-123183-1 | DA2mw-115-190401-GW | 1.7 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | ARSENIC | 280-123584-1 | FWGmw-011-190401-GW | 4.2 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | ARSENIC | 280-123584-1 | FWGmw-012-190401-GW | 1.1 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | ARSENIC | 280-123584-1 | FWGmw-015-190401-GW | 0.38 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | ARSENIC | 280-123221-1 | FWGmw-016-190401-GW | 4.5 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | ARSENIC | 280-123656-1 | FWGmw-021-190401-GW | 0.57 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | ARSENIC | 280-123656-1 | FWGmw-021-190402-GW | 0.66 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | ARSENIC | 280-123656-1 | FWGmw-024-190401-GW | 2.1 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | ARSENIC | 280-123330-1 | LL12mw-187-190401-GW | 0.56 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | ARSENIC | 280-123330-1 | LL12mw-242-190401-GW | 13 | 5.0 | J1 | J | MS-J |
| Metals | Groundwater | ARSENIC | 280-123467-1 | LL1mw-064-190401-GW | 4.9 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | ARSENIC | 280-123467-1 | LL1mw-086-190401-GW | 1.6 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | ARSENIC | 280-123467-1 | LL1mw-086-190401-GW | 4.2 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | ARSENIC | 280-123330-1 | LL1mw-087-190401-GW | 0.36 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | ARSENIC | 280-123330-1 | LL2mw-267-190401-GW | 2.1 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | ARSENIC | 280-123261-1 | LL7mw-001-190401-GW | 1.7 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | ARSENIC | 280-123656-1 | RQLmw-007-190401-GW | 0.70 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | ARSENIC | 280-123656-1 | RQLmw-009-190401-GW | 1.7 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | ARSENIC | 280-123584-1 | SCLmw-001-190401-GW | 3.4 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | ARSENIC | 280-123584-1 | SCLmw-002-190401-GW | 0.86 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | ARSENIC | 280-123584-1 | SCLmw-002-190402-GW | 1.0 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | ARSENIC | 280-123584-1 | SCLmw-003-190401-GW | 4.6 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | ARSENIC | 280-123221-1 | WBGmw-020-190401-GW | 1.2 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | BARIUM | 280-123584-1 | FWGmw-004-190401-GW | 22 | 3.0 | | J | ProJudge-J |
| Metals | Groundwater | BARIUM | 280-123584-1 | FWGmw-011-190401-GW | 29 | 3.0 | | J | ProJudge-J |
| Metals | Groundwater | BARIUM | 280-123584-1 | FWGmw-012-190401-GW | 26 | 3.0 | | J | ProJudge-J |
| Metals | Groundwater | BARIUM | 280-123584-1 | FWGmw-015-190401-GW | 10 | 3.0 | | J | ProJudge-J |

**Table H-4. Detailed Listing of Qualified Results – Spring 2019 Sampling Event (continued)**

| Analysis Type | Media | Chemical | Sample Delivery Group | Sample ID | Results | Det. Limit (LOQ) | Lab Qual | Val. Qual | Validation Code |
|---|---|---|---|---|---|---|---|---|---|
| Metals | Groundwater | BARIUM | 280-123802-1 | FWGmw-020-190401-GW | 84 | 3.0 | | J | ProJudge-J |
| Metals | Groundwater | BARIUM | 280-123330-1 | LL12mw-242-190401-GW | 34 | 3.0 | J1 | J | MS-J |
| Metals | Groundwater | BARIUM | 280-123457-1 | LL1mw-084-190401-GW | 3.0 | 3.0 | | J | ProJudge-J |
| Metals | Groundwater | BARIUM | 280-123457-1 | LL2mw-059-190401-GW | 15 | 3.0 | | J | ProJudge-J |
| Metals | Groundwater | BARIUM | 280-123457-1 | LL3mw-244-190401-GW | 14 | 3.0 | | J | ProJudge-J |
| Metals | Groundwater | BARIUM | 280-123584-1 | SCLmw-001-190401-GW | 53 | 3.0 | | J | ProJudge-J |
| Metals | Groundwater | BARIUM | 280-123584-1 | SCLmw-002-190401-GW | 51 | 3.0 | | J | ProJudge-J |
| Metals | Groundwater | BARIUM | 280-123584-1 | SCLmw-002-190402-GW | 51 | 3.0 | | J | ProJudge-J |
| Metals | Groundwater | BARIUM | 280-123584-1 | SCLmw-003-190401-GW | 21 | 3.0 | | J | ProJudge-J |
| Metals | Groundwater | BERYLLIUM | 280-123183-1 | DA2mw-115-190402-GW | 0.18 | 1.0 | J | J | RepLimit-J |
| Metals | Groundwater | BERYLLIUM | 280-123656-1 | FWGmw-021-190402-GW | 0.52 | 1.0 | J | J | RepLimit-J |
| Metals | Groundwater | BERYLLIUM | 280-123656-1 | FWGmw-024-190401-GW | 0.11 | 1.0 | J | J | RepLimit-J |
| Metals | Groundwater | BERYLLIUM | 280-123330-1 | LL12mw-242-190401-GW | 0.093 | 1.0 | J | J | RepLimit-J |
| Metals | Groundwater | BERYLLIUM | 280-123330-1 | LL12mw-242-190401-GW | 0.11 | 1.0 | J | J | RepLimit-J |
| Metals | Groundwater | BERYLLIUM | 280-123467-1 | LL1mw-086-190401-GW | 0.098 | 1.0 | J | J | RepLimit-J |
| Metals | Groundwater | BERYLLIUM | 280-123457-1 | LL3mw-244-190401-GW | 0.12 | 1.0 | J | J | RepLimit-J |
| Metals | Groundwater | BERYLLIUM | 280-123584-1 | SCLmw-002-190402-GW | 0.56 | 1.0 | J | J | RepLimit-J |
| Metals | Groundwater | BERYLLIUM | 280-123221-1 | WBGmw-020-190401-GW | 0.082 | 1.0 | J | J | RepLimit-J |
| Metals | Groundwater | CHROMIUM | 280-123221-1 | DET-004-190401-GW | 0.55 | 10 | J | J | RepLimit-J |
| Metals | Groundwater | CHROMIUM | 280-123221-1 | FWGmw-007-190401-GW | 0.51 | 10 | J | J | RepLimit-J |
| Metals | Groundwater | CHROMIUM | 280-123584-1 | FWGmw-011-190401-GW | 0.90 | 10 | J | J | RepLimit-J |
| Metals | Groundwater | CHROMIUM | 280-123656-1 | FWGmw-021-190401-GW | 0.76 | 10 | J | J | RepLimit-J |
| Metals | Groundwater | CHROMIUM | 280-123656-1 | FWGmw-021-190402-GW | 0.82 | 10 | J | J | RepLimit-J |
| Metals | Groundwater | CHROMIUM | 280-123330-1 | LL12mw-242-190401-GW | 2.4 | 10 | J | J | RepLimit-J |
| Metals | Groundwater | CHROMIUM | 280-123330-1 | LL12mw-242-190401-GW | 3.1 | 10 | J | J | RepLimit-J |
| Metals | Groundwater | CHROMIUM | 280-123261-1 | LL12mw-247-190401-GW | 1.1 | 10 | J | J | RepLimit-J |
| Metals | Groundwater | CHROMIUM | 280-123467-1 | LL1mw-064-190401-GW | 0.58 | 10 | J | J | RepLimit-J |
| Metals | Groundwater | CHROMIUM | 280-123467-1 | LL1mw-086-190401-GW | 2.8 | 10 | J | J | RepLimit-J |
| Metals | Groundwater | CHROMIUM | 280-123656-1 | LL1mw-088-190401-GW | 0.50 | 10 | J | J | RepLimit-J |
| Metals | Groundwater | CHROMIUM | 280-123330-1 | LL2mw-267-190401-GW | 0.79 | 10 | J | J | RepLimit-J |

**Table H-4. Detailed Listing of Qualified Results – Spring 2019 Sampling Event (continued)**

| Analysis Type | Media | Chemical | Sample Delivery Group | Sample ID | Results | Det. Limit (LOQ) | Lab Qual | Val. Qual | Validation Code |
|---|---|---|---|---|---|---|---|---|---|
| Metals | Groundwater | CHROMIUM | 280-123330-1 | SCFmw-004-190401-GW | 1.3 | 10 | J | J | RepLimit-J |
| Metals | Groundwater | COBALT | 280-123221-1 | DET-003-190401-GW | 0.29 | 1.0 | J Q | J | RepLimit-J |
| Metals | Groundwater | COBALT | 280-123221-1 | DET-003-190402-GW | 0.24 | 1.0 | J Q | J | RepLimit-J |
| Metals | Groundwater | COBALT | 280-123221-1 | FWGmw-007-190401-GW | 0.42 | 1.0 | J Q | U | RepLimit-J,CalBlk-U |
| Metals | Groundwater | COBALT | 280-123584-1 | FWGmw-015-190401-GW | 0.066 | 1.0 | J Q | J | RepLimit-J |
| Metals | Groundwater | COBALT | 280-123656-1 | FWGmw-021-190402-GW | 0.18 | 1.0 | J Q | J | RepLimit-J |
| Metals | Groundwater | COBALT | 280-123656-1 | FWGmw-024-190401-GW | 0.90 | 1.0 | J Q | J | RepLimit-J |
| Metals | Groundwater | COBALT | 280-123330-1 | LL12mw-242-190401-GW | 0.96 | 1.0 | J Q | J | RepLimit-J |
| Metals | Groundwater | COBALT | 280-123261-1 | LL12mw-247-190401-GW | 0.75 | 1.0 | J Q | U | MB-U,RepLimit-J |
| Metals | Groundwater | COBALT | 280-123457-1 | LL1mw-084-190401-GW | 0.35 | 1.0 | J Q | J | RepLimit-J |
| Metals | Groundwater | COBALT | 280-123467-1 | LL1mw-086-190401-GW | 0.56 | 1.0 | J Q | J | RepLimit-J |
| Metals | Groundwater | COBALT | 280-123330-1 | LL1mw-087-190401-GW | 0.18 | 1.0 | J Q | J | RepLimit-J |
| Metals | Groundwater | COBALT | 280-123656-1 | LL1mw-088-190401-GW | 0.19 | 1.0 | J Q | J | RepLimit-J |
| Metals | Groundwater | COBALT | 280-123656-1 | RQLmw-009-190401-GW | 0.87 | 1.0 | J Q | J | RepLimit-J |
| Metals | Groundwater | COBALT | 280-123330-1 | SCFmw-004-190401-GW | 0.14 | 1.0 | J Q | J | RepLimit-J |
| Metals | Groundwater | COBALT | 280-123584-1 | SCLmw-001-190401-GW | 0.67 | 1.0 | J Q | J | RepLimit-J |
| Metals | Groundwater | COBALT | 280-123584-1 | SCLmw-002-190401-GW | 0.057 | 1.0 | J Q | J | RepLimit-J |
| Metals | Groundwater | COBALT | 280-123584-1 | SCLmw-002-190402-GW | 0.11 | 1.0 | J Q | J | RepLimit-J |
| Metals | Groundwater | COBALT | 280-123221-1 | WBGmw-006-190401-GW | 0.29 | 1.0 | J Q | U | RepLimit-J,CalBlk-U |
| Metals | Groundwater | COBALT | 280-123221-1 | WBGmw-009-190401-GW | 0.62 | 1.0 | J Q | U | RepLimit-J,CalBlk-U |
| Metals | Groundwater | COBALT | 280-123221-1 | WBGmw-020-190401-GW | 0.38 | 1.0 | J Q | U | RepLimit-J,CalBlk-U |
| Metals | Groundwater | COBALT | 280-123221-1 | WBGmw-021-190401-GW | 0.20 | 1.0 | J Q | U | RepLimit-J,CalBlk-U |
| Metals | Groundwater | COPPER | 280-123221-1 | DET-004-190401-GW | 1.5 | 2.0 | J | J | RepLimit-J |
| Metals | Groundwater | COPPER | 280-123584-1 | FWGmw-015-190401-GW | 0.87 | 2.0 | J | J | RepLimit-J |
| Metals | Groundwater | COPPER | 280-123656-1 | FWGmw-021-190401-GW | 1.2 | 2.0 | J | J | RepLimit-J |
| Metals | Groundwater | COPPER | 280-123656-1 | FWGmw-021-190402-GW | 1.1 | 2.0 | J | J | RepLimit-J |
| Metals | Groundwater | COPPER | 280-123330-1 | LL12mw-187-190401-GW | 1.0 | 2.0 | J | J | RepLimit-J |
| Metals | Groundwater | COPPER | 280-123330-1 | LL12mw-242-190401-GW | 1.1 | 2.0 | J B | U | MB-U,RepLimit-J |
| Metals | Groundwater | COPPER | 280-123330-1 | LL12mw-245-190401-GW | 1.3 | 2.0 | J | J | RepLimit-J |
| Metals | Groundwater | COPPER | 280-123261-1 | LL12mw-247-190401-GW | 0.59 | 2.0 | J | J | RepLimit-J |

**Table H-4. Detailed Listing of Qualified Results – Spring 2019 Sampling Event (continued)**

| Analysis Type | Media | Chemical | Sample Delivery Group | Sample ID | Results | Det. Limit (LOQ) | Lab Qual | Val. Qual | Validation Code |
|---|---|---|---|---|---|---|---|---|---|
| Metals | Groundwater | COPPER | 280-123330-1 | LL1mw-087-190401-GW | 0.94 | 2.0 | J | J | RepLimit-J |
| Metals | Groundwater | IRON | 280-123584-1 | FWGmw-004-190401-GW | 50 | 100 | J | J | RepLimit-J |
| Metals | Groundwater | IRON | 280-123584-1 | FWGmw-015-190401-GW | 45 | 100 | J | J | RepLimit-J |
| Metals | Groundwater | IRON | 280-123656-1 | FWGmw-021-190401-GW | 630 | 100 | | J | ProJudge-J |
| Metals | Groundwater | IRON | 280-123656-1 | FWGmw-024-190401-GW | 1600 | 100 | | J | ProJudge-J |
| Metals | Groundwater | IRON | 280-123330-1 | LL10mw-005-190401-GW | 25 | 100 | J | J | RepLimit-J |
| Metals | Groundwater | IRON | 280-123457-1 | LL1mw-084-190401-GW | 82 | 100 | J | J | RepLimit-J |
| Metals | Groundwater | IRON | 280-123656-1 | LL1mw-088-190401-GW | 1700 | 100 | | J | ProJudge-J |
| Metals | Groundwater | IRON | 280-123457-1 | LL2mw-059-190401-GW | 46 | 100 | J | J | RepLimit-J |
| Metals | Groundwater | IRON | 280-123656-1 | LL3mw-246-190401-GW | 22 | 100 | J | J | RepLimit-J,ProJudge-J |
| Metals | Groundwater | IRON | 280-123656-1 | LL3mw-246-190402-GW | 85 | 100 | J | U | RepLimit-J,ProJudge-U |
| Metals | Groundwater | IRON | 280-123656-1 | RQLmw-007-190401-GW | 75 | 100 | J | U | RepLimit-J,ProJudge-U |
| Metals | Groundwater | IRON | 280-123330-1 | SCFmw-004-190401-GW | 81 | 100 | J | J | RepLimit-J |
| Metals | Groundwater | IRON | 280-123221-1 | WBGmw-006-190401-GW | 46 | 100 | J | J | RepLimit-J |
| Metals | Groundwater | IRON | 280-123221-1 | WBGmw-009-190401-GW | 58 | 100 | J | J | RepLimit-J |
| Metals | Groundwater | LEAD | 280-123221-1 | FWGmw-007-190401-GW | 0.22 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | LEAD | 280-123584-1 | FWGmw-011-190401-GW | 0.37 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | LEAD | 280-123656-1 | FWGmw-021-190402-GW | 0.23 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | LEAD | 280-123330-1 | LL12mw-187-190401-GW | 0.20 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | LEAD | 280-123330-1 | LL12mw-242-190401-GW | 0.67 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | LEAD | 280-123330-1 | LL12mw-242-190401-GW | 1.7 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | LEAD | 280-123330-1 | LL12mw-245-190401-GW | 0.32 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | LEAD | 280-123261-1 | LL12mw-247-190401-GW | 0.38 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | LEAD | 280-123467-1 | LL1mw-086-190401-GW | 2.2 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | LEAD | 280-123656-1 | LL1mw-088-190401-GW | 0.18 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | LEAD | 280-123457-1 | LL3mw-244-190401-GW | 0.33 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | LEAD | 280-123656-1 | RQLmw-007-190401-GW | 0.28 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | LEAD | 280-123656-1 | RQLmw-009-190401-GW | 1.4 | 3.0 | J | J | RepLimit-J |

**Table H-4. Detailed Listing of Qualified Results – Spring 2019 Sampling Event (continued)**

| Analysis Type | Media | Chemical | Sample Delivery Group | Sample ID | Results | Det. Limit (LOQ) | Lab Qual | Val. Qual | Validation Code |
|---|---|---|---|---|---|---|---|---|---|
| Metals | Groundwater | LEAD | 280-123584-1 | SCLmw-001-190401-GW | 0.21 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | MAGNESIUM | 280-123330-1 | LL12mw-187-190401-GW | 320000 | 500 | J1 | J | MS-J |
| Metals | Groundwater | MANGANESE | 280-123221-1 | DET-004-190401-GW | 0.63 | 3.5 | J | J | RepLimit-J |
| Metals | Groundwater | MANGANESE | 280-123584-1 | FWGmw-004-190401-GW | 3.1 | 3.5 | J | U | MB-U,RepLimit-J |
| Metals | Groundwater | MANGANESE | 280-123330-1 | LL10mw-005-190401-GW | 680 | 3.5 | | U | ProJudge-U |
| Metals | Groundwater | MANGANESE | 280-123330-1 | LL12mw-242-190401-GW | 74 | 3.5 | J1 | J | MS-J |
| Metals | Groundwater | MANGANESE | 280-123330-1 | LL12mw-242-190401-GW | 120 | 3.5 | | U | ProJudge-U |
| Metals | Groundwater | MANGANESE | 280-123330-1 | LL12mw-245-190401-GW | 110 | 3.5 | | U | ProJudge-U |
| Metals | Groundwater | MANGANESE | 280-123330-1 | LL1mw-087-190401-GW | 37 | 3.5 | | U | ProJudge-U |
| Metals | Groundwater | MANGANESE | 280-123457-1 | LL2mw-059-190401-GW | 1.2 | 3.5 | J | U | MB-U,RepLimit-J |
| Metals | Groundwater | MANGANESE | 280-123330-1 | LL2mw-267-190401-GW | 590 | 3.5 | | U | ProJudge-U |
| Metals | Groundwater | MANGANESE | 280-123656-1 | LL3mw-246-190401-GW | 1.5 | 3.5 | J | U | MB-U,RepLimit-J |
| Metals | Groundwater | MANGANESE | 280-123656-1 | LL3mw-246-190402-GW | 1.2 | 3.5 | J | U | MB-U,RepLimit-J |
| Metals | Groundwater | MANGANESE | 280-123330-1 | SCFmw-004-190401-GW | 840 | 3.5 | | U | ProJudge-U |
| Metals | Groundwater | MERCURY | 280-123183-1 | DA2mw-115-190401-GW | 0.080 | 0.20 | U J1 | UJ | MS-UJ |
| Metals | Groundwater | NICKEL | 280-123584-1 | FWGmw-004-190401-GW | 0.43 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | NICKEL | 280-123221-1 | FWGmw-007-190401-GW | 1.2 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | NICKEL | 280-123584-1 | FWGmw-011-190401-GW | 1.5 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | NICKEL | 280-123584-1 | FWGmw-012-190401-GW | 1.1 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | NICKEL | 280-123584-1 | FWGmw-015-190401-GW | 0.97 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | NICKEL | 280-123656-1 | FWGmw-021-190401-GW | 1.8 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | NICKEL | 280-123656-1 | FWGmw-021-190402-GW | 1.6 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | NICKEL | 280-123330-1 | LL10mw-005-190401-GW | 0.57 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | NICKEL | 280-123330-1 | LL12mw-242-190401-GW | 2.1 | 3.0 | J J1 | J | MS-J,RepLimit-J |
| Metals | Groundwater | NICKEL | 280-123330-1 | LL12mw-245-190401-GW | 1.4 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | NICKEL | 280-123261-1 | LL12mw-247-190401-GW | 1.1 | 3.0 | J | U | MB-U,RepLimit-J |
| Metals | Groundwater | NICKEL | 280-123467-1 | LL1mw-086-190401-GW | 1.8 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | NICKEL | 280-123330-1 | LL1mw-087-190401-GW | 0.92 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | NICKEL | 280-123656-1 | LL1mw-088-190401-GW | 0.39 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | NICKEL | 280-123457-1 | LL2mw-059-190401-GW | 1.4 | 3.0 | J | J | RepLimit-J |

**Table H-4. Detailed Listing of Qualified Results – Spring 2019 Sampling Event (continued)**

| Analysis Type | Media | Chemical | Sample Delivery Group | Sample ID | Results | Det. Limit (LOQ) | Lab Qual | Val. Qual | Validation Code |
|---|---|---|---|---|---|---|---|---|---|
| Metals | Groundwater | NICKEL | 280-123656-1 | LL3mw-246-190401-GW | 1.6 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | NICKEL | 280-123656-1 | LL3mw-246-190402-GW | 1.4 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | NICKEL | 280-123656-1 | RQLmw-009-190401-GW | 1.6 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | NICKEL | 280-123584-1 | SCLmw-001-190401-GW | 0.71 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | NICKEL | 280-123584-1 | SCLmw-003-190401-GW | 2.9 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | NICKEL | 280-123221-1 | WBGmw-006-190401-GW | 0.33 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | NICKEL | 280-123221-1 | WBGmw-009-190401-GW | 2.7 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | NICKEL | 280-123221-1 | WBGmw-020-190401-GW | 2.2 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | NICKEL | 280-123221-1 | WBGmw-021-190401-GW | 0.36 | 3.0 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123221-1 | DET-003-190401-GW | 1900 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123221-1 | DET-003-190402-GW | 1900 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123221-1 | DET-004-190401-GW | 1200 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123584-1 | FWGmw-004-190401-GW | 700 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123221-1 | FWGmw-007-190401-GW | 2500 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123584-1 | FWGmw-011-190401-GW | 1200 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123221-1 | FWGmw-016-190401-GW | 2400 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123656-1 | FWGmw-018-190401-GW | 1900 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123656-1 | FWGmw-021-190401-GW | 1200 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123656-1 | FWGmw-021-190402-GW | 1200 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123656-1 | FWGmw-024-190401-GW | 810 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123330-1 | LL10mw-005-190401-GW | 630 | 3000 | J | U | RepLimit-J,ProJudge-U |
| Metals | Groundwater | POTASSIUM | 280-123330-1 | LL12mw-242-190401-GW | 2300 | 3000 | J | U | RepLimit-J,ProJudge-U |
| Metals | Groundwater | POTASSIUM | 280-123330-1 | LL12mw-245-190401-GW | 3400 | 3000 | | U | ProJudge-U |
| Metals | Groundwater | POTASSIUM | 280-123261-1 | LL12mw-247-190401-GW | 2600 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123467-1 | LL1mw-064-190401-GW | 920 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123467-1 | LL1mw-065-190401-GW | 1400 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123457-1 | LL1mw-084-190401-GW | 880 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123467-1 | LL1mw-086-190401-GW | 21000 | 3000 | | J | ProJudge-J |
| Metals | Groundwater | POTASSIUM | 280-123330-1 | LL1mw-087-190401-GW | 900 | 3000 | J | J | RepLimit-J |

**Table H-4. Detailed Listing of Qualified Results – Spring 2019 Sampling Event (continued)**

| Analysis Type | Media | Chemical | Sample Delivery Group | Sample ID | Results | Det. Limit (LOQ) | Lab Qual | Val. Qual | Validation Code |
|---|---|---|---|---|---|---|---|---|---|
| Metals | Groundwater | POTASSIUM | 280-123656-1 | LL1mw-088-190401-GW | 2400 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123457-1 | LL2mw-059-190401-GW | 1400 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123330-1 | LL2mw-267-190401-GW | 790 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123656-1 | LL3mw-246-190401-GW | 1200 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123656-1 | LL3mw-246-190402-GW | 1100 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123261-1 | LL7mw-001-190401-GW | 1100 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123221-1 | NTAmw-119-190401-GW | 1400 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123656-1 | RQLmw-007-190401-GW | 2900 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123656-1 | RQLmw-008-190401-GW | 2100 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123656-1 | RQLmw-009-190401-GW | 2800 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123330-1 | SCFmw-004-190401-GW | 2900 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123221-1 | WBGmw-006-190401-GW | 860 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123221-1 | WBGmw-009-190401-GW | 610 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123221-1 | WBGmw-020-190401-GW | 800 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | POTASSIUM | 280-123221-1 | WBGmw-021-190401-GW | 1400 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | Phosphorus | 280-123584-1 | SCLmw-001-190401-GW | 18 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | Phosphorus | 280-123584-1 | SCLmw-002-190401-GW | 100 | 3000 | J | J | MS-J,RepLimit-J |
| Metals | Groundwater | Phosphorus | 280-123584-1 | SCLmw-002-190402-GW | 110 | 3000 | J | J | RepLimit-J |
| Metals | Groundwater | SELENIUM | 280-123584-1 | FWGmw-004-190401-GW | 1.1 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | SELENIUM | 280-123656-1 | FWGmw-021-190402-GW | 0.72 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | SELENIUM | 280-123457-1 | LL3mw-244-190401-GW | 2.3 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | SELENIUM | 280-123584-1 | SCLmw-002-190402-GW | 0.48 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | SILVER | 280-123467-1 | LL1mw-086-190401-GW | 0.10 | 5.0 | U | UJ | ProJudge-UJ |
| Metals | Groundwater | SILVER | 280-123584-1 | SCLmw-001-190401-GW | 0.18 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | SILVER | 280-123584-1 | SCLmw-002-190402-GW | 0.040 | 5.0 | J | J | RepLimit-J |
| Metals | Groundwater | SODIUM | 280-123221-1 | DET-004-190401-GW | 2200 | 5000 | J Q | J | RepLimit-J |
| Metals | Groundwater | SODIUM | 280-123584-1 | FWGmw-004-190401-GW | 4600 | 5000 | J Q | J | RepLimit-J,ProJudge-J |
| Metals | Groundwater | SODIUM | 280-123584-1 | FWGmw-011-190401-GW | 5700 | 5000 | Q | J | ProJudge-J |
| Metals | Groundwater | SODIUM | 280-123584-1 | FWGmw-012-190401-GW | 6700 | 5000 | Q | J | ProJudge-J |

**Table H-4. Detailed Listing of Qualified Results – Spring 2019 Sampling Event (continued)**

| Analysis Type | Media | Chemical | Sample Delivery Group | Sample ID | Results | Det. Limit (LOQ) | Lab Qual | Val. Qual | Validation Code |
|---|---|---|---|---|---|---|---|---|---|
| Metals | Groundwater | SODIUM | 280-123584-1 | FWGmw-015-190401-GW | 44000 | 5000 | Q | J | ProJudge-J |
| Metals | Groundwater | SODIUM | 280-123802-1 | FWGmw-020-190401-GW | 16000 | 5000 | Q | J | ProJudge-J |
| Metals | Groundwater | SODIUM | 280-123656-1 | FWGmw-021-190401-GW | 3000 | 5000 | J Q | J | RepLimit-J,ProJudge-J |
| Metals | Groundwater | SODIUM | 280-123656-1 | FWGmw-021-190402-GW | 2900 | 5000 | J Q | J | RepLimit-J |
| Metals | Groundwater | SODIUM | 280-123656-1 | FWGmw-024-190401-GW | 4900 | 5000 | J Q | J | RepLimit-J,ProJudge-J |
| Metals | Groundwater | SODIUM | 280-123330-1 | LL10mw-005-190401-GW | 3500 | 5000 | J Q | J | RepLimit-J,ProJudge-J |
| Metals | Groundwater | SODIUM | 280-123330-1 | LL12mw-187-190401-GW | 44000 | 5000 | Q | J | ProJudge-J |
| Metals | Groundwater | SODIUM | 280-123330-1 | LL12mw-242-190401-GW | 29000 | 5000 | Q | J | ProJudge-J |
| Metals | Groundwater | SODIUM | 280-123330-1 | LL12mw-245-190401-GW | 25000 | 5000 | Q | J | ProJudge-J |
| Metals | Groundwater | SODIUM | 280-123467-1 | LL1mw-064-190401-GW | 5500 | 5000 | Q | J | ProJudge-J |
| Metals | Groundwater | SODIUM | 280-123467-1 | LL1mw-065-190401-GW | 15000 | 5000 | Q | J | ProJudge-J |
| Metals | Groundwater | SODIUM | 280-123457-1 | LL1mw-084-190401-GW | 3400 | 5000 | J Q | J | RepLimit-J,ProJudge-J |
| Metals | Groundwater | SODIUM | 280-123467-1 | LL1mw-086-190401-GW | 16000 | 5000 | Q | J | ProJudge-J |
| Metals | Groundwater | SODIUM | 280-123330-1 | LL1mw-087-190401-GW | 10000 | 5000 | Q | J | ProJudge-J |
| Metals | Groundwater | SODIUM | 280-123656-1 | LL1mw-088-190401-GW | 23000 | 5000 | Q | J | ProJudge-J |
| Metals | Groundwater | SODIUM | 280-123457-1 | LL2mw-059-190401-GW | 3300 | 5000 | J Q | J | RepLimit-J,ProJudge-J |
| Metals | Groundwater | SODIUM | 280-123330-1 | LL2mw-267-190401-GW | 8100 | 5000 | Q | J | ProJudge-J |
| Metals | Groundwater | SODIUM | 280-123457-1 | LL3mw-244-190401-GW | 2800 | 5000 | J Q | UJ | RepLimit-J,CalBlk-U,ProJudge-J |
| Metals | Groundwater | SODIUM | 280-123656-1 | LL3mw-246-190401-GW | 2800 | 5000 | J Q | J | RepLimit-J,ProJudge-J |
| Metals | Groundwater | SODIUM | 280-123656-1 | LL3mw-246-190402-GW | 2700 | 5000 | J Q | J | RepLimit-J |
| Metals | Groundwater | SODIUM | 280-123656-1 | RQLmw-007-190401-GW | 1800 | 5000 | J Q | U | RepLimit-J,ProJudge-U |
| Metals | Groundwater | SODIUM | 280-123656-1 | RQLmw-008-190401-GW | 2200 | 5000 | J Q | U | RepLimit-J,ProJudge-U |
| Metals | Groundwater | SODIUM | 280-123656-1 | RQLmw-009-190401-GW | 1400 | 5000 | J Q | U | RepLimit-J,ProJudge-U |
| Metals | Groundwater | SODIUM | 280-123330-1 | SCFmw-004-190401-GW | 13000 | 5000 | Q | J | ProJudge-J |

**Table H-4. Detailed Listing of Qualified Results – Spring 2019 Sampling Event (continued)**

| Analysis Type | Media | Chemical | Sample Delivery Group | Sample ID | Results | Det. Limit (LOQ) | Lab Qual | Val. Qual | Validation Code |
|---|---|---|---|---|---|---|---|---|---|
| Metals | Groundwater | SODIUM | 280-123584-1 | SCLmw-002-190401-GW | 3300 | 5000 | J Q | J | RepLimit-J |
| Metals | Groundwater | SODIUM | 280-123584-1 | SCLmw-002-190402-GW | 3300 | 5000 | J Q | J | RepLimit-J |
| Metals | Groundwater | SODIUM | 280-123584-1 | SCLmw-003-190401-GW | 38000 | 5000 | Q | J | ProJudge-J |
| Metals | Groundwater | SODIUM | 280-123221-1 | WBGmw-009-190401-GW | 3300 | 5000 | J Q | J | RepLimit-J |
| Metals | Groundwater | SODIUM | 280-123221-1 | WBGmw-020-190401-GW | 3900 | 5000 | J Q | J | RepLimit-J |
| Metals | Groundwater | SODIUM | 280-123221-1 | WBGmw-021-190401-GW | 4800 | 5000 | J Q | J | RepLimit-J |
| Metals | Groundwater | THALLIUM | 280-123656-1 | FWGmw-021-190402-GW | 0.11 | 1.0 | J | J | RepLimit-J |
| Metals | Groundwater | THALLIUM | 280-123330-1 | LL12mw-187-190401-GW | 0.75 | 1.0 | J | J | RepLimit-J |
| Metals | Groundwater | THALLIUM | 280-123457-1 | LL3mw-244-190401-GW | 0.27 | 1.0 | J | J | RepLimit-J |
| Metals | Groundwater | THALLIUM | 280-123261-1 | LL7mw-001-190401-GW | 0.11 | 1.0 | J | J | RepLimit-J |
| Metals | Groundwater | THALLIUM | 280-123584-1 | SCLmw-002-190402-GW | 0.094 | 1.0 | J | J | RepLimit-J |
| Metals | Groundwater | VANADIUM | 280-123330-1 | LL12mw-242-190401-GW | 1.5 | 6.0 | J | J | RepLimit-J |
| Metals | Groundwater | VANADIUM | 280-123330-1 | LL12mw-242-190401-GW | 3.2 | 6.0 | J J1 | J | MS-J,RepLimit-J |
| Metals | Groundwater | VANADIUM | 280-123467-1 | LL1mw-086-190401-GW | 1.2 | 6.0 | J | J | RepLimit-J |
| Metals | Groundwater | ZINC | 280-123221-1 | DET-004-190401-GW | 14 | 20 | J | J | RepLimit-J |
| Metals | Groundwater | ZINC | 280-123221-1 | FWGmw-007-190401-GW | 2.7 | 20 | J | J | RepLimit-J |
| Metals | Groundwater | ZINC | 280-123584-1 | FWGmw-011-190401-GW | 3.9 | 20 | J | J | RepLimit-J |
| Metals | Groundwater | ZINC | 280-123584-1 | FWGmw-015-190401-GW | 3.9 | 20 | J | J | RepLimit-J |
| Metals | Groundwater | ZINC | 280-123802-1 | FWGmw-020-190401-GW | 3.5 | 20 | J | J | RepLimit-J |
| Metals | Groundwater | ZINC | 280-123656-1 | FWGmw-021-190401-GW | 5.5 | 20 | J | J | RepLimit-J |
| Metals | Groundwater | ZINC | 280-123656-1 | FWGmw-021-190402-GW | 5.2 | 20 | J | J | RepLimit-J |
| Metals | Groundwater | ZINC | 280-123330-1 | LL12mw-187-190401-GW | 6.3 | 20 | J | J | RepLimit-J |
| Metals | Groundwater | ZINC | 280-123330-1 | LL12mw-242-190401-GW | 9.3 | 20 | J | J | RepLimit-J |
| Metals | Groundwater | ZINC | 280-123330-1 | LL12mw-242-190401-GW | 5.6 | 20 | J | U | MB-U,RepLimit-J |
| Metals | Groundwater | ZINC | 280-123330-1 | LL12mw-245-190401-GW | 4.7 | 20 | J | J | RepLimit-J |
| Metals | Groundwater | ZINC | 280-123261-1 | LL12mw-247-190401-GW | 6.3 | 20 | J | J | RepLimit-J |
| Metals | Groundwater | ZINC | 280-123457-1 | LL1mw-084-190401-GW | 2.2 | 20 | J | J | RepLimit-J |
| Metals | Groundwater | ZINC | 280-123467-1 | LL1mw-086-190401-GW | 9.3 | 20 | J | J | RepLimit-J |
| Metals | Groundwater | ZINC | 280-123457-1 | LL2mw-059-190401-GW | 2.1 | 20 | J | J | RepLimit-J |
| Metals | Groundwater | ZINC | 280-123330-1 | LL2mw-267-190401-GW | 2.3 | 20 | J | J | RepLimit-J |

**Table H-4. Detailed Listing of Qualified Results – Spring 2019 Sampling Event (continued)**

| Analysis Type | Media | Chemical | Sample Delivery Group | Sample ID | Results | Det. Limit (LOQ) | Lab Qual | Val. Qual | Validation Code |
|---|---|---|---|---|---|---|---|---|---|
| Metals | Groundwater | ZINC | 280-123656-1 | LL3mw-246-190401-GW | 2.5 | 20 | J | J | RepLimit-J |
| Metals | Groundwater | ZINC | 280-123656-1 | LL3mw-246-190402-GW | 2.0 | 20 | J | J | RepLimit-J |
| Metals | Groundwater | ZINC | 280-123656-1 | RQLmw-008-190401-GW | 11 | 20 | J | J | RepLimit-J |
| Metals | Groundwater | ZINC | 280-123656-1 | RQLmw-009-190401-GW | 3.7 | 20 | J | J | RepLimit-J |
| Metals | Groundwater | ZINC | 280-123584-1 | SCLmw-001-190401-GW | 2.2 | 20 | J | J | RepLimit-J |
| Metals | Groundwater | ZINC | 280-123584-1 | SCLmw-002-190401-GW | 2.0 | 20 | J | J | RepLimit-J |
| Metals | Groundwater | ZINC | 280-123584-1 | SCLmw-002-190402-GW | 2.0 | 20 | J | J | RepLimit-J |
| Metals | Groundwater | ZINC | 280-123584-1 | SCLmw-003-190401-GW | 2.2 | 20 | J | J | RepLimit-J |
| Explosives | Groundwater | 1,3-DINITROBENZENE | 280-123457-1 | LL2mw-059-190401-GW | 0.27 | 0.44 | J J1 | J | RepLimit-J |
| Explosives | Groundwater | 2,4,6-TRINITROTOLUENE | 280-123656-1 | FWGmw-021-190401-GW | 0.43 | 0.43 | U J1 | UJ | MS-UJ |
| Explosives | Groundwater | 2,4,6-TRINITROTOLUENE | 280-123330-1 | LL12mw-245-190401-GW | 0.46 | 0.42 | J1 | J | ProJudge-J |
| Explosives | Groundwater | 2-AMINO-4,6-DINITROTOLUENE | 280-123656-1 | FWGmw-021-190401-GW | 0.31 | 0.21 | J1 | J | MS-J |
| Explosives | Groundwater | 2-NITROTOLUENE | 280-123221-1 | DET-003-190401-GW | 0.22 | 0.45 | U Q J1 | UJ | MS-UJ,LCS-UJ |
| Explosives | Groundwater | 2-NITROTOLUENE | 280-123221-1 | DET-003-190402-GW | 0.22 | 0.44 | U Q | UJ | LCS-UJ |
| Explosives | Groundwater | 2-NITROTOLUENE | 280-123221-1 | DET-004-190401-GW | 0.21 | 0.41 | U Q | UJ | LCS-UJ |
| Explosives | Groundwater | 2-NITROTOLUENE | 280-123221-1 | FWGmw-007-190401-GW | 0.22 | 0.44 | U Q | UJ | LCS-UJ |
| Explosives | Groundwater | 2-NITROTOLUENE | 280-123221-1 | FWGmw-016-190401-GW | 0.20 | 0.40 | U Q | UJ | LCS-UJ |
| Explosives | Groundwater | 2-NITROTOLUENE | 280-123656-1 | FWGmw-021-190401-GW | 0.21 | 0.43 | U J1 | UJ | MS-UJ |
| Explosives | Groundwater | 2-NITROTOLUENE | 280-123221-1 | NTAmw-119-190401-GW | 0.22 | 0.43 | U J1 Q | UJ | MS-UJ,LCS-UJ |
| Explosives | Groundwater | 2-NITROTOLUENE | 280-123221-1 | NTAmw-119-190402-GW | 0.21 | 0.43 | U Q | UJ | LCS-UJ |
| Explosives | Groundwater | 2-NITROTOLUENE | 280-123221-1 | WBGmw-006-190401-GW | 0.20 | 0.39 | U Q | UJ | LCS-UJ |
| Explosives | Groundwater | 2-NITROTOLUENE | 280-123221-1 | WBGmw-009-190401-GW | 0.21 | 0.42 | U Q | UJ | LCS-UJ |
| Explosives | Groundwater | 2-NITROTOLUENE | 280-123221-1 | WBGmw-020-190401-GW | 0.19 | 0.39 | U Q | UJ | LCS-UJ |
| Explosives | Groundwater | 2-NITROTOLUENE | 280-123221-1 | WBGmw-021-190401-GW | 0.22 | 0.44 | U Q | UJ | LCS-UJ |
| Explosives | Groundwater | 3-NITROTOLUENE | 280-123221-1 | DET-003-190401-GW | 0.45 | 0.45 | U J1 | UJ | MS-UJ |
| Explosives | Groundwater | 3-NITROTOLUENE | 280-123656-1 | FWGmw-021-190401-GW | 0.43 | 0.43 | U J1 | UJ | MS-UJ |
| Explosives | Groundwater | 3-NITROTOLUENE | 280-123221-1 | NTAmw-119-190401-GW | 0.43 | 0.43 | U J1 | UJ | MS-UJ |
| Explosives | Groundwater | 4-AMINO-2,6-DINITROTOLUENE | 280-123656-1 | FWGmw-021-190401-GW | 0.28 | 0.21 | J1 | J | MS-J |

**Table H-4. Detailed Listing of Qualified Results – Spring 2019 Sampling Event (continued)**

| Analysis Type | Media | Chemical | Sample Delivery Group | Sample ID | Results | Det. Limit (LOQ) | Lab Qual | Val. Qual | Validation Code |
|---|---|---|---|---|---|---|---|---|---|
| Explosives | Groundwater | 4-NITROTOLUENE | 280-123656-1 | FWGmw-021-190401-GW | 0.43 | 1.1 | U J1 | UJ | MS-UJ |
| Explosives | Groundwater | 4-NITROTOLUENE | 280-123221-1 | NTAmw-119-190401-GW | 0.43 | 1.1 | U J1 | UJ | MS-UJ |
| Explosives | Groundwater | Hexahydro-1,3,5-Trinitro-1,3,5-Triazine (RDX) | 280-123261-1 | FBQmw-174-190401-GW | 1.2 | 0.42 | M J1 | J | ProJudge-J |
| Explosives | Groundwater | Hexahydro-1,3,5-Trinitro-1,3,5-Triazine (RDX) | 280-123330-1 | LL12mw-245-190401-GW | 0.72 | 0.42 | M J1 | J | ProJudge-J |
| Explosives | Groundwater | Hexahydro-1,3,5-Trinitro-1,3,5-Triazine (RDX) | 280-123467-1 | LL1mw-081-190401-GW | 0.16 | 0.41 | J M | J | RepLimit-J |
| Explosives | Groundwater | Hexahydro-1,3,5-Trinitro-1,3,5-Triazine (RDX) | 280-123330-1 | LL2mw-267-190401-GW | 0.29 | 0.40 | J M | J | RepLimit-J |
| Explosives | Groundwater | Octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX) | 280-123261-1 | LL7mw-006-190401-GW | 0.17 | 0.40 | J M | J | RepLimit-J |
| Propellants | Groundwater | Nitrocellulose | 280-123467-1 | LL1mw-089-190402-GW | 630 | 2000 | J | J | RepLimit-J |
| SVOCs | Groundwater | BENZOIC ACID | 280-123584-1 | SCLmw-001-190401-GW | 30 | 79 | U Q | UJ | LCS-UJ |
| SVOCs | Groundwater | BENZOIC ACID | 280-123584-1 | SCLmw-002-190401-GW | 30 | 81 | U Q | UJ | LCS-UJ |
| SVOCs | Groundwater | BENZOIC ACID | 280-123584-1 | SCLmw-002-190402-GW | 31 | 83 | U Q | UJ | LCS-UJ |
| SVOCs | Groundwater | BENZOIC ACID | 280-123584-1 | SCLmw-003-190401-GW | 31 | 82 | U Q | UJ | LCS-UJ |
| SVOCs | Groundwater | HEXACHLOROCYCLOPENTADIENE | 280-123584-1 | SCLmw-001-190401-GW | 9.9 | 50 | U | UJ | LCS-UJ |
| SVOCs | Groundwater | HEXACHLOROCYCLOPENTADIENE | 280-123584-1 | SCLmw-002-190401-GW | 10 | 51 | U | UJ | MS-UJ,LCS-UJ |
| SVOCs | Groundwater | HEXACHLOROCYCLOPENTADIENE | 280-123584-1 | SCLmw-002-190402-GW | 10 | 52 | U | UJ | LCS-UJ |
| SVOCs | Groundwater | HEXACHLOROCYCLOPENTADIENE | 280-123584-1 | SCLmw-003-190401-GW | 10 | 51 | U | UJ | LCS-UJ |
| SVOCs | Groundwater | N-NITROSODIPHENYLAMINE | 280-123584-1 | SCLmw-002-190401-GW | 1.0 | 10 | U J1 | UJ | MS-UJ |
| VOCs | Groundwater | 1,1,1-TRICHLOROETHANE | 280-123584-1 | SCLmw-001-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | 1,1,1-TRICHLOROETHANE | 280-123584-1 | SCLmw-003-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | 1,1,2,2-TETRACHLOROETHANE | 280-123584-1 | SCLmw-001-190401-GW | 0.80 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | 1,1,2,2-TETRACHLOROETHANE | 280-123584-1 | SCLmw-003-190401-GW | 0.80 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | 1,1,2-TRICHLOROETHANE | 280-123584-1 | SCLmw-001-190401-GW | 0.80 | 1.0 | U Q | UJ | ProJudge-UJ |
| VOCs | Groundwater | 1,1,2-TRICHLOROETHANE | 280-123584-1 | SCLmw-003-190401-GW | 0.80 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | 1,1-DICHLOROETHANE | 280-123584-1 | SCLmw-001-190401-GW | 0.80 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | 1,1-DICHLOROETHANE | 280-123584-1 | SCLmw-003-190401-GW | 0.80 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | 1,1-DICHLOROETHENE | 280-123584-1 | SCLmw-001-190401-GW | 0.80 | 1.0 | U | UJ | ProJudge-UJ |

**Table H-4. Detailed Listing of Qualified Results – Spring 2019 Sampling Event (continued)**

| Analysis Type | Media | Chemical | Sample Delivery Group | Sample ID | Results | Det. Limit (LOQ) | Lab Qual | Val. Qual | Validation Code |
|---|---|---|---|---|---|---|---|---|---|
| VOCs | Groundwater | 1,1-DICHLOROETHENE | 280-123584-1 | SCLmw-003-190401-GW | 0.80 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | 1,2-DIBROMOETHANE | 280-123584-1 | SCLmw-001-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | 1,2-DIBROMOETHANE | 280-123584-1 | SCLmw-003-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | 1,2-DICHLOROETHANE | 280-123584-1 | SCLmw-001-190401-GW | 0.15 | 1.0 | J Q | UJ | MB-U,RepLimit-J,ProJudge-J |
| VOCs | Groundwater | 1,2-DICHLOROETHANE | 280-123584-1 | SCLmw-003-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | 1,2-DICHLOROETHENE (TOTAL) | 280-123584-1 | SCLmw-001-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | 1,2-DICHLOROETHENE (TOTAL) | 280-123584-1 | SCLmw-003-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | 1,2-DICHLOROPROPANE | 280-123584-1 | SCLmw-001-190401-GW | 0.40 | 1.0 | U Q | UJ | ProJudge-UJ |
| VOCs | Groundwater | 1,2-DICHLOROPROPANE | 280-123584-1 | SCLmw-003-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | 2-BUTANONE | 280-123584-1 | SCLmw-001-190401-GW | 4.0 | 6.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | 2-BUTANONE | 280-123584-1 | SCLmw-003-190401-GW | 4.0 | 6.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | 2-HEXANONE | 280-123584-1 | SCLmw-001-190401-GW | 4.0 | 5.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | 2-HEXANONE | 280-123584-1 | SCLmw-003-190401-GW | 4.0 | 5.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | 4-METHYL-2-PENTANONE | 280-123584-1 | SCLmw-001-190401-GW | 3.2 | 5.0 | U Q | UJ | ProJudge-UJ |
| VOCs | Groundwater | 4-METHYL-2-PENTANONE | 280-123584-1 | SCLmw-003-190401-GW | 3.2 | 5.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | ACETONE | 280-123221-1 | DET-003-190401-GW | 2.8 | 10 | J | J | RepLimit-J |
| VOCs | Groundwater | ACETONE | 280-123221-1 | DET-003-190402-GW | 2.4 | 10 | J | J | RepLimit-J |
| VOCs | Groundwater | ACETONE | 280-123221-1 | DET-004-190401-GW | 5.1 | 10 | J | J | RepLimit-J |
| VOCs | Groundwater | ACETONE | 280-123802-1 | FWGmw-020-190401-GW | 5.8 | 10 | J | U | MB-U,RepLimit-J |
| VOCs | Groundwater | ACETONE | 280-123261-1 | LL10mw-003-190401-GW | 3.6 | 10 | J | J | RepLimit-J |
| VOCs | Groundwater | ACETONE | 280-123261-1 | LL10mw-003-190402-GW | 4.2 | 10 | J | J | RepLimit-J |
| VOCs | Groundwater | ACETONE | 280-123656-1 | RQLmw-008-190401-GW | 2.6 | 10 | J B | U | MB-U,RepLimit-J |
| VOCs | Groundwater | ACETONE | 280-123584-1 | SCLmw-001-190401-GW | 6.4 | 10 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | ACETONE | 280-123584-1 | SCLmw-002-190401-GW | 2.1 | 10 | J | J | RepLimit-J |
| VOCs | Groundwater | ACETONE | 280-123584-1 | SCLmw-003-190401-GW | 2.1 | 10 | J | J | RepLimit-J,ProJudge-J |
| VOCs | Groundwater | BENZENE | 280-123584-1 | SCLmw-001-190401-GW | 0.40 | 1.0 | U Q | UJ | ProJudge-UJ |
| VOCs | Groundwater | BENZENE | 280-123584-1 | SCLmw-003-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | BROMOCHLOROMETHANE | 280-123584-1 | SCLmw-001-190401-GW | 0.20 | 1.0 | U | UJ | ProJudge-UJ |

**Table H-4. Detailed Listing of Qualified Results – Spring 2019 Sampling Event (continued)**

| Analysis Type | Media | Chemical | Sample Delivery Group | Sample ID | Results | Det. Limit (LOQ) | Lab Qual | Val. Qual | Validation Code |
|---|---|---|---|---|---|---|---|---|---|
| VOCs | Groundwater | BROMOCHLOROMETHANE | 280-123584-1 | SCLmw-003-190401-GW | 0.20 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | BROMODICHLOROMETHANE | 280-123584-1 | SCLmw-001-190401-GW | 0.40 | 1.0 | U Q | UJ | ProJudge-UJ |
| VOCs | Groundwater | BROMODICHLOROMETHANE | 280-123584-1 | SCLmw-003-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | BROMOFORM | 280-123584-1 | SCLmw-001-190401-GW | 1.0 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | BROMOFORM | 280-123584-1 | SCLmw-003-190401-GW | 1.0 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | BROMOMETHANE | 280-123584-1 | SCLmw-001-190401-GW | 0.80 | 2.0 | U M | UJ | ProJudge-UJ |
| VOCs | Groundwater | BROMOMETHANE | 280-123584-1 | SCLmw-003-190401-GW | 0.80 | 2.0 | U M | UJ | ProJudge-UJ |
| VOCs | Groundwater | Bromobenzene | 280-123584-1 | SCLmw-001-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | Bromobenzene | 280-123584-1 | SCLmw-003-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | CARBON DISULFIDE | 280-123584-1 | SCLmw-001-190401-GW | 0.80 | 2.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | CARBON DISULFIDE | 280-123584-1 | SCLmw-003-190401-GW | 0.43 | 2.0 | J | UJ | MB-U,RepLimit-J,ProJudge-J |
| VOCs | Groundwater | CARBON TETRACHLORIDE | 280-123261-1 | LL10mw-003-190401-GW | 0.63 | 2.0 | J | J | RepLimit-J |
| VOCs | Groundwater | CARBON TETRACHLORIDE | 280-123261-1 | LL10mw-003-190402-GW | 0.86 | 2.0 | J | J | RepLimit-J |
| VOCs | Groundwater | CARBON TETRACHLORIDE | 280-123584-1 | SCLmw-001-190401-GW | 0.40 | 2.0 | U Q | UJ | ProJudge-UJ |
| VOCs | Groundwater | CARBON TETRACHLORIDE | 280-123584-1 | SCLmw-003-190401-GW | 0.40 | 2.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | CHLOROBENZENE | 280-123584-1 | SCLmw-001-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | CHLOROBENZENE | 280-123584-1 | SCLmw-003-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | CHLOROETHANE | 280-123584-1 | SCLmw-001-190401-GW | 1.6 | 2.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | CHLOROETHANE | 280-123584-1 | SCLmw-003-190401-GW | 1.6 | 2.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | CHLOROFORM | 280-123584-1 | SCLmw-001-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | CHLOROFORM | 280-123584-1 | SCLmw-003-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | CHLOROMETHANE | 280-123584-1 | SCLmw-001-190401-GW | 0.80 | 2.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | CHLOROMETHANE | 280-123584-1 | SCLmw-003-190401-GW | 0.80 | 2.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | CIS-1,3-DICHLOROPROPENE | 280-123584-1 | SCLmw-001-190401-GW | 0.40 | 1.0 | U Q | UJ | ProJudge-UJ |
| VOCs | Groundwater | CIS-1,3-DICHLOROPROPENE | 280-123584-1 | SCLmw-003-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | DIBROMOCHLOROMETHANE | 280-123584-1 | SCLmw-001-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | DIBROMOCHLOROMETHANE | 280-123584-1 | SCLmw-003-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | ETHYLBENZENE | 280-123584-1 | SCLmw-001-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | ETHYLBENZENE | 280-123584-1 | SCLmw-003-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |

**Table H-4. Detailed Listing of Qualified Results – Spring 2019 Sampling Event (continued)**

| Analysis Type | Media | Chemical | Sample Delivery Group | Sample ID | Results | Det. Limit (LOQ) | Lab Qual | Val. Qual | Validation Code |
|---|---|---|---|---|---|---|---|---|---|
| VOCs | Groundwater | METHYLENE CHLORIDE | 280-123584-1 | SCLmw-001-190401-GW | 2.0 | 5.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | METHYLENE CHLORIDE | 280-123584-1 | SCLmw-003-190401-GW | 2.0 | 5.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | STYRENE | 280-123584-1 | SCLmw-001-190401-GW | 0.80 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | STYRENE | 280-123584-1 | SCLmw-003-190401-GW | 0.80 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | TETRACHLOROETHENE | 280-123584-1 | SCLmw-001-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | TETRACHLOROETHENE | 280-123584-1 | SCLmw-003-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | TOLUENE | 280-123584-1 | SCLmw-001-190401-GW | 0.40 | 1.0 | U Q | UJ | ProJudge-UJ |
| VOCs | Groundwater | TOLUENE | 280-123584-1 | SCLmw-003-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | TRANS-1,3-DICHLOROPROPENE | 280-123584-1 | SCLmw-001-190401-GW | 0.40 | 1.0 | U Q | UJ | ProJudge-UJ |
| VOCs | Groundwater | TRANS-1,3-DICHLOROPROPENE | 280-123584-1 | SCLmw-003-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | TRICHLOROETHENE | 280-123584-1 | SCLmw-001-190401-GW | 0.40 | 1.0 | U Q | UJ | ProJudge-UJ |
| VOCs | Groundwater | TRICHLOROETHENE | 280-123584-1 | SCLmw-003-190401-GW | 0.40 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | VINYL CHLORIDE | 280-123584-1 | SCLmw-001-190401-GW | 0.20 | 1.5 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | VINYL CHLORIDE | 280-123584-1 | SCLmw-003-190401-GW | 0.20 | 1.5 | U M | UJ | ProJudge-UJ |
| VOCs | Groundwater | XYLENES (TOTAL) | 280-123584-1 | SCLmw-001-190401-GW | 0.80 | 1.0 | U | UJ | ProJudge-UJ |
| VOCs | Groundwater | XYLENES (TOTAL) | 280-123584-1 | SCLmw-003-190401-GW | 0.80 | 1.0 | U | UJ | ProJudge-UJ |
| Pesticides | Groundwater | 4,4'-DDE | 280-123656-1 | RQLmw-007-190401-GW | 0.020 | 0.050 | U Q | UJ | LCS-UJ |
| Pesticides | Groundwater | 4,4'-DDE | 280-123656-1 | RQLmw-008-190401-GW | 0.021 | 0.053 | U Q | UJ | LCS-UJ |
| Pesticides | Groundwater | 4,4'-DDE | 280-123656-1 | RQLmw-009-190401-GW | 0.022 | 0.054 | U Q | UJ | LCS-UJ |
| Pesticides | Groundwater | 4,4'-DDE | 280-123584-1 | SCLmw-001-190401-GW | 0.021 | 0.052 | U Q | UJ | LCS-UJ |
| Pesticides | Groundwater | 4,4'-DDE | 280-123584-1 | SCLmw-002-190401-GW | 0.022 | 0.054 | U Q | UJ | LCS-UJ |
| Pesticides | Groundwater | 4,4'-DDE | 280-123584-1 | SCLmw-003-190401-GW | 0.021 | 0.053 | U Q | UJ | LCS-UJ |
| Pesticides | Groundwater | ALDRIN | 280-123656-1 | RQLmw-007-190401-GW | 0.020 | 0.050 | U Q | UJ | LCS-UJ |
| Pesticides | Groundwater | ALDRIN | 280-123656-1 | RQLmw-008-190401-GW | 0.021 | 0.053 | U Q | UJ | LCS-UJ |
| Pesticides | Groundwater | ALDRIN | 280-123656-1 | RQLmw-009-190401-GW | 0.022 | 0.054 | U Q | UJ | LCS-UJ |
| Pesticides | Groundwater | ALDRIN | 280-123584-1 | SCLmw-001-190401-GW | 0.021 | 0.052 | U Q | UJ | LCS-UJ |
| Pesticides | Groundwater | ALDRIN | 280-123584-1 | SCLmw-002-190401-GW | 0.022 | 0.054 | U Q | UJ | LCS-UJ |
| Pesticides | Groundwater | ALDRIN | 280-123584-1 | SCLmw-003-190401-GW | 0.021 | 0.053 | U Q | UJ | LCS-UJ |
| Pesticides | Groundwater | ALPHA-CHLORDANE | 280-123656-1 | RQLmw-007-190401-GW | 0.020 | 0.050 | U Q | UJ | LCS-UJ |

**Table H-4. Detailed Listing of Qualified Results – Spring 2019 Sampling Event (continued)**

| Analysis Type | Media | Chemical | Sample Delivery Group | Sample ID | Results | Det. Limit (LOQ) | Lab Qual | Val. Qual | Validation Code |
|---|---|---|---|---|---|---|---|---|---|
| Pesticides | Groundwater | ALPHA-CHLORDANE | 280-123656-1 | RQLmw-008-190401-GW | 0.021 | 0.053 | U Q | UJ | LCS-UJ |
| Pesticides | Groundwater | ALPHA-CHLORDANE | 280-123656-1 | RQLmw-009-190401-GW | 0.022 | 0.054 | U Q | UJ | LCS-UJ |
| Pesticides | Groundwater | ALPHA-CHLORDANE | 280-123584-1 | SCLmw-001-190401-GW | 0.021 | 0.052 | U Q | UJ | LCS-UJ |
| Pesticides | Groundwater | ALPHA-CHLORDANE | 280-123584-1 | SCLmw-002-190401-GW | 0.022 | 0.054 | U Q | UJ | LCS-UJ |
| Pesticides | Groundwater | ALPHA-CHLORDANE | 280-123584-1 | SCLmw-003-190401-GW | 0.021 | 0.053 | U Q | UJ | LCS-UJ |
| Pesticides | Groundwater | GAMMA-CHLORDANE | 280-123656-1 | RQLmw-007-190401-GW | 0.020 | 0.050 | U Q | UJ | LCS-UJ |
| Pesticides | Groundwater | GAMMA-CHLORDANE | 280-123656-1 | RQLmw-008-190401-GW | 0.021 | 0.053 | U Q | UJ | LCS-UJ |
| Pesticides | Groundwater | GAMMA-CHLORDANE | 280-123656-1 | RQLmw-009-190401-GW | 0.022 | 0.054 | U Q | UJ | LCS-UJ |
| Pesticides | Groundwater | GAMMA-CHLORDANE | 280-123584-1 | SCLmw-001-190401-GW | 0.021 | 0.052 | U Q | UJ | LCS-UJ |
| Pesticides | Groundwater | GAMMA-CHLORDANE | 280-123584-1 | SCLmw-002-190401-GW | 0.022 | 0.054 | U Q | UJ | LCS-UJ |
| Pesticides | Groundwater | GAMMA-CHLORDANE | 280-123584-1 | SCLmw-003-190401-GW | 0.021 | 0.053 | U Q | UJ | LCS-UJ |
| Cyanide | Groundwater | Cyanide, Total | 280-123656-1 | FWGmw-018-190401-GW | 0.0065 | 0.010 | J | J | MS-J,RepLimit-J |
| Cyanide | Groundwater | Cyanide, Total | 280-123330-1 | LL2mw-264-190401-GW | 0.0060 | 0.010 | J | J | RepLimit-J |
| Cyanide | Groundwater | Cyanide, Total | 280-123467-1 | LL3mw-234-190401-GW | 0.0087 | 0.010 | J | J | RepLimit-J |
| Cyanide | Groundwater | Cyanide, Total | 280-123656-1 | RQLmw-008-190401-GW | 0.0053 | 0.010 | J | J | MS-J,RepLimit-J |
| Cyanide | Groundwater | Cyanide, Total | 280-123656-1 | RQLmw-009-190401-GW | 0.013 | 0.010 |  | J | MS-J |
| Cyanide | Groundwater | Cyanide, Total | 280-123656-1 | RQLmw-012-190401-GW | 0.040 | 0.010 |  | J | MS-J |
| Cyanide | Groundwater | Cyanide, Total | 280-123584-1 | SCLmw-001-190401-GW | 0.015 | 0.010 |  | J | MS-J |
| Cyanide | Groundwater | Cyanide, Total | 280-123584-1 | SCLmw-002-190402-GW | 0.0052 | 0.010 | J | J | MS-J,RepLimit-J |
| Perchlorate | Groundwater | Perchlorate | 280-123656-1 | LL3mw-246-190401-GW | 0.052 | 0.050 | J1 | J | MS-J |
| Perchlorate | Groundwater | Perchlorate | 280-123656-1 | LL3mw-246-190402-GW | 0.062 | 0.050 |  | J | MS-J |
| Anions | Groundwater | Nitrate as N | 280-123261-1 | FBQmw-171-190401-GW | 0.33 | 0.50 | J H | J | HT-J,RepLimit-J |
| Anions | Groundwater | Nitrate as N | 280-123330-1 | LL12mw-245-190401-GW | 0.12 | 0.50 | J | J | RepLimit-J |
| Anions | Groundwater | Nitrite as N | 280-123261-1 | FBQmw-171-190401-GW | 0.10 | 0.50 | U H | UJ | HT-UJ |
| Anions | Groundwater | Nitrite as N | 280-123656-1 | RQLmw-012-190401-GW | 0.10 | 0.50 | U H | UJ | HT-UJ |
| Anions | Groundwater | Nitrite as N | 280-123656-1 | RQLmw-013-190401-GW | 0.10 | 0.50 | U H | R | HT-R |
| Anions | Groundwater | Sulfate | 280-123457-1 | LL1mw-083-190401-GW | 120 | 5.0 | M | J | MS-J |
| Anions | Groundwater | Sulfate | 280-123457-1 | LL1mw-084-190401-GW | 140 | 5.0 | M J1 | J | MS-J |
| Anions | Groundwater | Sulfate | 280-123656-1 | RQLmw-011-190401-GW | 130 | 5.0 | J1 | J | MS-J |
| Anions | Groundwater | Sulfate | 280-123656-1 | RQLmw-011-190402-GW | 130 | 5.0 |  | J | MS-J |

**Table H-4. Detailed Listing of Qualified Results – Spring 2019 Sampling Event (continued)**

| Analysis Type | Media | Chemical | Sample Delivery Group | Sample ID | Results | Det. Limit (LOQ) | Lab Qual | Val. Qual | Validation Code |
|---|---|---|---|---|---|---|---|---|---|
| Anions | Groundwater | Sulfate | 280-123656-1 | RQLmw-012-190401-GW | 110 | 5.0 | | J | MS-J |
| Anions | Groundwater | Sulfate | 280-123656-1 | RQLmw-013-190401-GW | 160 | 5.0 | M J1 | J | MS-J |
| Anions | Groundwater | Sulfide | 280-123457-1 | LL1mw-084-190401-GW | 0.80 | 4.0 | J | J | RepLimit-J |
| Alkalinity | Groundwater | Alkalinity | 280-123261-1 | FBQmw-174-190401-GW | 4.8 | 10 | J | J | RepLimit-J |
| Alkalinity | Groundwater | Alkalinity | 280-123656-1 | RQLmw-012-190401-GW | 9.9 | 10 | J | J | RepLimit-J |

Laboratory Qualifiers: J = estimated because result is between the method detection limit and the reporting limit, J1= Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria, U = not detected, H = Holding Time, M = Manually integrated compound, Q = One or more quality control failed.
Validation Qualifiers: J = estimated, R = rejected, U = not detected, and UJ = not detected and reporting limit estimated.
Validation Reason Codes: HT = holding time, LCS = laboratory control sample, MB = method blank, MS = matrix spike, ProJudge = professional judgment, RptLimit = reporting limit, and Surr = surrogate recovery.
BHC = Hexachlorocyclohexane.
DDD = Dichlorodiphenyldichloroethane.
DDE = Dichlorodiphenyldichloroethylene.
DDT = Dichlorodiphenyltrichloroethane.
ID = Identification.
µg/kg = Micrograms per kilogram.
µg/L = Micrograms per liter.
mg/kg = Milligrams per kilogram.
PAH = Polycyclic aromatic hydrocarbon.
PETN = Pentaerythritol tetranitrate.
SVOC = Semi-volatile organic compound.
VOC = Volatile organic compound.

**Table H-5. Results for Analytes Detected in Field Blanks or Trip Blanks – Spring 2019 Sampling Event**

| Client Sample ID | Analysis Type | Analyte Name | Results | Laboratory Qualifier | Final Qualifier |
|---|---|---|---|---|---|
| FWGTB-191002-TB | VOCs | 1,2-Dichloroethene (Total) | 0.00033 | J | J |

Data Qualifiers: J = estimated
ID = Identification.
VOC = Volatile organic compound.

**Table H-6. Field Duplicate Pair Comparisons for Analytes Detected in Samples – Spring 2019 Sampling Event**

| Sample No. | Analysis Type | Chemical | Parent Result (mg/Kg) | Duplicate Result (mg/Kg) | RPD % or (Abs. Diff) | Test |
|---|---|---|---|---|---|---|
| DA2mw-115-190401-GW/ DA2mw-115-190402-GW | Metals | ALUMINUM | 0.021J | 0.07U | (0.16) | D |
| DA2mw-115-190401-GW/ DA2mw-115-190402-GW | Metals | ARSENIC | 0.0017J | 0.001U | (0.14) | D |
| DA2mw-115-190401-GW/ DA2mw-115-190402-GW | Metals | BARIUM | 0.023 | 0.00095U | (7.40) | D * |
| DA2mw-115-190401-GW/ DA2mw-115-190402-GW | Metals | BERYLLIUM | 0.0003U | 0.00018J | (0.12) | D |
| DA2mw-115-190401-GW/ DA2mw-115-190402-GW | Metals | CALCIUM | 100 | 100 | 0% | RPD |
| DA2mw-115-190401-GW/ DA2mw-115-190402-GW | Metals | IRON | 0.84 | 0.82 | 2% | RPD |
| DA2mw-115-190401-GW/ DA2mw-115-190402-GW | Metals | MAGNESIUM | 28 | 28 | 0% | RPD |
| DA2mw-115-190401-GW/ DA2mw-115-190402-GW | Metals | MANGANESE | 0.099 | 0.00095U | (25.0) | D * |
| DA2mw-115-190401-GW/ DA2mw-115-190402-GW | Metals | POTASSIUM | 3.3 | 3.4 | (0.03) | D |
| DA2mw-115-190401-GW/ DA2mw-115-190402-GW | Metals | SODIUM | 12 | 12 | (0.00) | D |
| DET-003-190401-GW/ DET-003-190402-GW | Metals | ARSENIC | 0.0092 | 0.0093 | (0.02) | D |
| DET-003-190401-GW/ DET-003-190402-GW | Metals | BARIUM | 0.043 | 0.042 | 2% | RPD |
| DET-003-190401-GW/ DET-003-190402-GW | Metals | CALCIUM | 90 | 91 | 1% | RPD |
| DET-003-190401-GW/ DET-003-190402-GW | Metals | COBALT | 0.00029J | 0.00024J | (0.05) | D |
| DET-003-190401-GW/ DET-003-190402-GW | Metals | IRON | 1.9 | 1.9 | 0% | RPD |
| DET-003-190401-GW/ DET-003-190402-GW | Metals | MAGNESIUM | 33 | 33 | 0% | RPD |
| DET-003-190401-GW/ DET-003-190402-GW | Metals | MANGANESE | 0.24 | 0.24 | 0% | RPD |
| DET-003-190401-GW/ DET-003-190402-GW | Metals | POTASSIUM | 1.9J | 1.9J | (0.00) | D |
| DET-003-190401-GW/ DET-003-190402-GW | Metals | SODIUM | 12 | 12 | (0.00) | |
| DET-003-190401-GW/ DET-003-190402-GW | VOCs | ACETONE | 0.0028J | 0.0024J | (0.04) | D |
| FBQmw-175-190401-GW/ FBQmw-175-190402-GW | Anions | NITRATE AS N | 1.6 | 1.6 | (0.00) D | D |
| FBQmw-175-190401-GW/ FBQmw-175-190402-GW | Anions | SULFATE | 20 | 18 | (0.40) | D |
| FBQmw-175-190401-GW/ FBQmw-175-190402-GW | Alkalinity | ALKALINITY | 13 | 12 | (0.10) | D |
| FWGmw-021-190401-GW/ FWGmw-021-190402-GW | Metals | ANTIMONY | 0.00051J | 0.00099J | (0.08) | D |
| FWGmw-021-190401-GW/ FWGmw-021-190402-GW | Metals | ARSENIC | 0.00057J | 0.00066J | (0.02) | D |
| FWGmw-021-190401-GW/ FWGmw-021-190402-GW | Metals | BARIUM | 0.016 | 0.016 | 0% | RPD |
| FWGmw-021-190401-GW/ FWGmw-021-190402-GW | Metals | BERYLLIUM | 0.0003U | 0.00052J | (0.22) | D |
| FWGmw-021-190401-GW/ FWGmw-021-190402-GW | Metals | CALCIUM | 21 | 20 | 5% | RPD |
| FWGmw-021-190401-GW/ FWGmw-021-190402-GW | Metals | CHROMIUM | 0.00076J | 0.00082J | (0.01) | D |
| FWGmw-021-190401-GW/ FWGmw-021-190402-GW | Metals | COBALT | 0.0002U | 0.00018J | (0.02) | D |

**Table H-6. Field Duplicate Pair Comparisons for Analytes Detected in Samples – Spring 2019 Sampling Event (continued)**

| Sample No. | Analysis Type | Chemical | Parent Result (mg/Kg) | Duplicate Result (mg/Kg) | RPD % or (Abs. Diff) | Test |
|---|---|---|---|---|---|---|
| FWGmw-021-190401-GW/ FWGmw-021-190402-GW | Metals | COPPER | 0.0012J | 0.0011J | (0.05) | D |
| FWGmw-021-190401-GW/ FWGmw-021-190402-GW | Metals | IRON | 0.63J | 0.66 | 5% | RPD |
| FWGmw-021-190401-GW/ FWGmw-021-190402-GW | Metals | LEAD | 0.0007U | 0.00023J | (0.16) | D |
| FWGmw-021-190401-GW/ FWGmw-021-190402-GW | Metals | MAGNESIUM | 6.9 | 6.8 | 2% | RPD |
| FWGmw-021-190401-GW/ FWGmw-021-190402-GW | Metals | MANGANESE | 0.0099 | 0.0094 | (0.13) | D |
| FWGmw-021-190401-GW/ FWGmw-021-190402-GW | Metals | NICKEL | 0.0018J | 0.0016J | (0.07) | D |
| FWGmw-021-190401-GW/ FWGmw-021-190402-GW | Metals | POTASSIUM | 1.2J | 1.2J | (0.00) | D |
| FWGmw-021-190401-GW/ FWGmw-021-190402-GW | Metals | SELENIUM | 0.001U | 0.00072J | (0.06) | D |
| FWGmw-021-190401-GW/ FWGmw-021-190402-GW | Metals | SODIUM | 3J | 2.9J | (0.02) | D |
| FWGmw-021-190401-GW/ FWGmw-021-190402-GW | Metals | THALLIUM | 0.0002U | 0.00011J | (0.09) | D |
| FWGmw-021-190401-GW/ FWGmw-021-190402-GW | Metals | ZINC | 0.0055J | 0.0052J | (0.02) | D |
| FWGmw-021-190401-GW/ FWGmw-021-190402-GW | Explosives | 2-AMINO-4,6-DINITROTOLUENE | 0.00031J | 0.00038 | (0.34) | D |
| FWGmw-021-190401-GW/ FWGmw-021-190402-GW | Explosives | 4-AMINO-2,6-DINITROTOLUENE | 0.00028J | 0.00031 | (0.15) | D |
| LL10mw-003-190401-GW/ LL10mw-003-190402-GW | VOCs | ACETONE | 0.0036J | 0.0042J | (0.06) | D |
| LL10mw-003-190401-GW/ LL10mw-003-190402-GW | VOCs | CARBON TETRACHLORIDE | 0.00063J | 0.00086J | (0.12) | D |
| LL1mw-089-190401-GW/ LL1mw-089-190402-GW | Propellants | NITROCELLULOSE | 1U | 0.63J | (0.19) | D |
| LL3mw-246-190401-GW/ LL3mw-246-190402-GW | Metals | ANTIMONY | 0.00059J | 0.00056J | (0.01) | D |
| LL3mw-246-190401-GW/ LL3mw-246-190402-GW | Metals | BARIUM | 0.015 | 0.015 | 0% | RPD |
| LL3mw-246-190401-GW/ LL3mw-246-190402-GW | Metals | CALCIUM | 20 | 20 | 0% | RPD |
| LL3mw-246-190401-GW/ LL3mw-246-190402-GW | Metals | IRON | 0.022J | 0.085U | (0.63) | D |
| LL3mw-246-190401-GW/ LL3mw-246-190402-GW | Metals | MAGNESIUM | 6.7 | 6.6 | 2% | RPD |
| LL3mw-246-190401-GW/ LL3mw-246-190402-GW | Metals | NICKEL | 0.0016J | 0.0014J | (0.07) | D |
| LL3mw-246-190401-GW/ LL3mw-246-190402-GW | Metals | POTASSIUM | 1.2J | 1.1J | (0.03) | D |
| LL3mw-246-190401-GW/ LL3mw-246-190402-GW | Metals | SODIUM | 2.8J | 2.7J | (0.02) | D |
| LL3mw-246-190401-GW/ LL3mw-246-190402-GW | Metals | ZINC | 0.0025J | 0.002J | (0.03) | D |
| LL3mw-246-190401-GW/ LL3mw-246-190402-GW | Explosives | 2-AMINO-4,6-DINITROTOLUENE | 0.00031 | 0.0003 | (0.05) | D |
| LL3mw-246-190401-GW/ LL3mw-246-190402-GW | Explosives | 4-AMINO-2,6-DINITROTOLUENE | 0.00027 | 0.00026 | (0.05) | D |
| LL3mw-246-190401-GW/ LL3mw-246-190402-GW | Perchlorate | PERCHLORATE | 0.000052J | 0.000062J | (0.20) | D |

**Table H-6. Field Duplicate Pair Comparisons for Analytes Detected in Samples – Spring 2019 Sampling Event (continued)**

| Sample No. | Analysis Type | Chemical | Parent Result (mg/Kg) | Duplicate Result (mg/Kg) | RPD % or (Abs. Diff) | Test |
|---|---|---|---|---|---|---|
| RQLmw-011-190401-GW/ RQLmw-011-190402-GW | Anions | SULFATE | 130J | 130J | 0% | RPD |
| SCLmw-002-190401-GW/ SCLmw-002-190402-GW | Metals | ALUMINUM | 0.019J | 0.018J | (0.00) | D |
| SCLmw-002-190401-GW/ SCLmw-002-190402-GW | Metals | ANTIMONY | 0.001U | 0.00059J | (0.07) | D |
| SCLmw-002-190401-GW/ SCLmw-002-190402-GW | Metals | ARSENIC | 0.00086J | 0.001J | (0.03) | D |
| SCLmw-002-190401-GW/ SCLmw-002-190402-GW | Metals | BARIUM | 0.051J | 0.051J | 0% | RPD |
| SCLmw-002-190401-GW/ SCLmw-002-190402-GW | Metals | BERYLLIUM | 0.0003U | 0.00056J | (0.26) | D |
| SCLmw-002-190401-GW/ SCLmw-002-190402-GW | Metals | CALCIUM | 190 | 190 | 0% | RPD |
| SCLmw-002-190401-GW/ SCLmw-002-190402-GW | Metals | COBALT | 0.000057J | 0.00011J | (0.05) | D |
| SCLmw-002-190401-GW/ SCLmw-002-190402-GW | Metals | IRON | 10 | 10 | 0% | RPD |
| SCLmw-002-190401-GW/ SCLmw-002-190402-GW | Metals | MAGNESIUM | 16 | 16 | 0% | RPD |
| SCLmw-002-190401-GW/ SCLmw-002-190402-GW | Metals | MANGANESE | 1.1 | 1 | 10% | RPD |
| SCLmw-002-190401-GW/ SCLmw-002-190402-GW | Metals | POTASSIUM | 4 | 4 | (0.00) | D |
| SCLmw-002-190401-GW/ SCLmw-002-190402-GW | Metals | PHOSPHORUS | 0.1J | 0.11J | (0.00) | D |
| SCLmw-002-190401-GW/ SCLmw-002-190402-GW | Metals | SELENIUM | 0.001U | 0.00048J | (0.10) | D |
| SCLmw-002-190401-GW/ SCLmw-002-190402-GW | Metals | SILVER | 0.0001U | 0.00004J | (0.01) | D |
| SCLmw-002-190401-GW/ SCLmw-002-190402-GW | Metals | SODIUM | 3.3J | 3.3J | (0.00) | D |
| SCLmw-002-190401-GW/ SCLmw-002-190402-GW | Metals | THALLIUM | 0.0002U | 0.000094J | (0.11) | D |
| SCLmw-002-190401-GW/ SCLmw-002-190402-GW | Metals | ZINC | 0.002J | 0.002J | (0.00) | D |
| SCLmw-002-190401-GW/ SCLmw-002-190402-GW | Cyanide | CYANIDE, TOTAL | 0.01U | 0.0052J | (0.48) | D |

RPD is calculated as 100x |R-D|/(R-D)/2, where R is the concentration of the regular sample and D is the concentration of the duplicate. The absolute difference is calculated as |R-D|/L, where L is the average reporting limit of the two samples. Values followed by a "%" are RPD values. Values in parentheses are absolute difference values.
The test used to evaluate the duplicate comparison is the RPD if both sample results were more than five times the reporting limit or D if any result was less than five times the reporting limit.
*RPD or D outside criteria
Data Qualifiers: J = estimated, U = not detected, and UJ = not detected and reporting limit estimated.
BHC = Hexachlorocyclohexane.
D = Absolute difference.
ID = Identification.
mg/kg = Milligrams per kilogram.
PAH = Polycyclic aromatic hydrocarbon.
SVOC = Semi-volatile organic compound.
RDX = Hexahydro-1,3,5-Trinitro-1,3,5-Triazine.
RPD = Relative percent difference.
SVOC = Semi-volatile organic compound.

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# APPENDIX I

## Well Abandonment Records

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# I.1 Ohio EPA Notification Letter

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

May 30, 2019

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

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 include:

1) Abandonment of the one temporary well at Open Demolition Area #1; and
2) Abandonment of the three temporary wells at Electric Substations No. 3.

It is anticipated that the mobilization, well abandonment activities, and demobilization will take place from 6/12/19 to 6/14/19. Acknowledging this is only a 13 day notice, please advise if you require rescheduling the field operation.

Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

Mr. David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Mark Johnson, Ohio EPA, DERR-NEDO
Bob Princic, Ohio EPA, DERR-NEDO
Liam McEvoy, Ohio EPA, DERR-NEDO
Kevin Sedlak, ARNG, Camp James A. Garfield
Katie Tait, OHARNG, Camp James A. Garfield
Craig Coombs, USACE Louisville
Jay Trumble, USACE Louisville
Vasu Peterson, Leidos
Jed Thomas, Leidos
Gail Harris, Vista Sciences Corporation

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# I.2 Well Abandonment Logs

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# leidos MONITORING WELL/BOREHOLE ABANDONMENT RECORD

Well/Borehole Number: DA1tw-001 Abandonment Date: 6/12/19

County: Portage State: OH

Address or Location: Camp James A. Garfield / former Camp Ravenna

RL/6/12/19

Investigative Unit (if applicable): ~~Area Test Area~~ DJG 6/14/19 Open Demolition Area #1

Reason for Abandonment: NO longer necessary for groundwater evaluation

---

Geologist/Field Supervisor: Gabby Gromofsky

Drilling Company: Frontz Drilling

Driller: Ricky Shanks . Helpers: Andre Ewart N/A

---

Static Water Level: 7.40 BTOC Date/Time Measured: 6/12/19 1018

Casing Stick-up Height: 2.90 Total Well Depth: 17.91'

Type of Well Casing: PVC Diameter: 2"

Length of Well Casing Cutoff During Abandonment: 4.66'

Final Casing Stick-up Height or Depth Below Ground Surface: 1.75' BGS

---

Abandonment Method/Procedure: Remove casing to 1.75' BGS, backfill PVC with Bentonite chips, hydrate bentonite to approx. 1' BGS, backfill hole with ~~native~~ on-site soil. DJG 6/12/19 * entire casing could not be removed

Grout Mixture: Portland Cement (lbs/bags) N/A Type: N/A

Bentonite (lbs/bags) 25 lbs/1/2-50 lb bag Type: Bentonite chips

Water (gallons) 4 Gallons

Total Amount of Grout Used: N/A gallons/lbs/buckets

Surface Restoration: Complete at surface using on-site soil from hole dug in order to remove PVC.

Recorded By: 6/12/19 QA Check By: 6/12/19

leidos **MONITORING WELL/BOREHOLE ABANDONMENT RECORD**

Well/Borehole Number: ES3 tw - 0001 Abandonment Date: 6/12/19

County: Portage State: OH

Address or Location: Camp James A. Garfield / Former Camp Ravenna

RE/6/12/19

Investigative Unit (if applicable): Electric Substation 3

Reason for Abandonment: No longer needed for groundwater evaluation

---

Geologist/Field Supervisor: Gabby Gramofsky

Drilling Company: Frontz Drilling

Driller: Ricky Shanks Helpers: Andre Ewart N/A

---

Static Water Level: 5.40' BTOC Date/Time Measured: 6/12/19 0905

Casing Stick-up Height: 3.0' Total Well Depth: 7.0' BGS

Type of Well Casing: PVC Diameter: 2"

Length of Well Casing Cutoff During Abandonment: N/A

Final Casing Stick-up Height or Depth Below Ground Surface: N/A

---

Abandonment Method/Procedure: Remove entire casing by hand and backfill with hydrated coarse grained wyoming sodium bentonite chips.

RE/6/12/19

Grout Mixture: Portland Cement (lbs/bags) N/A Type: N/A

Bentonite (lbs/bags) 71b / ~1/6-50 lb bag Type: bentonite chips

Water (gallons) 1.5 Gallons

Total Amount of Grout Used: N/A gallons/lbs/buckets

Surface Restoration: Complete at surface using on-site gravel and soil

Recorded By: 6/12/19 QA Check By: 6/12/19

leidos **MONITORING WELL/BOREHOLE ABANDONMENT RECORD**

Well/Borehole Number: ES3 tw-002 Abandonment Date: 6/12/19

County: Portage State: OH

Address or Location: Camp James A. Garfield / Former Camp Ravenna

Investigative Unit (if applicable): Electric Substation 3

Reason for Abandonment: No longer needed for groundwater evaluation

---

Geologist/Field Supervisor: Gabby Gromofsky

Drilling Company: Frontz Drilling

Driller: Ricky Shanks Helpers: Andre Ewart N/A

---

Static Water Level: 6.30 BTOC Date/Time Measured: 6/12/19 0840

Casing Stick-up Height: 2.4' Total Well Depth: 16'

Type of Well Casing: PVC Diameter: 2"

Length of Well Casing Cutoff During Abandonment: N/A

Final Casing Stick-up Height or Depth Below Ground Surface: N/A

---

Abandonment Method/Procedure: Remove entire casing by hand and backfill borehole with coarse grained Wyoming bentonite chips. Hydrate bentonite chips.

TM 6/12/19

Grout Mixture: Portland Cement (lbs/bags) N/A Type: N/A

Bentonite (lbs/bags) 10 lbs | 1/8 - 50lb bag Type: Bentonite Chips

Water (gallons) 2 gallons

Total Amount of Grout Used: N/A gallons/lbs/buckets

Surface Restoration: Complete level to surface using on-site soil and gravel

Recorded By: 6/12/19 QA Check By: 6/12/19

leidos **MONITORING WELL/BOREHOLE ABANDONMENT RECORD**

Well/Borehole Number: ES3 tw-0003 Abandonment Date: 6/12/19

County: Portage State: OH

Address or Location: Camp James A. Garfield | Former Camp Ravenna

Investigative Unit (if applicable): Electric Substation 3

Reason for Abandonment: No longer needed for groundwater evaluation

---

Geologist/Field Supervisor: Gabby Gromofsky

Drilling Company: Frontz Drilling

Driller: Ricky Shanks Helpers: Andre Ewart N/A

---

Static Water Level: 3.10 BTOC Date/Time Measured: 6/12/19 0914

Casing Stick-up Height: 2' AGS Total Well Depth: 10' BGS

Type of Well Casing: PVC Diameter: 2"

Length of Well Casing Cutoff During Abandonment: N/A

Final Casing Stick-up Height or Depth Below Ground Surface: N/A

---

Abandonment Method/Procedure: Remove entire well casing by hand and backfill with hydrated bentonite chips.

6/12/19

Grout Mixture: Portland Cement (lbs/bags) N/A Type: N/A

Bentonite (lbs/bags) 5 lbs / 1/10 - 50 lb bag Type: Bentonite chips

Water (gallons) None

Total Amount of Grout Used: N/A gallons/lbs/buckets

Surface Restoration: Complete at surface using on-site soil and gravel

Recorded By: 6/12/19 QA Check By: 6/12/19

# I.3 Well Sealing Reports

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DNR 7810.12e

# WATER WELL SEALING REPORT e-FORM
OHIO DEPARTMENT OF NATURAL RESOURCES
Division of Soil and Water Resources
2045 Morse Road, Bldg B
Columbus, OH 43229-6693
Voice: (614) 265-6740 Fax: (614) 265-6767

324494

## LOCATION

County PORTAGE Township CHARLESTOWN Section No. Lot No.

Owner OHIO ARMY NATIONAL GUARD

Address of Well Location 8451 SR 5

City RAVENNA Zip Code 44266

Well Location Description (120 Characters): WELL ID: ES3TW-001

Location of Well in either:
State Plane N ☐ S ☐ X +/- ft. Y +/- ft.
OR
Latitude/Longitude Latitude 41.186763 Longitude -81.099458

Elevation of Well +/- ft. Datum Plane: ☐ NAD27 ☒ NAD83

Source of Coordinates: ☐ GPS ☐ Survey ☒ Other GLOBAL POSITIONING SYSTEM
Source of Elevation: ☐ GPS ☐ Survey ☐ Other

**WELL IDENTIFICATION** ODNR Well Log Number 2071779 Project Well ID

## MEASURED CONSTRUCTION DETAILS

Date of measurements 6/12/2019
Depth of Well 8.5 ft. Static Water Level 6 ft.
Borehole Depth 8.5 ft. Borehole Diameter 8 in.
Casing Diameter 2 in. Casing Length 3 ft. Casing Type PVC

## SEALING PROCEDURE

| Placement: | Sealing Material | Volume/Weight Used (Units Required) | Placement Method |
|---|---|---|---|
| From 0 ft. To 8.5 ft. | Bentonite pellets/chunks | 20 LBS. | Poured (gravity) |
| From ft. To ft. | | | |
| From ft. To ft. | | | |
| From ft. To ft. | | | |

Condition of Casing GOOD Was Casing Removed? ☒ Yes or ☐ No (check one)

If casing **Not Removed**, was it Perforated? ☐ Yes or ☒ No (check one) Perforations: From ft. To ft.

Date Sealing Performed 6/12/2019
Comments/Reason for Sealing: NO LONGER NEEDED FOR ENVIRONMENTAL MONITORING.

## CONTRACTOR

Name FRONTZ DRILLING INC / ENVIRONMENTAL ODH Registration # 0120
Address 2031 MILLERSBURG ROAD
City/State/Zip WOOSTER, OH 44691

e-Signature STEPHEN R. WRIGHT Filed electronically on 7/19/2019
I hereby certify the information given is accurate and correct to the best of my knowledge.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of sealing.
Distribute additional copies to: Customer, Driller and Local Health Department.

DNR 7810.12e

# WATER WELL SEALING REPORT e-FORM
OHIO DEPARTMENT OF NATURAL RESOURCES
Division of Soil and Water Resources
2045 Morse Road, Bldg B
Columbus, OH 43229-6693
Voice: (614) 265-6740 Fax: (614) 265-6767

324495

## LOCATION

County PORTAGE Township CHARLESTOWN Section No. Lot No.

Owner OHIO ARMY NATIONAL GUARD

Address of Well Location 8451 SR 5

City RAVENNA Zip Code 44266

Well Location Description (120 Characters): WELL ID: ES3TW-002

Location of Well in either: State Plane N ☐ S ☐ X +/- ft. Y +/- ft.
OR
Latitude/Longitude Latitude 41.186892 Longitude -81.099226

Elevation of Well +/- ft. Datum Plane: ☐ NAD27 ☒ NAD83

Source of Coordinates: ☐ GPS ☐ Survey ☒ Other GLOBAL POSITIONING SYSTEM
Source of Elevation: ☐ GPS ☐ Survey ☐ Other

**WELL IDENTIFICATION** ODNR Well Log Number 2071780 Project Well ID

## MEASURED CONSTRUCTION DETAILS

Date of measurements 6/12/2019
Depth of Well 10 ft. Static Water Level 5 ft.
Borehole Depth 10 ft. Borehole Diameter 8 in.
Casing Diameter 2 in. Casing Length 4 ft. Casing Type PVC

## SEALING PROCEDURE

| Placement: | Sealing Material | Volume/Weight Used (Units Required) | Placement Method |
|---|---|---|---|
| From 0 ft. To 10 ft. | Bentonite pellets/chunks | 20 LBS. | Poured (gravity) |
| From ft. To ft. | | | |
| From ft. To ft. | | | |
| From ft. To ft. | | | |

Condition of Casing GOOD Was Casing Removed? ☒ Yes or ☐ No (check one)

If casing **Not Removed**, was it Perforated? ☐ Yes or ☒ No (check one) Perforations: From ft. To ft.

Date Sealing Performed 6/12/2019
Comments/Reason for Sealing: NO LONGER NEEDED FOR ENVIRONMENTAL MONITORING

## CONTRACTOR

Name FRONTZ DRILLING INC / ENVIRONMENTAL ODH Registration # 0120
Address 2031 MILLERSBURG ROAD
City/State/Zip WOOSTER, OH 44691

e-Signature STEPHEN R. WRIGHT Filed electronically on 7/19/2019
I hereby certify the information given is accurate and correct to the best of my knowledge.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of sealing.
Distribute additional copies to: Customer, Driller and Local Health Department.

DNR 7810.12e

# WATER WELL SEALING REPORT e-FORM
OHIO DEPARTMENT OF NATURAL RESOURCES
Division of Soil and Water Resources
2045 Morse Road, Bldg B
Columbus, OH 43229-6693
Voice: (614) 265-6740 Fax: (614) 265-6767

324496

## LOCATION

County PORTAGE Township CHARLESTOWN Section No. Lot No.

Owner OHIO ARMY NATIONAL GUARD

Address of Well Location 8451 SR 5

City RAVENNA Zip Code 44266

Well Location Description (120 Characters): WELL ID: ES3TW-003

Location of Well in either: State Plane N ☐ S ☐ X +/- ft. Y +/- ft.
OR
Latitude/Longitude Latitude 41.186889 Longitude -81.099597

Elevation of Well +/- ft. Datum Plane: ☐ NAD27 ☒ NAD83

Source of Coordinates: ☐ GPS ☐ Survey ☒ Other GLOBAL POSITIONING SYSTEM
Source of Elevation: ☐ GPS ☐ Survey ☐ Other

**WELL IDENTIFICATION** ODNR Well Log Number 2071781 Project Well ID

## MEASURED CONSTRUCTION DETAILS

Date of measurements 6/12/2019
Depth of Well 10 ft. Static Water Level 4 ft.
Borehole Depth 10 ft. Borehole Diameter 8 in.
Casing Diameter 2 in. Casing Length 4 ft. Casing Type PVC

## SEALING PROCEDURE

| Placement: | Sealing Material | Volume/Weight Used (Units Required) | Placement Method |
|---|---|---|---|
| From 0 ft. To 10 ft. | Bentonite pellets/chunks | 20 LBS. | Poured (gravity) |
| From ft. To ft. | | | |
| From ft. To ft. | | | |
| From ft. To ft. | | | |

Condition of Casing GOOD Was Casing Removed? ☒ Yes or ☐ No (check one)

If casing **Not Removed**, was it Perforated? ☐ Yes or ☒ No (check one) Perforations: From ft. To ft.

Date Sealing Performed 6/12/2019
Comments/Reason for Sealing: NO LONGER NEEDED FOR ENVIRONMENTAL MONITORING

## CONTRACTOR

Name FRONTZ DRILLING INC / ENVIRONMENTAL ODH Registration # 0120
Address 2031 MILLERSBURG ROAD
City/State/Zip WOOSTER, OH 44691

e-Signature STEPHEN R. WRIGHT Filed electronically on 7/19/2019
I hereby certify the information given is accurate and correct to the best of my knowledge.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of sealing.
Distribute additional copies to: Customer, Driller and Local Health Department.

DNR 7810.12e

# WATER WELL SEALING REPORT e-FORM
OHIO DEPARTMENT OF NATURAL RESOURCES
Division of Soil and Water Resources
2045 Morse Road, Bldg B
Columbus, OH 43229-6693
Voice: (614) 265-6740 Fax: (614) 265-6767

324497

## LOCATION

County PORTAGE Township CHARLESTOWN Section No. Lot No.

Owner OHIO ARMY NATIONAL GUARD

Address of Well Location 8451 SR 5

City RAVENNA Zip Code 44266

Well Location Description (120 Characters): WELL ID: DA1TW-001

Location of Well in either: State Plane N ☐ S ☐ X +/- ft Y +/- ft
OR
Latitude/Longitude Latitude 41.171325 Longitude -81.12794

Elevation of Well +/- ft. Datum Plane: ☐ NAD27 ☒ NAD83

Source of Coordinates: ☐ GPS ☐ Survey ☒ Other GLOBAL POSITIONING SYSTEM
Source of Elevation: ☐ GPS ☐ Survey ☐ Other

**WELL IDENTIFICATION** ODNR Well Log Number 2071778 Project Well ID

## MEASURED CONSTRUCTION DETAILS

Date of measurements 6/12/2019
Depth of Well 18 ft. Static Water Level 7 ft
Borehole Depth 18 ft. Borehole Diameter 8 in.
Casing Diameter 2 in. Casing Length 7 ft. Casing Type PVC

## SEALING PROCEDURE

| Placement: | Sealing Material | Volume/Weight Used Units Required | Placement Method |
|---|---|---|---|
| From 0 ft. To 18 ft. | Bentonite pellets/chunks | 40 LBS. | Poured (gravity) |
| From ft. To ft. | | | |
| From ft. To ft. | | | |
| From ft. To ft. | | | |

Condition of Casing GOOD Was Casing Removed? ☐ Yes or ☒ No (check one)

If casing **Not Removed**, was it Perforated? ☐ Yes or ☒ No (check one) Perforations: From ft. To ft.

Date Sealing Performed 6/12/2019
Comments/Reason for Sealing NO LONGER NEEDED FOR ENVIRONMENTAL MONITORING.
CASING CUT 1.75 FT. BELOW GRADE.

## CONTRACTOR

Name FRONTZ DRILLING INC / ENVIRONMENTAL ODH Registration # 0120
Address 2031 MILLERSBURG ROAD
City/State/Zip WOOSTER, OH 44691

e-Signature STEPHEN R. WRIGHT Filed electronically on 7/19/2019
I hereby certify the information given is accurate and correct to the best of my knowledge.

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Distribute additional copies to: Customer, Driller and Local Health Department.

# APPENDIX J

# Ohio EPA Comments

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Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**Jon Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

January 17, 2020

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

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNGD-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Subject: Response to Ohio EPA Comments on the "Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2019 Sampling Event," Dated December 17, 2019**

Dear Mr. Connolly:

The Ohio Environmental Protection Agency (Ohio EPA) has received and reviewed the response to Ohio EPA comments on the "Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2019 Sampling Event." This document was received via email at Ohio EPA's Northeast District Office (NEDO), Division of Environmental Response and Revitalization (DERR), on December 17, 2019. The response 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.

Ohio EPA finds that the two comments from Ohio EPA's December 10, 2019 comment letter have been adequately addressed and are resolved with no further comments warranted. Please finalize the document with the changes agreed to according to this correspondence.

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JAN 21 2020

If you have questions, please call me at (330) 963-1292.

Sincerely,

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

KP/sc

ec: David Connolly, ARNG
Kevin Sedlak, ARNG, Camp James A. Garfield
Katie Tait, OHARNG, Camp James A. Garfield
Craig Coombs, USACE Louisville
Nathaniel Peters, USACE Louisville
Rebecca Shreffler, Chenega Tri-Services, LLC
Natalie Oryshkewych, Manager, Ohio EPA, NEDO, DERR
Bob Princic, 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

December 17, 2019

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 Semi-Annual Report for Spring 2019 Sampling Event (Work Activity No. 267-000-859-036)

Dear Mr. Palombo:

The Army appreciates your time and comments (dated December 10, 2019) on the *Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2019 Sampling Event*. Enclosed for your review are responses to your comments. Upon resolution of these comments, the Army will provide a Final version of the report for Ohio EPA concurrence.

This comment response table was prepared for the Army National Guard in support of the RVAAP restoration program. Please contact the undersigned at (703) 607-7589 or david.m.connolly8.civ@mail.mil if there are issues or concerns with this submission.

Sincerely,

David Connolly
RVAAP Restoration Program Manager
Army National Guard Directorate

cc: Bob Princic, Ohio EPA, NEDO, DERR
Natalie Oryshkewych, Ohio EPA, NEDO, DERR
Liam Envoy, Ohio EPA, NEDO, DERR
Megan Oravec, Ohio EPA, NEDO, DERR
Thomas Schneider, Ohio EPA, SWDO, DERR
Carrie Rasik, Ohio EPA, CO, DERR
Kevin Sedlak, ARNG, Camp James A. Garfield
Katie Tait, OHARNG, Camp James A. Garfield
Craig Coombs, USACE Louisville
Jay Trumble, USACE Louisville
Vasu Peterson, Leidos
Jed Thomas, Leidos
Rebecca Shreffler, Chenega Tri-Services, LLC
Gail Harris, Vista Sciences Corporation

Subject: Former Ravenna Army Ammunition Plant (RVAAP) Restoration Program, Portage/Trumbull Counties, Responses to Comments on RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2019 Sampling Event (Work Activity No. 267-000-859-036)

**Comments**

**Ohio EPA Comment 1: Figure 3-1 reference in the Draft FWGWMP Semi-Annual Report for Spring 2019:**

Page 3-1 contains several references (line 5 and line 40) to the 72 wells selected for sampling as being listed on "Figure 3-1". It appears that the reference should be "Table 3-1", as that is the table found starting on page 3-3 containing the listing of the FWGWMP wells and analytical testing suites. It is correctly referenced as "Table 3-1" on page 3-2, line 10.

Figure/Table reference needs corrected throughout the document to accurately represent nomenclature of the figure/table being referenced.

Army Response: Clarification and agree. The callouts for "Figure 3-1 were reviewed, and the intent of these callouts were to show the reader where the 72 wells are located within the facility. For clarity, the text references have been revised to state "These wells are depicted in Figure 3-1."

**Ohio EPA Comment 2: Table 4-1 reference in the Draft FWGWMP Semi-Annual Report for Spring 2019:**

Page 4-1, line 3 refers to a "Table 4-1" presenting sampling rationale and discussion of analytical results for each well which appears correct. However, the actual title block on Table 4-1 found starting on Page 4-3 reads "Table 4-1. Recommended FWGWMP Wells for 2019" which appears to be a carry-over from the 2019 FWGWMP Addendum.

Please advise if this title block is correct, or if it needs corrected to more accurately reflect the intent of the information presented on Table 4-1 which also summarizes the results of the 2019 sampling event.

Army Response: Clarification and agree. Part of the intent of Table 4-1 is to provide the "2019 FWGWMP Sampling Recommendations" (see the fifth column). That said, the first paragraph in Section 4.0 has been revised to state "Table 4-1 presents the 2019 FWGWMP sampling recommendations ~~rationale~~ for sampling each individual well, as presented in the 2019 Addendum."

Ohio Environmental Protection Agency

**Mike DeWine**, Governor
**John Husted**, Lt. Governor
**Laurie A. Stevenson**, Director

December 10, 2019

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

Mr. David Connolly
Army National Guard Directorate
Environmental Programs Division
ARNGD-ILE-CR
111 South George Mason Drive
Arlington, VA 22204

**Subject: Ohio EPA Comments on the "Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2019 Sampling Event" Dated September 26, 2019**

Dear Mr. Connolly:

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 2019 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) on September 27, 2019.

The report was prepared for the United States Army Corps of Engineers (USACE) 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 Director's Findings and Orders.

**STATEMENT**

The Draft Facility-Wide Ground Water Monitoring Plan (FWGWMP) Semi-Annual Report for Spring 2019 summarizes ground water monitoring activities conducted during the Spring 2019 sampling event, provides descriptions of field activities performed, and presents field and analytical results. The report also evaluates chemical data collected per the approved ground water sampling scheme specified in the FWGWMP Ground Water Addendum for 2019:

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- During 2019, four temporary monitoring wells were abandoned (DA1tw-001, ES3tw-001, ES3tw-002, and ES3tw-003), and well abandonment logs and Ohio Department of Natural Resources (ODNR) Water Well Sealing Report e-forms were provided in Appendix I.1.

- Between April 29 through May 13, 2019 (Spring 2019 sampling event), a total of 72 of the facility's monitoring wells were sampled. This included sampling of the five semi-annual Resource Conservation and Recovery Act (RCRA) ground water wells.

- Section 3.4 (Page 3-2, line 20) documents the three approved field change requests submitted for the Spring 2019 sampling event, also included as Appendix C.

- Table 4-1 of the Draft FWGWMP Semi-Annual Report for Spring 2019 indicated that all 72 wells were analyzed for the proper analytical parameters in accordance with the 2019 Addendum (combinations of volatile organic compounds, semi volatile organic compounds, polycyclic aromatic hydrocarbons, phenols, polychlorinated biphenyls, hexachlorocyclopentadiene, perchlorate, nitroaromatics, propellants, explosives, phthalates, pesticides, cyanide, phosphorus, anions, pH, alkalinity, and metals). No summary or evaluation of the data findings was presented in this report; evaluation of the Spring 2019 data is expected to be presented along with the Fall 2019 data in the Draft FWGWMP Annual Report for 2019.

- A review of Appendix H (Data Quality Assessment Report) documented that greater than 99.9% of the data were qualified as usable, with some data qualified as "estimated," and one data point was rejected. Overall, the data quality assessment reported that data produced for the project can withstand scientific scrutiny, are appropriate for its intended purpose, are technically defensible, and are of known and acceptable sensitivity, precision, and accuracy.

**COMMENTS**

1. **Figure 3-1 reference in the Draft FWGWMP Semi-Annual Report for Spring 2019:** Page 3-1 contains several references (line 5 and line 40) to the 72 wells selected for sampling as being listed on "Figure 3-1". It appears that the reference should be "Table 3-1", as that is the table found starting on page 3-3 containing the listing of the FWGWMP wells and analytical testing suites. It is correctly referenced as "Table 3-1" on page 3-2, line 10.

   Figure/Table reference needs corrected throughout the document to accurately represent nomenclature of the figure/table being referenced.

2. **Table 4-1 reference in the Draft FWGWMP Semi-Annual Report for Spring 2019:** Page 4-1, line 3 refers to a "Table 4-1" presenting sampling rationale and discussion of analytical results for each well which appears correct. However, the actual title block on Table 4-1 found starting on Page 4-3 reads "Table 4-1. Recommended FWGWMP Wells for 2019" which appears to be a carry-over from the 2019 FWGWMP Addendum.

   Please advise if this title block is correct, or if it needs corrected to more accurately reflect the intent of the information presented on Table 4-1 which also summarizes the results of the 2019 sampling event.

This "Draft Facility-wide Groundwater Monitoring Program Plan RVAAP-66 Facility-wide Groundwater Semi-Annual Report for Spring 2019 Sampling Event" was reviewed by personnel from Ohio EPA, who have determined that 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 call me at (330) 963-1292.

Sincerely,

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

KP/sc

ec: David Connolly, ARNG
Kevin Sedlak, ARNG, Camp James A. Garfield
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Carrie Rasik, Ohio EPA, CO, DERR

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