GROUNDWATER MONITORING PROGRAM
2019 SEMI-ANNUAL (DECEMBER) STATUS REPORT
FOR
REMEDIAL ACTION AT
THE DEFENSE NATIONAL STOCKPILE CENTER SCOTIA DEPOT
GLENVILLE, NEW YORK

Prepared For:

U.S. Army Corps of Engineers

Prepared By:

AECOM Technical Services

March 2020

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2019 QUARTER FOUR STATUS REPORT

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1 INTRODUCTION

This report has been prepared by AECOM on behalf of the United States Army Corps of Engineers (USACE) and the United States General Services Administration (GSA) to document the groundwater monitoring activities performed at the Former Scotia Navy Depot (FSND) (Site) for the semi-annual period between June 22, 2019 and December 12, 2019. This report presents the results of the eleventh groundwater sampling event after the completion of the construction of the zero valent iron (ZVI) permeable reactive barrier (PRB) which was installed across the volatile organic compound (VOC) plume to remediate groundwater at the Site. The first eight sampling events were conducted on a quarterly basis. Starting with the ninth event, the schedule has changed to a semi-annual basis (December and June) in accordance with the Site Management Plan (SMP) (AECOM, 2017b).

This groundwater sampling event included collection of groundwater samples from 12 monitoring wells. Installation of the PRB was completed from February 2016 to December 2016. The Site is adjacent to the north side of New York State (NYS) Route 5 (Amsterdam Road) in the Town of Glenville, Schenectady County, New York. A Site location map is provided in Figure 1-1.

1.1 Site Description

The Site and adjacent properties are zoned for commercial use. Residential properties are located to the south between Amsterdam Road and the Mohawk River. The Mohawk River is located approximately 1,500 feet west-southwest of the Site and represents the major drainage feature in Schenectady County. The water table beneath the Site is approximately 65 feet below ground surface (bgs), and groundwater beneath the Site flows from northeast to southwest toward the Mohawk River.

The Site overlies a United States Environmental Protection Agency (US EPA) designated Sole Source Aquifer referred to as the Schenectady or Great Flats Aquifer system, which is adjacent to and extends beneath the Mohawk River over a distance of approximately 12 miles in Schenectady County. Relative to a series of four aquifer protection zones established to protect five municipal water supplies relying on the aquifer system, the Site lies in Zone III or the General Aquifer Recharge Area. The Site is located approximately 1,500 feet southwest of the Village of Scotia well field and approximately 1.25 miles north of the Town of Rotterdam and City of Schenectady well fields.

Portions of the original Scotia Naval Depot have been subdivided and sold since 1972 by the United States Government. The Site now consists of several large privately held parcels in addition to a portion of land still administered by the GSA. The private parcels contain a variety of industrial tenants; while the GSA leases its remaining portion to the Defense Logistics Agency/Defense National Stockpile Center and the Navy.

1.2 Site History

The Scotia Depot was built in 1942 and 1943 and was commissioned as a United States Navy facility on March 30, 1943. It served as a storage and supply depot for naval forces along the Atlantic coast and Europe, and as a storage and distribution point for National Stockpile materials.

On January 1, 1960, the Navy turned the facility over to the GSA. During the period between early 1966 and approximately 1973, the USACE/Army Material Command (AMC) leased buildings from the Navy for the fabrication and storage of vehicles as well as other military equipment. Additionally, between 1967 and 1969, the GSA and the Navy leased to the United States Army/Defense Supply Agency, Buildings 202 and 203. The agreement indicates these buildings were used for the preservation and rail loading of trucks; and storage of trucks and vehicles.

1.2.1 Summary of Previous Investigations

In the late 1980s, trichloroethene (TCE) was detected at low-level concentrations of less than 1 microgram per liter (µg/L) in the Town of Rotterdam and City of Schenectady well fields. In an effort to determine the potential source(s) of the TCE, the New York State Department of Health (NYSDOH) performed sampling of private water supply wells in the area during 1991. The private water supply sampling included residences located on NYS Route 5 in the Town of Glenville hydraulically downgradient of the Defense National Stockpile Center Scotia Depot Site. VOCs, including TCE, 1,1,1-trichloroethane (1,1,1-TCA), and tetrachloroethene (PCE), were detected in groundwater collected in some of these residential wells. The sampling results were consistent with the known groundwater contamination concentrations at the Defense National Stockpile Center Scotia Depot Site, including TCE which was detected in the NYS Route 5 residential well water samples at concentrations up to 320 µg/L. Following a recommendation by the NYSDOH to connect to public water, the homes on NYS Route 5 were subsequently connected to public water provided by the Town of Glenville. Although the drinking water standard was never exceeded in the City of Schenectady and the Town of Rotterdam municipal water supply wells, increased groundwater quality monitoring was initiated following the identification of the contamination.

Subsequent to the NYSDOH residential groundwater sampling, six subsurface investigations were completed to identify the possible source of TCE in the residential wells and to delineate the extent of the TCE groundwater plume. The investigations were completed between 1995 and 2007 and focused on the assemblage of properties comprising the former 337-acre Defense National Stockpile Center Scotia Depot. The New York State Department of Environmental Conservation (NYSDEC) 2007 Expanded Site Investigation (ESI) (NYSDEC, 2007) provides details on each of these investigations. Investigation data indicated that TCE disposal may have also occurred in the northeast corner of the 401 sub-block and the area near the north corner of the 403 sub-block.

Based on these investigations, a Record of Decision (ROD) specifying a groundwater remedy was approved by the NYSDEC in March 2010 (NYSDEC, 2010). The ROD specified a remedial action for the groundwater plume which included treatment of the plume through the installation of a zero valent iron (ZVI) PRB. During this time investigations were also conducted in relation to a carbon tetrachloride plume that was identified as a source for potential soil vapor intrusion. In addition to the groundwater remedy, the ROD also identified the need for soil vapor intrusion mitigation at the building 201 sub-block. Details on the installation and monitoring of the Soil Vapor Intrusion (SVI) portion of the remedy are provided in the Final Engineering Report (FER) (AECOM, 2017a). A Site Layout Map is provided in Figure 1-2.

1.2.2 Pre-Design Groundwater Investigation – 2013

A pre-design investigation (PDI) was completed by Stone Environmental in 2013 to verify the location and dimensions of the TCE plume to better estimate the appropriate location and depth of the PRB. The PDI was completed as a component of the ROD selected remedy to aid in the PRB design. The pre-design investigation included:

- Baseline groundwater sampling of 24 existing onsite monitoring wells
- Synoptic measurement of groundwater elevations in 35 on-site and off-site monitoring wells
- Vertical groundwater profile of VOC plume at 16 locations (WP-01 to WP-16)
- Installation and development of four on-site monitoring wells (MW-24 through MW-27)
- Hydraulic conductivity measurements
- Geotechnical soil sampling (laboratory sieve, bulk density, and effective porosity analyses)
- ZVI treatability study (bench-scale column test) using Site soil and groundwater

The results of the PDI indicated that the plume location had shifted to the south/southeast from the estimated plume delineation shown in the 2010 ROD (see Figure 3 from the ROD and Figures 6 and 10 from Final PDI Report) (Stone, 2013). The PDI also delineated the vertical and horizontal limits of the plume across a transect of groundwater profile locations, which had not been well defined in previous investigations. The results of the ZVI treatability study indicated that ZVI would be effective in remediating the TCE plume at the detected maximum concentrations and Site-specific geochemical conditions. The PDI evaluated a preliminary PRB design approximately 850-feet long centered on the highest concentration axis of the TCE plume and extending to estimated lateral limits of the plume based on the results of the vertical groundwater profile locations. Subsequent evaluation of the data to maximize effectiveness and efficiency of the remedial design suggested a 700-feet long deep section centered on the TCE plume with a shallower 250-feet long section to treat lower TCE concentrations would be effective at mitigating the groundwater contamination.

1.2.3 Baseline Groundwater Investigation

As part of the remedial design investigation work plan (RDIWP) (AECOM, 2015) various field activities were conducted during the fall of 2015 in order to gather data and information needed to complete the final PRB design. The main components of the remedial design investigation (RDI) field activities that related to the PRB design included:

- Installation and development of four compliance well pairs (MW-28 to MW-35) and one additional monitoring well (MW-36) to confirm upgradient edge of groundwater plume

- Collection of 33 baseline groundwater samples
- Performance of a confirmatory ZVI bench scale test
- Performance of aquifer tests including slug testing and hydraulic pulse interference testing (HPIT)

Detailed methods and results of these field activities were presented in the Remedial Action Work Plan (PRB-RAWP) (AECOM, 2016) and the 2015 RDI Work Summary Memo presented in Appendix A of the PRB-RAWP.

1.3 PRB Design Summary

The remedial investigation activities at the Site indicated that variable hydraulic conductivity and hydraulic gradient conditions may exist at the Site, resulting in varied groundwater velocity. Therefore, various design cases were analyzed within the range of the measured values to determine the optimum design for the PRB. Three design cases in particular were outlined in the (PRB-RAWP) (AECOM, 2016). These design cases were based on average values from the slug test data and HPIT data from the 2015 RDI activities and historic data from the Stone PDI (Stone, 2013). The three design cases used an average value of 0.004 ft/ft for the hydraulic gradient and varied the hydraulic conductivity from 15.66 ft/day to 193.8 ft/day. Using an assumed porosity of 0.4 this variability of hydraulic conductivity results in an expected range of groundwater velocity at the Site from 0.128 ft/day to 2.83 ft/day. GeoSierra Environmental, Inc. (GeoSierra), the PRB installation subcontractor, performed a sensitivity analysis based on these design cases and the design of the PRB was chosen based on design scenarios that reflected a conservative approach. A full description of the PRB design including details of each design case is presented in the PRB-RAWP (AECOM, 2016).

1.4 Remedial Action Implementation

In accordance with the ROD for the remedial action at the FSND, a ZVI PRB was installed in order to mitigate the impacted groundwater plume at the Site. AECOM, and its subcontractor GeoSierra, performed the installation of the PRB over the course of 10 months in 2016. The design and installation procedures of the PRB are outlined in the PRB-RAWP (AECOM, 2016). The main components of PRB installation were as follows:

- Installation of 77 injection wells
- Installation of 31 Resistivity strings
- Placement of ZVI into the formation via injection wells
- Post PRB installation HPIT testing

The installation of the ZVI PRB was successfully completed in November of 2016. Details of the PRB construction activities of the PRB are provided in the FER (AECOM, 2017a) for the Site.

2 GROUNDWATER MONITORING PROGRAM

Monitoring well locations are shown on Figure 1-2 and are described in Table 2-1. Table 2-1 also provides the monitoring well sampling schedule and analytical information for the groundwater monitoring program. The December 2019 event included groundwater monitoring from 12 locations. The groundwater monitoring program will be carried out in accordance with the schedule and sampling protocol outlined in the SMP.

The eight compliance monitoring wells (MW-28 through MW-35) were installed in pairs so that groundwater quality could be monitored directly upgradient and directly downgradient of the PRB. The four monitoring well pairs are installed 20 feet apart on opposite sides of the wall, one being upgradient and one being downgradient, with corresponding screen depths. Figure 2-1 provides a profile of the compliance monitoring wells showing the screened interval in relation to the PRB. Results from the groundwater monitoring program will be used to evaluate the effectiveness of the remedy at decreasing chlorinated VOC concentrations in groundwater and preventing the migration of contaminated groundwater off-site. The compliance well pairs, in addition to MW-24 (downgradient), MW-26 (downgradient), MW-15 (upgradient) and MW-16 (outside of plume), were to be sampled quarterly for the first two years (eight quarters) then semi-annually thereafter. The first quarterly sampling event was conducted in December 2016. The first semi-annual sampling event was conducted in December 2018. Monitoring well locations are shown on Figure 1-2 and are described in Table 2-1.

2.1 Sample Collection Methods

Prior to sample collection, depth to water measurements were collected with an electronic water level meter from all accessible wells on Site. Depth to water measurements were taken to the hundredth of a foot from a designated measuring point on the well casing.

The groundwater sampling event was performed in accordance with EPA's low stress, often referred to as low-flow, sampling technique (Low-Flow (Minimal Drawdown) Ground-Water Sampling Procedures, EPA/540/S-95/504) (EPA, 2010) and is discussed below.

A bladder pump was used to purge the monitoring wells with the pump intake set at the midpoint of the saturated screened interval. During purging, the pump was operated at a flow rate of approximately 100 to 500 milliliters per minute (mL/min) and water levels were monitored to ensure that the pumping rate caused minimal/no drawdown. Dedicated tubing for each monitoring well was used for groundwater sample collection. Field parameters were recorded on the Well Sampling Forms every five minutes during purging, including:

- Purge rate (mL/min)
- Depth to water (0.01 ft)
- Temperature (degrees Celsius)
- pH

- Specific conductance (millisiemens per centimeter [ms/cm])
- Dissolved Oxygen (DO) (milligrams per liter [mg/L])
- Oxidation-Reduction Potential (ORP) (millivolts [mV])
- Turbidity (NTU)

A flow-through cell was used to obtain temperature, pH, specific conductance, DO, and ORP. Turbidity will be measured using a separate instrument. Purging was considered complete when the indicator parameters have stabilized over three consecutive readings, indicating that formation water was being drawn. Stabilization parameters include the following:

- Drawdown: less than 0.3 ft drawdown during purging
- pH: ± 0.1 standard unit
- Specific Conductivity: ± 3%
- DO: ± 10 % (mg/L) for values greater than 0.5 mg/L or 3 readings < 0.5 mg/L
- ORP: ±10 mV
- Turbidity: < 5 NTU or ± 10% for readings >5 NTU

Groundwater sample collection forms with the field parameter readings for each monitoring well are included as Appendix A. Sampling instruments were calibrated daily prior to starting sampling activities, or as needed throughout the day. A log of the field equipment calibration records is provided in Appendix B.

During past groundwater sampling events observed DO readings have been variable between sampling events and monitoring well locations, and sometimes readings were higher than expected. To get a better understanding of DO measurements in the field during the December 2018 and June 2019 events DO readings were collected with the flow through cell using a YSI Pro DSS, as well as a YSI 550A DO meter placed directly in the monitoring well to compare differences in measurements. The YSI Pro DSS has an optical DO meter, and the YSI 550A DO meter is a membrane based DO meter. Periodic in field verification of the DO readings was performed by inserting the probes into a 0 mg/L DO solution. The use of the YSI 550A DO meter was discontinued for the December 2019 sampling event.

Prior to sample collection, the flow-through cell was disconnected from the dedicated sample tubing and the sample was collected directly from the tubing into the laboratory supplied sample containers. The target flow rate during sample collection was approximately 100 mL/min and sample collection was completed within a single bladder pulse for VOC analysis. Once sampling was complete, the purge water was placed in a 55-gallon drum at the conclusion of the sampling event. More detailed procedures for sample collection and handling and waste handling, are included in Appendix H of the SMP (AECOM, 2017b). Appendix G of the SMP includes the analytical QAPP for the site management activities. Appendix I of the SMP includes the HASP for the site management activities.

Groundwater samples were packaged on ice and delivered to ALS Laboratory daily via FedEX shipping during the sample collection timeframe. Standard chain of custody procedures were used for sample transport. In total, 12 groundwater samples were collected and analyzed for targeted VOCs (EPA method 8260C) and monitored natural attenuation (MNA) parameters including TOC (SM 5310B), alkalinity (SM 2320B), chloride, nitrate, sulfate (EPA Method 300.0), and dissolved gases (methane, ethane, and ethene; Method RSK 175). In addition, five groundwater samples were analyzed for dissolved hydrogen (PACE Method AM20GAX), and eight groundwater samples were analyzed for total and dissolved iron (EPA SW-846 Method 6010C).

3 RESULTS

3.1 Hydrogeologic Results

The groundwater elevations for the Site were determined based on the initial depth to groundwater measurements that were taken prior to sample collection. Table 3-1 shows the groundwater elevation data for the December 2019 sampling event and compares it to the November/December 2015 baseline sampling event and past sampling event levels. A potentiometric Site map indicating the overburden, groundwater elevation and direction of groundwater flow during the December 2019 sampling event is included as Figure 3-1. Observed general groundwater flow direction in December 2019 was from northeast to southwest, which is similar to past sampling events.

Based on observed trends during the past sampling events groundwater elevation at the Site is subject to seasonal variability. The December and March sampling events exhibit lower groundwater elevations than the June and September sampling events. The similarities between the winter events and summer events indicate a seasonal groundwater level trend. Groundwater elevation data for the December 2019 sampling event indicate that groundwater levels are currently above the top of the PRB wall at the southern end of the wall. Similar groundwater levels have been observed during other sampling events both in the summer and the winter, suggesting that the recent average groundwater level at the site may be different from when the wall was designed. The current potentiometric surface in relation to the PRB is shown in profile on Figure 2-1A and in relation to along the axis of the estimate plume in Figure 2-1B. AECOM has reviewed the vertical COC groundwater concentration data from the 2013 PDI and found that there were no detected COCs at elevations above the wall in this area. AECOM does not believe that groundwater being slightly above the top of the wall in this area is cause for concern because the concentrations of COCs in the elevations around the top of the wall were low or non-detect. The majority of the higher COC concentrations were detected at locations in the lower section of the wall.

The hydraulic gradient is the change in hydraulic head, or water level, per unit distance. The average hydraulic gradient at the Site in the vicinity of the PRB, estimated based on the December 2019 hydrogeologic conditions, was determined to be 0.0069 ft/ft. The hydraulic gradient for the past three sampling events was 0.0038 ft/ft in June 2019, 0.0044 ft/ft in December 2018 and 0.0019 ft/ft in September 2018. The groundwater seepage velocity is the rate of solute transport through the open pore space in the soil. Based on the December 2019 hydraulic gradient of 0.0069 ft/ft and the range of hydraulic conductivities evaluated for the PRB design (15.66 ft/day to 193.8 ft/day), and assuming a porosity of 0.4, groundwater seepage velocity at the Site could vary between approximately 0.27 ft/day and 3.33 ft/day, which is slightly higher than the range of estimated groundwater velocities used for the PRB design (0.128 ft/day-2.83 ft/day). Calculations for hydraulic gradient and velocity estimates are included in Appendix C.

Drums containing purge water from the December 2019 sampling event were removed from the Site on January 14, 2020 and their contents were properly disposed of by the environmental waste services contractor.

3.2 Groundwater MNA and Field Parameter Results

Results of groundwater MNA parameters obtained from the baseline sampling event through the December 2019 semi-annual sampling event for the PRB monitoring compliance wells are presented in Table 3-2. MNA parameters were compared between compliance well pairs to observe changes in groundwater quality from upgradient to downgradient of the wall. Field parameter readings are primarily collected to demonstrate stabilization criteria as discussed in Section 2.1, however they can also give insight as to subsurface conditions and served as indicators for reactions taking place.

During previous sampling events DO measurements were variable with some well pairs showing an increase and some pairs showing a decrease from upgradient to downgradient. ORP values downgradient of the wall are expected to be within the -300 to -400 range, and we should expect to see little to no DO in these monitoring locations. To date these expected values have not been observed on a consistent basis and no definitive trends on DO and ORP measurements have been defined.

DO measurements during the December 2019 event were collected with an optical DO meter (YSI Pro DSS) located in a flow through cell. For most compliance well pairs, the downgradient DO readings were very low (i.e. <1.0 mg/L), which is within the range of what we expect to see in downgradient compliance wells. All downgradient compliance wells DO readings were lower than their upgradient compliance well pairing. Periodically during the sampling event, field verification of the DO reading was performed by inserting the probe into a 0 mg/L DO solution, and these checks showed that the instruments were reading 0 mg/L or very close to 0 mg/L during the checks. The DO data is presented in Table 3-2. For past recent sampling events a second DO meter, the YSI 550A, was used to measure DO in the monitoring well. AECOM found that these results were not consistent to the YSI Pro DSS results for unknown reasons, and did not clarify the redox status of the groundwater. The DO measured in the flow-through cell appeared to be more consistent with the expected geochemistry. Therefore, to eliminate confusion on the data and gain efficiency during the field event the use of the downhole YSI 550A was discontinued for the December 2019 event and future sampling events.

During the December 2019 sampling event ORP levels were again variable but measurements showed decreases between three out of four compliance well pairs. However, ORP values were still not showing values that are typically expected downgradient of a ZVI PRB wall. ORP levels decreased significantly from upgradient to downgradient at well pairs MW-28/29 and MW-32/33. Lower ORP values are expected downgradient of the PRB indicating reducing conditions as the groundwater passes through the PRB, however we expect to see ORP levels in the range of the -300 to -400 range for the Beta elimination CVOC reduction to occur.

The December 2019 groundwater results showed a general increase in methane, ethane and ethene in well pairs MW-30/31 and MW-32/33 when compared to their upgradient counterparts. For methane, there was a particularly large increase between upgradient and downgradient in monitoring well pairs MW-30/31 and MW-32/33. The largest increase in methane, was seen in compliance monitoring well pairs in the middle of the PRB. Increased downgradient methane concentrations began to be observed by mid-2017 and since then the methane levels have been relatively sustained in the mid-section of the wall. Initially methane, ethane and ethene concentrations increased from the breakdown of the ZVI carrier fluids (guar) and served as an indicator for biological reductive dechlorination activity in the subsurface. Elevated levels of methane continue to be observed, shifting from the southern end to the middle of the wall's downgradient compliance wells, suggesting the continued occurrence of anaerobic biological activity in the subsurface in some portions of the wall.

To date, nitrate and sulfate levels have been variable since the 2015 baseline sampling event including for the December 2019 event. During this event most downgradient wells showed a decrease in nitrate and sulfate from their upgradient counterparts. Nitrate and sulfate concentrations are expected to decrease from upgradient to downgradient wells as this would further indicate that bioactivity is occurring.

The continued presence of ethane and ethene in downgradient well pairs is indicative of the β-elimination abiotic reaction of CVOCs with the PRB. These compounds, along with acetylene, are final products from the interaction of the ZVI and CVOCs. The June 2018 results did not indicate the presence of acetylene, however the detection of acetylene is very rare since it is extremely volatile. Acetylene could be produced as a byproduct of abiotic TCE reduction. Its presence would be an indicator of an abiotic TCE reduction, but it absence does not necessarily provide any insight into the reactions that may be occurring within the ZVI PRB. For the 10 locations where acetylene was analyzed for in June 2019, there were no detections. Therefore, acetylene was not analyzed for in the December 2019 event.

The December 2019 event included sampling for dissolved hydrogen at five of the compliance wells to monitor for the expected geochemical conditions present from the CVOC reactions with the ZVI wall. Dissolved hydrogen is a byproduct of the CVOCs degradation reactions taking place in the wall and may serve as an indicator of ZVI reactivity. Results showed very low concentrations of dissolved hydrogen in the vicinity of the wall at both upgradient and downgradient locations; however, the lack of detections of dissolved hydrogen is not unusual since dissolved hydrogen is quickly consumed in the subsurface. The background locations sampled in June 2019 (MW-15 and MW-24) also showed very low dissolved hydrogen concentrations, similar to those within the compliance monitoring well locations.

Dissolved iron and total iron were sampled for at the eight compliance wells during this quarter to monitor for reaction byproducts in the vicinity of the wall. Dissolved iron is another byproduct of ZVI redox reactions with CVOCs and it is expected to see increased concentrations in the subsurface at monitoring wells downgradient of the wall. Neither dissolved nor total iron was detected in concentrations at wells downgradient of the PRB that are indicative of presence of ZVI redox reaction byproducts.

Overall the MNA data does not show consistency in the well pairs throughout the expanse of the PRB. The December 2019 monitoring data may indicate that the groundwater conditions at the site are shifting away from the anaerobic conditions that were created in the wake of the PRB wall installation, to conditions that indicate that abiotic reductive dechlorination reactions are occurring in the middle of the wall. However, MNA parameters to date have not yet shown signs indicative of the redox reactions that would be expected to take place as the COCs flow through the ZVI PRB wall. ZVI reactions typically show a significant increase in pH to about 9-10 in downgradient monitoring locations depending on the buffer capacity of the soil. However, pH measurements observed to date downgradient of the wall have been mostly the same, typically between 7-9, since the installation of the PRB with only some minor increases throughout time.

3.3 Groundwater VOC Results

The VOC results from the June 2019 sampling event are presented in Table 3-2. This groundwater sampling event included collection of 12 groundwater samples for VOCs. Figure 3-2 provides a summary of the groundwater VOC results for the monitoring well compliance pairs, and semi-annual wells that exceed the NYSDEC Ambient Water Quality Standards (AWQS) and Guidance Values (GV) found in the Technical and Operational Guidance Series (TOGS) 1.1.1 (NYSDEC, 1998) and compares the December 2019 sampling event results to the historic sampling event results. Figure 3-3 shows the Site-wide monitoring locations total CVOC results. Full analytical reports are included in Appendix D.

The laboratory data was validated by an AECOM chemist and a full data usability summary report (DUSR) was prepared. The DUSR, included in Appendix E, indicated that all data points were usable with some qualifications and no data points were rejected. Further details on other data that required qualifications are provided in the DUSR.

A narrative summary of the results is presented below:

- TCE, the primary constituent of concern, was detected in all 8 of the compliance wells, 7 of which were above or equal to the AWQS of 5 µg/L. One downgradient monitoring well location, MW-34, for the second consecutive sampling event showed the TCE concentration to be below the AWQS.

- For the December 2019 event three out of the four downgradient wells of the compliance well monitoring pairs showed lower levels of TCE concentrations than their upgradient counterparts. The downgradient TCE concentrations ranged from 2.9 µg/L (MW-34) to 219 µg/L (MW-28).

- TCE was also detected at varying levels in two of the four other wells that were sampled, including elevated levels of TCE at MW-15 (105 µg/L) upgradient of the wall. The TCE concentration at downgradient well MW-24 was below the AWQS. While there may be some seasonal variability in TCE concentrations, at this time there does not seem to be a clear pattern in the results.

- In general detected concentrations of TCE in the 12 wells, as well as other CVOCs, for the December 2019 sampling event were consistent with previous groundwater sample results. However, as previously noted, there appears to be a decreasing trend in TCE concentrations at some downgradient compliance well pair locations.

- Wells with detectable levels of tetrachloroethene (PCE) were MW-15, MW-28, MW-29 and MW-31. The concentration of PCE measured in MW-28 and MW-29 were above the AWGS of 5 μg/L and the others were below the AWQS.

Graphs showing concentrations of CVOCS were created for the monitoring well compliance pairs to monitor groundwater concentration trends. Data shown includes the baseline sampling event in December 2015 through the most recent sampling event in December 2019. These trend plots are included in Appendix F as Figures F-1 through F-4. Analysis of concentration trends so far indicates a decreasing trend in concentration of CVOCs in all downgradient compliance monitoring wells except MW-28. Over the last several monitoring events in particular a decrease in total CVOCs from upgradient to downgradient compliance well pair locations has been observed.

4 SUMMARY AND CONCLUSIONS

The December 2019 groundwater monitoring event was the third semi-annual sampling event and the eleventh overall sampling event completed since the installation of the PRB wall. Sampling is now conducted on a semiannual basis for a 3 year period as described in the SMP (AECOM 2017b).

Mann-Kendall trend analysis of the laboratory results for TCE suggests that there is a decreasing trend in TCE concentrations at the downgradient compliance wells located in the deeper portion of the PRB. MW-28, screened in the shallow portion of the wall, does not exhibit a trend. Trend analysis results are included in Appendix G. CVOC concentrations at downgradient well pair locations have in general been lower than their upgradient counterparts for the last several monitoring events. Continued observations of elevated methane and ethane concentrations at some downgradient monitoring wells, particularly in the center of the wall, indicate the presence of anaerobic biological activity within the subsurface in the vicinity of the PRB. While there had been increased TOC concentrations at the monitoring well compliance pairs noted in the previous sampling events it appears TOC has moved toward baseline conditions. Results from the December 2019 event indicate this trend is continuing. Since the installation of the wall downgradient parameters including the presence of ethane, ethene, and methane suggest that the biotic degradation of TCE may be taking place as impacted groundwater flows through the PRB in most well pairs. However, more recent dissolved gasses data indicates that a shift from biotic reductive dechlorination to abiotic reductive dechlorination conditions and reactions may be occurring in the subsurface.

The laboratory and field data from the MW-28/29 well pair at the northern end of the wall is noticeably different from the other three well pairs along the wall and has not yet shown the decreasing trend of CVOCs at the downgradient monitoring location that has been observed in the other three well pairs. This well pair has consistently shown the presence of TCE degradation daughter products which are not very prevalent at any of the other well pairs. Furthermore, field parameters in this well pair are different from other locations along the wall. These differences in data could be due to MW-28/29 well pair being screened in the upper portion of the PRB which is in a different geologic layer of the aquifer that is more transmissive than the lower layer. Groundwater hydrology is also different in this area of the Site and the hydraulic gradient appears to be flat in this area, especially during the summer. AECOM and the USACE are considering how to better evaluate the remedy for the area around the MW-28/29 well pair, and will continue to closely review data to look for trends for this well pair during subsequent sampling events.

Current Site groundwater flow conditions indicate that on average the hydraulic gradient is consistent with the PRB design, with the December 2019 event showing slightly elevated gradients as compared with the other sampling events. The PRB was designed based on a hydraulic gradient of 0.004 ft/ft which is lower than the estimated hydraulic gradient of 0.0069 ft/ft measured in December 2019. Seasonal variability in groundwater elevations and overall hydraulic gradient has been observed throughout the past sampling events. During the winter months when the Mohawk River is lowered, there appears to be an effect on the groundwater elevation at the site, and groundwater elevations are lower than in the summer. In turn, this could contribute to the slightly higher hydraulic gradients observed during these times. The gradient at the Site is slight and at times there appears to be a reverse gradient in the MW-28/29 well pair at the northern edge of the wall. In actuality this is likely an area with a flat gradient and the minor variability in groundwater levels between the well pair is due to margin of error in the survey of the well casing or with the field measurments. Historic data indicates a range of gradients from 0.001 to 0.006 ft/ft measured at the Site (Stone 2013).

At this time monitoring results have not yet shown the expected decrease in COC concentrations; however, they have shown evidence of groundwater flow through the wall in that increased concentrations of methane have been observed at downgradient locations. As described in the PRB RAWP, expectations are that ZVI PRBs will function for at least 30 years with the possibility of a greater lifetime depending on site conditions. Approximately three years have elapsed since the completion of PRB construction, so the wall is well within the expected operational lifetime. Although concentrations of COCs at downgradient compliance wells are lower than their upgradient counterparts, the observed concentrations are not as low as they were expected to be at this point in the project. Preliminary modeling conducted during the project proposal using the existing conceptual site model data indicated that COC concentrations were originally estimated to be at or below MCL cleanup standards at 10 feet downgradient of the wall approximately 6 months after the PRB wall installation effort was completed. Subsequently, the slower than expected decline in COC concentrations have prompted discussions on possible investigative actions with the USACE in order to work on a path forward to get clarity on groundwater geochemistry and hydrogeology around the PRB wall in order to help evaluate remedy effectiveness.

The next groundwater sampling event is scheduled for June 2020 and will include sampling from 34 locations across the site.

In 2018 dissolved hydrogen, dissolved acetylene and total and dissolved iron were added to the sampling parameters in order to help gain an understanding of the PRB wall performance and groundwater geochemistry. At this time AECOM and the USACE no longer feel that the dissolved acetylene and dissolved hydrogen results are producing data that is helpful and therefore will be eliminating these parameters from future sampling events. The use of the down-well DO meter will also remain discontinued, and the DO will be measured using the YSI Pro DSS in the flow through cell. Iron sampling will be retained.

5 REFERENCES

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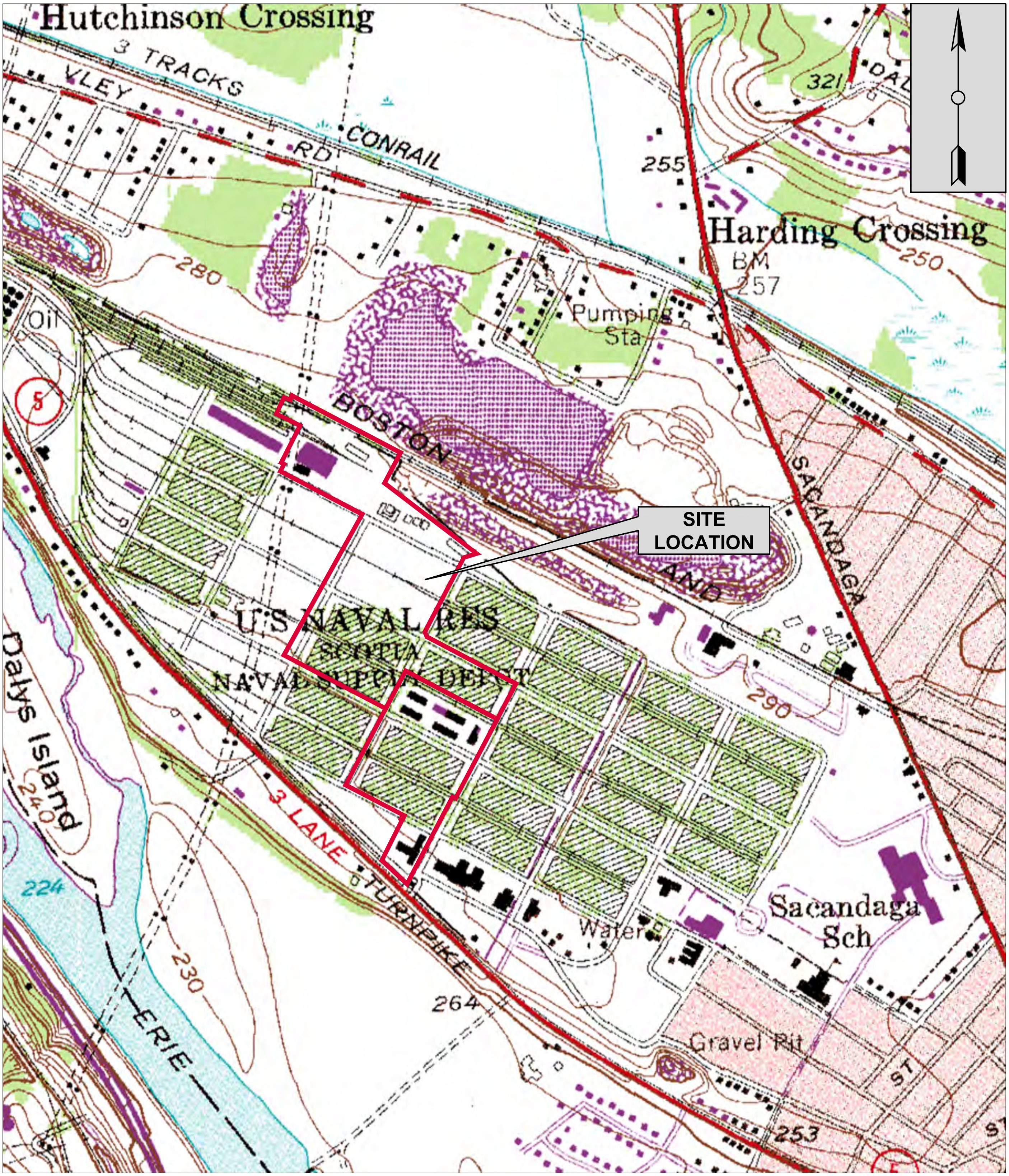
FIGURES



MAP REFERENCE:
IMAGE SHOWN FROM U.S.G.S.7.5 MINUTE
QUADRANGLE, SCHENECTADY SERIES

0 1000' 2000'

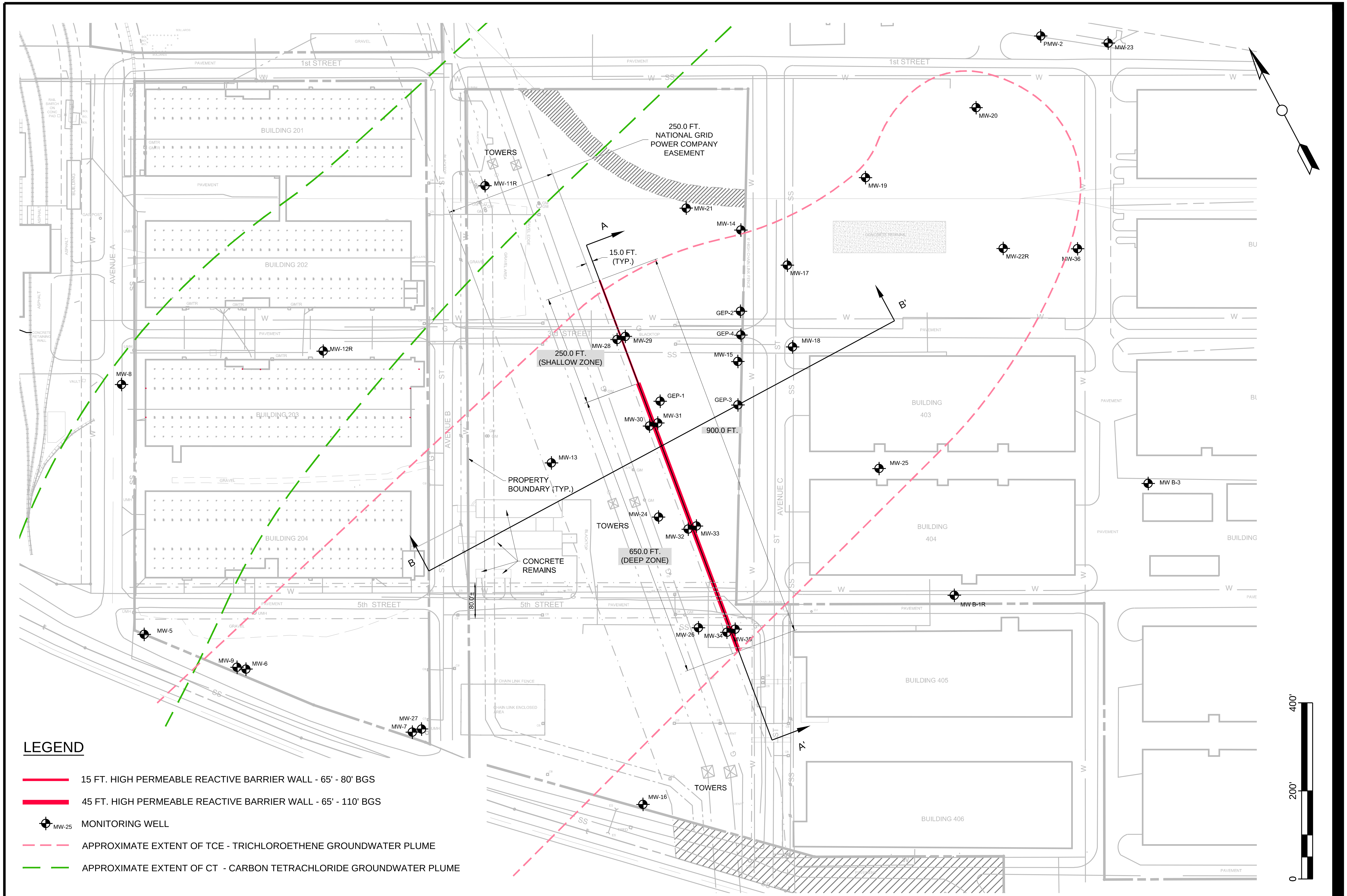
2019 4TH QUARTER GROUNDWATER REPORT
DEFENSE NATIONAL STOCKPILE
SCOTIA DEPOT SITE - SCOTIA, NY
Project No.: 60440641 Date: February 2020

US ARMY Corps
of Engineers

SITE LOCATION
MAP

AECOM

Figure: 1-1



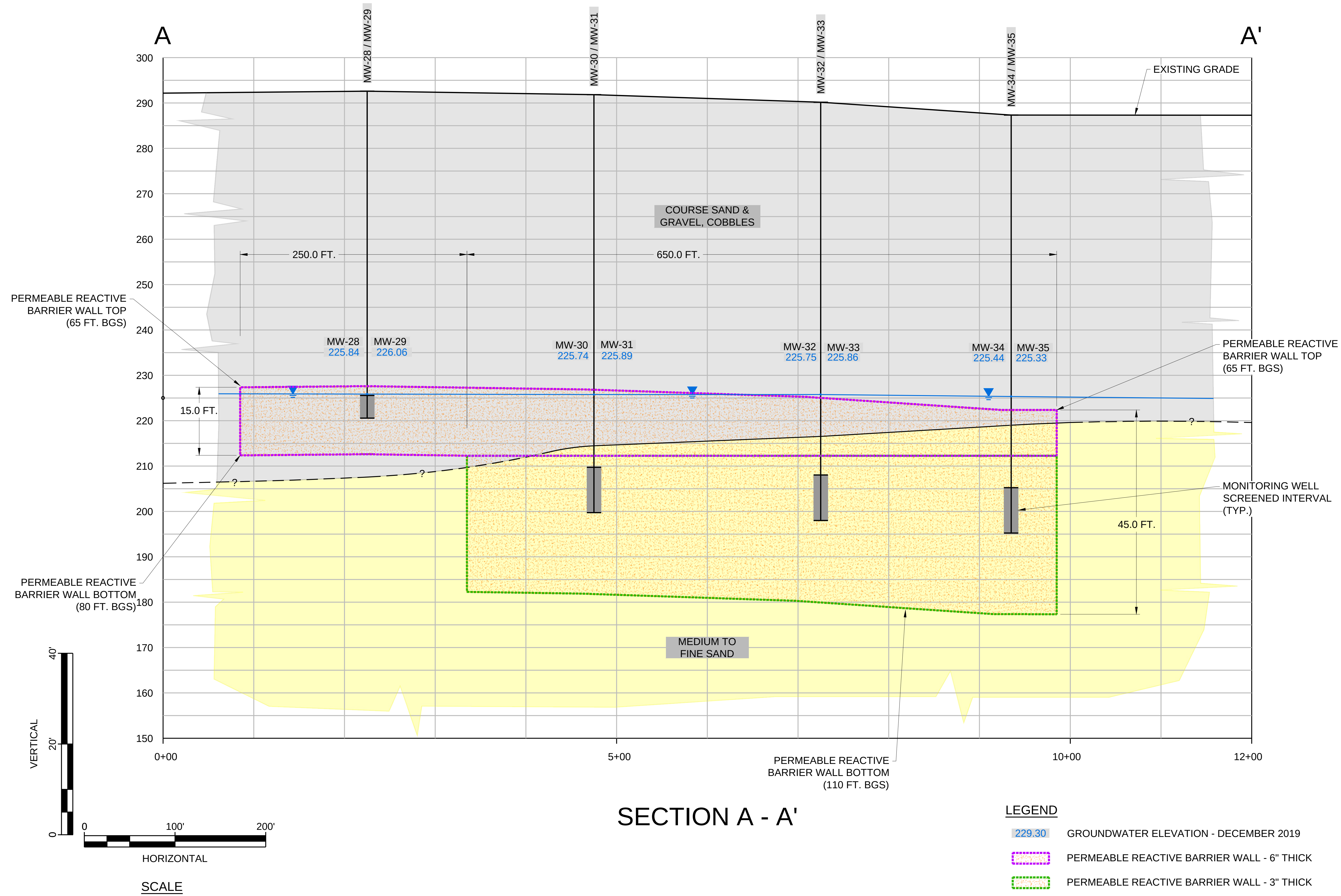
SITE LAYOUT MAP

Figure: 1-2

AECOM

US ARMY Corps of Engineers

2019 4TH QUARTER GROUNDWATER REPORT
DEFENSE NATIONAL STOCKPILE CENTER
SCOTIA DEPOT SITE - SCOTIA, NY
Project No.: 60440641 Date: February 2020



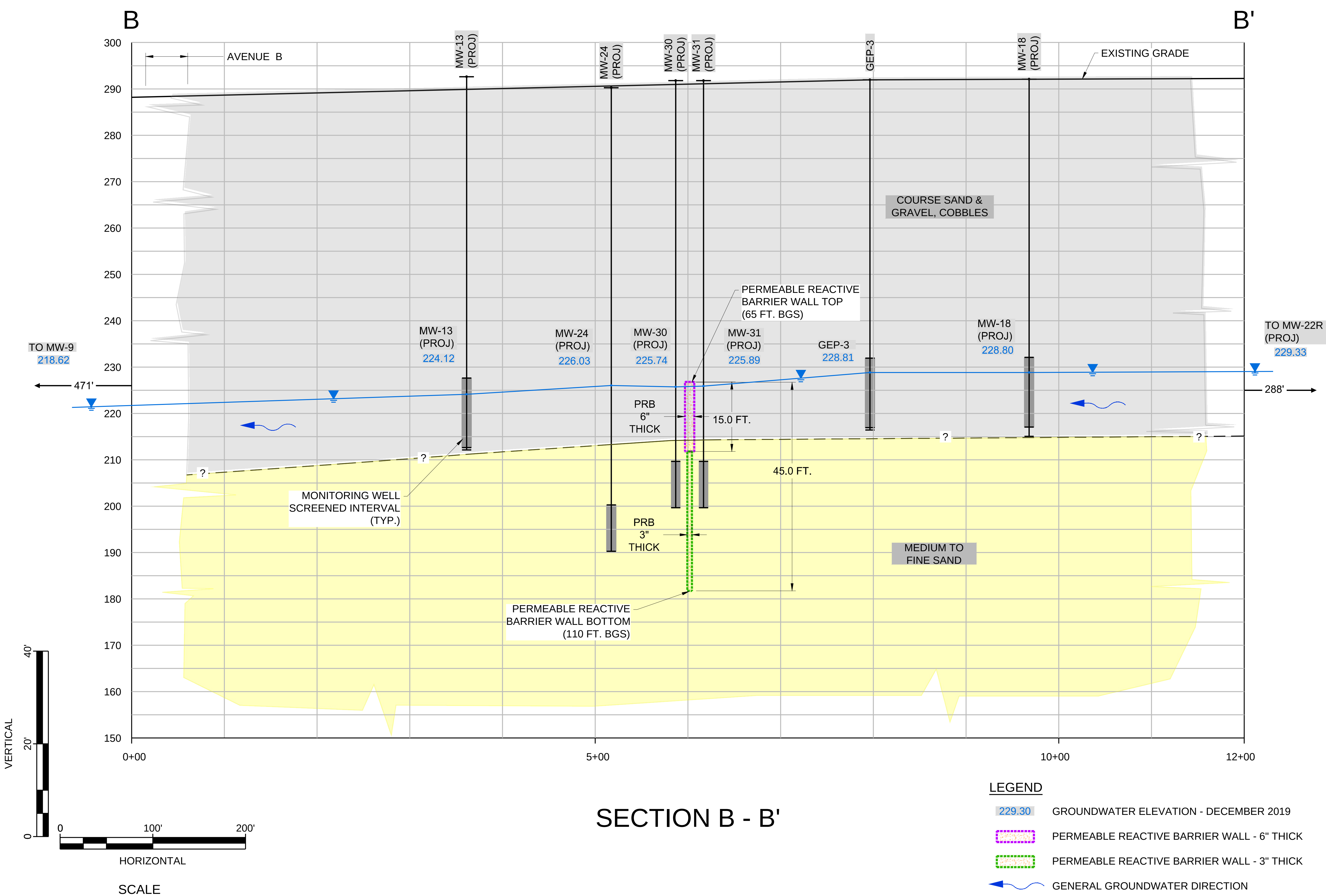
AECOM

Figure: 2-1A

COMPLIANCE MONITORING WELLS AND PRB WALL PROFILE GROUNDWATER SECTION A - A'
DECEMBER 2019

US ARMY Corps of Engineers

2019 4th QUARTER GROUNDWATER REPORT
DEFENSE NATIONAL STOCKPILE CENTER
SCOTIA DEPOT SITE - SCOTIA, NY
Project No.: 60440641 Date: February 2020



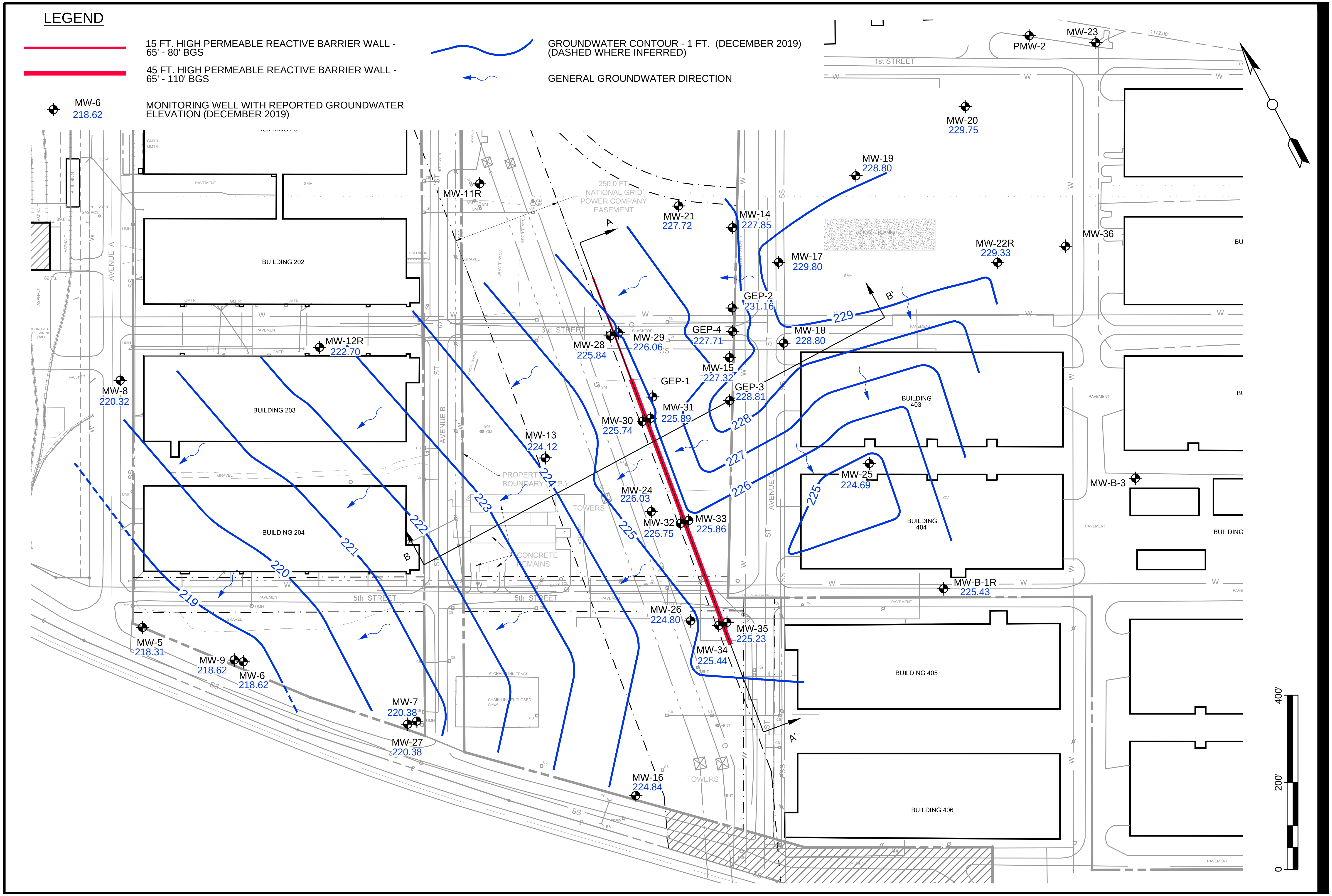
AECOM

Figure: 2-1B

GROUNDWATER SECTION B - B' DECEMBER 2019

US ARMY Corps of Engineers

2019 4th QUARTER GROUNDWATER REPORT
DEFENSE NATIONAL STOCKPILE CENTER
SCOTIA DEPOT SITE - SCOTIA, NY
Project No.: 60440641 Date: February 2020



AECOM

Figure: 3-1

POTENTIOMETRIC SITE MAP
DECEMBER 2019

US ARMY Corps of Engineers

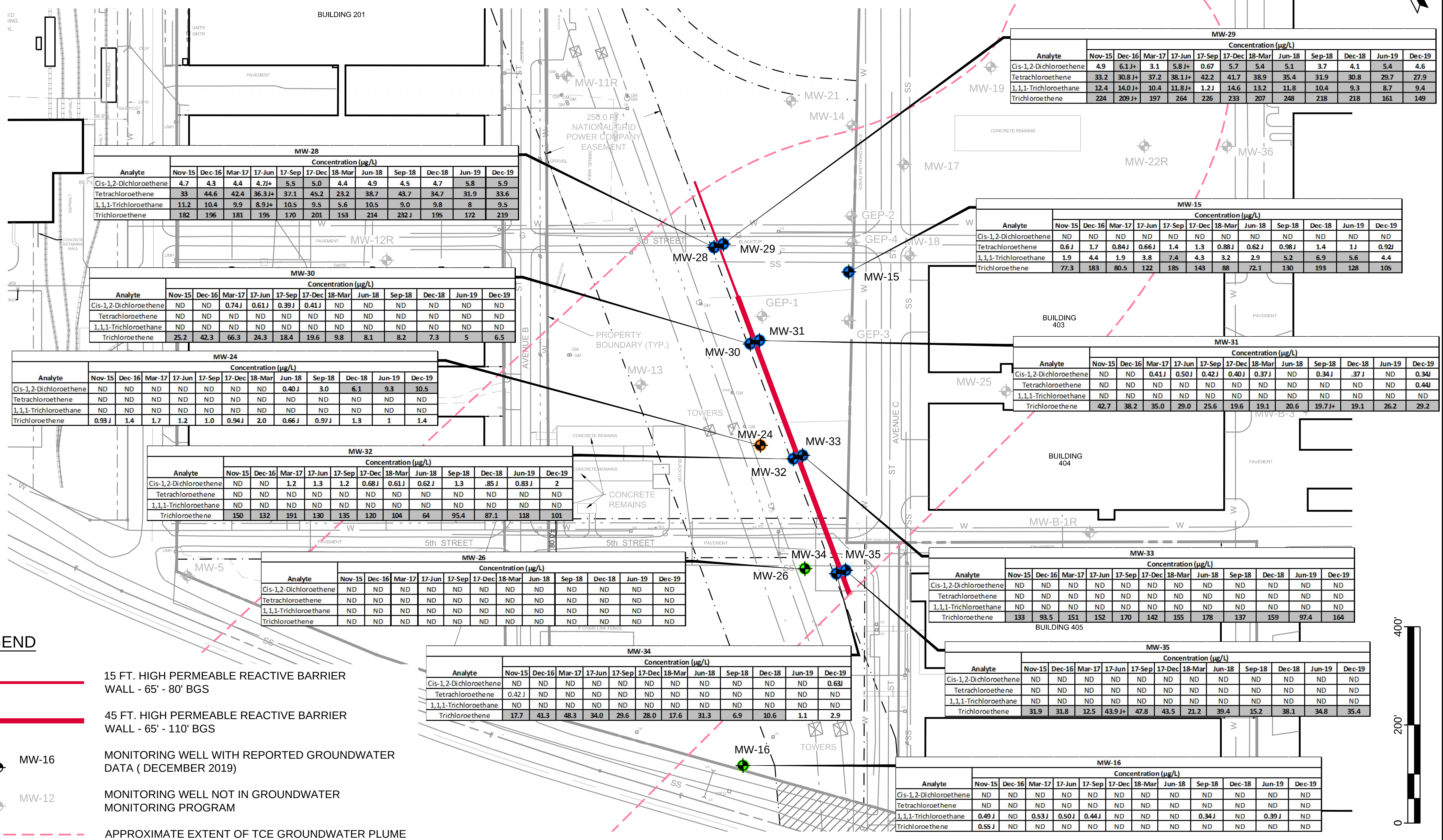
2019 4th QUARTER GROUNDWATER REPORT
DEFENSE NATIONAL STOCKPILE CENTER
SCOTIA DEPOT SITE - SCOTIA, NY
Project No.: 60440641 Date: February 2020

SAMPLE KEY

- VOC's NOT DETECTED
- VOC's DETECTED OF CONCENTRATIONS BELOW NYSDEC AWQSGV
- VOC's DETECTED OF CONCENTRATIONS AT OR ABOVE NYSDEC AWQSGV

SAMPLE NOTES

1. Detected concentrations are in bold font.
2. Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray. For listed compounds the NYSDEC AWQS is 5 mg/L.
3. J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
4. J+ - The result is an estimated quantity, likely to be biased high.
5. ND - Indicates that the analyte was not detected above the method detection limit



MW-28 — Concentration (µg/L)

Analyte	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18	Jun-19	Dec-19
Cis-1,2-Dichloroethene	4.7	4.3	4.4	4.7J+	5.5	5.0	4.4	4.9	4.5	4.7	5.8	5.9
Tetrachloroethene	33	44.6	42.4	36.3 J+	37.1	45.2	23.2	38.7	43.7	34.7	31.9	33.6
1,1,1-Trichloroethane	11.2	10.4	9.9	8.9 J+	10.5	9.5	5.6	10.5	9.0	9.8	8	9.5
Trichloroethene	182	196	181	195	170	201	153	214	232 J	195	172	219

MW-29 — Concentration (µg/L)

Analyte	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18	Jun-19	Dec-19
Cis-1,2-Dichloroethene	4.9	6.1 J+	3.1	5.8 J+	0.67	5.7	5.4	5.1	3.7	4.1	5.4	4.6
Tetrachloroethene	33.2	30.8 J+	37.2	38.1 J+	42.2	41.7	38.9	35.4	31.9	30.8	29.7	27.9
1,1,1-Trichloroethane	12.4	14.0 J+	10.4	11.8 J+	1.2 J	14.6	13.2	11.8	10.4	9.3	8.7	9.4
Trichloroethene	224	209 J+	197	264	226	233	207	248	218	218	161	149

MW-15 — Concentration (µg/L)

Analyte	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18	Jun-19	Dec-19
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	0.6 J	1.7	0.84 J	0.66 J	1.4	1.3	0.88 J	0.62 J	0.98 J	1.4	1 J	0.92J
1,1,1-Trichloroethane	1.9	4.4	1.9	3.8	7.4	4.3	3.2	2.9	5.2	6.9	5.6	4.4
Trichloroethene	77.3	183	80.5	122	185	143	88	72.1	130	193	128	105

MW-30 — Concentration (µg/L)

Analyte	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18	Jun-19	Dec-19
Cis-1,2-Dichloroethene	ND	ND	0.74 J	0.61 J	0.39 J	0.41 J	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	25.2	42.3	66.3	24.3	18.4	19.6	9.8	8.1	8.2	7.3	5	6.5

MW-31 — Concentration (µg/L)

Analyte	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18	Jun-19	Dec-19
Cis-1,2-Dichloroethene	ND	ND	0.41 J	0.50 J	0.42 J	0.40 J	0.37 J	ND	0.34 J	.37 J	ND	0.34J
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.44J
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	42.7	38.2	35.0	29.0	25.6	19.6	19.1	20.6	19.7 J+	19.1	26.2	29.2

MW-24 — Concentration (µg/L)

Analyte	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18	Jun-19	Dec-19
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	0.40 J	3.0	6.1	9.3	10.5
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	0.93 J	1.4	1.7	1.2	1.0	0.94 J	2.0	0.66 J	0.97 J	1.3	1	1.4

MW-32 — Concentration (µg/L)

Analyte	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18	Jun-19	Dec-19
Cis-1,2-Dichloroethene	ND	ND	1.2	1.3	1.2	0.68 J	0.61 J	0.62 J	1.3	.85 J	0.83 J	2
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	150	132	191	130	135	120	104	64	95.4	87.1	118	101

MW-33 — Concentration (µg/L)

Analyte	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18	Jun-19	Dec-19
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	133	93.5	151	152	170	142	155	178	137	159	97.4	164

MW-26 — Concentration (µg/L)

Analyte	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18	Jun-19	Dec-19
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

MW-34 — Concentration (µg/L)

Analyte	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18	Jun-19	Dec-19
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.63J
Tetrachloroethene	0.42 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	17.7	41.3	48.3	34.0	29.6	28.0	17.6	31.3	6.9	10.6	1.1	2.9

MW-35 — Concentration (µg/L)

Analyte	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18	Jun-19	Dec-19
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	31.9	31.8	12.5	43.9 J+	47.8	43.5	21.2	39.4	15.2	38.1	34.8	35.4

MW-16 — Concentration (µg/L)

Analyte	Nov-15	Dec-16	Mar-17	17-Jun	17-Sep	17-Dec	18-Mar	Jun-18	Sep-18	Dec-18	Jun-19	Dec-19
Cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	0.49 J	ND	0.53 J	0.50 J	0.44 J	ND	ND	ND	0.34 J	ND	0.39 J	ND
Trichloroethene	0.55 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

LEGEND

- 15 FT. HIGH PERMEABLE REACTIVE BARRIER WALL - 65' - 80' BGS
- 45 FT. HIGH PERMEABLE REACTIVE BARRIER WALL - 65' - 110' BGS
- MW-16 — MONITORING WELL WITH REPORTED GROUNDWATER DATA (DECEMBER 2019)
- MW-12 — MONITORING WELL NOT IN GROUNDWATER MONITORING PROGRAM
- APPROXIMATE EXTENT OF TCE GROUNDWATER PLUME

AECOM

Figure: 3-2

GROUNDWATER RESULTS
QUARTERLY MONITORING LOCATIONS
DECEMBER 2019

US ARMY Corps of Engineers

2019 4TH QUARTER GROUNDWATER REPORT
DEFENSE NATIONAL STOCKPILE CENTER
SCOTIA DEPOT SITE - SCOTIA, NY
Project No.: 60440641 Date: February 2020

TABLES

Table 2-1
Monitoring Well Sampling Schedule and Guidelines
The Defense National Stockpile Center Scotia Depot

Monitoring Well ID[1]	Rationale[2]	Sampling Frequency	Analytes[3]	Screen Interval (ft bgs)
MW-15	Upgradient	Quarterly for 2 years then semi-anually	VOCs/MNA	65-80
MW-16	Outside Plume	Quarterly for 2 years then semi-anually	VOCs/MNA	55-70
MW-24	Downgradient	Quarterly for 2 years then semi-anually	VOCs/MNA	100-110
MW-26	Downgradient	Quarterly for 2 years then semi-anually	VOCs/MNA	100-110
MW-28	Downgradient	Quarterly for 2 years then semi-anually	VOCs/MNA	67-72
MW-29	Upgradient	Quarterly for 2 years then semi-anually	VOCs/MNA	67-72
MW-30	Downgradient	Quarterly for 2 years then semi-anually	VOCs/MNA	82-92
MW-31	Upgradient	Quarterly for 2 years then semi-anually	VOCs/MNA	82-92
MW-32	Downgradient	Quarterly for 2 years then semi-anually	VOCs/MNA	82-92
MW-33	Upgradient	Quarterly for 2 years then semi-anually	VOCs/MNA	82-92
MW-34	Downgradient	Quarterly for 2 years then semi-anually	VOCs/MNA	82-92
MW-35	Upgradient	Quarterly for 2 years then semi-anually	VOCs/MNA	82-92
GEP-3	Upgradient	Annually	VOCs	59.6-74.6
MW-B-3	Outside Plume	Annually	VOCs	47.5-67.5
MW-5	Downgradient	Annually	VOCs	62.5-72.5
MW-6	Downgradient	Annually	VOCs	58.5-68.5
MW-7	Outside Plume	Annually	VOCs	61-71
MW-8	CT Plume	Annually	VOCs	66-76
MW-9	Downgradient	Annually	VOCs	110-120

Monitoring Well ID[1]	Rationale[2]	Sampling Frequency	Analytes[3]	Screen Interval (ft bgs)
MW-11	CT Plume	Annually	VOCs	65-80
MW-12	CT Plume	Annually	VOCs	65-80
MW-14	Upgradient	Annually	VOCs	65-80
MW-17	Upgradient	Annually	VOCs	60-75
MW-18	Upgradient	Annually	VOCs	60-75
MW-19	Upgradient	Annually	VOCs	62-77
MW-20	Upgradient	Annually	VOCs	63-78
MW-22	Upgradient	Annually	VOCs	63-78
MW-23	Outside Plume	Annually	VOCs	63-78
MW-25	Upgradient	Annually	VOCs	65-75
MW-27	Downgradient	Annually	VOCs	100-110
MW-36	Upgradient	Annually	VOCs	70-80
GEP-2	Upgradient	Annually	VOCs	60.6-75.6
GEP-1	Upgradient	Annually	VOCs	59.6-74.6
GEP-4	Upgradient	Annually	VOCs	60.15-75.15

Notes:
[1] *2015 Compliance monitoring well
[2] Rationale: Upgradient of PRB wall; Downgradient of PRB wall; Outside of any plume; Within Carbon Tetrachloride (CT) plume
[3] Monitored natural attenuation (MNA) parameters include TOC (EPA SM 5310B), alkalinity (EPA SM 2320B), Chloride, nitrate, sulfate (EPA Method 300.0), and Dissolved Gases (Methane, ethane, and ethene; Method RSK 175).

Table 3-1
Groundwater Elevations Data
The Defense National Stockpile Center Scotia Depot

Well IDs	Screened Interval (ft bgs)	Ground Surface Elevation (ft)	Reference Point Elevation (ft)	Adjusted Reference Point Elevation (ft)	Depth To Water (ft bgs) Q1 2017	Depth to Water (ft bgs) Q2 2017	Depth To Water (ft bgs) Q3 2017	Depth To Water (ft bgs) Q4 2017	Depth To Water (ft bgs) Q1 2018	Depth To Water (ft bgs) Q2 2018	Depth To Water (ft bgs) Q3 2018	Depth To Water (ft bgs) Q4 2018	Depth To Water (ft bgs) Q2 2019	Depth to Water (ft bags) Q4 2019	Groundwater Elevation 2015	Groundwater Elevation 2016	Groundwater Elevation Q1 2017	Groundwater Elevation Q2 2017	Groundwater Elevation Q3 2017	Groundwater Elevation Q4 2017	Groundwater Elevation Q1 2018	Groundwater Elevation Q2 2018	Groundwater Elevation Q3 2018	Groundwater Elevation Q4 2018	Groundwater Elevation Q2 2019	Groundwater Elevation Q4 2019
B-1	48-68	-	287.14	-	-	57.34	-	-	-	dry	dry	dry	-	-	227.74	-	-	229.80	-	-	-	-	-	-	-	-
B-1R	48-68	-	-	287.42	-	-	-	-	-	-	-	-	57.05	61.99	-	-	-	-	-	-	-	-	-	-	230.37	225.43
B-3	47.5-67.5	-	287.05	-	-	-	-	-	-	58.61	58.74	59.74	dry	-	227.95	-	-	-	-	-	-	228.44	228.31	dry	dry	-
MW-4	63.8-73.8	289.58	291.74	-	-	-	-	-	-	-	-	-	-	-	225.74	-	-	-	-	-	-	-	-	-	-	-
MW-5	62.5-72.5	287.95	290.11	-	70.50	63.82	64.00	72.12	71.83	64.30	63.72	71.27	64.02	71.80	225.75	219.29	219.61	226.29	226.11	217.99	218.28	225.81	226.39	218.84	226.09	218.31
MW-6	58.5-68.5	286.28	288.58	-	68.78	62.03	62.27	70.19	69.96	62.57	62.11	69.32	62.28	69.96	225.86	219.80	219.80	226.55	226.31	218.39	218.62	226.01	226.47	219.26	226.30	218.62
MW-7	61-71	286.8	289.26	-	68.47	61.96	61.95	67.84	68.22	62.80	62.32	66.72	62.31	67.82	226.28	223.16	220.79	227.30	227.31	221.42	221.04	226.46	226.94	222.54	226.95	221.44
MW-8		-	-	293.03	-								65.78	72.71	-	-	-	-	-	-	-	-	-	-	227.25	220.32
MW-9	110-120	285.98	288.33	-	68.55	61.85	62.04	69.70	69.74	62.40	61.89	69.06	62.07	69.71	225.83	219.75	219.78	226.48	226.29	218.63	218.59	225.93	226.44	219.27	226.26	218.62
MW-11	65-80	295.73	295.12	-	70.12	64.36	65.36	69.55	70.15	66.12	66.80	67.43	-	-	227.7	225.91	225.00	230.76	229.76	225.57	224.97	229.00	228.32	-	-	-
MW-11R	65-80	-	-	295.56	-	-	-	-	-	-	-	-	64.81	-	-	-	-	-	-	-	-	-	-	-	230.75	-
MW-12R	60-80	-	-	292.34	-	-	-	-	-	-	-	-	64.16	69.64	-	-	-	-	-	-	-	-	-	-	228.18	222.70
MW-13	65-80	292.62	293.85	-	69.90	64.25	64.40	68.86	69.72	65.75	65.99	67.51	64.20	69.73	227.32	225.43	223.95	229.60	229.45	224.99	224.13	228.10	227.86	226.34	229.65	224.12
MW-14	65-80	-	296.2	-	70.13	64.88	65.60	69.13	70.17	66.81	67.52	67.18	64.58	68.35	228.08	226.56	226.07	231.32	230.60	227.07	226.03	229.39	228.68	229.02	231.62	227.85
MW-15	65-80	-	293.67	-	68.35	63.07	63.49	67.00	68.20	64.88	65.32	65.42	62.76	66.35	227.8	226.27	225.32	230.60	230.18	226.67	225.47	228.79	228.35	228.25	230.91	227.32
MW-16	55-70	-	288.33	-	66.38	60.7	60.28	63.72	65.13	62.14	61.36	63.17	60.63	63.85	226.39	225.38	221.95	227.63	228.05	224.61	223.20	226.19	226.97	225.16	227.70	224.48
MW-17	60-75	-	295.24	292.05	69.25	64.09	64.66	67.99	69.20	65.98	66.60	66.26	60.49	62.25	228.08	226.55	225.99	231.15	230.58	227.25	226.04	229.26	228.64	228.98	231.56	229.80
MW-18	60-75	-	295.24	291.97	69.56	64.49	64.86	68.15	69.48	66.34	66.76	66.62	60.77	63.17	227.94	226.46	225.68	230.75	230.38	227.09	225.76	228.90	228.48	228.62	231.20	228.80
MW-19	62-77	-	297.67	295.33	70.54	65.74	66.42	69.63	70.80	67.80	68.66	67.50	62.86	63.36	228.43	226.85	227.13	231.93	231.25	228.04	226.87	229.87	229.01	230.17	232.47	231.97
MW-20	63-78	-	301.55	298.55	73.72	69.22	69.90	72.93	74.10	71.35	72.34	70.82	65.55	68.80	228.71	227.01	227.83	232.33	231.65	228.62	227.45	230.20	229.21	230.73	233.00	229.75
MW-21	57-72	-	296.52	-	70.55	65.19	65.40	69.70	-	-	67.85	67.61	64.93	68.80	-	-	-	-	-	-	-	-	228.67	228.91	231.59	227.72
MW-22	63-78	-	298.91	-	72.08	67.64	67.80	70.61	72.20	69.65	70.14	-	-	-	228.29	226.73	226.83	231.27	231.11	228.30	226.71	229.26	228.77	-	-	-
MW-22R	63-78		-	296.35	-	-	-	-	-	-	-	-	64.38	67.02	-	-	-	-	-	-	-	-	-	-	231.97	229.33
MW-23	63-78	-	300.54	-	72.14	67.98	68.55	-	-	70.70	71.23	70.76	67.34	-	228.9	227.06	228.40	232.56	231.99	-	-	229.84	229.31	229.78	233.20	-
MW-24	90-100	290.24	292.45	-	68.85	63.4	63.62	67.33	68.46	65.02	65.13	66.06	63.22	66.42	226.79	225.30	223.60	229.05	228.83	225.12	223.99	227.43	227.32	226.39	229.23	226.03
MW-25	65-75	288.16	290.26	288.11	65.44	60.61	60.57	63.56	65.13	62.48	62.59	62.42	57.28	63.42	227.16	225.82	224.82	229.65	229.69	226.70	225.13	227.78	227.67	227.84	230.83	224.69
MW-26	100-110	287.23	286.45	-	63.85	58.44	58.35	61.80	63.19	60.02	59.86	60.88	58.23	61.65	226.06	224.75	222.60	228.01	228.10	224.65	223.26	226.43	226.59	225.57	228.22	224.80
MW-27	100-110	286.08	288.32	-	68.67	61.89	62.00	67.35	67.93	63.11	62.52	67.11	63.71	69.00	225.5	223.44	219.65	226.43	226.32	220.97	220.39	225.21	225.80	221.21	224.61	219.32
MW-28	67-72	292.55	292.25	-	67.94	62.46	63.06	66.72	67.81	64.18	64.63	65.24	62.28	66.41	227.07	225.41	224.31	229.79	229.19	225.53	224.44	228.07	227.62	227.01	229.97	225.84
MW-29	67-72	292.50	292.13	-	67.80	62.31	62.94	66.90	67.70	64.04	64.49	65.06	62.13	66.07	227.05	225.38	224.33	229.82	229.19	225.23	224.43	228.09	227.64	227.07	230.00	226.06
MW-30	82-92	291.76	291.63	-	67.65	62.19	62.59	66.35	67.35	63.83	64.11	64.93	62.01	65.89	226.98	225.35	223.98	229.44	229.04	225.28	224.28	227.80	227.52	226.70	229.62	225.74
MW-31	82-92	291.80	291.54	-	67.42	62.02	62.43	66.14	67.20	63.70	63.99	64.69	61.84	65.65	226.95	225.40	224.12	229.52	229.11	225.40	224.34	227.84	227.55	226.85	229.70	225.89
MW-32	82-92	290.12	289.75	-	66.05	60.7	60.82	64.33	65.57	62.30	62.36	63.15	60.45	64.00	226.86	225.45	223.70	229.05	228.93	225.42	224.18	227.45	227.39	226.60	229.30	225.75
MW-33	82-92	290.27	289.91	-	66.11	60.8	60.86	64.37	65.65	62.40	62.49	63.23	60.54	64.05	226.89	225.51	223.80	229.11	229.05	225.54	224.26	227.51	227.42	226.68	229.37	225.86
MW-34	82-92	287.30	287.05	-	63.70	58.39	58.28	61.54	63.16	60.02	59.84	60.68	58.44	61.61	226.73	225.48	223.35	228.66	228.77	225.51	223.89	227.03	227.21	226.37	228.61	225.44
MW-35	82-92	287.25	286.96	-	63.56	58.28	58.15	61.40	62.88	59.92	59.70	60.49	58.01	61.73	226.69	225.46	223.40	228.68	228.81	225.56	224.08	227.04	227.26	226.47	228.95	225.23
MW-36	70-80	292.61	292.36	-	66.10	61.87	60.98	64.42	66.40	63.23	64.27	63.36	61.21	-	227.8	226.12	226.26	230.49	231.38	227.94	225.96	229.13	228.09	229.00	231.15	-
GEP-1	59.6-74.6	-	294.98	295.2	70.55	65.06	-	69.30	70.33	-	-	67.72	65.07	66.30	227.36	-	224.43	229.92	-	225.68	224.65	-	-	227.26	230.13	228.90
GEP-2	60.6-75.6	-	296.02	-	70.43	65.18	65.69	69.19	70.35	67.00	67.52	67.51	64.86	68.50	227.9	226.38	225.59	230.84	230.33	226.83	225.67	229.02	228.50	228.51	231.16	227.52
GEP-3	59.6-74.6	-	292.97	-	67.71	62.47	62.85	66.30	67.54	64.25	64.62	64.86	62.21	64.16	227.81	226.31	225.26	230.50	230.12	226.67	225.43	228.72	228.35	228.11	230.76	228.81
GEP-4	60.15-75.15	-	295.62	292.88	70.23	65.01	65.50	68.98	-	-	-	-	61.94	65.17	227.73	226.22	225.39	230.61	230.12	226.64	-	-	-	-	230.94	227.71

Notes:
"-" data is not available due to inaccessibility or damage to monitoring well location, or well was replaced.

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	MW-15											
		11/9/2015	12/14/2016	3/22/2017	6/21/2017	9/28/2017	12/14/2017	3/14/2018	6/20/2018	9/18/2018	12/20/2018	6/20/2019	12/9/2019
		Upgradient											
VOCs (µg/L)													
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	**1.9**	**4.4**	**1.9**	**3.8**	**7.4**	**4.3**	**3.2**	**2.9**	**5.2**	**6.9**	**5.6**	**4.4**
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	**0.44 J**	0.75 U	0.75 U	**0.69 J**	0.75 U	0.75 U	0.75 U	**0.35 J**	**0.51 J**	0.75 U	0.75 U
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	**0.45 J**	0.75 U	0.75 U	0.75 U	0.75 U	**0.48 J**	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Tetrachloroethene (PCE; PERC)	5	**0.6 J**	**1.7**	**0.84 J**	**0.66 J**	**1.4**	**1.3**	**0.88 J**	**0.62 J**	**0.98 J**	**1.4**	**1.0 J**	**0.92 J**
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	**77.3**	**183**	**80.5**	**122**	**185**	**143**	**87.8**	**72.1**	**130**	**193**	**128**	**105**
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters													
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	**2.4**	**1.5**	NA
Acetylene (ug/L)	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA	**<0.50**	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**0.10**	**0.26**	**0.06 J**	NA
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.044 U	0.04 U	0.04 U	NA
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**182**	**212**	**201**	**217**	**229**	**216**	**223**	**209**	**236**	**224**	**169**	**200**
Chloride (mg/L)	NS	**28.9**	**14.3**	**28.3**	**40.1**	**30.6**	**39.7**	**24.0**	**46.4**	**42.5**	**37.1**	**43.4**	**34.4**
Nitrate (mg/L)	NS	**0.58**	**0.56**	**0.90**	**0.52**	**0.58**	**0.60**	**0.70**	**0.48**	**0.54**	**0.70**	**0.56**	**0.50**
Sulfate (mg/L)	NS	**12.3**	**12.4**	**21.3**	**20.5**	**14.3**	**20.5**	**12.4**	**15.2**	**13.2**	**11.3**	**12.0**	**12.1**
Methane (µg/L)	NS	**0.19 J**	**0.21 J**	**0.21 J**	**0.25 J**	**0.21 J**	0.50 U	**0.18 J**	**1.3 J+**	1.5 U	1.5 U	1.5 U	1.5 U
Ethane (µg/L)	NS	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	3.3 U	3.3 U	3.3 U	3.3 U
Ethene (µg/L)	NS	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	2.4 U	2.4 U	2.4 U	2.4 U
Total Organic Carbon (mg/L)	NS	**0.55 J**	**0.57 J**	**0.47 J**	**0.21 J**	**0.59 J**	**0.33 J**	**0.26 J**	**0.41 J**	**0.46 J**	**1.0 J+**	1.0 U	**0.83 J**
Field Parameters													
pH (pH Unit)	NS	7.73	7.31	7.53	7.42	7.16	7.38	7.94	7.62	7.49	7.43	7.48	7.46
Turbidity (NTU)	NS	11.1	7.00	15.7	2.10	52.1	6.30	9.22	153.0	8.7	17.9	4.49	2.71
ORP (MeV)	NS	91.4	54.6	-0.6	114.6	92.8	16.6	-1.1	67.2	135.2	320.4	102.0	133.7
Conductivity (mS/cm)	NS	0.358	0.250	0.387	0.487	0.709	0.416	0.295	0.369	0.458	0.585	0.445	0.399
Dissolved Oxygen YSI (mg/L)	NS	31.45	8.04	6.37	4.90	9.22	8.38	7.64	6.72	9.44	9.4	7.98	9.75
Dissolved Oxygen- Downhole (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	7.9	10.4	NA
Groundwater Elevation (ft)	NS	227.80	226.27	225.32	230.60	230.18	226.67	225.47	228.79	228.35	228.25	230.91	227.32

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg $CaCO_3$/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	MW-16											
		11/11/2015	12/12/2016	3/20/2017	6/20/2017	9/25/2017	12/11/2017	3/13/2018	6/19/2018	9/18/2018	12/18/2018	6/24/2019	12/12/2019
		Outside Plume											
VOCs (µg/L)													
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	**0.49 J**	0.75 U	**0.53 J**	**0.50 J**	**0.44 J**	0.75 U	0.75 U	0.75 U	**0.34 J**	0.75 U	**0.39 J**	0.75 U
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 UJ	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Tetrachloroethene (PCE; PERC)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	**0.55 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters													
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetylene (ug/L)	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA	NA	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**0.15**	NA	**0.07**	NA
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.044 U	NA	0.04 U	NA
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**248**	**312**	**317**	**322**	**480**	**322**	**295**	**317**	**339**	**321**	**303**	**296**
Chloride (mg/L)	NS	**13.6**	**9.0**	**5.6**	**20.2**	**4.3**	**4.0**	**2.9**	**3.9**	**2.3**	**2.8**	**5.5**	**1.7 J**
Nitrate (mg/L)	NS	**1.6**	**1.6**	**2.1**	**3.7**	**1.4**	**1.1**	**1.6**	**2.0**	**1.9**	**0.88 J**	**1.3**	**0.84**
Sulfate (mg/L)	NS	**35.2**	**44.8**	**65.3**	**75.5**	**64.8**	**119**	**123**	**27.3**	**28.7**	**46.0**	**41.9**	**71.1**
Methane (µg/L)	NS	0.25 U	**0.14 J**	0.50 U	**0.19 J**	**0.23 J**	0.50 U	0.25 U	1.1 U	1.2 U	1.5 U	1.5 U	1.5 U
Ethane (µg/L)	NS	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	3.3 U	3.3 U	3.3 U	3.3 U
Ethene (µg/L)	NS	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	2.4 U	2.4 U	2.4 U	2.4 U
Total Organic Carbon (mg/L)	NS	**3.6**	**1.0 J**	**1.1**	**0.67 J**	**0.64 J**	**0.9 J**	**0.86 J**	**1.2**	**0.62 J**	**1.5 J+**	**1.6 J+**	**0.88 J**
Field Parameters													
pH (pH Unit)	NS	7.64	7.27	10.8	6.57	7.12	7.1	6.76	7.89	7.08	7.25	7.19	7.27
Turbidity (NTU)	NS	8.01	14.8	7.71	4.40	199	30.9	8.14	10.77	20.50	1.53	7.58	3.07
ORP (MeV)	NS	137.6	139.9	115.9	298.7	82.2	94.5	118.7	16.2	215.7	138.2	299.9	64.3
Conductivity (mS/cm)	NS	0.361	0.388	0.436	0.486	0.928	0.596	0.462	0.441	0.511	0.874	0.218	0.310
Dissolved Oxygen YSI (mg/L)	NS	22.27	9.50	10.40	10.82	9.81	10.30	10.09	11.71	10.04	10.93	9.28	10.98
Dissolved Oxygen- Downhole (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	9.2	10.17	NA
Groundwater Elevation (ft)	NS	226.39	225.38	221.95	227.63	228.05	224.61	223.20	226.19	226.97	225.16	227.70	224.48

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg $CaCO_3$/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	MW-24											
		11/10/2015	12/13/2016	3/21/2017	6/26/2017	9/26/2017	12/12/2017	3/14/2018	6/21/2018	9/18/2018	12/20/2018	6/20/2019	12/12/2019
		Downgradient											
VOCs (µg/L)													
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	**0.37 J**	0.75 U	0.75 U	**0.55 J**	**26.5**	**37.2 J**
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 UJ	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	**0.40 J**	**3.0**	**6.1**	**9.3**	**10.5**
Tetrachloroethene (PCE; PERC)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	**0.93 J**	**1.4**	**1.7**	**1.2**	**1.0**	**0.94 J**	**2.0**	**0.66 J**	**0.97 J**	**1.3**	**1.0**	**1.4**
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters													
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	**3.4**	**1.9**	NA
Acetylene (ug/L)	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA	**<0.50**	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**1.4**	**1.4**	**1.1**	NA
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.044 U	0.04 U	0.04 U	NA
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**168**	**198**	**205**	**195**	**282**	**352**	**313**	**159**	**200**	**185**	**134**	**146**
Chloride (mg/L)	NS	**36.3**	**38.5**	**59.0**	**41.0**	**110**	**155**	**60.8**	**37.1**	**36.7**	**32.6**	**29.1 J-**	**29.2**
Nitrate (mg/L)	NS	**0.9**	0.06 U	0.06 U	**0.04 J**	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
Sulfate (mg/L)	NS	**15.5**	**21.4**	**24.1**	**22.1**	0.5 U	**0.48 J**	**0.22 J**	**21.5**	**14.2**	**2.7**	**3.0**	**2.3**
Methane (µg/L)	NS	**0.82**	**1.6**	**1.7**	**2.2**	**7.8**	**431**	**927**	**1.3 J+**	**13.9**	**102**	**179**	**103**
Ethane (µg/L)	NS	**0.34 J**	0.50 U	0.50 U	0.50 U	**0.29 J**	0.50 U	0.50 U	0.50 U	**1.5 J**	**11.2**	**14.7**	**5.2**
Ethene (µg/L)	NS	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	**1.0 J**	**0.20 J**	**9.5**	**9.7**	**1.7 J**	**2.9**
Total Organic Carbon (mg/L)	NS	**3.5**	**1.9**	**1.0 J**	**0.79 J**	**94.6**	**96.2**	**44.1**	**4.5**	**3.1**	**4.0**	**2.0 J+**	**1.4**
Field Parameters													
pH (pH Unit)	NS	7.75	7.22	7.83	7.78	7.40	7.29	7.97	7.95	7.70	7.92	7.53	7.64
Turbidity (NTU)	NS	9.33	13.9	16.3	35.2	88.37	2.8	16.0	19.5	7.94	2.77	1.74	0.0
ORP (MeV)	NS	-80.2	-93.2	-111.3	-108.6	-169.9	-83.1	-127.6	-147.3	-162.2	-185.0	-149	-189.1
Conductivity (mS/cm)	NS	0.327	0.570	0.438	0.365	1.396	8.411	0.409	0.204	0.403	0.436	0.333	0.161
Dissolved Oxygen YSI (mg/L)	NS	0.94	0.44	0.55	1.20	0.30	0.15	0.55	11.71	7.23	0.5	0.29	0.18
Dissolved Oxygen- Downhole (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.1	-0.25	NA
Groundwater Elevation (ft)	NS	226.79	225.30	223.60	229.05	228.83	225.12	223.99	227.43	227.32	226.39	229.23	226.03

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg $CaCO_3$/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	MW-26											
		11/17/2015	12/13/2016	3/21/2017	6/26/2017	9/25/2017	12/12/2017	3/14/2018	6/20/2018	9/18/2018	12/18/2018	6/20/2019	12/12/2019
		Downgradient											
VOCs (µg/L)													
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 UJ	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Tetrachloroethene (PCE; PERC)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Toluene	5	**0.57 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters													
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acetylene (ug/L)	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA	NA	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**0.61**	**0.23**	**1.1**	NA
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**0.43**	**0.029 J**	**0.15**	NA
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**204**	**197**	**196**	**223**	**317**	**204**	**196**	**225**	**178**	**179**	**174**	**171**
Chloride (mg/L)	NS	**45.2**	**44.9**	**53.4**	**133**	**86.2**	**56.7**	**32.3**	**49.1**	**21**	**48.3**	**32.2**	**22.8**
Nitrate (mg/L)	NS	0.06 U	**0.04 J**	0.06 U	**0.02 J**	0.06 U	0.06 U	0.06 U	0.06 U	**0.04 J**	**0.06 J**	0.06 U	**0.06 J**
Sulfate (mg/L)	NS	**25.1**	**24.6**	**29.4**	**20.9**	**5.9**	**25.7**	**10.6**	**16.3**	**4.8**	**22.4**	**9.5**	**9.6**
Methane (µg/L)	NS	**34.8**	**2.7**	**1.4 J**	**2.1**	**444**	**20.7**	**26.6**	**80**	**12.9**	**19.7 J+**	**112**	**8.1**
Ethane (µg/L)	NS	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	3.3 U	3.3 U	3.3 U	3.3 U
Ethene (µg/L)	NS	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	2.4 U	2.4 U	2.4 U	2.4 U
Total Organic Carbon (mg/L)	NS	**9.3**	**2.6**	**1.3 J**	**30.7**	**52.1**	**1.1**	**5.8 J**	**0.50 J**	**12.9**	**2.2**	**6.4**	**5.4**
Field Parameters													
pH (pH Unit)	NS	7.52	7.22	7.80	7.23	7.39	7.65	7.56	7.57	7.29	7.43	7.6	7.37
Turbidity (NTU)	NS	68.3	21.8	31.9	0.4	60.96	57.38	18.6	36.2	9.12	7.65	9.3	1.79
ORP (MeV)	NS	-103.6	-28.9	-46.4	-26.9	-138.7	-173.0	-89.4	-75.3	82.0	-44.9	-108.6	-119.0
Conductivity (mS/cm)	NS	0.324	0.590	0.469	0.630	1.347	0.426	0.260	0.415	0.270	0.715	0.423	0.161
Dissolved Oxygen YSI (mg/L)	NS	0.00	0.33	0.27	0.62	0.33	0.66	0.27	1.38	8.9	0.55	0.3	0.36
Dissolved Oxygen- Downhole (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.3	-0.19	NA
Groundwater Elevation (ft)	NS	226.06	224.75	222.60	228.01	228.10	224.65	223.26	226.43	226.59	225.57	228.22	224.80

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg $CaCO_3$/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well											
		MW-28											
		12/1/2015	12/14/2016	3/22/2017	6/27/2017	9/27/2017	12/14/2017	3/15/2018	6/22/2018	9/21/2018	12/20/2018	6/19/2019	12/10/2019
		Downgradient											
VOCs (µg/L)													
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	**11.2**	**10.4**	**9.9**	**8.9 J**	**10.5**	**9.5**	**5.6**	**10.5**	**9.0**	**9.8**	**8.0**	**9.5**
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	**0.46 J**	0.75 U	0.75 U	0.75 U	0.75 U	**0.33 J**	0.75 U	**0.44 J**	**0.42 J**	**0.34 J**	0.75 U	**0.38 J**
1,1-Dichloroethane (1,1-DCA)	5	**1.0**	**0.77 J**	**0.88 J**	**1.0 J**	**1.3**	**0.84 J**	**0.69 J**	**0.86 J**	**1.2**	**1.2**	**1.2**	**0.98 J**
1,1-Dichloroethene (1,1-DCE)	5	**0.53 J**	**0.43 J**	**0.53 J**	**0.38 J**	**0.76 J**	**0.45 J**	0.75 U	**0.39 J**	**0.34 J**	**0.42 J**	0.75 U	**0.45 J**
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	**0.61 J**	0.75 U	**0.62 J**	0.75 U	**0.53 J**	**0.57 J**	0.75 U	0.75 U	0.75 U	**0.42 J**	**0.36 J**	**0.51 J**
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	**4.7**	**4.3**	**4.4**	**4.7 J**	**5.5**	**5.0**	**4.4**	**4.9**	**4.5**	**4.7**	**5.8**	**5.9**
Tetrachloroethene (PCE; PERC)	5	**33**	**44.6**	**42.4**	**36.3 J**	**37.1**	**45.2**	**23.2**	**38.7**	**43.7**	**34.7**	**31.9**	**33.6**
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	**0.47 J**	**0.42 J**	**0.37 J**	**0.35 J**	**0.49 J**	0.75 U	**0.36 J**	**0.33 J**	0.75 U	0.75 U	**0.37 J**
Trichloroethene (TCE)	5	**182**	**196**	**181**	**195**	**170**	**201**	**153**	**214**	**232 J**	**195**	**172**	**219**
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters													
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**3.9**	**3.7**	**2.7**	**1.8**
Acetylene (ug/L)	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA	**<0.50**	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.045 U	**0.024 J**	0.045 U	0.045 U
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.044 U	0.04 U	0.04 U	0.04 U
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**352**	**316**	**295**	**352**	**380**	**383**	**360**	**422**	**345**	**342**	**325**	**307**
Chloride (mg/L)	NS	**22.1**	**32.4**	**25.7**	**29.0**	**25.7**	**20.4**	**20.9**	**33.1**	**42.7**	**25.4**	**41.6**	**38.0**
Nitrate (mg/L)	NS	0.06 U	**0.06 J**	**0.44**	**1.5**	**0.18 J**	**1.2**	**1.5**	**0.58**	**0.58**	**0.16 J**	0.20 U	**0.74**
Sulfate (mg/L)	NS	**22.4**	**20.9**	**21.6**	**13.0**	**10.3**	**22.4**	**20.2**	**23.1**	**13.2**	**13.1**	**13.6**	**22.0**
Methane (µg/L)	NS	**3.4**	**3.0**	**0.94**	**1.0**	**0.37 J**	0.50 U	0.25 U	**1800**	**60.8**	1.5 U	1.5 U	1.5 U
Ethane (µg/L)	NS	0.50 U	**3.6**	**1.0**	0.50 U	**0.45 J**	0.50 U	0.50 U	0.50 U	**1.3 J**	3.3 U	3.3 U	3.3 U
Ethene (µg/L)	NS	0.75 U	**1.3 J**	**1.9**	0.75 U	**0.72 J**	0.75 U	0.75 U	0.75 U	**1.4 J**	2.4 U	2.4 U	2.4 U
Total Organic Carbon (mg/L)	NS	**1.9**	**2.3**	**0.81 J**	**0.76 J**	**1.9**	**0.94 J**	**0.36 J**	**4.1**	**0.85 J**	**2.1 J+**	**1.6 J+**	**1.0**
Field Parameters													
pH (pH Unit)	NS	6.83	7.03	7.12	7.05	6.87	7.15	8.17	7.33	7.08	7.21	6.84	7.08
Turbidity (NTU)	NS	209	1.5	2.07	-3	61.1	229.80	8.52	1.32	0.02	0.59	0.02	0.78
ORP (MeV)	NS	273	71.2	77.1	97.4	32.1	19.0	-16.3	11.1	120.9	81.7	176.4	190.5
Conductivity (mS/cm)	NS	0.324	0.366	0.520	0.554	1.045	0.564	0.406	0.733	0.797	0.759	0.613	0.510
Dissolved Oxygen YSI (mg/L)	NS	6.75	3.94	5.2	7.59	4.3	8.45	11.96	0.63	8.83	4.13	0.89	5.79
Dissolved Oxygen- Downhole (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.7	10.41	NA
Groundwater Elevation (ft)	NS	227.07	225.41	224.31	229.79	229.19	225.53	224.44	228.07	227.62	227.01	229.97	225.84

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg $CaCO_3$/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

AECOM

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well											
		MW-29											
		12/1/2015	12/14/2016	3/22/2017	6/27/2017	9/27/2017	12/14/2017	3/15/2018	6/22/2018	9/20/2018	12/20/2018	6/19/2019	12/9/2019
		Upgradient											
VOCs (µg/L)													
1,1,1,2-Tetrachloroethane	5	0.75 U	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	**12.4**	**14.0 J**	**10.4**	**11.8 J**	**13.6**	**14.6**	**13.2**	**11.8**	**10.4**	**9.3**	**8.7**	**9.4**
1,1,2,2-Tetrachloroethane	5	0.75 U	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	**0.45 J**	**0.34 J**	**0.36 J**	0.75 U	**0.42 J**
1,1-Dichloroethane (1,1-DCA)	5	**0.97 J**	3.8 U	**0.45 J**	**1.0 J**	**1.2**	**0.88 J**	**0.91 J**	**0.84 J**	**0.87 J**	**1.0 J**	**1.1**	**0.93 J**
1,1-Dichloroethene (1,1-DCE)	5	**0.68 J**	3.8 U	**0.55 J**	**0.63 J**	**0.99 J**	**0.96 J**	**0.77 J**	**0.48 J**	**0.41 J**	**0.46 J**	**0.35 J**	0.43 J
1,2-Dichloroethane (EDC)	0.6	0.75 U	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	3.8 U	**0.63 J**	0.75 U	**0.85 J**	**0.71 J**	**0.72 J**	**0.82 J**	0.75 U	**0.67 J**	**0.49 J**	**0.60 J**
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	**4.9**	**6.1 J**	**3.1**	**5.8 J**	**5.6**	**5.7**	**5.4**	**5.1**	**3.7**	**4.1**	**5.4**	**4.6**
Tetrachloroethene (PCE; PERC)	5	**33.2**	**30.8 J**	**37.2**	**38.1 J**	**42.2**	**41.7**	**38.9**	**35.4**	**31.9**	**30.8**	**29.7**	**27.9**
Toluene	5	0.75 U	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	3.8 U	**0.61 J**	**0.70 J**	**0.67 J**	**0.62 J**	**0.44 J**	**0.59 J**	**0.35 J**	**0.40 J**	0.75 U	0.75 U
Trichloroethene (TCE)	5	**224**	**209 J**	**197**	**264**	**226**	**233**	**207**	**248**	**218**	**218**	**161**	**149**
Vinyl Chloride (VC)	2	0.75 U	3.8 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters													
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**2.8**	**2**	**1.5**	NA
Acetylene (ug/L)	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA	**<0.50**	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**0.062 J**	**0.14**	**0.13**	**0.23**
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.044 U	0.040 U	0.04 U	0.04 U
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**327**	**301**	**258**	**361**	**374**	**348**	**360**	**370**	**374**	**380**	**342**	**303**
Chloride (mg/L)	NS	**28.2**	**28.4**	**21.3**	**49.4**	**24.2**	**21.3**	**23.4**	**28**	**29.9**	**28.8**	**38.9**	**33.8**
Nitrate (mg/L)	NS	**0.1 J**	**0.26**	**0.52**	**1.3**	**0.12 J**	**0.86**	**1.3**	**0.38**	**0.48 J**	**0.50**	**0.26**	**0.90**
Sulfate (mg/L)	NS	**29.2**	**24.9**	**20.1**	**13.8**	**16.1**	**22.7**	**15**	**21**	**11.8**	**21.0**	**12.9**	**22.7**
Methane (µg/L)	NS	**13.9**	**0.62**	**1.1**	**0.20 J**	**0.21 J**	0.50 U	0.25 U	**210**	1.5 U	1.5 U	1.5 U	1.5 U
Ethane (µg/L)	NS	**0.81 J**	0.50 U	0.5 U	0.50	0.50 U	0.50 U	0.50 U	0.50 U	3.3 U	3.3 U	3.3 U	3.3 U
Ethene (µg/L)	NS	**0.59 J**	0.75 U	0.75 U	0.75	0.75 U	0.75 U	0.75 U	0.75 U	2.4 U	2.4 U	2.4 U	2.4 U
Total Organic Carbon (mg/L)	NS	**2.3**	**1.4**	**0.91 J**	**0.92 J**	**2.1**	**1.2**	**0.38 J**	**3.2**	**1.3**	**1.7 J+**	**5.3**	**1.4**
Field Parameters													
pH (pH Unit)	NS	7.06	7.02	7.43	7.02	6.91	7.01	7.79	7.33	7.14	7.2	6.96	6.88
Turbidity (NTU)	NS	82.4	0.62	2.73	2.80	65.1	1.50	8.11	15.2	0.02	4.55	3.43	11.9
ORP (MeV)	NS	-25.1	60.9	46.1	120	41.7	33.7	2.8	52.3	90.9	98.6	169.6	251.2
Conductivity (mS/cm)	NS	0.325	0.354	0.424	0.619	1.058	0.559	0.420	0.61	0.683	0.796	0.63	0.471
Dissolved Oxygen YSI (mg/L)	NS	4.29	6.17	9.26	7.12	6.46	8.65	7.42	2.98	9.66	5.02	2.23	6.62
Dissolved Oxygen- Downhole (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.6	9.12	NA
Groundwater Elevation (ft)	NS	227.05	225.38	224.33	229.79	229.19	225.23	224.43	228.09	227.64	227.07	230.00	226.06

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg $CaCO_3$/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well											
		MW-30											
		12/1/2015	12/13/2016	3/21/2017	6/26/2017	9/27/2017	12/13/2017	3/15/2018	6/21/2018	9/20/2018	12/19/2018	6/19/2019	12/10/2019
		Downgradient											
VOCs (µg/L)													
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	**0.74 J**	**0.61 J**	**0.39 J**	**0.41 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Tetrachloroethene (PCE; PERC)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	**25.2**	**42.3**	**66.3**	**24.3**	**18.4**	**19.6**	**9.8**	**8.1**	**8.2**	**7.3**	**5.0**	**6.5**
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters													
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**12**	**36**	**8.5**	**10**
Acetylene (ug/L)	NS	NA	NA	NA	NA	NA	NA	NA	1.0 UJ	NA	NA	**<0.50**	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**0.16**	**0.087**	**0.93**	**0.42**
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.04 U	0.040 U	**0.33**	**0.11**
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**143**	**319**	**210**	**154**	**104**	**347**	**141**	**58**	**59**	**51**	**65**	**74**
Chloride (mg/L)	NS	**38.4**	**182**	**136**	**49.6**	**35.3**	**87.3**	**43.6**	**38.8**	**40.7**	**39.2**	**37.6**	**38.3**
Nitrate (mg/L)	NS	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
Sulfate (mg/L)	NS	**35.9**	**2.9**	0.5 U	**0.32 J**	0.5 U	**0.22 J**	0.5 U	**0.34 J**	0.5 U	**0.76 J**	2.0 U	0.5 U
Methane (µg/L)	NS	**47.4**	**146**	**870**	**3210**	**3560**	**12900**	**5860**	**3700**	**4410**	**3790**	**91.6**	**5670**
Ethane (µg/L)	NS	**4.7**	**5.4**	**23.5**	**36.7**	**39.7**	**40.5**	**31.1**	**52**	**42.2**	**46.4**	3.3 U	**23.4**
Ethene (µg/L)	NS	**2.2**	**3.3**	**9.1**	**12.7**	**8.5**	**4.2**	**2.2**	**6.3**	**4.3**	**2.8**	2.4 U	**2.0 J**
Total Organic Carbon (mg/L)	NS	**2.2**	**225**	**139**	**75.2**	**27.0**	**366**	**50.9**	**9.7 J**	**10.2**	**12.1**	**7.7**	**8.8**
Field Parameters													
pH (pH Unit)	NS	8.91	6.83	7.60	8.01	8.01	7.41	8.54	8.28	8.48	8.84	7.8	7.66
Turbidity (NTU)	NS	58.2	3.55	3.82	3	69.1	16.1	3.12	950.5	0.02	1.36	0.81	1.33
ORP (MeV)	NS	-278.4	-166.3	-166.9	-173.3	-212.2	-170.1	-122.8	12.1	-217.6	-208.4	-164	-152.9
Conductivity (mS/cm)	NS	0.210	1.410	0.740	0.320	0.412	0.758	0.212	0.238	0.235	0.216	0.23	0.158
Dissolved Oxygen YSI (mg/L)	NS	3.70	0.29	0.17	0.48	0.06	0.80	0.19	0.98	8.41	0.44	0.28	0.22
Dissolved Oxygen- Downhole (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.2	-0.41	NA
Groundwater Elevation (ft)	NS	226.98	225.35	223.98	229.44	229.04	225.28	224.28	227.80	227.52	226.70	229.62	225.74

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg $CaCO_3$/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well											
		MW-31											
		12/1/2015	12/14/2016	3/22/2017	6/26/2017	9/27/2017	12/13/2017	3/15/2018	6/21/2018	9/20/2018	12/19/2018	6/19/2019	12/10/2019
		Upgradient											
VOCs (µg/L)													
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	**0.41 J**	**0.50 J**	**0.42 J**	**0.40 J**	**0.37 J**	0.75 U	**0.34 J**	**0.37 J**	0.75 U	**0.34 J**
Tetrachloroethene (PCE; PERC)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	**0.44 J**
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	**42.7**	**38.2**	**35.0**	**29.0**	**25.6**	**19.6**	**19.1**	**20.6**	**19.7 J+**	**19.1**	**26.2**	**29.2**
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters													
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**4.1**	**1.9**	**2**	**2.2**
Acetylene (ug/L)	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA	**<0.50**	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**0.76**	**0.87**	**0.72**	**0.98**
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.04 U	0.04 U	0.04 U	**0.023 J**
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**178**	**222**	**381**	**150**	**132**	**119**	**143**	**169**	**169**	**172**	**142**	**146**
Chloride (mg/L)	NS	**41.9**	**56.6**	**98.5**	**31.0**	**31.7**	**36.3**	**50.6**	**39.9**	**32**	**34.6**	**45.9**	**44.3**
Nitrate (mg/L)	NS	0.06 U	0.06 U	**0.04 J**	**0.02 J**	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
Sulfate (mg/L)	NS	**26.3**	**10.9**	**2.6**	**5.6**	**5.6**	**7.8**	**6.7**	**7.8**	**4.6**	**7.1**	**10.2**	**8.8**
Methane (µg/L)	NS	**20.7**	**3.5**	**106**	**56.5**	**29.1**	**59.4**	**34.4**	**120**	**90.6**	**126**	**99.3**	**512**
Ethane (µg/L)	NS	**2.2**	**1.5**	**10.1**	**2.7**	**2.6**	**3.3**	**2.6**	**5.7**	**4.2**	**4.3**	**3.0 J**	**3.9**
Ethene (µg/L)	NS	**0.91 J**	**0.84 J**	**4.7**	**3.2**	**2.3**	**1.9**	**1.6**	**104**	**1.4 J**	**1.3 J**	2.4 U	2.4 U
Total Organic Carbon (mg/L)	NS	**2.1**	**43.9**	**257**	**2.8**	**1.5**	**1.3**	**1.1**	**2.1**	**0.69 J**	**1.1 J+**	1.0 U	**0.79 J**
Field Parameters													
pH (pH Unit)	NS	7.80	7.20	7.61	9.79	7.63	7.68	8.31	7.83	7.85	8.00	7.80	7.77
Turbidity (NTU)	NS	51.7	8.03	11.4	4.60	8.60	8.62	2.95	2.6	0.02	4.36	0.69	0.0
ORP (MeV)	NS	-319.7	-163.1	-201.5	-283.2	-174.4	-208.0	-161.7	-155.1	-180.6	-172.9	-165.3	-202.2
Conductivity (mS/cm)	NS	0.243	0.348	0.850	0.280	0.526	0.294	0.261	0.324	0.378	0.362	0.402	0.308
Dissolved Oxygen YSI (mg/L)	NS	1.29	0.28	0.22	0.70	0.13	0.19	0.17	0.22	7.99	0.48	0.15	0.31
Dissolved Oxygen- Downhole (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.1	-0.24	NA
Groundwater Elevation (ft)	NS	226.95	225.40	224.12	229.52	229.11	225.40	224.34	227.84	227.55	226.85	229.70	225.89

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg $CaCO_3$/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well MW-32											
		11/30/2015	12/13/2016	3/21/2017	6/26/2017	9/26/2017	12/13/2017	3/14/2018	6/21/2018	9/20/2018	12/19/2018	6/20/2019	12/11/2019
		Downgradient											
VOCs (µg/L)													
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.75 U	**0.40 J**	**0.48 J**	**0.60 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	**0.34 J**	0.75 U
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	**1.2**	**1.3**	**1.2**	**0.68 J**	**0.61 J**	**0.62 J**	**1.3**	**0.85 J**	**0.83 J**	**2.0**
Tetrachloroethene (PCE; PERC)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	**150**	**132**	**191**	**130**	**135**	**120**	**104**	**64.1**	**95.4**	**87.1**	**118**	**101**
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters													
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**7.4**	**2.2**	**3.7**	**5.0**
Acetylene (ug/L)	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA	**<0.50**	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**0.51**	**1.0**	**0.47**	**1.1**
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.044 U	0.04 U	**0.024 J**	0.04 U
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**196**	**277**	**214**	**129**	**129**	**141**	**162**	**128**	**129**	**158**	**134**	**157**
Chloride (mg/L)	NS	**35.6**	**138**	**84.6**	**38.0**	**30.7**	**28.2**	**25.4**	**29.5**	**27.8**	**24.5**	**24.1 J-**	**30.6**
Nitrate (mg/L)	NS	0.06 U	0.06 U	**0.02 J**	**0.02 J**	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U	0.06 U
Sulfate (mg/L)	NS	**21.1**	**2.8**	**0.68 J**	**0.50 J**	**0.4 J**	**6.0**	**7.1**	**2.3**	**1.4 J**	**6.0**	**8.6**	**8.1**
Methane (µg/L)	NS	**6.8**	**16.5**	**309**	**817**	**835**	**233 J**	**583**	**130**	**2650**	**407**	**2190**	**1180**
Ethane (µg/L)	NS	**0.5 J**	**1.5**	**19.3**	**35.9**	**29.4**	**5.6 J**	**10.7**	**2**	**21.1**	**12.0**	**12.1**	**9.3**
Ethene (µg/L)	NS	0.75 U	**1.8**	**10.3**	**15.6**	**5.4**	**2.3 J**	**3.3**	**0.25 J**	**4.7**	**1.5 J**	**1.7 J**	**0.96 J**
Total Organic Carbon (mg/L)	NS	**2.6**	**133**	**98.0**	**22.0**	**5.0**	**5.4 J**	**2.7**	**6.4**	**3.9**	**2.4**	**1.4 J+**	**0.80 J**
Field Parameters													
pH (pH Unit)	NS	8.00	6.69	7.54	9.28	7.65	7.43	7.97	8.03	7.94	7.94	7.77	7.80
Turbidity (NTU)	NS	180	5.92	4.01	5.10	3.91	5.11	1.36	0.02	0.02	1.60	0.02	1.98
ORP (MeV)	NS	-234.2	-107.7	-140.7	-238.7	-149.4	-181.9	-106.4	-149.4	-201	-180.0	-165.3	-185.0
Conductivity (mS/cm)	NS	0.239	1.180	0.640	0.261	0.478	0.257	0.239	0.206	0.291	0.338	0.320	0.264
Dissolved Oxygen YSI (mg/L)	NS	0.64	1.81	1.77	2.50	1.80	1.50	0.25	8.26	8.44	0.47	0.30	0.78
Dissolved Oxygen- Downhole (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.4	-0.39	NA
Groundwater Elevation (ft)	NS	226.86	225.45	223.70	229.05	228.93	225.42	224.18	227.45	227.39	226.60	229.30	225.75

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg $CaCO_3$/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well											
		MW-33											
		11/24/2015	12/14/2016	3/22/2017	6/26/2017	9/26/2017	12/13/2017	3/14/2018	6/21/2018	9/19/2018	12/19/2018	6/19/2019	12/11/2019
		Upgradient											
VOCs (µg/L)													
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Tetrachloroethene (PCE; PERC)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	**133**	**93.5**	**151**	**152**	**170**	**142**	**155**	**178**	**137**	**159**	**97.4**	**164**
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters													
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**3.9**	**2.1**	**3.3**	NA
Acetylene (ug/L)	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA	**<0.50**	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.05 U	**0.071**	**0.32**	**0.041 J**
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**0.045 J**	0.04 U	0.04 U	0.04 U
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**172**	**218**	**194**	**205**	**202**	**212**	**215**	**215**	**213**	**211**	**172**	**197**
Chloride (mg/L)	NS	**41.8**	**43.2**	**29.2**	**22.8**	**24.6**	**28.1**	**23.0**	**22.5**	**24.8 J-**	**23.9**	**21.2**	**31.6**
Nitrate (mg/L)	NS	0.06 U	0.06 U	**0.32**	**0.32**	**0.30**	**0.32**	**0.34**	**0.42**	**0.4 J**	**0.44**	**0.42**	**0.40**
Sulfate (mg/L)	NS	**25.1**	**8.2**	**15.0**	**11.8**	**12.6**	**14.8**	**11.6**	**14.3**	**14.6**	**12.1**	**10.9**	**12.1**
Methane (µg/L)	NS	**64**	**3.4**	**9.2**	**16.0**	**17.8**	**7.2**	**6.1**	**17**	1.5 U	**10.3 J+**	**4.7**	1.5 U
Ethane (µg/L)	NS	**7**	**0.25 J**	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	3.3 U	3.3 U	3.3 U	3.3 U
Ethene (µg/L)	NS	**3.6**	**0.48 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	2.4 U	2.4 U	**1.2 J**	2.4 U
Total Organic Carbon (mg/L)	NS	**8.1**	**30.9**	**2.1**	**0.54 J**	**0.44 J**	**0.44 J**	**0.83 J**	**1.6**	**0.58 J**	**1.1 J+**	**1.8 J+**	**0.86 J**
Field Parameters													
pH (pH Unit)	NS	8.39	7.18	7.58	8.8	7.51	7.53	7.99	7.66	7.69	7.69	7.21	7.65
Turbidity (NTU)	NS	23.1	9.31	11.7	3.40	51.2	6.38	9.18	2.78	0.02	2.96	7.84	0.00
ORP (MeV)	NS	-471.2	-126.8	-64.3	44.9	-3.2	-20.4	-49.9	17.6	98.7	81.9	2.8	17.1
Conductivity (mS/cm)	NS	0.247	0.303	0.386	0.350	0.648	0.370	0.285	0.385	0.456	0.390	0.374	0.325
Dissolved Oxygen YSI (mg/L)	NS	0.92	0.41	2.50	2.99	2.87	6.80	1.89	3.41	9.21	3.96	0.65	3.73
Dissolved Oxygen- Downhole (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.3	3.82	NA
Groundwater Elevation (ft)	NS	226.89	225.51	223.80	229.11	229.05	225.54	224.26	227.51	227.42	226.68	229.37	225.86

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg $CaCO_3$/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well											
		MW-34											
		11/24/2015	12/13/2016	3/21/2017	6/26/2017	9/26/2017	12/12/2017	3/13/2018	6/20/2018	9/19/2018	12/20/2018	6/20/2019	12/11/2019
		Downgradient											
VOCs (µg/L)													
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 UJ	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	**0.63 J**
Tetrachloroethene (PCE; PERC)	5	**0.42 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	**17.7**	**41.3**	**48.3**	**34.0**	**29.6**	**28.0**	**17.6**	**31.3**	**6.9**	**10.6**	**1.1**	**2.9**
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters													
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**3.1**	**3.1**	**2.2**	**3.0**
Acetylene (ug/L)	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA	**<0.50**	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.05 U	**0.07**	**0.33 J**	**0.35**
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.04 U	0.04 U	**0.18**	**0.081**
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**99**	**191**	**597**	**201**	**197**	**203**	**174**	**226**	**183**	**162**	**194**	**140**
Chloride (mg/L)	NS	**48.5**	**62.3**	**461**	**15.7**	**11.7**	**12.9**	**15.4**	**16.3**	2.0 U	**12.6**	**6.6 J-**	**2.5**
Nitrate (mg/L)	NS	**0.56**	**0.06 J**	0.06 U	**0.04 J**	0.06 U	**0.02 J**	**0.02 J**	0.06 U	**0.56 J**	0.06 U	0.06 U	**0.22**
Sulfate (mg/L)	NS	**64.3**	**23.8**	**0.56 J**	**13.4**	**9.0**	**7.3**	**8.5**	**11.2**	**3.9**	**3.3**	2.0 U	**2.5**
Methane (µg/L)	NS	**14.5**	**1.2**	**1780**	**12.4**	**88.1**	**531**	**1260**	**35**	1.5 U	**737**	**419**	**144**
Ethane (µg/L)	NS	**2.2**	0.50 U	**17.3**	0.50 U	**0.45 J**	**1.1**	**1.3**	0.50 U	3.31 U	**4.0**	**0.77 J**	3.3 U
Ethene (µg/L)	NS	**1.8**	0.75 U	**4.4**	0.75 U	**0.58 J**	0.75 U	0.75 U	0.75 U	2.41 U	2.4 U	**1.1 J**	2.4 U
Total Organic Carbon (mg/L)	NS	**5.9**	**12.0**	**631**	**3.3**	**3.8**	**4.1**	**3.4**	**0.93 J**	**6.8**	**3.2 J+**	**8.3**	**4.3**
Field Parameters													
pH (pH Unit)	NS	12.68	7.14	7.45	7.26	7.26	7.40	7.37	7.30	7.12	7.67	8.91	7.80
Turbidity (NTU)	NS	44.7	3.23	4.59	-4	4.40	4.20	5.63	1.4	0.02	4.26	5.55	2.96
ORP (MeV)	NS	-185.4	-8.4	-144.0	-139.4	-63.1	-133.4	25.0	-76.3	118.1	-29.2	-140.1	269.7
Conductivity (mS/cm)	NS	0.361	0.630	2.280	0.332	0.578	0.310	0.234	0.332	0.312	0.341	0.368	0.178
Dissolved Oxygen YSI (mg/L)	NS	6.9	1.12	0.12	0.46	0.62	2.70	0.34	1.31	8.69	0.47	0.35	5.05
Dissolved Oxygen- Downhole (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.2	-0.15	NA
Groundwater Elevation (ft)	NS	226.73	225.48	223.35	228.66	228.77	225.51	223.89	227.03	227.21	226.37	228.61	225.44

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg $CaCO_3$/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

Table 3-2
Groundwater Sample Results
The Defense National Stockpile Center Scotia Depot

Analytes	NYSDEC Ambient Water Quality Standards and Guidance Value	Confirmation Well											
		MW-35											
		11/24/2015	12/15/2016	3/22/2017	6/26/2017	9/26/2017	12/12/2017	3/13/2018	6/20/2018	9/19/20118	12/20/2018	6/20/2019	12/11/2019
		Upgradient											
VOCs (µg/L)													
1,1,1,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,1-Trichloroethane (1,1,1-TCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2,2-Tetrachloroethane	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1,2-Trichloroethane	1	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethane (1,1-DCA)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,1-Dichloroethene (1,1-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
1,2-Dichloroethane (EDC)	0.6	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Carbon Tetrachloride	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 UJ	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
cis-1,2-Dichloroethene (cis-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Tetrachloroethene (PCE; PERC)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Toluene	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
trans-1,2-Dichloroethene (trans-1,2-DCE)	5	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
Trichloroethene (TCE)	5	**31.9**	**31.8**	**12.5**	**43.8 J**	**47.8**	**43.5**	**21.2**	**39.4**	**15.2**	**38.1**	**34.8**	**35.4**
Vinyl Chloride (VC)	2	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U
MNA Parameters													
Dissolved Hydrogen (nmol/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**2.6**	**2.1**	**1.4**	NA
Acetylene (ug/L)	NS	NA	NA	NA	NA	NA	NA	NA	1.0 U	NA	NA	**<0.50**	NA
Total Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	**0.45**	**0.12**	**0.61**	**0.30**
Dissolved Iron (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	0.044 U	**0.09**	0.04 U	0.04 U
Alkalinity, Total (as $CaCO_3$) (mg/L)[1]	NS	**181**	**223**	**51**	**202**	**192**	**210**	**171**	**197**	**115**	**195**	**174**	**168**
Chloride (mg/L)	NS	**42.2**	**53.9**	**2.0**	**17.1**	**14.4**	**22.2 J+**	**14.5**	**15.7**	**2.1**	**24.4**	**21.2 J-**	**23.1**
Nitrate (mg/L)	NS	0.06 U	**0.04 J**	**0.14 J**	**0.66**	**0.6**	**0.44**	**0.44**	**0.64**	**0.68 J**	**0.58**	**0.38**	**0.44**
Sulfate (mg/L)	NS	**48.1**	**7.2**	**3.5**	**13.6**	**10.8**	**10.2**	**8.5**	**10.7**	**2.5**	**9.7**	**9.8**	**9.1**
Methane (µg/L)	NS	**13.8**	**0.90**	**5.8**	**7.2**	**7.5**	**7.9**	**32.7**	**23**	**50.5**	**12.3 J+**	**38.3**	**166**
Ethane (µg/L)	NS	**2.9**	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	3.31 U	3.3 U	3.3 U	3.3 U
Ethene (µg/L)	NS	**1.6**	0.75 U	**0.32 J**	0.75 U	0.75 U	0.75 U	0.75 U	0.75 U	2.41 U	2.4 U	2.4 U	2.4 U
Total Organic Carbon (mg/L)	NS	**7.7**	**18.3**	**1.4**	**0.75 J**	**0.68 J**	**0.56 J**	**1.2**	**0.6 J**	**3.5**	**1.1 J**	**1.2 J+**	**1.6**
Field Parameters													
pH (pH Unit)	NS	9.68	7.09	8.79	7.66	7.46	7.44	7.46	7.55	7.49	7.77	7.42	7.59
Turbidity (NTU)	NS	381	5.99	16.3	38.2	31.91	13.81	11.00	25.8	33.8	4.49	12.1	9.0
ORP (MeV)	NS	-404	-167.9	-68.4	-10.6	30	0.40	57.10	69.5	65.6	45.4	-37.1	173.8
Conductivity (mS/cm)	NS	0.287	0.329	0.078	0.324	0.600	0.338	0.218	0.335	0.204	0.453	0.361	0.134
Dissolved Oxygen YSI (mg/L)	NS	0.79	0.41	6.63	3.67	4.58	4.84	1.32	3.54	9.57	5.38	1.82	5.55
Dissolved Oxygen- Downhole (mg/L)	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.5	1.35	NA
Groundwater Elevation (ft)	NS	226.69	225.46	223.40	228.68	228.81	225.56	224.08	227.04	227.26	226.47	228.95	225.23

Notes:
MNA - Monitored Natural Attenuation
NS - No Standard
NA - Not Analyzed
Acetylene analysis was added in June 2018.
Detected concentrations are in bold font.
Detections exceeding the NYSDEC Ambient Water Quality Standards (AWQS) are highlighted in gray.
J - Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte.
J+ - The result is an estimated quantity, likely to be biased high.
U - Indicates that the analyte was not detected (ND).
R - Non-detect result rejected due to holding time being exceeded.
1 - TheTotal Alkalinity is titrated to a pH of 4.5 and reported as mg $CaCO_3$/L.
2 - Analyte was analyzed past the 48 hour holding time.
3 - The QC sample type DUP for method RSK 175 was outside the control limits for the analyte Methane. The RPD was reported as 23.8 and the upper contol limit is 20.

APPENDICES

APPENDIX A: Groundwater Sample Collection Field Forms

Monitoring Well Purging / Sampling Form

Project Name and Number:	Scotia Navy Depot
Monitoring Well Number:	MW-15 Date: 12/9/19
Samplers:	AG + JK
Sample Number:	MW-15 120919 QA/QC Collected? —
Purging / Sampling Method:	bladder pump

1. L = Well Depth: ______ feet
2. D = Riser Diameter (I.D.): ______ feet
3. W = Depth to Water: 66.35 feet
4. C = Column of Water in Well: ______ feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$ ______ gal
6. 3(V) = Target Purge Volume ______ gal

D (inches)	D (feet)
1-inch	0.08
~~2-inch~~	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI + NTU

Parameter	Units	Readings						
Time	24 hr	1334	1339	1344	1349	1354	1359	1404
Water Level (0.33)	feet	66.35	66.35	66.38	66.39	66.39	66.39	66.39
Volume Purged	gal	—	0.15	0.30	0.50	0.75	1.00	1.25
Flow Rate	mL/min	220	220	220	220	220	220	220
Turbidity (+/- 10%)	NTU	62.4	27.8	15.6	14.5	12.7	10.1	7.49
Dissolved Oxygen (+/- 10%)	%	87.7	87.1	87.3	87.2	86.4	86.9	86.7
Dissolved Oxygen (+/- 10%)	mg/L	9.85	9.82	9.80	9.79	9.73	9.76	9.74
Eh / ORP (+/- 10)	MeV	114.0	124.6	127.6	129.3	130.8	131.3	131.9
Specific Conductivity (+/- 3%)	mS/cm^c	517	519	519	519	521	518	519
Conductivity (+/- 3%)	mS/cm	0.401	0.398	0.399	0.399	0.400	0.399	0.399
pH (+/- 0.1)	pH unit	7.56	7.48	7.47	7.46	7.45	7.46	7.46
Temp (+/- 0.5)	C°	10.1	10.0	10.2	10.1	10.1	10.2	10.1
Color	Visual	cloudy	cloudy	clear	clear	clear	clear	clear
Odor	Olfactory	—	—	—	—	—	—	—

Comments:

Sample @ 1445

NO IRON / NO HYDROGEN

Monitoring Well Purging / Sampling Form

Project Name and Number: [redacted] Scotia Navy Depot

Monitoring Well Number: MW-15 cont. Date: 12/9/19

Samplers: [redacted] JK + AG

Sample Number: MW-15 120919 QA/QC Collected? —

Purging / Sampling Method: Bladder Pump

1. L = Well Depth: ______ feet
2. D = Riser Diameter (I.D.): ______ feet
3. W = Depth to Water: 66.35 feet
4. C = Column of Water in Well: ______ feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$ ______ gal
6. 3(V) = Target Purge Volume ______ gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI + NTU

Parameter	Units	Readings						
Time	24 hr	1409	1414	1419				
Water Level (0.33)	feet	66.38	66.38	66.39				
Volume Purged	gal	1.50	1.75	2.00				
Flow Rate	mL/min	220	220	220				
Turbidity (+/- 10%)	NTU	7.46	5.32	2.71				
Dissolved Oxygen (+/- 10%)	%	86.6	86.6	86.8				
Dissolved Oxygen (+/- 10%)	mg/L	9.73	9.74	9.75				
Eh / ORP (+/- 10)	MeV	132.4	133.1	133.7				
Specific Conductivity (+/- 3%)	mS/cm^c	519	520	520				
Conductivity (+/- 3%)	mS/cm	0.398	0.398	0.399				
pH (+/- 0.1)	pH unit	7.47	7.46	7.46				
Temp (+/- 0.5)	C°	10.1	10.0	10.1				
Color	Visual	clear	clear	clear				
Odor	Olfactory	—	—	—				

Comments:

Sampled @ 1445

NO IRON / NO HYDROGEN

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-29 Date: 12/09/19

Samplers: AG and JK

Sample Number: MW-29 120919 QA/QC Collected? Dup-1

Purging / Sampling Method: Bladder Pump and dedicated tubing

1. L = Well Depth: 71.84 feet
2. D = Riser Diameter (I.D.): ______ feet
3. W = Depth to Water: 66.07 feet
4. C = Column of Water in Well: ______ feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$ ______ gal
6. 3(V) = Target Purge Volume ______ gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using NTU + YSI

Parameter	Units	Readings			✓	✓	✓	
Time	24 hr	1415	1420	1425	1430	1435	1440	1445
Water Level (0.33)	feet	66.07	68.10	69.32	70.15	70.17	70.18	70.18
Volume Purged	gal	—	0.15	0.30	0.45	0.60	0.75	0.90
Flow Rate	mL/min	200	200	200	200	200	200	200
Turbidity (+/- 10%)	NTU	28.1	23.7	15.2	15.5	13.0	12.5	11.9
Dissolved Oxygen (+/- 10%)	%	67.1	59.5	58.6	59.1	58.7	58.7	58.1
Dissolved Oxygen (+/- 10%)	mg/L	7.78	6.77	6.61	6.68	6.67	6.68	6.62
Eh / ORP (+/- 10)	MeV	236.2	245.1	246.7	248.4	250.4	251.3	251.2
Specific Conductivity (+/- 3%)	mS/cm^c	304.2	663	669	667	670	670	669
Conductivity (+/- 3%)	mS/cm	0.455	0.469	0.477	0.472	0.473	0.472	0.471
pH (+/- 0.1)	pH unit	7.20	7.02	6.96	6.92	6.67	6.89	6.88
Temp (+/- 0.5)	C°	9.1	9.5	9.9	9.8	9.7	9.5	9.5
Color	Visual	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	—	—	—	—	—	—	—

Comments:

Sampled @ 1500

IRON SAMPLE - yes
No H-sample

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-28 Date: 12/10/19

Samplers: Ah + JK

Sample Number: MW-28 121019 QA/QC Collected? —

Purging / Sampling Method: bladder pump

1. L = Well Depth: 71.87 feet
2. D = Riser Diameter (I.D.): ____ feet
3. W = Depth to Water: 66.41 feet
4. C = Column of Water in Well: ____ feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$ ____ gal
6. 3(V) = Target Purge Volume ____ gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI + NTU

Parameter	Units	Readings						
Time	24 hr	0950	0955	1000	1005	1010	1015	1020
Water Level (0.33)	feet	66.41	66.48	66.51	66.53	66.50	66.50	66.50
Volume Purged	gal	—	0.11	0.23	0.35	0.47	0.59	0.70
Flow Rate	mL/min	200	200	200	200	200	200	200
Turbidity (+/- 10%)	NTU	5.93	4.81	2.24	0.02	0.02	0.38	0.78
Dissolved Oxygen (+/- 10%)	%	46.9	46.9	49.1	50.4	50.8	51.2	51.7
Dissolved Oxygen (+/- 10%)	mg/L	5.30	5.28	5.57	5.69	5.72	5.76	5.79
Eh / ORP (+/- 10)	MeV	185.1	190.7	209.9	203.0	197.5	193.2	190.5
Specific Conductivity (+/- 3%)	mS/cm^c	713	711	713	712	709	710	710
Conductivity (+/- 3%)	mS/cm	.507	.507	.504	0.506	0.506	0.509	0.510
pH (+/- 0.1)	pH unit	8.46	8.11	7.30	7.17	7.14	7.09	7.08
Temp (+/- 0.5)	C°	9.8	9.9	9.7	9.9	10.0	10.2	10.3
Color	Visual	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	—	—	—	—	—	—	—

Comments:

slight brown discoloration @ bottom of tubing

* H sample (240mL/min) @ 1145

Sampled at 10:40

Monitoring Well Purging / Sampling Form

Project Name and Number: [redacted] Scotia Navy Depot

Monitoring Well Number: MW-30 Date: 12/10/19

Samplers: [redacted] AG + JK

Sample Number: MW-30121019 QA/QC Collected? —

Purging / Sampling Method: Bladder Pump

1. L = Well Depth: 91.38 feet
2. D = Riser Diameter (I.D.): feet
3. W = Depth to Water: 65.89 feet
4. C = Column of Water in Well: feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$ gal
6. 3(V) = Target Purge Volume gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI + NTU

Parameter	Units	Readings						
Time	24 hr	1227	1232	1237	1242	1247	1252	1257
Water Level (0.33)	feet	65.89	65.90	65.91	65.91	65.92	65.92	65.92
Volume Purged	gal	—	0.15	0.30	0.45	0.60	0.75	0.90
Flow Rate	mL/min	280	280	280	280	280	280	280
Turbidity (+/- 10%)	NTU	5.53	4.28	4.75	4.62	4.01	2.92	2.57
Dissolved Oxygen (+/- 10%)	%	11.3	8.6	4.6	3.1	2.7	2.4	2.2
Dissolved Oxygen (+/- 10%)	mg/L	1.34	0.87	0.54	0.36	0.31	0.28	0.26
Eh / ORP (+/- 10)	MeV	-36.4	-53.2	-80.4	-99.8	-115.9	-130.9	-142.7
Specific Conductivity (+/- 3%)	mS/cm^c	270.6	268.5	267.0	270.5	282.0	286.7	287.8
Conductivity (+/- 3%)	mS/cm	0.155	0.154	0.154	0.156	0.157	0.159	0.159
pH (+/- 0.1)	pH unit	8.16	7.85	7.79	7.65	7.60	7.59	7.60
Temp (+/- 0.5)	C°	7.6	7.8	8.2	8.5	8.4	8.3	8.4
Color	Visual	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	—	—	—	—	—	—	—

Comments:

*H-sample @ 1400

sample @ 1320

*IRON SAMPLE

Monitoring Well Purging / Sampling Form

Project Name and Number: [redacted] Scotia Navy Depot

Monitoring Well Number: MW-30 cont. Date: 12/10/19

Samplers: JK and [redacted] AG

Sample Number: MW-30121019 QA/QC Collected? —

Purging / Sampling Method: Bladder Pump

1. L = Well Depth: 91.38 feet
2. D = Riser Diameter (I.D.): feet
3. W = Depth to Water: 65.89 feet
4. C = Column of Water in Well: feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$ gal
6. 3(V) = Target Purge Volume gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI + NTU

Parameter	Units	Readings						
Time	24 hr	1302	1307	1312	1317			
Water Level (0.33)	feet	65.93	65.93	65.93	65.93			
Volume Purged	gal	1.05	1.20	1.35	1.50			
Flow Rate	mL/min	280	280	280	280			
Turbidity (+/- 10%)	NTU	1.38	0.98	1.87	1.33			
Dissolved Oxygen (+/- 10%)	%	2.1	1.9	1.8	1.9			
Dissolved Oxygen (+/- 10%)	mg/L	0.24	0.22	0.21	0.22			
Eh / ORP (+/- 10)	MeV	-149.6	-153.4	-154.1	-152.9			
Specific Conductivity (+/- 3%)	mS/cm^c	287.9	284.9	285.1	286.5			
Conductivity (+/- 3%)	mS/cm	0.160	0.157	0.157	0.158			
pH (+/- 0.1)	pH unit	7.62	7.64	7.65	7.66			
Temp (+/- 0.5)	C°	8.4	8.5	8.3	8.4			
Color	Visual	clear	clear	clear	clear			
Odor	Olfactory	—	—	—	—			

Comments:

Sample @ 1320

H-sample @ 1400

* IRON SAMPLE

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-31 Date: 12/10/19

Samplers: AG and JK

Sample Number: MW-31 121019 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump and dedicated tubing

1. L = Well Depth: 91.69 feet
2. D = Riser Diameter (I.D.): ______ feet
3. W = Depth to Water: 65.65 feet
4. C = Column of Water in Well: ______ feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$ ______ gal
6. 3(V) = Target Purge Volume ______ gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using NTU + YSI

Parameter	Units	Readings				✓	✓	✓
Time	24 hr	1250	1255	1300	1305	1310	1315	1320
Water Level (0.33)	feet	65.65	65.66	65.67	65.67	65.68	65.67	65.67
Volume Purged	gal	0.10	0.20	0.30	0.45	0.60	0.78	0.95
Flow Rate	mL/min	268	268	268	268	268	268	268
Turbidity (+/- 10%)	NTU	1.43	1.12	0.08	0.0	0.0	0.0	0.0
Dissolved Oxygen (+/- 10%)	%	8.2	5.9	4.1	3.1	2.9	2.7	2.7
Dissolved Oxygen (+/- 10%)	mg/L	0.95	0.68	0.47	0.36	0.33	0.32	0.31
Eh / ORP (+/- 10)	MeV	-167.3	-184.3	-202.5	-208.4	-205.5	-202.3	-202.2
Specific Conductivity (+/- 3%)	mS/cm^c	157.7	193.2	357.0	416.4	439.1	446.1	446.6
Conductivity (+/- 3%)	mS/cm	0.111	0.134	0.249	0.288	0.305	0.308	0.308
pH (+/- 0.1)	pH unit	7.91	7.44	7.37	7.53	7.69	7.76	7.77
Temp (+/- 0.5)	C°	9.0	9.0	9.1	9.0	9.0	8.9	8.8
Color	Visual	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	—	Sulfur	Sulfur	Sulfur	Sulfur	Sulfur	Sulfur

Comments:

* Black discoloration @ bottom of tubing

sample @ 1345

H-Sample @ 1405

IRON SAMPLE - yes

Monitoring Well Purging / Sampling Form

Project Name and Number: [redacted] Scotia Navy Depot

Monitoring Well Number: MW-35 Date: 12/11/19

Samplers: [redacted] JK + AG

Sample Number: MW-35 121119 QA/QC Collected? —

Purging / Sampling Method: Bladder Pump

1. L = Well Depth: 92.33 feet
2. D = Riser Diameter (I.D.): ____ feet
3. W = Depth to Water: 61.73 feet
4. C = Column of Water in Well: ____ feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$ ____ gal
6. 3(V) = Target Purge Volume ____ gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI + NTU

Parameter	Units	Readings						
Time	24 hr	0847	0852	0857	0902	0907	0912	0917
Water Level (0.33)	feet	61.73	61.74	61.74	61.75	61.75	61.75	61.75
Volume Purged	gal	—	0.20	0.35	0.50	0.65	0.80	0.95
Flow Rate	mL/min	225	225	225	225	225	225	225
Turbidity (+/- 10%)	NTU	57.9	16.5	17.8	10.5	10.6	10.2	9.9
Dissolved Oxygen (+/- 10%)	%	62.1	69.8	67.4	65.5	60.4	58.7	54.8
Dissolved Oxygen (+/- 10%)	mg/L	7.42	7.99	7.75	7.53	6.94	6.73	6.30
Eh / ORP (+/- 10)	MeV	203.7	227.5	222.4	218.6	185.6	187.7	188.5
Specific Conductivity (+/- 3%)	mS/cm^c	201.6	206.4	206.0	208.9	239.5	250.5	270.7
Conductivity (+/- 3%)	mS/cm	0.080	0.080	0.083	0.084	0.084	0.091	0.106
pH (+/- 0.1)	pH unit	7.97	7.86	7.74	7.79	7.61	7.60	7.58
Temp (+/- 0.5)	C°	8.9	8.9	9.2	9.3	9.3	9.2	9.3
Color	Visual	brownish	clear	clear	clear	clear	clear	clear
Odor	Olfactory	—	—	—	—	—	—	—

Comments:

$$\frac{300\ mL}{80\ sec} \cdot \frac{60\ sec}{1\ min} = \frac{225\ mL}{min}$$

NO HYDROGEN
Iron sample • Sampled @ 0950

Monitoring Well Purging / Sampling Form

Project Name and Number: ~~[illegible]~~ Scotia Navy Depot

Monitoring Well Number: MW-35 con't   Date: 12/11/19

Samplers: JK and AG

Sample Number: MW-35 121119   QA/QC Collected? —

Purging / Sampling Method: Bladder Pump

1. L = Well Depth:	92.33	feet
2. D = Riser Diameter (I.D.):		feet
3. W = Depth to Water:	61.73	feet
4. C = Column of Water in Well:		feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$		gal
6. 3(V) = Target Purge Volume		gal

D (inches)	D (feet)
1-inch	0.08
~~2-inch~~	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI + NTU

Parameter	Units	Readings						
Time	24 hr	0922	0927	0932	0937	0942		
Water Level (0.33)	feet	61.75	61.75	61.75	61.75	61.76		
Volume Purged	gal	1.10	1.25	1.40	1.55	1.70		
Flow Rate	mL/min	225	225	225	225	225		
Turbidity (+/- 10%)	NTU	9.6	9.4	8.8	9.3	9.0		
Dissolved Oxygen (+/- 10%)	%	52.6	51.2	50.0	49.3	49.6		
Dissolved Oxygen (+/- 10%)	mg/L	6.05	5.85	5.70	5.58	5.55		
Eh / ORP (+/- 10)	MeV	188.0	184.9	182.7	177.3	173.8		
Specific Conductivity (+/- 3%)	mS/cm^c	289.9	328.7	342.9	347.1	352.5		
Conductivity (+/- 3%)	mS/cm	0.115	0.120	0.131	0.132	0.134		
pH (+/- 0.1)	pH unit	7.58	7.58	7.59	7.59	7.59		
Temp (+/- 0.5)	C°	9.3	9.4	9.8	9.9	10.2		
Color	Visual	clear	clear	clear	clear	clear		
Odor	Olfactory	—	—	—	—	—		

Comments:

Sampled @ 0950

NO HYDROGEN
#Iron sample

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-34 Date: 12/11/19

Samplers: AG + JK

Sample Number: MW-34 121119 QA/QC Collected? —

Purging / Sampling Method: bladder pump

1. L = Well Depth: 88.09 feet
2. D = Riser Diameter (I.D.): feet
3. W = Depth to Water: 61.61 feet
4. C = Column of Water in Well: feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$ gal
6. 3(V) = Target Purge Volume gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI + NTU

Parameter	Units	Readings							
Time	24 hr	0905	0910	0915	0920	0925	0930	0935	0940
Water Level (0.33)	feet	61.61	61.85	61.99	61.98	61.98	61.97	61.98	61.98
Volume Purged	gal	.12	.27	.41	.68	.75	.91	1.10	1.35
Flow Rate	mL/min	136	136	136	136	136	136	136	136
Turbidity (+/- 10%)	NTU	6.60	3.82	4.40	4.47	3.20	3.19	2.62	2.96
Dissolved Oxygen (+/- 10%)	%	68.4	57.8	72.6	53.0	50.0	43.4	41.6	39.8
Dissolved Oxygen (+/- 10%)	mg/L	8.38	7.05	8.86	6.49	6.14	5.37	5.15	5.05
Eh / ORP (+/- 10)	MeV	277.0	268.5	235.2	259.9	264.1	265.6	271.6	269.7
Specific Conductivity (+/- 3%)	mS/cm^c	279.6	280.1	280.9	278.6	278.9	279.1	277.4	276.0
Conductivity (+/- 3%)	mS/cm	.181	.183	.181	.182	.180	.180	.178	.178
pH (+/- 0.1)	pH unit	7.95	7.87	7.82	7.81	7.81	7.81	7.80	7.80
Temp (+/- 0.5)	C°	6.5	6.8	6.4	6.7	6.6	6.4	6.3	6.3
Color	Visual	Clear	Clear	Clear	Clear	Clear	Clear	Clear	Clear
Odor	Olfactory	—	—	—	—	—	—	—	—

Comments: GW sample @ 0945

Hydrogen sample @ 1030

* Iron sample

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Depot

Monitoring Well Number: MW-33 Date: 12/11/19

Samplers: AG + JK

Sample Number: MW 33 121119 QA/QC Collected? DUP-2

Purging / Sampling Method: Bladder Pump

1. L = Well Depth: 92.32 feet
2. D = Riser Diameter (I.D.): ____ feet
3. W = Depth to Water: 64.05 feet
4. C = Column of Water in Well: ____ feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$ ____ gal
6. 3(V) = Target Purge Volume ____ gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using YSI + NTU

Parameter	Units	Readings						
Time	24 hr	1215	1230	1235	1240	1245	1250	1255
Water Level (0.33)	feet	64.05	64.08	64.10	64.11	64.10	64.10	64.10
Volume Purged	gal	—	.25	.49	.67	.70	.94	1.15
Flow Rate	mL/min	200	200	200	200	200	200	200
Turbidity (+/- 10%)	NTU	1.27	0.93	0.62	0.38	0.39	0.63	.80
Dissolved Oxygen (+/- 10%)	%	4.5	3.6	3.1	3.5	4.1	6.9	8.9
Dissolved Oxygen (+/- 10%)	mg/L	.54	.42	.36	.42	.50	.84	1.10
Eh / ORP (+/- 10)	MeV	-70.9	-63.9	-43.3	-34.5	-30.0	-22.2	-18.4
Specific Conductivity (+/- 3%)	mS/cm^c	482	488.7	490.2	495.2	492.0	491.9	491.5
Conductivity (+/- 3%)	mS/cm	.318	.332	.332	.328	.321	.318	.320
pH (+/- 0.1)	pH unit	7.72	7.63	7.59	7.59	7.59	7.59	7.61
Temp (+/- 0.5)	C°	7.2	8.2	7.9	7.8	6.9	6.5	6.7
Color	Visual	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	—	—	—	—	—	—	—

Comments: * No H sample *

Sample @ 1320

Iron sample ✓

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-33 cont Date: 12/11/19

Samplers: AG/JK

Sample Number: MW-33121119 QA/QC Collected? Dup-2

Purging / Sampling Method: Bladder Pump

				D (inches)	D (feet)
1. L = Well Depth:	92.32	feet		1-inch	0.08
2. D = Riser Diameter (I.D.):		feet		2-inch	0.17
3. W = Depth to Water:	64.05	feet		3-inch	0.25
4. C = Column of Water in Well:		feet		4-inch	0.33
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)		gal		6-inch	0.50
6. 3(V) = Target Purge Volume		gal			

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using ____________

Parameter	Units	Readings						
Time	24 hr	1250	1255	1300	1305	1310		
Water Level (0.33)	feet	64.11	64.10	64.10	64.10	64.10		
Volume Purged	gal	1.40	1.59	1.67	1.99	2.02		
Flow Rate	mL/min	200	200	200	200	200		
Turbidity (+/- 10%)	NTU	0.00	0.00	0.00	0.00	0.00		
Dissolved Oxygen (+/- 10%)	%	11.5	15.0	29.3	30.3	30.7		
Dissolved Oxygen (+/- 10%)	mg/L	1.41	2.05	3.53	3.67	3.73		
Eh / ORP (+/- 10)	MeV	-13.5	-9.8	11.8	15.9	17.1		
Specific Conductivity (+/- 3%)	mS/cm^c	491.6	492.3	494.8	495.6	496.4		
Conductivity (+/- 3%)	mS/cm	.320	.321	.325	.325	.325		
pH (+/- 0.1)	pH unit	7.59	7.59	7.63	7.64	7.65		
Temp (+/- 0.5)	C°	6.7	6.8	6.9	7.0	6.9		
Color	Visual	Clear	Clear	Clear	Clear	Clear		
Odor	Olfactory	—	—	—	—	—		

Comments:

Sample @ 1320

No H-sample

IRON SAMPLE - Yes

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-32 Date: 12/11/19

Samplers: AG and JK

Sample Number: MW-32 121119 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump and dedicated tubing

1. L = Well Depth:	91.61	feet
2. D = Riser Diameter (I.D.):		feet
3. W = Depth to Water:	64.00	feet
4. C = Column of Water in Well:		feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48)		gal
6. 3(V) = Target Purge Volume		gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using NTU + YSI

Parameter	Units	Readings						
Time	24 hr	1210	1215	1220	1225	1230	1235	1240
Water Level (0.33)	feet	64.00	64.01	64.01	64.01	64.01	64.02	64.02
Volume Purged	gal	—	0.15	0.30	0.50	0.70	0.90	1.10
Flow Rate	mL/min	203	203	203	203	203	203	203
Turbidity (+/- 10%)	NTU	5.48	3.96	3.01	2.17	2.03	2.48	2.17
Dissolved Oxygen (+/- 10%)	%	15.3	11.9	11.4	11.0	9.7	9.1	8.6
Dissolved Oxygen (+/- 10%)	mg/L	1.84	1.42	1.37	1.32	1.15	1.09	1.01
Eh / ORP (+/- 10)	MeV	-59.1	-69.3	-71.9	-78.0	-84.8	-96.9	-102.8
Specific Conductivity (+/- 3%)	mS/cm^c	87.0	86.8	86.6	88.4	94.0	117.9	124.4
Conductivity (+/- 3%)	mS/cm	0.093	0.092	0.091	0.098	0.100	0.119	0.133
pH (+/- 0.1)	pH unit	8.35	7.76	7.61	7.41	7.27	7.18	7.12
Temp (+/- 0.5)	C°	7.5	7.6	7.8	7.5	7.6	7.5	7.6
Color	Visual	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	—	—	—	—	—	—	—

Comments:

$\frac{284\text{ mL}}{84\text{ sec}} \cdot \frac{60\text{ sec}}{1\text{ min}} = \frac{202.8\text{ mL}}{\text{min}} \approx \frac{203\text{ mL}}{\text{min}}$

Sampled @ 1325

H sample @ 1420

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-32 cont Date: 12/11/19

Samplers: AG and JK

Sample Number: MW-32 121119 QA/QC Collected?

Purging / Sampling Method: Bladder Pump and dedicated tubing

1. L = Well Depth: 91.61 feet
2. D = Riser Diameter (I.D.): feet
3. W = Depth to Water: 64.00 feet
4. C = Column of Water in Well: feet
5. V = Volume of Water in Well = C(3.14159)(0.5D)^2(7.48) gal
6. 3(V) = Target Purge Volume gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using NTU + YSI

Parameter	Units	Readings				✓	✓	✓
Time	24 hr	1245	1250	1255	1300	1305	1310	1315
Water Level (0.33)	feet	64.02	64.02	64.03	64.03	64.03	64.03	64.03
Volume Purged	gal	1.30	1.50	1.70	1.90	2.10	2.30	2.50
Flow Rate	mL/min	203	203	203	203	203	203	203
Turbidity (+/- 10%)	NTU	2.03	2.63	1.91	1.72	2.09	2.32	1.98
Dissolved Oxygen (+/- 10%)	%	8.3	7.9	7.8	7.0	6.7	6.6	6.5
Dissolved Oxygen (+/- 10%)	mg/L	1.00	0.94	0.93	0.85	0.80	0.79	0.78
Eh / ORP (+/- 10)	MeV	-145.4	-157.1	-160.7	-175.7	-178.9	-182.8	-185.0
Specific Conductivity (+/- 3%)	mS/cm^c	224.1	273.8	317.9	368.7	398.9	396.1	398.7
Conductivity (+/- 3%)	mS/cm	0.179	0.201	0.218	0.254	0.259	0.262	0.264
pH (+/- 0.1)	pH unit	7.29	7.39	7.44	7.59	7.73	7.77	7.80
Temp (+/- 0.5)	C°	7.3	7.5	7.6	7.4	7.2	7.2	7.2
Color	Visual	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	—	—	—	—	—	—	—

Comments:

Sampled @ 1325

H-sample @ 1420

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-16 Date: 12/12/19

Samplers: AG and JK

Sample Number: MW-16 121219 QA/QC Collected? MS / MSD

Purging / Sampling Method: Bladder Pump and dedicated tubing

1. L = Well Depth: 69.20 feet
2. D = Riser Diameter (I.D.): ______ feet
3. W = Depth to Water: 63.85 feet
4. C = Column of Water in Well: ______ feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$ ______ gal
6. 3(V) = Target Purge Volume ______ gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using NTU + YSI

Parameter	Units	Readings						
Time	24 hr	0915	0920	0925	0930	0935	0940	0945
Water Level (0.33)	feet	63.85	63.85	63.85	63.85	63.85	63.85	63.85
Volume Purged	gal	—	0.20	0.40	0.60	0.80	1.00	1.20
Flow Rate	mL/min	240	240	240	240	240	240	240
Turbidity (+/- 10%)	NTU	2.74	4.31	4.97	3.74	3.96	3.53	3.07
Dissolved Oxygen (+/- 10%)	%	94.2	97.5	97.9	98.1	98.0	98.6	98.4
Dissolved Oxygen (+/- 10%)	mg/L	10.93	10.93	10.92	10.92	10.90	10.96	10.98
Eh / ORP (+/- 10)	MeV	72.1	60.3	61.7	63.1	63.9	63.9	64.3
Specific Conductivity (+/- 3%)	mS/cm^c	431.9	431.8	431.3	431.2	431.4	430.5	429.1
Conductivity (+/- 3%)	mS/cm	0.304	0.311	0.312	0.313	0.311	0.312	0.310
pH (+/- 0.1)	pH unit	7.74	7.40	7.33	7.30	7.28	7.27	7.27
Temp (+/- 0.5)	C°	9.7	10.4	10.5	10.6	10.5	10.6	10.5
Color	Visual	clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	—	—	—	—	—	—	—

Comments:

sampled @ 1000

NO IRON
NO H-SAMPLE

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-26 Date: 12/12/19

Samplers: AG and JK

Sample Number: MW-26 121219 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump and dedicated tubing

1. L = Well Depth: 108.79 feet
2. D = Riser Diameter (I.D.): ______ feet
3. W = Depth to Water: 61.65 feet
4. C = Column of Water in Well: ______ feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$ ______ gal
6. 3(V) = Target Purge Volume ______ gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using NTU + YSI

Parameter	Units	Readings						
Time	24 hr	1640	1045	1050	1055	1100	1105	1110
Water Level (0.33)	feet	61.65	61.65	61.65	61.65	61.65	61.65	61.65
Volume Purged	gal	—	0.20	0.40	0.60	0.80	01.00	1.20
Flow Rate	mL/min	190	190	190	190	190	190	190
Turbidity (+/- 10%)	NTU	9.77	8.14	10.44	14.39	13.01	11.60	10.33
Dissolved Oxygen (+/- 10%)	%	48.6	46.3	44.3	39.9	36.5	34.4	29.0
Dissolved Oxygen (+/- 10%)	mg/L	6.24	5.82	5.52	4.93	4.55	4.23	3.64
Eh / ORP (+/- 10)	MeV	58.3	49.1	45.0	41.7	40.0	37.2	26.9
Specific Conductivity (+/- 3%)	mS/cm^c	151.2	148.8	148.6	148.9	149.8	150.6	155.5
Conductivity (+/- 3%)	mS/cm	0.091	0.094	0.094	0.095	0.095	0.095	0.098
pH (+/- 0.1)	pH unit	7.74	7.44	7.38	7.32	7.30	7.28	7.27
Temp (+/- 0.5)	C°	4.5	5.7	5.7	6.1	6.0	6.0	5.8
Color	Visual	Clear	clear	clear	clear	clear	clear	clear
Odor	Olfactory	—	—	—	—	—	—	—

Comments:

Sampled @ 1145

No IRON
No H-sample

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-26 cont Date: 12/12/19

Samplers: AG and JK

Sample Number: MW-26121219 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump and dedicated tubing

1. L = Well Depth: 108.79 feet
2. D = Riser Diameter (I.D.): ______ feet
3. W = Depth to Water: 61.65 feet
4. C = Column of Water in Well: ______ feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$ ______ gal
6. 3(V) = Target Purge Volume ______ gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using NTU + YSI

Parameter	Units	Readings						
Time	24 hr	1115	1120	1125	1130	1135		
Water Level (0.33)	feet	61.65	61.65	61.65	61.65	61.65		
Volume Purged	gal	1.40	1.60	1.80	2.00	2.20		
Flow Rate	mL/min	190	190	190	190	190		
Turbidity (+/- 10%)	NTU	5.4	3.31	2.07	1.96	1.79		
Dissolved Oxygen (+/- 10%)	%	9.10	4.1	3.2	2.9	3.0		
Dissolved Oxygen (+/- 10%)	mg/L	1.10	0.51	0.40	0.37	0.36		
Eh / ORP (+/- 10)	MeV	-74.9	-108.7	-116.1	-117.9	-119.0		
Specific Conductivity (+/- 3%)	mS/cm^c	216.4	240.9	249.0	250.9	251.5		
Conductivity (+/- 3%)	mS/cm	0.135	0.153	0.158	0.160	0.161		
pH (+/- 0.1)	pH unit	7.26	7.33	7.36	7.37	7.37		
Temp (+/- 0.5)	C°	5.9	5.9	5.8	5.9	5.9		
Color	Visual	clear	clear	clear	clear	clear		
Odor	Olfactory	—	—	—	—	—		

Comments:

Sampled @ 1145

NO IRON
NO H. SAMPLE

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-24 Date: 12/12/19

Samplers: AG and JK

Sample Number: MW-24121219 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump and dedicated tubing

1. L = Well Depth: 105.40 feet
2. D = Riser Diameter (I.D.): ______ feet
3. W = Depth to Water: 66.79 feet
4. C = Column of Water in Well: ______ feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$ ______ gal
6. 3(V) = Target Purge Volume ______ gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using NTU + YSI

Parameter	Units	Readings						
Time	24 hr	1300	1305	1310	1315	1320	1325	1330
Water Level (0.33)	feet	66.79	66.79	66.79	66.79	66.79	66.79	66.79
Volume Purged	gal	—	0.15	0.30	0.45	0.60	0.75	0.90
Flow Rate	mL/min	200	200	200	200	200	200	200
Turbidity (+/- 10%)	NTU	0.01	0.02	0.01	0.01	0.00	0.00	0.00
Dissolved Oxygen (+/- 10%)	%	5.7	3.2	2.8	2.3	2.1	1.7	1.5
Dissolved Oxygen (+/- 10%)	mg/L	0.68	0.38	0.33	0.28	0.24	0.21	0.18
Eh / ORP (+/- 10)	MeV	-162.5	-171.7	-174.9	-178.7	-182.3	-185.1	-188.0
Specific Conductivity (+/- 3%)	mS/cm^c	236.3	236.4	236.4	236.0	236.5	235.9	236.0
Conductivity (+/- 3%)	mS/cm	0.159	0.160	0.156	0.157	0.162	0.161	0.162
pH (+/- 0.1)	pH unit	7.90	7.66	7.66	7.65	7.64	7.64	7.63
Temp (+/- 0.5)	C°	7.7	8.3	7.3	7.6	8.5	8.4	8.6
Color	Visual	Clear	Clear	clear	Clear	Clear	Clear	clear
Odor	Olfactory	—	—	—	—	—	—	—

Comments:

Sampled @ 1350

*Black at end of tubing

NO IRON

No H-Sample

Monitoring Well Purging / Sampling Form

Project Name and Number: Scotia Navy Depot

Monitoring Well Number: MW-24 con't Date: 12/12/19

Samplers: AG and JK

Sample Number: MW-24121219 QA/QC Collected? No

Purging / Sampling Method: Bladder Pump and dedicated tubing

1. L = Well Depth: 105.40 feet
2. D = Riser Diameter (I.D.): ______ feet
3. W = Depth to Water: 66.79 feet
4. C = Column of Water in Well: ______ feet
5. V = Volume of Water in Well = $C(3.14159)(0.5D)^2(7.48)$ ______ gal
6. 3(V) = Target Purge Volume ______ gal

D (inches)	D (feet)
1-inch	0.08
2-inch	0.17
3-inch	0.25
4-inch	0.33
6-inch	0.50

Conversion factors to determine V given C

D (inches)	1-inch	2-inch	3-inch	4-inch	6-inch
V (gal / ft)	0.041	0.163	0.37	0.65	1.5

Water Quality Readings Collected Using NTU + YSI

Parameter	Units	✓	Readings					
Time	24 hr	1335						
Water Level (0.33)	feet	66.79						
Volume Purged	gal	1.10						
Flow Rate	mL/min	200						
Turbidity (+/- 10%)	NTU	0.0						
Dissolved Oxygen (+/- 10%)	%	1.5						
Dissolved Oxygen (+/- 10%)	mg/L	0.18						
Eh / ORP (+/- 10)	MeV	-189.1						
Specific Conductivity (+/- 3%)	mS/cm^c	236.8						
Conductivity (+/- 3%)	mS/cm	0.161						
pH (+/- 0.1)	pH unit	7.64						
Temp (+/- 0.5)	C°	8.4						
Color	Visual	clear						
Odor	Olfactory	—						

Comments:

Sampled @ 1350

NO IRON

NO H. SAMPLE

APPENDIX B: Field Calibration Forms

Calibration Record

Project Name: Scotia Navy Depot

Personnel: Jillian K, Alex G.

Instrument: YSI +NTU

Parameter	Units	Calibration Readings			
		Start	Finish	Start	Finish
Date	-	12/9/19		12/9/19	
Time	24 hr	1300		1500	
Temperature	°F				
pH1	pH unit	8.11	7.00	7.39	7.00
pH2	pH unit	3.94	4.00	3.81	4.00
pH3	pH unit	10.03	10.00	10.30	10.00
ORP	MeV	224.1	220	231.4	220
Conductivity	mS/cm	1340	1413	1382	1413
Turbidity	NTU	0.1	0.0	0.0	0.0
D.O.	mg/L	14.3	0.0	0.6	0.0

Parameter	Units	Calibration Readings			
		Start	Finish	Start	Finish
Date	-	12/9/19		12/9/19	
Time	24 hr	1300		1500	
Temperature	°F				
pH1	pH unit	7.21	7.00	7.83	7.00
pH2	pH unit	3.90	4.00	4.08	4.00
pH3	pH unit	10.14	10.00	10.33	10.00
ORP	MeV	232.2	220	225.4	220
Conductivity	mS/cm	1507	1413	1480	1413
Turbidity	NTU	0.0	0.0	0.0	0.0
D.O.	mg/L	0.0	0.0	0.0	0.0

Calibration Record

Project Name: Scotia Navy Depot

Personnel: AG + JK

Instrument: YSI + NTU

Parameter	Units	Calibration Readings			
		Start	Finish	Start	Finish
Date	-	12/10/19		12/10/19	
Time	24 hr	0740		1425	
Temperature	°F	48°F		48°F	
pH1	pH unit	9.20	7.00	8.78	7.00
pH2	pH unit	3.78	4.00	4.18	4.00
pH3	pH unit	10.63	10.00	10.20	10.00
ORP	MeV	235.4	220.0	245.1	220.0
Conductivity	mS/cm	1285	1413.0	1399	1413.0
Turbidity	NTU	0.1	0.0	0.0	0.0
D.O.	mg/L	21.8	0.0	0.0	0.0

Parameter	Units	Calibration Readings			
		Start	Finish	Start	Finish
Date	-	12/10/19		12/10/19	
Time	24 hr	0740		1425	
Temperature	°F	48.0°F		48.0°F	
pH1	pH unit	6.86	7.00	6.93	7.00
pH2	pH unit	3.80	4.00	3.88	4.00
pH3	pH unit	10.01	10.00	10.08	10.00
ORP	MeV	243.8	220.0	230.8	220.0
Conductivity	mS/cm	1420	1413	1415	1413
Turbidity	NTU	0.2	0.0	0.0	0.0
D.O.	mg/L	20.6	0.0	0.9	0.0

Calibration Record

Project Name: Scotia Navy Depot

Personnel: Jillian K, Alex G

Instrument: YSI +NTU

Parameter	Units	Calibration Readings			
		Start	Finish	Start	Finish
Date	-	12/11/19		12/11/19	
Time	24 hr	0730		1430	
Temperature	°F	27°F		26°F	
pH1	pH unit	6.31	7.00	7.08	7.00
pH2	pH unit	5.16	4.00	4.18	4.00
pH3	pH unit	10.78	10.00	10.20	10.00
ORP	MeV	251.9	220	245.1	220
Conductivity	mS/cm	1294	1413	1399	1413
Turbidity	NTU	0.1	0.0	0.0	0.0
D.O.	mg/L	22.6	0.0	0.0	0.0

Parameter	Units	Calibration Readings			
		Start	Finish	Start	Finish
Date	-	12/11/19		12/11/19	
Time	24 hr	0730		1430	
Temperature	°F	27°F		26°F	
pH1	pH unit	6.87	7.00	7.14	7.00
pH2	pH unit	4.88	4.00	4.10	4.00
pH3	pH unit	10.23	10.00	9.79	10.00
ORP	MeV	263.4	220	215.6	220
Conductivity	mS/cm	1436	1413	1445	1413
Turbidity	NTU	0.1	0.0	0.0	0.0
D.O.	mg/L	19.1	0.0	0.0	0.0

Calibration Record

Project Name: Scotia

Personnel: AG | JK

Instrument: YSI + NTU

Parameter	Units	Calibration Readings			
		Start	Finish	Start	Finish
Date	-	12/12/19		12/12/19	
Time	24 hr	0800	0900	1400	
Temperature	°F	13°		15°F	
pH1	pH unit	3.81	4.00	3.93	4.00
pH2	pH unit	6.82	7.00	6.89	7.00
pH3	pH unit	9.98	10.0	10.03	10.00
ORP	MeV	235.6	220.0	244.4	220.0
Conductivity	mS/cm	1107	960 *	1101	960 *
Turbidity	NTU	0.1	0.0	0.0	0.0
D.O.	mg/L	—	0.0	—	0.0

960 standard per temp

Parameter	Units	Calibration Readings			
		Start	Finish	Start	Finish
Date	-				
Time	24 hr				
Temperature	°F				
pH1	pH unit				
pH2	pH unit				
pH3	pH unit				
ORP	MeV				
Conductivity	mS/cm				
Turbidity	NTU				
D.O.	mg/L				

APPENDIX C: Hydraulic Gradient and Velocity Calculations

December 2019 Annual Monitoring Report
The Defense National Stockpile Center Scotia Depot
Appendix C Hydraulic Gradient and Velocity Calculations

Hydraulic Gradient Calculation

$$hydraulic\ gradient = \frac{change\ in\ groundwater\ elevation}{change\ in\ distance} = \frac{\Delta h}{\Delta L}$$

December 2019 Data		GW Elevation (ft)	Delta Elevation (ft)	Delta Distance (ft)	Gradient	**Average Gradient (ft/ft)**
Pair 1	MW-25	224.69	-0.11	540	-0.000203704	**0.006874**
	MW-26	224.80				
Pair 2	GEP-3	228.81	4.69	420	0.011166667	
	MW-13	224.12				
Pair 3	MW-17	229.80	3.96	410	0.009658537	
	MW-28	225.84				

Groundwater Darcy Velocity

$$Darcy\ Velocty = K \times hydraulic\ gradient = K \times \frac{\Delta h}{\Delta L}$$

Low Hydraulic Conductivity (K) (ft/day)	15.66
High Hydraulic Conductivity (K) (ft/day)	193.8

Darcy Velocity Low (ft/day)	0.11
Darcy Velocity High (ft/day)	1.33

Seepage Velocity

$$\text{Seepage } Velocty = \frac{K \times hydraulic\ gradient}{n} = \frac{Darcy\ Velocity}{n}$$

Porosity (n)	0.4

Seepage Velocity Low (ft/day)	**0.27**
Seepage Velocity High (ft/day)	**3.33**

APPENDIX D: Laboratory Reports

ALS Environmental
301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

December 20, 2019

Ms. Gerlinde Wolfe
AECOM - Latham NY
40 British American Blvd
Albany, NY 12210

Certificate of Analysis

Project Name:	**2015-SCOTIA NAVY DEPOT-PO 60440641**	Workorder:	**3074551**
Purchase Order:	**66432/60440641.11**	Workorder ID:	**ASN052|2015-SCOTIA NAVY DEPOT-**

Dear Ms. Wolfe:

Enclosed are the analytical results for samples received by the laboratory on Tuesday, December 10, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Mrs. Vanessa N Badman (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

CC: Mr. Greg Malzone , Mr. Daniel Servetas , Mr. Scott Underhill

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Vanessa N. Badman
Mrs. Vanessa N Badman
Project Coordinator

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

December 20, 2019

Ms. Gerlinde Wolfe
AECOM - Latham NY
40 British American Blvd
Albany, NY 12210

Certificate of Analysis

Project Name:	**2015-SCOTIA NAVY DEPOT-PO 60440641**	Workorder:	**3074551**
Purchase Order:	**66432/60440641.11**	Workorder ID:	**ASN052|2015-SCOTIA NAVY DEPOT-**

Dear Ms. Wolfe:

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Greg Malzone , Mr. Daniel Servetas , Mr. Scott Underhill

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Vanessa N. Badman
Mrs. Vanessa N Badman
Project Coordinator

SAMPLE SUMMARY

Workorder: 3074551 ASN052|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3074551001	MW-15 120919	Ground Water	12/9/2019 14:45	12/10/2019 08:47	
3074551002	MW-29 120920	Ground Water	12/9/2019 15:00	12/10/2019 08:47	
3074551003	DUP-1	Ground Water	12/9/2019 15:00	12/10/2019 08:47	

SAMPLE SUMMARY

Workorder: 3074551 ASN052|2015-SCOTIA NAVY DEPOT-

Notes

- -- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- -- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- -- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- -- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- -- The Chain of Custody document is included as part of this report.
- -- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- -- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
- -- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
- -- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- -- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

ALS Environmental
301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3074551 ASN052|2015-SCOTIA NAVY DEPOT-

Lab ID:	**3074551001**	Date Collected:	12/9/2019 14:45	Matrix:	Ground Water
Sample ID:	**MW-15 120919**	Date Received:	12/10/2019 08:47		

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:16	PDK	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:16	PDK	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:16	PDK	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:16	PDK	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:16	PDK	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:16	PDK	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:16	PDK	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:16	PDK	A
Tetrachloroethene	0.92J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:16	PDK	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:16	PDK	A
1,1,1-Trichloroethane	4.4		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:16	PDK	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:16	PDK	A
Trichloroethene	105		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:16	PDK	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:16	PDK	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	81 - 118			SW846 8260C			12/13/19 03:16	PDK	A
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C			12/13/19 03:16	PDK	A
Dibromofluoromethane (S)	97.5		%	80 - 119			SW846 8260C			12/13/19 03:16	PDK	A
Toluene-d8 (S)	94.6		%	89 - 112			SW846 8260C			12/13/19 03:16	PDK	A
LIGHT HYDROCARBON GASES												
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175			12/12/19 08:35	CHS	D
Ethane	3.3U	U	ug/L	3.3	3.3	0.55	RSK 175			12/12/19 08:35	CHS	D
Ethene	2.4U	U	ug/L	2.4	2.4	0.81	RSK 175			12/12/19 08:35	CHS	D
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175			12/12/19 08:35	CHS	D
Methane	1.5U	U	ug/L	1.5	1.5	0.53	RSK 175			12/12/19 08:35	CHS	D
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175			12/12/19 08:35	CHS	D
WET CHEMISTRY												
Alkalinity, Total	200	1	mg/L	5	5	0.8	SM2320B-2011			12/18/19 18:52	MBW	I
Chloride	34.4		mg/L	2.0	0.50	0.16	EPA 300.0			12/11/19 03:40	CHW	H
Nitrate-N	0.50		mg/L	0.20	0.060	0.020	EPA 300.0			12/11/19 03:40	CHW	H
Sulfate	12.1		mg/L	2.0	0.50	0.20	EPA 300.0			12/11/19 03:40	CHW	H
Total Organic Carbon (TOC)	0.83J	J	mg/L	1.0	0.50	0.18	SM5310B-2011			12/12/19 08:43	PAG	F

ANALYTICAL RESULTS

Workorder: 3074551 ASN052|2015-SCOTIA NAVY DEPOT-

Lab ID:	**3074551001**	Date Collected:	12/9/2019 14:45	Matrix:	Ground Water
Sample ID:	**MW-15 120919**	Date Received:	12/10/2019 08:47		

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*

Vanessa N. Badman
Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3074551 ASN052|2015-SCOTIA NAVY DEPOT-

Lab ID: **3074551002** Date Collected: 12/9/2019 15:00 Matrix: Ground Water

Sample ID: **MW-29 120920** Date Received: 12/10/2019 08:47

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.60J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
1,1-Dichloroethane	0.93J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
1,1-Dichloroethene	0.43J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
cis-1,2-Dichloroethene	4.6		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
Tetrachloroethene	27.9		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
1,1,1-Trichloroethane	9.4		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
1,1,2-Trichloroethane	0.42J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
Trichloroethene	149		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	100		%	81 - 118	SW846 8260C			12/13/19 06:40	PDK	A
4-Bromofluorobenzene (S)	103		%	85 - 114	SW846 8260C			12/13/19 06:40	PDK	A
Dibromofluoromethane (S)	97.4		%	80 - 119	SW846 8260C			12/13/19 06:40	PDK	A
Toluene-d8 (S)	95.5		%	89 - 112	SW846 8260C			12/13/19 06:40	PDK	A

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
LIGHT HYDROCARBON GASES												
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175			12/12/19 09:02	CHS	D
Ethane	3.3U	U	ug/L	3.3	3.3	0.55	RSK 175			12/12/19 09:02	CHS	D
Ethene	2.4U	U	ug/L	2.4	2.4	0.81	RSK 175			12/12/19 09:02	CHS	D
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175			12/12/19 09:02	CHS	D
Methane	1.5U	U	ug/L	1.5	1.5	0.53	RSK 175			12/12/19 09:02	CHS	D
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175			12/12/19 09:02	CHS	D
WET CHEMISTRY												
Alkalinity, Total	303	1	mg/L	5	5	0.8	SM2320B-2011			12/18/19 19:05	MBW	I
Chloride	33.8		mg/L	2.0	0.50	0.16	EPA 300.0			12/11/19 03:56	CHW	H
Nitrate-N	0.90		mg/L	0.20	0.060	0.020	EPA 300.0			12/11/19 03:56	CHW	H
Sulfate	22.7		mg/L	2.0	0.50	0.20	EPA 300.0			12/11/19 03:56	CHW	H
Total Organic Carbon (TOC)	1.4		mg/L	1.0	0.50	0.18	SM5310B-2011			12/12/19 08:43	PAG	F
METALS												
Iron, Total	0.23		mg/L	0.067	0.045	0.022	SW846 6010C	12/11/19	AHI	12/12/19 08:59	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/17/19	SRT	12/17/19 10:45	SRT	K

ANALYTICAL RESULTS

Workorder: 3074551 ASN052|2015-SCOTIA NAVY DEPOT-

Lab ID: **3074551002** Date Collected: 12/9/2019 15:00 Matrix: Ground Water
Sample ID: **MW-29 120920** Date Received: 12/10/2019 08:47

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*

Mrs. Vanessa N Badman
Project Coordinator

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3074551 ASN052|2015-SCOTIA NAVY DEPOT-

Lab ID:	**3074551003**	Date Collected:	12/9/2019 15:00	Matrix:	Ground Water
Sample ID:	**DUP-1**	Date Received:	12/10/2019 08:47		

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.66J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 07:02	PDK	A
1,1-Dichloroethane	0.95J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 07:02	PDK	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 07:02	PDK	A
1,1-Dichloroethene	0.45J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 07:02	PDK	A
cis-1,2-Dichloroethene	4.8		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 07:02	PDK	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 07:02	PDK	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 07:02	PDK	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 07:02	PDK	A
Tetrachloroethene	30.3		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 07:02	PDK	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 07:02	PDK	A
1,1,1-Trichloroethane	10.1		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 07:02	PDK	A
1,1,2-Trichloroethane	0.44J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 07:02	PDK	A
Trichloroethene	162		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 07:02	PDK	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 07:02	PDK	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	81 - 118	SW846 8260C			12/13/19 07:02	PDK	A
4-Bromofluorobenzene (S)	102		%	85 - 114	SW846 8260C			12/13/19 07:02	PDK	A
Dibromofluoromethane (S)	97.7		%	80 - 119	SW846 8260C			12/13/19 07:02	PDK	A
Toluene-d8 (S)	95.8		%	89 - 112	SW846 8260C			12/13/19 07:02	PDK	A

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
LIGHT HYDROCARBON GASES												
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175			12/12/19 09:21	CHS	D
Ethane	3.3U	U	ug/L	3.3	3.3	0.55	RSK 175			12/12/19 09:21	CHS	D
Ethene	2.4U	U	ug/L	2.4	2.4	0.81	RSK 175			12/12/19 09:21	CHS	D
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175			12/12/19 09:21	CHS	D
Methane	1.5U	U	ug/L	1.5	1.5	0.53	RSK 175			12/12/19 09:21	CHS	D
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175			12/12/19 09:21	CHS	D
WET CHEMISTRY												
Alkalinity, Total	307	1	mg/L	5	5	0.8	SM2320B-2011			12/18/19 19:20	MBW	I
Chloride	33.7		mg/L	2.0	0.50	0.16	EPA 300.0			12/11/19 04:11	CHW	H
Nitrate-N	0.90		mg/L	0.20	0.060	0.020	EPA 300.0			12/11/19 04:11	CHW	H
Sulfate	22.7		mg/L	2.0	0.50	0.20	EPA 300.0			12/11/19 04:11	CHW	H
Total Organic Carbon (TOC)	1.0		mg/L	1.0	0.50	0.18	SM5310B-2011			12/12/19 08:43	PAG	F
METALS												
Iron, Total	0.099		mg/L	0.067	0.045	0.022	SW846 6010C	12/11/19	AHI	12/12/19 09:03	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/17/19	SRT	12/17/19 10:48	SRT	K

ANALYTICAL RESULTS

Workorder: 3074551 ASN052|2015-SCOTIA NAVY DEPOT-

Lab ID: **3074551003** Date Collected: 12/9/2019 15:00 Matrix: Ground Water
Sample ID: **DUP-1** Date Received: 12/10/2019 08:47

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*

Vanessa N. Badman
Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3074551 ASN052|2015-SCOTIA NAVY DEPOT-

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3074551001	1	MW-15 120919	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3074551002	1	MW-29 120920	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3074551003	1	DUP-1	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3074551 ASN052|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Analysis Method	Prep Method
3074551001	MW-15 120919	EPA 300.0	
3074551001	MW-15 120919	RSK 175	
3074551001	MW-15 120919	SM2320B-2011	
3074551001	MW-15 120919	SM5310B-2011	
3074551001	MW-15 120919	SW846 8260C	
3074551002	MW-29 120920	EPA 300.0	
3074551002	MW-29 120920	In-House	
3074551002	MW-29 120920	RSK 175	
3074551002	MW-29 120920	SM2320B-2011	
3074551002	MW-29 120920	SM5310B-2011	
3074551002	MW-29 120920	SW846 6010C	SW846 3015
3074551002	MW-29 120920	SW846 6010C	SW846 6010C
3074551002	MW-29 120920	SW846 8260C	
3074551003	DUP-1	EPA 300.0	
3074551003	DUP-1	In-House	
3074551003	DUP-1	RSK 175	
3074551003	DUP-1	SM2320B-2011	
3074551003	DUP-1	SM5310B-2011	
3074551003	DUP-1	SW846 6010C	SW846 3015
3074551003	DUP-1	SW846 6010C	SW846 6010C
3074551003	DUP-1	SW846 8260C	

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

QUALITY CONTROL DATA

Workorder: 3074551 ASN052|2015-SCOTIA NAVY DEPOT-

QC Batch: MDIG/81349 **Analysis Method:** SW846 6010C

QC Batch Method: SW846 3015

Associated Lab Samples: 3074551002, 3074551003

METHOD BLANK: 3058290

Parameter	Blank Result	Units	Reporting Limit
Iron, Total	0.045U	mg/L	0.067

LABORATORY CONTROL SAMPLE: 3058291

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Total	102	mg/L	1.1	1.1	87 - 115

LABORATORY CONTROL SAMPLE: 3058292

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Total	104	mg/L	1.1	1.2	87 - 115

QUALITY CONTROL DATA

Workorder: 3074551 ASN052|2015-SCOTIA NAVY DEPOT-

QC Batch: MDIG/81430 **Analysis Method:** SW846 6010C

QC Batch Method: SW846 6010C

Associated Lab Samples: 3074551002, 3074551003

METHOD BLANK: 3061292

Parameter	Blank Result	Units	Reporting Limit
Iron, Dissolved	0.040U	mg/L	0.060

LABORATORY CONTROL SAMPLE: 3061293

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Dissolved	103	mg/L	1	1.0	87 - 115

LABORATORY CONTROL SAMPLE: 3061294

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Dissolved	101	mg/L	1	1.0	87 - 115

QUALITY CONTROL DATA

Workorder: 3074551 ASN052|2015-SCOTIA NAVY DEPOT-

QC Batch: SVGC/55411 **Analysis Method:** RSK 175

QC Batch Method: RSK 175

Associated Lab Samples: 3074551001, 3074551002, 3074551003

METHOD BLANK: 3058985

Parameter	Blank Result	Units	Reporting Limit
n-Butane	4.3U	ug/L	4.3
Ethane	3.3U	ug/L	3.3
Ethene	2.4U	ug/L	2.4
Isobutane	4.6U	ug/L	4.6
Methane	1.5U	ug/L	1.5
Propane	3.2U	ug/L	3.2
Methyl-t-Butyl ether-d3 (S)			

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

QUALITY CONTROL DATA

Workorder: 3074551 ASN052|2015-SCOTIA NAVY DEPOT-

QC Batch: VOMS/53356 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 3074551001, 3074551002, 3074551003

METHOD BLANK: 3059516

Parameter	Blank Result	Units	Reporting Limit
Carbon Tetrachloride	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,1,1,2-Tetrachloroethane	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.75U	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
Trichloroethene	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	101	%	81 - 118
4-Bromofluorobenzene (S)	102	%	85 - 114
Dibromofluoromethane (S)	97	%	80 - 119
Toluene-d8 (S)	95.8	%	89 - 112

LABORATORY CONTROL SAMPLE: 3059517

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	116	ug/L	20	23.2	72 - 136
1,1-Dichloroethane	120	ug/L	20	23.9	77 - 125
1,2-Dichloroethane	112	ug/L	20	22.3	73 - 128
1,1-Dichloroethene	129	ug/L	20	25.8	71 - 131
cis-1,2-Dichloroethene	115	ug/L	20	23.1	78 - 123
trans-1,2-Dichloroethene	124	ug/L	20	24.9	75 - 124
1,1,1,2-Tetrachloroethane	115	ug/L	20	22.9	78 - 124
1,1,2,2-Tetrachloroethane	108	ug/L	20	21.6	71 - 121
Tetrachloroethene	118	ug/L	20	23.7	74 - 129
Toluene	118	ug/L	20	23.6	80 - 121
1,1,1-Trichloroethane	118	ug/L	20	23.7	74 - 131
1,1,2-Trichloroethane	109	ug/L	20	21.7	80 - 119
Trichloroethene	115	ug/L	20	23.0	79 - 123

QUALITY CONTROL DATA

Workorder: 3074551 ASN052|2015-SCOTIA NAVY DEPOT-

Vinyl Chloride	106	ug/L	20	21.2	58 - 137
1,2-Dichloroethane-d4 (S)	101	%			81 - 118
4-Bromofluorobenzene (S)	104	%			85 - 114
Dibromofluoromethane (S)	101	%			80 - 119
Toluene-d8 (S)	97.2	%			89 - 112

QUALITY CONTROL DATA

Workorder: 3074551 ASN052|2015-SCOTIA NAVY DEPOT-

QC Batch: WETC/231663 **Analysis Method:** EPA 300.0

QC Batch Method: EPA 300.0

Associated Lab Samples: 3074551001, 3074551002, 3074551003

METHOD BLANK: 3058123

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.25U	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 3058125

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Chloride	99.4	mg/L	20	19.9	87 - 111
Nitrate-N	101	mg/L	2.5	2.5	88 - 111
Sulfate	103	mg/L	20	20.6	87 - 112

METHOD BLANK: 3058805

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.25U	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

QUALITY CONTROL DATA

Workorder: 3074551 ASN052|2015-SCOTIA NAVY DEPOT-

QC Batch: WETC/231701 **Analysis Method:** SM5310B-2011

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 3074551001, 3074551002, 3074551003

METHOD BLANK: 3058511

Parameter	Blank Result	Units	Reporting Limit
Total Organic Carbon (TOC)	0.50U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 3058512

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	99.6	mg/L	1	1.0J	85 - 115

MATRIX SPIKE: 3058513 DUPLICATE: 3058514 ORIGINAL: 3074714001

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	.049	mg/L	6	6.392	6.395	106	106	85 - 115	.05	20

MATRIX SPIKE: 3058515 DUPLICATE: 3058516 ORIGINAL: 3074613002

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	1.71	mg/L	6	7.907	7.856	103	102	85 - 115	.65	20

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 3074551 ASN052|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
3074551001	MW-15 120919			EPA 300.0	WETC/231663
3074551002	MW-29 120920			EPA 300.0	WETC/231663
3074551003	DUP-1			EPA 300.0	WETC/231663
3074551002	MW-29 120920	SW846 3015	MDIG/81349	SW846 6010C	META/71510
3074551003	DUP-1	SW846 3015	MDIG/81349	SW846 6010C	META/71510
3074551001	MW-15 120919			SM5310B-2011	WETC/231701
3074551002	MW-29 120920			SM5310B-2011	WETC/231701
3074551003	DUP-1			SM5310B-2011	WETC/231701
3074551001	MW-15 120919			RSK 175	SVGC/55411
3074551002	MW-29 120920			RSK 175	SVGC/55411
3074551003	DUP-1			RSK 175	SVGC/55411
3074551001	MW-15 120919			SW846 8260C	VOMS/53356
3074551002	MW-29 120920			SW846 8260C	VOMS/53356
3074551003	DUP-1			SW846 8260C	VOMS/53356
3074551002	MW-29 120920	SW846 6010C	MDIG/81430	SW846 6010C	META/71575
3074551003	DUP-1	SW846 6010C	MDIG/81430	SW846 6010C	META/71575
3074551001	MW-15 120919			SM2320B-2011	WETC/232006
3074551002	MW-29 120920			SM2320B-2011	WETC/232006
3074551003	DUP-1			SM2320B-2011	WETC/232006

ALS Environmental

34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F.717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Page 1 of 1
Courier: ycs
Tracking #:

3074551

Co. Name: AECOM
Contact (Report to): Geninde Wolf
Phone: 518-951-2370
Address: 40 British American Blvd Latham, NY 12110
Bill to (if different than Report to):
PO#:
Project Name/#: 60440641
ALS Quote #:
TAT: [X] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALS approval and surcharges.
Date Required:
Approved By:
Email? [X] Y geninde.wolf@aecom.com
Fax? Y No.:

Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	8260C	RSK175	Alkalinity	Cl, NO_3, SO_4	TOC	Total Fe	Diss Fe		
***Container Type						CG	CG	PL	PL	AG	PL	PL		
***Container Size						40	40	250	250	40	250	250		
***Preservative						HCl	HCl	—	—	H4	HNO_3	—		
1 MW-15 120919		12/9/19	1445	G	GW	2	2	1	1	2	X	X		
2 MW-29 120919		↓	1500	↓	↓	2	2	1	1	2	1	1		
3 Dup-1		—	—	↓	↓	2	2	1	1	2	1	1		
4														
5														
6														
7														
8														

ANALYSES/METHOD REQUESTED — Enter Number of Containers Per Analysis

AG

(completed by Sample Receiving)
Performed By:
Cooler Temp: 2
Therm. ID:
No. of Coolers:
Notes:

Circle appropriate Y or N.

	Correct containers?	Correct sample volume?	Correct preservation?	Headspace/Volatiles?
	Y N	Y N	Y N	Y N

Custody seals Present?	(if present) Seals Intact?	Received on Ice?	COC/Labels complete/accurate?	Container in good condition?
Y N	Y N	Y N	Y N	Y N

SAMPLED BY (Please Print): Alexandra Golden

Project Comments:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Alexandra Golden AECOM	12/9/19	1530	2 Daniel Hagen ALS	12/9/19	1530
3 Daniel Hagen ALS	12/9/19	1700	4 fedex		
5 fedex			6 [illegible] ALS	12/10/19	0840
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ]
EDDs Required? [ ] If yes, format type:
SDWA Forms? yes [ ] yes [ ] yes [ ] yes [ ] Other
State Samples Collected In? MD [ ] NJ [ ] NY [X] PA [ ]
DOD Criteria Required?

ALS FIELD SERVICES
[X] Pickup
[ ] Labor
[ ] Composite Sampling
[ ] Rental Equipment
[ ] Other:

* G=Grab; C=Composite
**Matrix: Al=Air; DW=Drinking Water; GW=Groundwater; Ol=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater
***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY

Rev 01-2013

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
AECOM	3074551	CLS	12/10

1. Were airbills / tracking numbers present and recorded? Tracking number: 4808 8630 0910	NONE	YES	NO
2. Are Custody Seals on shipping containers intact?	NONE	YES	NO
3. Are Custody Seals on sample containers intact?	NONE	YES	NO
4. Is there a COC (Chain-of-Custody) present?		YES	NO
5. Are the COC and bottle labels complete, legible and in agreement?		YES	NO
5a. Does the COC contain sample locations?		YES	NO
5b. Does the COC contain date and time of sample collection for all samples?		YES	NO
5c. Does the COC contain sample collectors name?		YES	NO
5d. Does the COC note the type(s) of preservation for all bottles?		YES	NO
5e. Does the COC note the number of bottles submitted for each sample?		YES	NO
5f. Does the COC note the type of sample, composite or grab?		YES	NO
5g. Does the COC note the matrix of the sample(s)?		YES	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		YES	NO
8. Are all samples within holding times for the requested analyses?		YES	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		YES	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	N/A	YES	NO
11. Were the samples received on ice?		YES	NO
12. Were sample temperatures measured at 0.0-6.0°C		YES	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	NO
13b. Did the client provide a SDWA PWS ID#?	N/A	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO

Cooler #:

Temperature (°C): 2

Thermometer ID: 318

Radiological (µCi):

COMMENTS (Required for all NO responses above and any sample non-conformance):

Rev. 4/29/2019

ALS Environmental
301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

December 24, 2019

Ms. Gerlinde Wolfe
AECOM - Latham NY
40 British American Blvd
Albany, NY 12210

Certificate of Analysis

Project Name:	**2015-SCOTIA NAVY DEPOT-PO 60440641**	Workorder:	**3074827**
Purchase Order:	**66432/60440641.11**	Workorder ID:	**ASN053|60440641**

Dear Ms. Wolfe:

Enclosed are the analytical results for samples received by the laboratory on Wednesday, December 11, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Mrs. Vanessa N Badman (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Greg Malzone , Mr. Daniel Servetas , Mr. Scott Underhill

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Vanessa N. Badman
Mrs. Vanessa N Badman
Project Coordinator

SAMPLE SUMMARY

Workorder: 3074827 ASN053|60440641

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3074827001	MW-28 121019	Ground Water	12/10/2019 10:40	12/11/2019 09:30	Collected by Client
3074827002	MW-30 121019	Ground Water	12/10/2019 13:20	12/11/2019 09:30	Collected by Client
3074827003	MW-31 121019	Ground Water	12/10/2019 13:45	12/11/2019 09:30	Collected by Client

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

SAMPLE SUMMARY

Workorder: 3074827 ASN053|60440641

Notes

-- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
-- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
-- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
-- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
-- The Chain of Custody document is included as part of this report.
-- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
-- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
-- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
-- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
-- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

ANALYTICAL RESULTS

Workorder: 3074827 ASN053|60440641

Lab ID: **3074827001** Date Collected: 12/10/2019 10:40 Matrix: Ground Water
Sample ID: **MW-28 121019** Date Received: 12/11/2019 09:30

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.51J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:38	PDK	J
1,1-Dichloroethane	0.98J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:38	PDK	J
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:38	PDK	J
1,1-Dichloroethene	0.45J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:38	PDK	J
cis-1,2-Dichloroethene	5.9		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:38	PDK	J
trans-1,2-Dichloroethene	0.37J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:38	PDK	J
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:38	PDK	J
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:38	PDK	J
Tetrachloroethene	33.6		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:38	PDK	J
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:38	PDK	J
1,1,1-Trichloroethane	9.5		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:38	PDK	J
1,1,2-Trichloroethane	0.38J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:38	PDK	J
Trichloroethene	219		ug/L	5.0	3.8	1.7	SW846 8260C			12/18/19 17:41	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 03:38	PDK	J

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	102		%	81 - 118	SW846 8260C			12/13/19 03:38	PDK	J
1,2-Dichloroethane-d4 (S)	104		%	81 - 118	SW846 8260C			12/18/19 17:41	TMP	A
4-Bromofluorobenzene (S)	103		%	85 - 114	SW846 8260C			12/13/19 03:38	PDK	J
4-Bromofluorobenzene (S)	109		%	85 - 114	SW846 8260C			12/18/19 17:41	TMP	A
Dibromofluoromethane (S)	98.2		%	80 - 119	SW846 8260C			12/13/19 03:38	PDK	J
Dibromofluoromethane (S)	102		%	80 - 119	SW846 8260C			12/18/19 17:41	TMP	A
Toluene-d8 (S)	95.3		%	89 - 112	SW846 8260C			12/13/19 03:38	PDK	J
Toluene-d8 (S)	97.6		%	89 - 112	SW846 8260C			12/18/19 17:41	TMP	A

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
LIGHT HYDROCARBON GASES												
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175			12/12/19 09:44	CHS	C
Ethane	3.3U	U	ug/L	3.3	3.3	0.55	RSK 175			12/12/19 09:44	CHS	C
Ethene	2.4U	U	ug/L	2.4	2.4	0.81	RSK 175			12/12/19 09:44	CHS	C
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175			12/12/19 09:44	CHS	C
Methane	1.5U	U	ug/L	1.5	1.5	0.53	RSK 175			12/12/19 09:44	CHS	C
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175			12/12/19 09:44	CHS	C
WET CHEMISTRY												
Alkalinity, Total	307	1	mg/L	5	5	0.8	SM2320B-2011			12/19/19 05:15	DXC	I
Chloride	38.0		mg/L	2.0	0.50	0.16	EPA 300.0			12/12/19 05:07	CHW	F
Nitrate-N	0.74		mg/L	0.20	0.060	0.020	EPA 300.0			12/12/19 05:07	CHW	F
Sulfate	22.0		mg/L	2.0	0.50	0.20	EPA 300.0			12/12/19 05:07	CHW	F
Total Organic Carbon (TOC)	1.0		mg/L	1.0	0.50	0.18	SM5310B-2011			12/16/19 21:19	PAG	G

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3074827 ASN053|60440641

Lab ID:	**3074827001**	Date Collected:	12/10/2019 10:40	Matrix:	Ground Water
Sample ID:	**MW-28 121019**	Date Received:	12/11/2019 09:30		

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*
METALS												
Iron, Total	0.045U	U	mg/L	0.067	0.045	0.022	SW846 6010C	12/11/19	AHI	12/12/19 09:07	SRT	D
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/17/19	SRT	12/17/19 10:52	SRT	E

Vanessa N. Badman
Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3074827 ASN053|60440641

Lab ID: **3074827002** Date Collected: 12/10/2019 13:20 Matrix: Ground Water

Sample ID: **MW-30 121019** Date Received: 12/11/2019 09:30

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
Trichloroethene	6.5		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	102		%	81 - 118	SW846 8260C			12/13/19 04:01	PDK	J
4-Bromofluorobenzene (S)	103		%	85 - 114	SW846 8260C			12/13/19 04:01	PDK	J
Dibromofluoromethane (S)	98.1		%	80 - 119	SW846 8260C			12/13/19 04:01	PDK	J
Toluene-d8 (S)	95.6		%	89 - 112	SW846 8260C			12/13/19 04:01	PDK	J

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
LIGHT HYDROCARBON GASES												
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175			12/12/19 10:18	CHS	C
Ethane	23.4		ug/L	3.3	3.3	0.55	RSK 175			12/12/19 10:18	CHS	C
Ethene	2.0J	J	ug/L	2.4	2.4	0.81	RSK 175			12/12/19 10:18	CHS	C
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175			12/12/19 10:18	CHS	C
Methane	5670		ug/L	1.5	1.5	0.53	RSK 175			12/12/19 10:18	CHS	C
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175			12/12/19 10:18	CHS	C
WET CHEMISTRY												
Alkalinity, Total	74	1	mg/L	5	5	0.8	SM2320B-2011			12/19/19 05:15	DXC	I
Chloride	38.3		mg/L	2.0	0.50	0.16	EPA 300.0			12/12/19 05:22	CHW	F
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			12/12/19 05:22	CHW	F
Sulfate	0.50U	U	mg/L	2.0	0.50	0.20	EPA 300.0			12/12/19 05:22	CHW	F
Total Organic Carbon (TOC)	8.8		mg/L	1.0	0.50	0.18	SM5310B-2011			12/17/19 04:06	PAG	G
METALS												
Iron, Total	0.42		mg/L	0.067	0.045	0.022	SW846 6010C	12/11/19	AHI	12/12/19 09:10	SRT	D
Iron, Dissolved	0.11		mg/L	0.060	0.040	0.020	SW846 6010C	12/17/19	SRT	12/17/19 10:56	SRT	E

ANALYTICAL RESULTS

Workorder: 3074827 ASN053|60440641

Lab ID:	**3074827002**	Date Collected:	12/10/2019 13:20	Matrix:	Ground Water
Sample ID:	**MW-30 121019**	Date Received:	12/11/2019 09:30		

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*

Vanessa N. Badman
Mrs. Vanessa N Badman
Project Coordinator

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3074827 ASN053|60440641

Lab ID: **3074827003** Date Collected: 12/10/2019 13:45 Matrix: Ground Water
Sample ID: **MW-31 121019** Date Received: 12/11/2019 09:30

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:24	PDK	J
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:24	PDK	J
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:24	PDK	J
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:24	PDK	J
cis-1,2-Dichloroethene	0.34J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:24	PDK	J
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:24	PDK	J
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:24	PDK	J
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:24	PDK	J
Tetrachloroethene	0.44J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:24	PDK	J
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:24	PDK	J
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:24	PDK	J
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:24	PDK	J
Trichloroethene	29.2		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:24	PDK	J
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:24	PDK	J
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	81 - 118			SW846 8260C			12/13/19 04:24	PDK	J
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C			12/13/19 04:24	PDK	J
Dibromofluoromethane (S)	97.6		%	80 - 119			SW846 8260C			12/13/19 04:24	PDK	J
Toluene-d8 (S)	94.8		%	89 - 112			SW846 8260C			12/13/19 04:24	PDK	J
LIGHT HYDROCARBON GASES												
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175			12/12/19 10:35	CHS	C
Ethane	3.9		ug/L	3.3	3.3	0.55	RSK 175			12/12/19 10:35	CHS	C
Ethene	2.4U	U	ug/L	2.4	2.4	0.81	RSK 175			12/12/19 10:35	CHS	C
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175			12/12/19 10:35	CHS	C
Methane	512		ug/L	1.5	1.5	0.53	RSK 175			12/12/19 10:35	CHS	C
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175			12/12/19 10:35	CHS	C
WET CHEMISTRY												
Alkalinity, Total	146	1	mg/L	5	5	0.8	SM2320B-2011			12/19/19 05:15	DXC	I
Chloride	44.3		mg/L	2.0	0.50	0.16	EPA 300.0			12/12/19 05:37	CHW	F
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			12/12/19 05:37	CHW	F
Sulfate	8.8		mg/L	2.0	0.50	0.20	EPA 300.0			12/12/19 05:37	CHW	F
Total Organic Carbon (TOC)	0.79J	J	mg/L	1.0	0.50	0.18	SM5310B-2011			12/17/19 04:06	PAG	G
METALS												
Iron, Total	0.98		mg/L	0.067	0.045	0.022	SW846 6010C	12/11/19	AHI	12/12/19 09:14	SRT	D
Iron, Dissolved	0.023J	J	mg/L	0.060	0.040	0.020	SW846 6010C	12/17/19	SRT	12/17/19 10:59	SRT	E

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ANALYTICAL RESULTS

Workorder: 3074827 ASN053|60440641

Lab ID: **3074827003** Date Collected: 12/10/2019 13:45 Matrix: Ground Water
Sample ID: **MW-31 121019** Date Received: 12/11/2019 09:30

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*

Vanessa N. Badman
Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3074827 ASN053|60440641

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3074827001	1	MW-28 121019	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3074827002	1	MW-30 121019	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3074827003	1	MW-31 121019	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3074827 ASN053|60440641

Lab ID	Sample ID	Analysis Method	Prep Method
3074827001	MW-28 121019	EPA 300.0	
3074827001	MW-28 121019	In-House	
3074827001	MW-28 121019	RSK 175	
3074827001	MW-28 121019	SM2320B-2011	
3074827001	MW-28 121019	SM5310B-2011	
3074827001	MW-28 121019	SW846 6010C	SW846 3015
3074827001	MW-28 121019	SW846 6010C	SW846 6010C
3074827001	MW-28 121019	SW846 8260C	
3074827002	MW-30 121019	EPA 300.0	
3074827002	MW-30 121019	In-House	
3074827002	MW-30 121019	RSK 175	
3074827002	MW-30 121019	SM2320B-2011	
3074827002	MW-30 121019	SM5310B-2011	
3074827002	MW-30 121019	SW846 6010C	SW846 3015
3074827002	MW-30 121019	SW846 6010C	SW846 6010C
3074827002	MW-30 121019	SW846 8260C	
3074827003	MW-31 121019	EPA 300.0	
3074827003	MW-31 121019	In-House	
3074827003	MW-31 121019	RSK 175	
3074827003	MW-31 121019	SM2320B-2011	
3074827003	MW-31 121019	SM5310B-2011	
3074827003	MW-31 121019	SW846 6010C	SW846 3015
3074827003	MW-31 121019	SW846 6010C	SW846 6010C
3074827003	MW-31 121019	SW846 8260C	

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QUALITY CONTROL DATA

Workorder: 3074827 ASN053|60440641

QC Batch: MDIG/81349 **Analysis Method:** SW846 6010C

QC Batch Method: SW846 3015

Associated Lab Samples: 3074827001, 3074827002, 3074827003

METHOD BLANK: 3058290

Parameter	Blank Result	Units	Reporting Limit
Iron, Total	0.045U	mg/L	0.067

LABORATORY CONTROL SAMPLE: 3058291

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Total	102	mg/L	1.1	1.1	87 - 115

LABORATORY CONTROL SAMPLE: 3058292

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Total	104	mg/L	1.1	1.2	87 - 115

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

QUALITY CONTROL DATA

Workorder: 3074827 ASN053|60440641

QC Batch: MDIG/81430 **Analysis Method:** SW846 6010C

QC Batch Method: SW846 6010C

Associated Lab Samples: 3074827001, 3074827002, 3074827003

METHOD BLANK: 3061292

Parameter	Blank Result	Units	Reporting Limit
Iron, Dissolved	0.040U	mg/L	0.060

LABORATORY CONTROL SAMPLE: 3061293

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Dissolved	103	mg/L	1	1.0	87 - 115

LABORATORY CONTROL SAMPLE: 3061294

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Dissolved	101	mg/L	1	1.0	87 - 115

QUALITY CONTROL DATA

Workorder: 3074827 ASN053|60440641

QC Batch: SVGC/55411 **Analysis Method:** RSK 175

QC Batch Method: RSK 175

Associated Lab Samples: 3074827001, 3074827002, 3074827003

METHOD BLANK: 3058985

Parameter	Blank Result	Units	Reporting Limit
n-Butane	4.3U	ug/L	4.3
Ethane	3.3U	ug/L	3.3
Ethene	2.4U	ug/L	2.4
Isobutane	4.6U	ug/L	4.6
Methane	1.5U	ug/L	1.5
Propane	3.2U	ug/L	3.2
Methyl-t-Butyl ether-d3 (S)			

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QUALITY CONTROL DATA

Workorder: 3074827 ASN053|60440641

QC Batch: VOMS/53356 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 3074827001, 3074827002, 3074827003

METHOD BLANK: 3059516

Parameter	Blank Result	Units	Reporting Limit
Carbon Tetrachloride	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,1,1,2-Tetrachloroethane	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.75U	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
Trichloroethene	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	101	%	81 - 118
4-Bromofluorobenzene (S)	102	%	85 - 114
Dibromofluoromethane (S)	97	%	80 - 119
Toluene-d8 (S)	95.8	%	89 - 112

LABORATORY CONTROL SAMPLE: 3059517

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	116	ug/L	20	23.2	72 - 136
1,1-Dichloroethane	120	ug/L	20	23.9	77 - 125
1,2-Dichloroethane	112	ug/L	20	22.3	73 - 128
1,1-Dichloroethene	129	ug/L	20	25.8	71 - 131
cis-1,2-Dichloroethene	115	ug/L	20	23.1	78 - 123
trans-1,2-Dichloroethene	124	ug/L	20	24.9	75 - 124
1,1,1,2-Tetrachloroethane	115	ug/L	20	22.9	78 - 124
1,1,2,2-Tetrachloroethane	108	ug/L	20	21.6	71 - 121
Tetrachloroethene	118	ug/L	20	23.7	74 - 129
Toluene	118	ug/L	20	23.6	80 - 121
1,1,1-Trichloroethane	118	ug/L	20	23.7	74 - 131
1,1,2-Trichloroethane	109	ug/L	20	21.7	80 - 119
Trichloroethene	115	ug/L	20	23.0	79 - 123

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QUALITY CONTROL DATA

Workorder: 3074827 ASN053|60440641

Vinyl Chloride	106	ug/L	20	21.2	58 - 137
1,2-Dichloroethane-d4 (S)	101	%			81 - 118
4-Bromofluorobenzene (S)	104	%			85 - 114
Dibromofluoromethane (S)	101	%			80 - 119
Toluene-d8 (S)	97.2	%			89 - 112

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QUALITY CONTROL DATA

Workorder: 3074827 ASN053|60440641

QC Batch: VOMS/53408 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 3074827001

METHOD BLANK: 3061715

Parameter	Blank Result	Units	Reporting Limit
Trichloroethene	0.75U	ug/L	1.0
1,1,1,2-Tetrachloroethane	0.75U	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
Carbon Tetrachloride	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	105	%	81 - 118
4-Bromofluorobenzene (S)	107	%	85 - 114
Dibromofluoromethane (S)	101	%	80 - 119
Toluene-d8 (S)	97.6	%	89 - 112

LABORATORY CONTROL SAMPLE: 3061716

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Trichloroethene	114	ug/L	20	22.7	79 - 123
1,1,1,2-Tetrachloroethane	111	ug/L	20	22.1	78 - 124
1,1,1-Trichloroethane	118	ug/L	20	23.6	74 - 131
1,1,2,2-Tetrachloroethane	107	ug/L	20	21.4	71 - 121
1,1,2-Trichloroethane	108	ug/L	20	21.6	80 - 119
1,1-Dichloroethane	119	ug/L	20	23.7	77 - 125
1,1-Dichloroethene	129	ug/L	20	25.8	71 - 131
1,2-Dichloroethane	113	ug/L	20	22.5	73 - 128
Carbon Tetrachloride	111	ug/L	20	22.2	72 - 136
Tetrachloroethene	117	ug/L	20	23.5	74 - 129
Toluene	117	ug/L	20	23.3	80 - 121
Vinyl Chloride	96.8	ug/L	20	19.4	58 - 137
cis-1,2-Dichloroethene	115	ug/L	20	23.1	78 - 123

QUALITY CONTROL DATA

Workorder: 3074827 ASN053|60440641

trans-1,2-Dichloroethene	126*	ug/L	20	25.2	75 - 124
1,2-Dichloroethane-d4 (S)	103	%			81 - 118
4-Bromofluorobenzene (S)	106	%			85 - 114
Dibromofluoromethane (S)	102	%			80 - 119
Toluene-d8 (S)	99.1	%			89 - 112

MATRIX SPIKE: 3062294 DUPLICATE: 3062295 ORIGINAL: 3075513001

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Trichloroethene	0	ug/L	20	23.4251	24.4369	117	122	79 - 123	4.23	30
1,1,1,2-Tetrachloroethane	0	ug/L	20	23.2957	23.4909	116	117	78 - 124	.83	30
1,1,1-Trichloroethane	0	ug/L	20	24.6227	25.2931	123	126	74 - 131	2.69	30
1,1,2,2-Tetrachloroethane	0	ug/L	20	22.4467	21.1754	112	106	71 - 121	5.83	30
1,1,2-Trichloroethane	0	ug/L	20	33.7048	23.4105	169*	117	80 - 119	36	30
1,1-Dichloroethane	0	ug/L	20	24.2271	25.5678	121	128*	77 - 125	5.38	30
1,1-Dichloroethene	0	ug/L	20	26.7485	28.3759	134*	142*	71 - 131	5.9	30
1,2-Dichloroethane	0	ug/L	20	22.5835	23.448	113	117	73 - 128	3.76	30
Carbon Tetrachloride	0	ug/L	20	22.6047	23.7224	113	119	72 - 136	4.83	30
Tetrachloroethene	0	ug/L	20	24.058	23.9599	120	120	74 - 129	.41	30
Toluene	0	ug/L	20	24.9788	25.1102	125*	126*	80 - 121	.52	30
Vinyl Chloride	0	ug/L	20	20.8319	22.1502	104	111	58 - 137	6.13	30
cis-1,2-Dichloroethene	0	ug/L	20	23.4366	24.6507	117	123	78 - 123	5.05	30
trans-1,2-Dichloroethene	0	ug/L	20	25.6957	26.9336	128*	135*	75 - 124	4.7	30
1,2-Dichloroethane-d4 (S)	102	%				102	103	81 - 118		
4-Bromofluorobenzene (S)	110	%				110	109	85 - 114		
Dibromofluoromethane (S)	102	%				102	102	80 - 119		
Toluene-d8 (S)	101	%				101	98.3	89 - 112		

QUALITY CONTROL DATA

Workorder: 3074827 ASN053|60440641

QC Batch: WETC/231740 **Analysis Method:** EPA 300.0

QC Batch Method: EPA 300.0

Associated Lab Samples: 3074827001, 3074827002, 3074827003

METHOD BLANK: 3058911

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.25U	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 3058913

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Chloride	97.7	mg/L	20	19.5	87 - 111
Nitrate-N	100	mg/L	2.5	2.5	88 - 111
Sulfate	103	mg/L	20	20.6	87 - 112

METHOD BLANK: 3059605

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.25U	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

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QUALITY CONTROL DATA

Workorder: 3074827 ASN053|60440641

QC Batch: WETC/231929 **Analysis Method:** SM5310B-2011

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 3074827001, 3074827002, 3074827003

METHOD BLANK: 3060879

Parameter	Blank Result	Units	Reporting Limit
Total Organic Carbon (TOC)	0.50U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 3060880

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	96.2	mg/L	1	0.96J	85 - 115

MATRIX SPIKE: 3060881 DUPLICATE: 3060882 ORIGINAL: 3074825002

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	.629	mg/L	6	6.779	6.828	103	103	85 - 115	.72	20

MATRIX SPIKE: 3060883 DUPLICATE: 3060884 ORIGINAL: 3074882001

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	1.626	mg/L	6	7.745	7.78	102	103	85 - 115	.45	20

QUALITY CONTROL DATA

Workorder: 3074827 ASN053|60440641

QC Batch: WETC/232054 **Analysis Method:** SM2320B-2011

QC Batch Method: SM2320B-2011

Associated Lab Samples: 3074827001, 3074827002, 3074827003

METHOD BLANK: 3062247

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

METHOD BLANK: 3062253

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

METHOD BLANK: 3062257

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

METHOD BLANK: 3062261

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

METHOD BLANK: 3062265

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

METHOD BLANK: 3062269

Parameter	Blank Result	Units	Reporting Limit

QUALITY CONTROL DATA

Workorder: 3074827 ASN053|60440641

Alkalinity, Total	5U	mg/L	5

METHOD BLANK: 3062273

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

METHOD BLANK: 3062277

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

METHOD BLANK: 3062281

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 3074827 ASN053|60440641

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
3074827001	MW-28 121019	SW846 3015	MDIG/81349	SW846 6010C	META/71510
3074827002	MW-30 121019	SW846 3015	MDIG/81349	SW846 6010C	META/71510
3074827003	MW-31 121019	SW846 3015	MDIG/81349	SW846 6010C	META/71510
3074827001	MW-28 121019			EPA 300.0	WETC/231740
3074827002	MW-30 121019			EPA 300.0	WETC/231740
3074827003	MW-31 121019			EPA 300.0	WETC/231740
3074827001	MW-28 121019			RSK 175	SVGC/55411
3074827002	MW-30 121019			RSK 175	SVGC/55411
3074827003	MW-31 121019			RSK 175	SVGC/55411
3074827001	MW-28 121019			SW846 8260C	VOMS/53356
3074827002	MW-30 121019			SW846 8260C	VOMS/53356
3074827003	MW-31 121019			SW846 8260C	VOMS/53356
3074827001	MW-28 121019			SM5310B-2011	WETC/231929
3074827002	MW-30 121019			SM5310B-2011	WETC/231929
3074827003	MW-31 121019			SM5310B-2011	WETC/231929
3074827001	MW-28 121019	SW846 6010C	MDIG/81430	SW846 6010C	META/71575
3074827002	MW-30 121019	SW846 6010C	MDIG/81430	SW846 6010C	META/71575
3074827003	MW-31 121019	SW846 6010C	MDIG/81430	SW846 6010C	META/71575
3074827001	MW-28 121019			SW846 8260C	VOMS/53408
3074827001	MW-28 121019			SM2320B-2011	WETC/232054
3074827002	MW-30 121019			SM2320B-2011	WETC/232054
3074827003	MW-31 121019			SM2320B-2011	WETC/232054

ALS Environmental

34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Page 1 of 1

Courier:

Tracking #:

* 3 0 7 4 8 2 7 *

Co. Name: AECOM

Contact (Report to): Gerlinde Wolf

Phone: 518-951-2370

Address: 40 British American Blvd Latham, NY 12110

Bill to (if different than Report to):

PO#:

Project Name/#: 60440641

ALS Quote #:

TAT: [X] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALS approval and surcharges.

Date Required:

Approved By:

Email? [X] Y gerlinde.wolf@aecom.com

Fax? [ ] Y No:

**Container Type					CG	CG	PL	PL	PL	PL	AG		
***Container Size					40	40	8oz	8oz	8oz	8oz	40ml		
Preservative					HCl	HCl	HNO3	-	-	-	HCl		
ANALYSES/METHOD REQUESTED					8260C	8SK 175	Total Fe	Diss Fe	Alkalinity	Cl, NO3, SO4	TOC		
Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	Enter Number of Containers Per Analysis							
1 MW-28 121019		12/10/19	1040	G	GW	2	2	1	1	1	1	2	
2 MW-30 121019		↓	1320	↓	↓	2	2	1	1	1	1	2	
3 MW-31 121019		↓	1345	↓	↓	2	2	1	1	1	1	2	
4													
5 AG													
6													
7													
8													

Released by: | ENTRY HERE

Cooler Temp:

Therm. ID:

No. of Coolers:

Notes:

Circle appropriate Y or N.

Correct containers?	Y	N
Correct sample volume?	Y	N
Correct preservation?	Y	N
Headspace/Volatiles?	Y	N
Custody seals Present?	Y	N
(if present) Seals Intact?	Y	N
Received on ice?	Y	N
COC/Labels complete/accurate?	Y	N
Container in good condition?	Y	N

SAMPLED BY (Please Print): Alexandra Golden

Project Comments: Fe lab filter

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Alexandra Golden AECOM	12/10/19	1513	2 Daniel Hagen ALS	12/10/19	1518
3 Daniel Hagen ALS	12/10/19	1700	4 Fedex		
5 Fedex			6 [illegible]	12/11/19	930
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ] Other

EDDs Required? [ ] If yes, format type:

SDWA Forms? yes [ ] yes [ ] yes [ ] yes [ ] Other

State Samples Collected In? MD [ ] NJ [ ] NY [X] PA [ ]

DOD Criteria Required?

ALS FIELD SERVICES: [X] Pickup [ ] Labor [ ] Composite Sampling [ ] Rental Equipment [ ] Other:

* G=Grab; C=Composite

**Matrix: AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY

Rev 01-2013

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
AEcom	3074877	DN	12/11/19

1. Were airbills / tracking numbers present and recorded?	NONE	YES	NO
Tracking number: 4888 8630 0954			
2. Are Custody Seals on shipping containers intact?	NONE	YES	NO
3. Are Custody Seals on sample containers intact?	NONE	YES	NO
4. Is there a COC (Chain-of-Custody) present?		YES	NO
5. Are the COC and bottle labels complete, legible and in agreement?		YES	NO
5a. Does the COC contain sample locations?		YES	NO
5b. Does the COC contain date and time of sample collection for all samples?		YES	NO
5c. Does the COC contain sample collectors name?		YES	NO
5d. Does the COC note the type(s) of preservation for all bottles?		YES	NO
5e. Does the COC note the number of bottles submitted for each sample?		YES	NO
5f. Does the COC note the type of sample, composite or grab?		YES	NO
5g. Does the COC note the matrix of the sample(s)?		YES	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		YES	NO
8. Are all samples within holding times for the requested analyses?		YES	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		YES	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	N/A	YES	NO
11. Were the samples received on ice?		YES	NO
12. Were sample temperatures measured at 0.0-6.0ºC?		YES	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	NO
13b. Did the client provide a SDWA PWS ID#?	N/A	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO

Cooler #: ______

Temperature (ºC): 0

Thermometer ID: 525

Radiological (µCi): ______

COMMENTS (Required for all NO responses above and any sample non-conformance):

Rev. 4/29/2019

ALS Environmental
301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

December 27, 2019

Ms. Gerlinde Wolfe
AECOM - Latham NY
40 British American Blvd
Albany, NY 12210

Certificate of Analysis

Project Name:	**2015-SCOTIA NAVY DEPOT-PO 60440641**	Workorder:	**3075221**
Purchase Order:	**66432/60440641.11**	Workorder ID:	**ASN054|Granville**

Dear Ms. Wolfe:

Enclosed are the analytical results for samples received by the laboratory on Thursday, December 12, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Mrs. Vanessa N Badman (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Greg Malzone , Mr. Daniel Servetas , Mr. Scott Underhill

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Vanessa N. Badman
Mrs. Vanessa N Badman
Project Coordinator

SAMPLE SUMMARY

Workorder: 3075221 ASN054|Granville

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3075221001	MW-35	Ground Water	12/11/2019 14:05	12/12/2019 10:50	Collected by Client
3075221002	MW-34	Ground Water	12/11/2019 09:40	12/12/2019 10:50	Collected by Client
3075221003	MW-33	Ground Water	12/11/2019 13:20	12/12/2019 10:50	Collected by Client
3075221004	MW-32	Ground Water	12/11/2019 00:00	12/12/2019 10:50	Collected by Client
3075221005	DUP-2	Ground Water	12/11/2019 00:00	12/12/2019 10:50	Collected by Client
3075221006	Trip Blank	Ground Water	12/12/2019 09:18	12/12/2019 10:50	Collected by Client

SAMPLE SUMMARY

Workorder: 3075221 ASN054|Granville

Notes

- -- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- -- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- -- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- -- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- -- The Chain of Custody document is included as part of this report.
- -- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- -- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
- -- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
- -- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- -- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3075221 ASN054|Granville

Lab ID: **3075221001** Date Collected: 12/11/2019 14:05 Matrix: Ground Water
Sample ID: **MW-35** Date Received: 12/12/2019 10:50

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:47	PDK	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:47	PDK	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:47	PDK	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:47	PDK	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:47	PDK	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:47	PDK	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:47	PDK	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:47	PDK	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:47	PDK	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:47	PDK	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:47	PDK	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:47	PDK	A
Trichloroethene	35.4		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:47	PDK	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:47	PDK	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	81 - 118			SW846 8260C			12/13/19 04:47	PDK	A
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C			12/13/19 04:47	PDK	A
Dibromofluoromethane (S)	97.5		%	80 - 119			SW846 8260C			12/13/19 04:47	PDK	A
Toluene-d8 (S)	96.1		%	89 - 112			SW846 8260C			12/13/19 04:47	PDK	A
LIGHT HYDROCARBON GASES												
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175			12/18/19 08:21	CHS	H
Ethane	3.3U	U	ug/L	3.3	3.3	0.55	RSK 175			12/18/19 08:21	CHS	H
Ethene	2.4U	U	ug/L	2.4	2.4	0.81	RSK 175			12/18/19 08:21	CHS	H
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175			12/18/19 08:21	CHS	H
Methane	166		ug/L	1.5	1.5	0.53	RSK 175			12/18/19 08:21	CHS	H
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175			12/18/19 08:21	CHS	H
WET CHEMISTRY												
Alkalinity, Total	168	1	mg/L	5	5	0.8	SM2320B-2011			12/20/19 19:18	MBW	G
Chloride	23.1		mg/L	2.0	0.50	0.16	EPA 300.0			12/13/19 04:46	CHW	F
Nitrate-N	0.44		mg/L	0.20	0.060	0.020	EPA 300.0			12/13/19 04:46	CHW	F
Sulfate	9.1		mg/L	2.0	0.50	0.20	EPA 300.0			12/13/19 04:46	CHW	F
Total Organic Carbon (TOC)	1.6		mg/L	1.0	0.50	0.18	SM5310B-2011			12/17/19 14:24	PAG	D
METALS												
Iron, Total	0.30		mg/L	0.067	0.045	0.022	SW846 6010C	12/22/19	SXC	12/23/19 08:25	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/17/19	SRT	12/17/19 11:03	SRT	K

ANALYTICAL RESULTS

Workorder: 3075221 ASN054|Granville

Lab ID: **3075221001**   Date Collected: 12/11/2019 14:05   Matrix: Ground Water
Sample ID: **MW-35**   Date Received: 12/12/2019 10:50

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*

Vanessa N. Badman
Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental
301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3075221 ASN054|Granville

Lab ID: **3075221002** Date Collected: 12/11/2019 09:40 Matrix: Ground Water
Sample ID: **MW-34** Date Received: 12/12/2019 10:50

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
cis-1,2-Dichloroethene	0.63J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
Trichloroethene	2.9		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	102		%	81 - 118	SW846 8260C			12/13/19 05:09	PDK	A
4-Bromofluorobenzene (S)	103		%	85 - 114	SW846 8260C			12/13/19 05:09	PDK	A
Dibromofluoromethane (S)	99.2		%	80 - 119	SW846 8260C			12/13/19 05:09	PDK	A
Toluene-d8 (S)	96.5		%	89 - 112	SW846 8260C			12/13/19 05:09	PDK	A

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
LIGHT HYDROCARBON GASES												
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175			12/18/19 08:40	CHS	H
Ethane	3.3U	U	ug/L	3.3	3.3	0.55	RSK 175			12/18/19 08:40	CHS	H
Ethene	2.4U	U	ug/L	2.4	2.4	0.81	RSK 175			12/18/19 08:40	CHS	H
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175			12/18/19 08:40	CHS	H
Methane	144		ug/L	1.5	1.5	0.53	RSK 175			12/18/19 08:40	CHS	H
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175			12/18/19 08:40	CHS	H
WET CHEMISTRY												
Alkalinity, Total	140	1	mg/L	5	5	0.8	SM2320B-2011			12/20/19 19:18	MBW	G
Chloride	2.5		mg/L	2.0	0.50	0.16	EPA 300.0			12/13/19 05:00	CHW	F
Nitrate-N	0.22		mg/L	0.20	0.060	0.020	EPA 300.0			12/13/19 05:00	CHW	F
Sulfate	2.5		mg/L	2.0	0.50	0.20	EPA 300.0			12/13/19 05:00	CHW	F
Total Organic Carbon (TOC)	4.3		mg/L	1.0	0.50	0.18	SM5310B-2011			12/17/19 14:24	PAG	D
METALS												
Iron, Total	0.35		mg/L	0.067	0.045	0.022	SW846 6010C	12/22/19	SXC	12/23/19 08:29	SRT	J1
Iron, Dissolved	0.081		mg/L	0.060	0.040	0.020	SW846 6010C	12/17/19	SRT	12/17/19 11:07	SRT	K

ANALYTICAL RESULTS

Workorder: 3075221 ASN054|Granville

Lab ID:	**3075221002**	Date Collected:	12/11/2019 09:40	Matrix:	Ground Water
Sample ID:	**MW-34**	Date Received:	12/12/2019 10:50		

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*

Vanessa N. Badman
Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3075221 ASN054|Granville

Lab ID: **3075221003** Date Collected: 12/11/2019 13:20 Matrix: Ground Water

Sample ID: **MW-33** Date Received: 12/12/2019 10:50

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
Trichloroethene	164		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	99.6		%	81 - 118	SW846 8260C			12/13/19 05:32	PDK	A
4-Bromofluorobenzene (S)	102		%	85 - 114	SW846 8260C			12/13/19 05:32	PDK	A
Dibromofluoromethane (S)	97		%	80 - 119	SW846 8260C			12/13/19 05:32	PDK	A
Toluene-d8 (S)	95.5		%	89 - 112	SW846 8260C			12/13/19 05:32	PDK	A

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
LIGHT HYDROCARBON GASES												
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175			12/18/19 08:58	CHS	H
Ethane	3.3U	U	ug/L	3.3	3.3	0.55	RSK 175			12/18/19 08:58	CHS	H
Ethene	2.4U	U	ug/L	2.4	2.4	0.81	RSK 175			12/18/19 08:58	CHS	H
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175			12/18/19 08:58	CHS	H
Methane	1.5U	U	ug/L	1.5	1.5	0.53	RSK 175			12/18/19 08:58	CHS	H
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175			12/18/19 08:58	CHS	H
WET CHEMISTRY												
Alkalinity, Total	197	1	mg/L	5	5	0.8	SM2320B-2011			12/20/19 19:18	MBW	G
Chloride	31.6		mg/L	2.0	0.50	0.16	EPA 300.0			12/13/19 05:14	CHW	F
Nitrate-N	0.40		mg/L	0.20	0.060	0.020	EPA 300.0			12/13/19 05:14	CHW	F
Sulfate	12.1		mg/L	2.0	0.50	0.20	EPA 300.0			12/13/19 05:14	CHW	F
Total Organic Carbon (TOC)	0.86J	J	mg/L	1.0	0.50	0.18	SM5310B-2011			12/17/19 14:24	PAG	D
METALS												
Iron, Total	0.041J	J	mg/L	0.067	0.045	0.022	SW846 6010C	12/22/19	SXC	12/23/19 08:32	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/17/19	SRT	12/17/19 11:17	SRT	K

ALS Environmental
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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3075221 ASN054|Granville

Lab ID:	**3075221003**	Date Collected:	12/11/2019 13:20	Matrix:	Ground Water
Sample ID:	**MW-33**	Date Received:	12/12/2019 10:50		

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*

Vanessa N. Badman
Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3075221 ASN054|Granville

Lab ID: **3075221004** Date Collected: 12/11/2019 00:00 Matrix: Ground Water
Sample ID: **MW-32** Date Received: 12/12/2019 10:50

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
cis-1,2-Dichloroethene	2.0		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
Trichloroethene	101		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	81 - 118	SW846 8260C			12/13/19 05:54	PDK	A
4-Bromofluorobenzene (S)	102		%	85 - 114	SW846 8260C			12/13/19 05:54	PDK	A
Dibromofluoromethane (S)	98.8		%	80 - 119	SW846 8260C			12/13/19 05:54	PDK	A
Toluene-d8 (S)	95.7		%	89 - 112	SW846 8260C			12/13/19 05:54	PDK	A

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
LIGHT HYDROCARBON GASES												
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175			12/18/19 09:17	CHS	H
Ethane	9.3		ug/L	3.3	3.3	0.55	RSK 175			12/18/19 09:17	CHS	H
Ethene	0.96J	J	ug/L	2.4	2.4	0.81	RSK 175			12/18/19 09:17	CHS	H
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175			12/18/19 09:17	CHS	H
Methane	1180		ug/L	1.5	1.5	0.53	RSK 175			12/18/19 09:17	CHS	H
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175			12/18/19 09:17	CHS	H
WET CHEMISTRY												
Alkalinity, Total	157	1	mg/L	5	5	0.8	SM2320B-2011			12/20/19 19:18	MBW	G
Chloride	30.6		mg/L	2.0	0.50	0.16	EPA 300.0			12/13/19 05:27	CHW	F
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			12/13/19 05:27	CHW	F
Sulfate	8.1		mg/L	2.0	0.50	0.20	EPA 300.0			12/13/19 05:27	CHW	F
Total Organic Carbon (TOC)	0.80J	J	mg/L	1.0	0.50	0.18	SM5310B-2011			12/17/19 14:24	PAG	D
METALS												
Iron, Total	1.1		mg/L	0.067	0.045	0.022	SW846 6010C	12/22/19	SXC	12/23/19 08:36	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/17/19	SRT	12/17/19 11:21	SRT	K

ANALYTICAL RESULTS

Workorder: 3075221 ASN054|Granville

Lab ID:	**3075221004**	Date Collected:	12/11/2019 00:00	Matrix:	Ground Water
Sample ID:	**MW-32**	Date Received:	12/12/2019 10:50		

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	*Cntr*

Vanessa N. Badman
Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3075221 ASN054|Granville

Lab ID: **3075221005** Date Collected: 12/11/2019 00:00 Matrix: Ground Water
Sample ID: **DUP-2** Date Received: 12/12/2019 10:50

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:17	PDK	H
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:17	PDK	H
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:17	PDK	H
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:17	PDK	H
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:17	PDK	H
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:17	PDK	H
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:17	PDK	H
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:17	PDK	H
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:17	PDK	H
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:17	PDK	H
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:17	PDK	H
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:17	PDK	H
Trichloroethene	169		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:17	PDK	H
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:17	PDK	H

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	81 - 118	SW846 8260C			12/13/19 06:17	PDK	H
4-Bromofluorobenzene (S)	103		%	85 - 114	SW846 8260C			12/13/19 06:17	PDK	H
Dibromofluoromethane (S)	96.9		%	80 - 119	SW846 8260C			12/13/19 06:17	PDK	H
Toluene-d8 (S)	95.8		%	89 - 112	SW846 8260C			12/13/19 06:17	PDK	H

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
LIGHT HYDROCARBON GASES												
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175			12/18/19 09:35	CHS	H
Ethane	3.3U	U	ug/L	3.3	3.3	0.55	RSK 175			12/18/19 09:35	CHS	H
Ethene	2.4U	U	ug/L	2.4	2.4	0.81	RSK 175			12/18/19 09:35	CHS	H
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175			12/18/19 09:35	CHS	H
Methane	1.3J	J	ug/L	1.5	1.5	0.53	RSK 175			12/18/19 09:35	CHS	H
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175			12/18/19 09:35	CHS	H
WET CHEMISTRY												
Alkalinity, Total	198	1	mg/L	5	5	0.8	SM2320B-2011			12/20/19 19:18	MBW	G
Chloride	31.9		mg/L	2.0	0.50	0.16	EPA 300.0			12/13/19 05:41	CHW	F
Nitrate-N	0.40		mg/L	0.20	0.060	0.020	EPA 300.0			12/13/19 05:41	CHW	F
Sulfate	12.3		mg/L	2.0	0.50	0.20	EPA 300.0			12/13/19 05:41	CHW	F
Total Organic Carbon (TOC)	0.57J	J	mg/L	1.0	0.50	0.18	SM5310B-2011			12/17/19 14:24	PAG	D
METALS												
Iron, Total	0.072		mg/L	0.067	0.045	0.022	SW846 6010C	12/22/19	SXC	12/23/19 08:40	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/17/19	SRT	12/17/19 11:25	SRT	K

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3075221 ASN054|Granville

Lab ID: **3075221005** Date Collected: 12/11/2019 00:00 Matrix: Ground Water
Sample ID: **DUP-2** Date Received: 12/12/2019 10:50

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	*Cntr*

Vanessa N. Badman
Mrs. Vanessa N Badman
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NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3075221 ASN054|Granville

Lab ID:	**3075221006**	Date Collected:	12/12/2019 09:18	Matrix:	Ground Water
Sample ID:	**Trip Blank**	Date Received:	12/12/2019 10:50		

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	103		%	81 - 118	SW846 8260C			12/18/19 17:18	TMP	A
4-Bromofluorobenzene (S)	107		%	85 - 114	SW846 8260C			12/18/19 17:18	TMP	A
Dibromofluoromethane (S)	101		%	80 - 119	SW846 8260C			12/18/19 17:18	TMP	A
Toluene-d8 (S)	96.8		%	89 - 112	SW846 8260C			12/18/19 17:18	TMP	A

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3075221 ASN054|Granville

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3075221001	1	MW-35	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3075221002	1	MW-34	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3075221003	1	MW-33	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3075221004	1	MW-32	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3075221005	1	DUP-2	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3075221 ASN054|Granville

Lab ID	Sample ID	Analysis Method	Prep Method
3075221001	MW-35	EPA 300.0	
3075221001	MW-35	In-House	
3075221001	MW-35	RSK 175	
3075221001	MW-35	SM2320B-2011	
3075221001	MW-35	SM5310B-2011	
3075221001	MW-35	SW846 6010C	SW846 3015
3075221001	MW-35	SW846 6010C	SW846 6010C
3075221001	MW-35	SW846 8260C	
3075221002	MW-34	EPA 300.0	
3075221002	MW-34	In-House	
3075221002	MW-34	RSK 175	
3075221002	MW-34	SM2320B-2011	
3075221002	MW-34	SM5310B-2011	
3075221002	MW-34	SW846 6010C	SW846 3015
3075221002	MW-34	SW846 6010C	SW846 6010C
3075221002	MW-34	SW846 8260C	
3075221003	MW-33	EPA 300.0	
3075221003	MW-33	In-House	
3075221003	MW-33	RSK 175	
3075221003	MW-33	SM2320B-2011	
3075221003	MW-33	SM5310B-2011	
3075221003	MW-33	SW846 6010C	SW846 3015
3075221003	MW-33	SW846 6010C	SW846 6010C
3075221003	MW-33	SW846 8260C	
3075221004	MW-32	EPA 300.0	
3075221004	MW-32	In-House	
3075221004	MW-32	RSK 175	
3075221004	MW-32	SM2320B-2011	
3075221004	MW-32	SM5310B-2011	
3075221004	MW-32	SW846 6010C	SW846 3015
3075221004	MW-32	SW846 6010C	SW846 6010C
3075221004	MW-32	SW846 8260C	
3075221005	DUP-2	EPA 300.0	
3075221005	DUP-2	In-House	
3075221005	DUP-2	RSK 175	
3075221005	DUP-2	SM2320B-2011	
3075221005	DUP-2	SM5310B-2011	
3075221005	DUP-2	SW846 6010C	SW846 3015
3075221005	DUP-2	SW846 6010C	SW846 6010C
3075221005	DUP-2	SW846 8260C	
3075221006	Trip Blank	SW846 8260C	

QUALITY CONTROL DATA

Workorder: 3075221 ASN054|Granville

QC Batch: MDIG/81430 **Analysis Method:** SW846 6010C

QC Batch Method: SW846 6010C

Associated Lab Samples: 3075221001, 3075221002, 3075221003, 3075221004, 3075221005

METHOD BLANK: 3061292

Parameter	Blank Result	Units	Reporting Limit
Iron, Dissolved	0.040U	mg/L	0.060

LABORATORY CONTROL SAMPLE: 3061293

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Dissolved	103	mg/L	1	1.0	87 - 115

LABORATORY CONTROL SAMPLE: 3061294

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Dissolved	101	mg/L	1	1.0	87 - 115

QUALITY CONTROL DATA

Workorder: 3075221 ASN054|Granville

QC Batch: MDIG/81507 **Analysis Method:** SW846 6010C

QC Batch Method: SW846 3015

Associated Lab Samples: 3075221001, 3075221002, 3075221003, 3075221004, 3075221005

METHOD BLANK: 3064331

Parameter	Blank Result	Units	Reporting Limit
Iron, Total	0.045U	mg/L	0.067

LABORATORY CONTROL SAMPLE: 3064332

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Total	101	mg/L	1.1	1.1	87 - 115

LABORATORY CONTROL SAMPLE: 3064333

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Iron, Total	100	mg/L	1.1	1.1	87 - 115

QUALITY CONTROL DATA

Workorder: 3075221 ASN054|Granville

QC Batch: SVGC/55478 **Analysis Method:** RSK 175

QC Batch Method: RSK 175

Associated Lab Samples: 3075221001, 3075221002, 3075221003, 3075221004, 3075221005

METHOD BLANK: 3061973

Parameter	Blank Result	Units	Reporting Limit
n-Butane	4.3U	ug/L	4.3
Ethane	3.3U	ug/L	3.3
Ethene	2.4U	ug/L	2.4
Isobutane	4.6U	ug/L	4.6
Methane	1.5U	ug/L	1.5
Propane	3.2U	ug/L	3.2
Methyl-t-Butyl ether-d3 (S)			

SAMPLE DUPLICATE: 3061974 ORIGINAL: 3075513001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
n-Butane	0	ug/L	0	NC	20
Ethane	0	ug/L	0	NC	20
Ethene	0	ug/L	0	NC	20
Isobutane	0	ug/L	0	NC	20
Methane	0	ug/L	0	NC	20
Propane	0	ug/L	0	NC	20

QUALITY CONTROL DATA

Workorder: 3075221 ASN054|Granville

QC Batch: VOMS/53356 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 3075221001, 3075221002, 3075221003, 3075221004, 3075221005

METHOD BLANK: 3059516

Parameter	Blank Result	Units	Reporting Limit
Carbon Tetrachloride	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,1,1,2-Tetrachloroethane	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.75U	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
Trichloroethene	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	101	%	81 - 118
4-Bromofluorobenzene (S)	102	%	85 - 114
Dibromofluoromethane (S)	97	%	80 - 119
Toluene-d8 (S)	95.8	%	89 - 112

LABORATORY CONTROL SAMPLE: 3059517

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	116	ug/L	20	23.2	72 - 136
1,1-Dichloroethane	120	ug/L	20	23.9	77 - 125
1,2-Dichloroethane	112	ug/L	20	22.3	73 - 128
1,1-Dichloroethene	129	ug/L	20	25.8	71 - 131
cis-1,2-Dichloroethene	115	ug/L	20	23.1	78 - 123
trans-1,2-Dichloroethene	124	ug/L	20	24.9	75 - 124
1,1,1,2-Tetrachloroethane	115	ug/L	20	22.9	78 - 124
1,1,2,2-Tetrachloroethane	108	ug/L	20	21.6	71 - 121
Tetrachloroethene	118	ug/L	20	23.7	74 - 129
Toluene	118	ug/L	20	23.6	80 - 121
1,1,1-Trichloroethane	118	ug/L	20	23.7	74 - 131
1,1,2-Trichloroethane	109	ug/L	20	21.7	80 - 119
Trichloroethene	115	ug/L	20	23.0	79 - 123

QUALITY CONTROL DATA

Workorder: 3075221 ASN054|Granville

Vinyl Chloride	106	ug/L	20	21.2	58 - 137
1,2-Dichloroethane-d4 (S)	101	%			81 - 118
4-Bromofluorobenzene (S)	104	%			85 - 114
Dibromofluoromethane (S)	101	%			80 - 119
Toluene-d8 (S)	97.2	%			89 - 112

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QUALITY CONTROL DATA

Workorder: 3075221 ASN054|Granville

QC Batch: VOMS/53408 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 3075221006

METHOD BLANK: 3061715

Parameter	Blank Result	Units	Reporting Limit
Carbon Tetrachloride	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,1,1,2-Tetrachloroethane	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.75U	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
Trichloroethene	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	105	%	81 - 118
4-Bromofluorobenzene (S)	107	%	85 - 114
Dibromofluoromethane (S)	101	%	80 - 119
Toluene-d8 (S)	97.6	%	89 - 112

LABORATORY CONTROL SAMPLE: 3061716

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	111	ug/L	20	22.2	72 - 136
1,1-Dichloroethane	119	ug/L	20	23.7	77 - 125
1,2-Dichloroethane	113	ug/L	20	22.5	73 - 128
1,1-Dichloroethene	129	ug/L	20	25.8	71 - 131
cis-1,2-Dichloroethene	115	ug/L	20	23.1	78 - 123
trans-1,2-Dichloroethene	126*	ug/L	20	25.2	75 - 124
1,1,1,2-Tetrachloroethane	111	ug/L	20	22.1	78 - 124
1,1,2,2-Tetrachloroethane	107	ug/L	20	21.4	71 - 121
Tetrachloroethene	117	ug/L	20	23.5	74 - 129
Toluene	117	ug/L	20	23.3	80 - 121
1,1,1-Trichloroethane	118	ug/L	20	23.6	74 - 131
1,1,2-Trichloroethane	108	ug/L	20	21.6	80 - 119
Trichloroethene	114	ug/L	20	22.7	79 - 123

QUALITY CONTROL DATA

Workorder: 3075221 ASN054|Granville

Vinyl Chloride	96.8	ug/L	20	19.4	58 - 137
1,2-Dichloroethane-d4 (S)	103	%			81 - 118
4-Bromofluorobenzene (S)	106	%			85 - 114
Dibromofluoromethane (S)	102	%			80 - 119
Toluene-d8 (S)	99.1	%			89 - 112

MATRIX SPIKE: 3062294 DUPLICATE: 3062295 ORIGINAL: 3075513001

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Carbon Tetrachloride	0	ug/L	20	22.6047	23.7224	113	119	72 - 136	4.83	30
1,1-Dichloroethane	0	ug/L	20	24.2271	25.5678	121	128*	77 - 125	5.38	30
1,2-Dichloroethane	0	ug/L	20	22.5835	23.448	113	117	73 - 128	3.76	30
1,1-Dichloroethene	0	ug/L	20	26.7485	28.3759	134*	142*	71 - 131	5.9	30
cis-1,2-Dichloroethene	0	ug/L	20	23.4366	24.6507	117	123	78 - 123	5.05	30
trans-1,2-Dichloroethene	0	ug/L	20	25.6957	26.9336	128*	135*	75 - 124	4.7	30
1,1,1,2-Tetrachloroethane	0	ug/L	20	23.2957	23.4909	116	117	78 - 124	.83	30
1,1,2,2-Tetrachloroethane	0	ug/L	20	22.4467	21.1754	112	106	71 - 121	5.83	30
Tetrachloroethene	0	ug/L	20	24.058	23.9599	120	120	74 - 129	.41	30
Toluene	0	ug/L	20	24.9788	25.1102	125*	126*	80 - 121	.52	30
1,1,1-Trichloroethane	0	ug/L	20	24.6227	25.2931	123	126	74 - 131	2.69	30
1,1,2-Trichloroethane	0	ug/L	20	33.7048	23.4105	169*	117	80 - 119	36	30
Trichloroethene	0	ug/L	20	23.4251	24.4369	117	122	79 - 123	4.23	30
Vinyl Chloride	0	ug/L	20	20.8319	22.1502	104	111	58 - 137	6.13	30
1,2-Dichloroethane-d4 (S)	102	%				102	103	81 - 118		
4-Bromofluorobenzene (S)	110	%				110	109	85 - 114		
Dibromofluoromethane (S)	102	%				102	102	80 - 119		
Toluene-d8 (S)	101	%				101	98.3	89 - 112		

QUALITY CONTROL DATA

Workorder: 3075221 ASN054|Granville

QC Batch: WETC/231820 **Analysis Method:** EPA 300.0

QC Batch Method: EPA 300.0

Associated Lab Samples: 3075221001, 3075221002, 3075221003, 3075221004, 3075221005

METHOD BLANK: 3059758

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.17J	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 3059760

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Chloride	94.1	mg/L	20	18.8	87 - 111
Nitrate-N	93.6	mg/L	2.5	2.3	88 - 111
Sulfate	95	mg/L	20	19.0	87 - 112

METHOD BLANK: 3060242

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.20J	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

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QUALITY CONTROL DATA

Workorder: 3075221 ASN054|Granville

QC Batch: WETC/231930 **Analysis Method:** SM5310B-2011

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 3075221001, 3075221002, 3075221003, 3075221004, 3075221005

METHOD BLANK: 3060885

Parameter	Blank Result	Units	Reporting Limit
Total Organic Carbon (TOC)	0.50U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 3060886

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	96.2	mg/L	1	0.96J	85 - 115

MATRIX SPIKE: 3060887 DUPLICATE: 3060888 ORIGINAL: 3075102001

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	1.159	mg/L	6	7.352	7.375	103	104	85 - 115	.31	20

MATRIX SPIKE: 3060889 DUPLICATE: 3060890 ORIGINAL: 3075055007

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	3.543	mg/L	6	9.536	9.563	99.9	100	85 - 115	.28	20

QUALITY CONTROL DATA

Workorder: 3075221 ASN054|Granville

QC Batch: WETC/232135 **Analysis Method:** SM2320B-2011

QC Batch Method: SM2320B-2011

Associated Lab Samples: 3075221001, 3075221002, 3075221003, 3075221004, 3075221005

METHOD BLANK: 3063029

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

SAMPLE DUPLICATE: 3063034 ORIGINAL: 3073447001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	588.1	mg/L	553.2	6.12	20

METHOD BLANK: 3063037

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

METHOD BLANK: 3063041

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

SAMPLE DUPLICATE: 3063043 ORIGINAL: 3075055003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	158.99	mg/L	153.85	3.29	20

METHOD BLANK: 3063045

Parameter	Blank Result	Units	Reporting Limit

QUALITY CONTROL DATA

Workorder: 3075221 ASN054|Granville

Alkalinity, Total	6	mg/L	5

SAMPLE DUPLICATE: 3063047 ORIGINAL: 3075118001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	233.28	mg/L	228.1	2.25	20

METHOD BLANK: 3063049

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

SAMPLE DUPLICATE: 3063051 ORIGINAL: 3075221005

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	198.4	mg/L	194.95	1.75	20

METHOD BLANK: 3063053

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

METHOD BLANK: 3063057

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

METHOD BLANK: 3063061

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

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QUALITY CONTROL DATA

Workorder: 3075221 ASN054|Granville

SAMPLE DUPLICATE: 3063063 ORIGINAL: 3075380003

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	67.72	mg/L	66.77	1.41	20

METHOD BLANK: 3063065

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 3075221 ASN054|Granville

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
3075221001	MW-35			SW846 8260C	VOMS/53356
3075221002	MW-34			SW846 8260C	VOMS/53356
3075221003	MW-33			SW846 8260C	VOMS/53356
3075221004	MW-32			SW846 8260C	VOMS/53356
3075221005	DUP-2			SW846 8260C	VOMS/53356
3075221001	MW-35			EPA 300.0	WETC/231820
3075221002	MW-34			EPA 300.0	WETC/231820
3075221003	MW-33			EPA 300.0	WETC/231820
3075221004	MW-32			EPA 300.0	WETC/231820
3075221005	DUP-2			EPA 300.0	WETC/231820
3075221001	MW-35			SM5310B-2011	WETC/231930
3075221002	MW-34			SM5310B-2011	WETC/231930
3075221003	MW-33			SM5310B-2011	WETC/231930
3075221004	MW-32			SM5310B-2011	WETC/231930
3075221005	DUP-2			SM5310B-2011	WETC/231930
3075221001	MW-35	SW846 6010C	MDIG/81430	SW846 6010C	META/71575
3075221002	MW-34	SW846 6010C	MDIG/81430	SW846 6010C	META/71575
3075221003	MW-33	SW846 6010C	MDIG/81430	SW846 6010C	META/71575
3075221004	MW-32	SW846 6010C	MDIG/81430	SW846 6010C	META/71575
3075221005	DUP-2	SW846 6010C	MDIG/81430	SW846 6010C	META/71575
3075221006	Trip Blank			SW846 8260C	VOMS/53408
3075221001	MW-35			RSK 175	SVGC/55478
3075221002	MW-34			RSK 175	SVGC/55478
3075221003	MW-33			RSK 175	SVGC/55478
3075221004	MW-32			RSK 175	SVGC/55478
3075221005	DUP-2			RSK 175	SVGC/55478

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 3075221 ASN054|Granville

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
3075221001	MW-35			SM2320B-2011	WETC/232135
3075221002	MW-34			SM2320B-2011	WETC/232135
3075221003	MW-33			SM2320B-2011	WETC/232135
3075221004	MW-32			SM2320B-2011	WETC/232135
3075221005	DUP-2			SM2320B-2011	WETC/232135
3075221001	MW-35	SW846 3015	MDIG/81507	SW846 6010C	META/71661
3075221002	MW-34	SW846 3015	MDIG/81507	SW846 6010C	META/71661
3075221003	MW-33	SW846 3015	MDIG/81507	SW846 6010C	META/71661
3075221004	MW-32	SW846 3015	MDIG/81507	SW846 6010C	META/71661
3075221005	DUP-2	SW846 3015	MDIG/81507	SW846 6010C	META/71661

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Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Page 1 of 1

Courier:

Tracking #:

* 3 0 7 5 2 2 1 *

Co. Name: AECOM

Contact (Report to): Gerlinde Wolf

Phone:

Address: 40 British American Blvd Latham, NY 12110

Bill to (if different than Report to):

PO#:

Project Name/#: 60440641

ALS Quote #:

TAT: [X] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALS approval and surcharges.

Date Required:

Approved By:

Email? [X] Y gerlinde.wolf@aecom.com

Fax? [ ] Y No.

						8260C	RSK 175	Alkalinity	Cl, NO3, SO4	TOC	Total Fe	Diss Fe
***Container Type						CG	CG	PL	PL	AG	PL	PL
***Container Size						40	40	8oz	8oz	40	8oz	8oz
***Preservative						HCl	HCl	—	—	HCl	HNO3	—
Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	Enter Number of Containers Per Analysis						
1 MW-35 121119		12/11/19	0950	G	GW	2	2	1	1	2	1	1
2 MW-34 121119		↓	0940	↓	↓	2	2	1	1	2	1	1
3 MW-33 121119		↓	1320	↓	↓	2	2	1	1	2	1	1
4 MW-32 121119		↓		↓	↓	2	2	1	1	2	1	1
5 DUP-2		—	—	↓	↓	2	2	1	1	2	1	1
6 Trip blank		—	—	—	—	~~2~~ 40	X	X	X	X	X	X
7												
8												

AG 12/12/19

Cooler Temp:

Therm. ID:

No. of Coolers:

Notes:

	Y	N
Correct containers?	Y	N
Correct sample volume?	Y	N
Correct preservation?	Y	N
Headspace/Volatiles?	Y	N
Custody seals Present?	Y	N
(If present) Seals intact?	Y	N
Received on Ice?	Y	N
COC/Labels complete/accurate?	Y	N
Container in good condition?	Y	N

Circle appropriate Y or N.

SAMPLED BY (Please Print): Alexandra Golden

Project Comments:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [signature] / AECOM	12/11/19	1516	2 Daniel Hagan / ALS	12/11/19	1510
3 Daniel Hagan / ALS	12/11/19	1700	4 Fedex		
5 Fedex			6 [signature]	12/12/19	918
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ]

EDDs Required? [ ] If yes, format type:

SDWA Forms? yes [ ] yes [ ] yes [ ] yes [ ] Other

State Samples Collected In? MD [ ] NJ [ ] NY [X] PA [ ]

DOD Criteria Required?

ALS FIELD SERVICES: [X] Pickup [ ] Labor [ ] Composite Sampling [ ] Rental Equipment [ ] Other:

* G=Grab; C=Composite

**Matrix: AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY

Rev 01-2013

ALS

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client: AECOM	Work Order #: 3075221	Initials: DN	Date: 12/12

1. Were airbills / tracking numbers present and recorded? Tracking number: 4888 8630 0987	NONE	YES	NO
2. Are Custody Seals on shipping containers intact?	NONE	YES	NO
3. Are Custody Seals on sample containers intact?	NONE	YES	NO
4. Is there a COC (Chain-of-Custody) present?		YES	NO
5. Are the COC and bottle labels complete, legible and in agreement?		YES	NO
5a. Does the COC contain sample locations?		YES	NO
5b. Does the COC contain date and time of sample collection for all samples?		YES	NO
5c. Does the COC contain sample collectors name?		YES	NO
5d. Does the COC note the type(s) of preservation for all bottles?		YES	NO
5e. Does the COC note the number of bottles submitted for each sample?		YES	NO
5f. Does the COC note the type of sample, composite or grab?		YES	NO
5g. Does the COC note the matrix of the sample(s)?		YES	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		YES	NO
8. Are all samples within holding times for the requested analyses?		YES	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		YES	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	N/A	YES	NO
11. Were the samples received on ice?		YES	NO
12. Were sample temperatures measured at 0.0-6.0°C		YES	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	NO
13b. Did the client provide a SDWA PWS ID#?	N/A	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO

Cooler #:

Temperature (°C): 3

Thermometer ID: 318

Radiological (µCi):

COMMENTS (Required for all NO responses above and any sample non-conformance):

Rev. 4/29/2019

December 27, 2019

Ms. Gerlinde Wolfe
AECOM - Latham NY
40 British American Blvd
Albany, NY 12210

Certificate of Analysis

Project Name:	**2015-SCOTIA NAVY DEPOT-PO 60440641**	Workorder:	**3075513**
Purchase Order:	**66432/60440641.11**	Workorder ID:	**ASN055|60440641**

Dear Ms. Wolfe:

Enclosed are the analytical results for samples received by the laboratory on Friday, December 13, 2019.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Mrs. Vanessa N Badman (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Environmental.

ALS Spring City: 10 Riverside Drive, Spring City, PA 19475 610-948-4903

CC: Mr. Greg Malzone , Mr. Daniel Servetas , Mr. Scott Underhill

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Vanessa N. Badman
Mrs. Vanessa N Badman
Project Coordinator

SAMPLE SUMMARY

Workorder: 3075513 ASN055|60440641

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3075513001	MW-16 121219	Ground Water	12/12/2019 10:00	12/13/2019 09:20	Collected by Client
3075513002	MW-26 121219	Ground Water	12/12/2019 11:45	12/13/2019 09:20	Collected by Client
3075513003	MW-24 121219	Ground Water	12/12/2019 13:50	12/13/2019 09:20	Collected by Client

SAMPLE SUMMARY

Workorder: 3075513 ASN055|60440641

Notes

- -- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- -- All Waste Water analyses comply with methodology requirements of 40 CFR Part 136.
- -- All Drinking Water analyses comply with methodology requirements of 40 CFR Part 141.
- -- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.
- -- The Chain of Custody document is included as part of this report.
- -- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- -- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
- -- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
- -- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- -- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Reporting Detection Limit
ND	Not Detected - indicates that the analyte was Not Detected at the RDL
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3075513 ASN055|60440641

Lab ID: **3075513001**
Sample ID: **MW-16 121219**
Date Collected: 12/12/2019 10:00
Date Received: 12/13/2019 09:20
Matrix: Ground Water

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:04	TMP	C
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:04	TMP	C
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:04	TMP	C
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:04	TMP	C
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:04	TMP	C
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:04	TMP	C
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:04	TMP	C
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:04	TMP	C
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:04	TMP	C
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:04	TMP	C
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:04	TMP	C
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:04	TMP	C
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:04	TMP	C
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:04	TMP	C
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	103		%	81 - 118			SW846 8260C			12/18/19 18:04	TMP	C
4-Bromofluorobenzene (S)	109		%	85 - 114			SW846 8260C			12/18/19 18:04	TMP	C
Dibromofluoromethane (S)	99.8		%	80 - 119			SW846 8260C			12/18/19 18:04	TMP	C
Toluene-d8 (S)	97		%	89 - 112			SW846 8260C			12/18/19 18:04	TMP	C
LIGHT HYDROCARBON GASES												
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175			12/18/19 09:53	CHS	T
Ethane	3.3U	U	ug/L	3.3	3.3	0.55	RSK 175			12/18/19 09:53	CHS	T
Ethene	2.4U	U	ug/L	2.4	2.4	0.81	RSK 175			12/18/19 09:53	CHS	T
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175			12/18/19 09:53	CHS	T
Methane	1.5U	U	ug/L	1.5	1.5	0.53	RSK 175			12/18/19 09:53	CHS	T
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175			12/18/19 09:53	CHS	T
WET CHEMISTRY												
Alkalinity, Total	296	1	mg/L	5	5	0.8	SM2320B-2011			12/21/19 22:45	MBW	Q
Chloride	1.7J	J	mg/L	2.0	0.50	0.16	EPA 300.0			12/14/19 07:47	CHW	N
Nitrate-N	0.84		mg/L	0.20	0.060	0.020	EPA 300.0			12/14/19 07:47	CHW	N
Sulfate	71.1		mg/L	2.0	0.50	0.20	EPA 300.0			12/14/19 07:47	CHW	N
Total Organic Carbon (TOC)	0.88J	J	mg/L	1.0	0.50	0.18	SM5310B-2011			12/18/19 00:06	PAG	H

ANALYTICAL RESULTS

Workorder: 3075513 ASN055|60440641

Lab ID: **3075513001** Date Collected: 12/12/2019 10:00 Matrix: Ground Water
Sample ID: **MW-16 121219** Date Received: 12/13/2019 09:20

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*

Vanessa N. Badman
Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3075513 ASN055|60440641

Lab ID:	**3075513002**	Date Collected:	12/12/2019 11:45	Matrix:	Ground Water
Sample ID:	**MW-26 121219**	Date Received:	12/13/2019 09:20		

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:27	TMP	B
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:27	TMP	B
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:27	TMP	B
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:27	TMP	B
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:27	TMP	B
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:27	TMP	B
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:27	TMP	B
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:27	TMP	B
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:27	TMP	B
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:27	TMP	B
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:27	TMP	B
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:27	TMP	B
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:27	TMP	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:27	TMP	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	102		%	81 - 118			SW846 8260C			12/18/19 18:27	TMP	B
4-Bromofluorobenzene (S)	108		%	85 - 114			SW846 8260C			12/18/19 18:27	TMP	B
Dibromofluoromethane (S)	99.9		%	80 - 119			SW846 8260C			12/18/19 18:27	TMP	B
Toluene-d8 (S)	96.5		%	89 - 112			SW846 8260C			12/18/19 18:27	TMP	B
LIGHT HYDROCARBON GASES												
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175			12/18/19 10:30	CHS	H
Ethane	3.3U	U	ug/L	3.3	3.3	0.55	RSK 175			12/18/19 10:30	CHS	H
Ethene	2.4U	U	ug/L	2.4	2.4	0.81	RSK 175			12/18/19 10:30	CHS	H
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175			12/18/19 10:30	CHS	H
Methane	8.1		ug/L	1.5	1.5	0.53	RSK 175			12/18/19 10:30	CHS	H
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175			12/18/19 10:30	CHS	H
WET CHEMISTRY												
Alkalinity, Total	171	1	mg/L	5	5	0.8	SM2320B-2011			12/21/19 22:45	MBW	G
Chloride	22.8		mg/L	2.0	0.50	0.16	EPA 300.0			12/14/19 07:16	CHW	F
Nitrate-N	0.060J	J	mg/L	0.20	0.060	0.020	EPA 300.0			12/14/19 07:16	CHW	F
Sulfate	9.6		mg/L	2.0	0.50	0.20	EPA 300.0			12/14/19 07:16	CHW	F
Total Organic Carbon (TOC)	5.4		mg/L	2.0	1.0	0.37	SM5310B-2011			12/18/19 00:06	PAG	D

ANALYTICAL RESULTS

Workorder: 3075513 ASN055|60440641

Lab ID: **3075513002** Date Collected: 12/12/2019 11:45 Matrix: Ground Water
Sample ID: **MW-26 121219** Date Received: 12/13/2019 09:20

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	*Cntr*

Vanessa N. Badman
Mrs. Vanessa N Badman
Project Coordinator

ALS Environmental
301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

ANALYTICAL RESULTS

Workorder: 3075513 ASN055|60440641

Lab ID: **3075513003** Date Collected: 12/12/2019 13:50 Matrix: Ground Water

Sample ID: **MW-24 121219** Date Received: 12/13/2019 09:20

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:49	TMP	B
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:49	TMP	B
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:49	TMP	B
1,1-Dichloroethene	37.2		ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:49	TMP	B
cis-1,2-Dichloroethene	10.5		ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:49	TMP	B
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:49	TMP	B
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:49	TMP	B
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:49	TMP	B
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:49	TMP	B
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:49	TMP	B
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:49	TMP	B
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:49	TMP	B
Trichloroethene	1.4		ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:49	TMP	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 18:49	TMP	B

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	105		%	81 - 118	SW846 8260C			12/18/19 18:49	TMP	B
4-Bromofluorobenzene (S)	108		%	85 - 114	SW846 8260C			12/18/19 18:49	TMP	B
Dibromofluoromethane (S)	102		%	80 - 119	SW846 8260C			12/18/19 18:49	TMP	B
Toluene-d8 (S)	97.5		%	89 - 112	SW846 8260C			12/18/19 18:49	TMP	B

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
LIGHT HYDROCARBON GASES												
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175			12/18/19 10:48	CHS	H
Ethane	5.2		ug/L	3.3	3.3	0.55	RSK 175			12/18/19 10:48	CHS	H
Ethene	2.9		ug/L	2.4	2.4	0.81	RSK 175			12/18/19 10:48	CHS	H
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175			12/18/19 10:48	CHS	H
Methane	103		ug/L	1.5	1.5	0.53	RSK 175			12/18/19 10:48	CHS	H
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175			12/18/19 10:48	CHS	H
WET CHEMISTRY												
Alkalinity, Total	146	1	mg/L	5	5	0.8	SM2320B-2011			12/21/19 22:45	MBW	G
Chloride	29.2		mg/L	2.0	0.50	0.16	EPA 300.0			12/14/19 07:31	CHW	F
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			12/14/19 07:31	CHW	F
Sulfate	2.3		mg/L	2.0	0.50	0.20	EPA 300.0			12/14/19 07:31	CHW	F
Total Organic Carbon (TOC)	1.4		mg/L	1.0	0.50	0.18	SM5310B-2011			12/18/19 00:06	PAG	D

ANALYTICAL RESULTS

Workorder: 3075513 ASN055|60440641

Lab ID:	**3075513003**	Date Collected:	12/12/2019 13:50	Matrix:	Ground Water
Sample ID:	**MW-24 121219**	Date Received:	12/13/2019 09:20		

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	*Cntr*

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

ANALYTICAL RESULTS

Workorder: 3075513 ASN055|60440641

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3075513001	1	MW-16 121219	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3075513002	1	MW-26 121219	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3075513003	1	MW-24 121219	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

ANALYSIS - PREP METHOD CROSS REFERENCE TABLE

Workorder: 3075513 ASN055|60440641

Lab ID	Sample ID	Analysis Method	Prep Method
3075513001	MW-16 121219	EPA 300.0	
3075513001	MW-16 121219	RSK 175	
3075513001	MW-16 121219	SM2320B-2011	
3075513001	MW-16 121219	SM5310B-2011	
3075513001	MW-16 121219	SW846 8260C	
3075513002	MW-26 121219	EPA 300.0	
3075513002	MW-26 121219	RSK 175	
3075513002	MW-26 121219	SM2320B-2011	
3075513002	MW-26 121219	SM5310B-2011	
3075513002	MW-26 121219	SW846 8260C	
3075513003	MW-24 121219	EPA 300.0	
3075513003	MW-24 121219	RSK 175	
3075513003	MW-24 121219	SM2320B-2011	
3075513003	MW-24 121219	SM5310B-2011	
3075513003	MW-24 121219	SW846 8260C	

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

QUALITY CONTROL DATA

Workorder: 3075513 ASN055|60440641

QC Batch: SVGC/55478 **Analysis Method:** RSK 175

QC Batch Method: RSK 175

Associated Lab Samples: 3075513001, 3075513002, 3075513003

METHOD BLANK: 3061973

Parameter	Blank Result	Units	Reporting Limit
n-Butane	4.3U	ug/L	4.3
Ethane	3.3U	ug/L	3.3
Ethene	2.4U	ug/L	2.4
Isobutane	4.6U	ug/L	4.6
Methane	1.5U	ug/L	1.5
Propane	3.2U	ug/L	3.2
Methyl-t-Butyl ether-d3 (S)			

SAMPLE DUPLICATE: 3061974 ORIGINAL: 3075513001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
n-Butane	0	ug/L	0	NC	20
Ethane	0	ug/L	0	NC	20
Ethene	0	ug/L	0	NC	20
Isobutane	0	ug/L	0	NC	20
Methane	0	ug/L	0	NC	20
Propane	0	ug/L	0	NC	20

QUALITY CONTROL DATA

Workorder: 3075513 ASN055|60440641

QC Batch: VOMS/53408 **Analysis Method:** SW846 8260C

QC Batch Method: SW846 8260C

Associated Lab Samples: 3075513001, 3075513002, 3075513003

METHOD BLANK: 3061715

Parameter	Blank Result	Units	Reporting Limit
Carbon Tetrachloride	0.75U	ug/L	1.0
1,1-Dichloroethane	0.75U	ug/L	1.0
1,2-Dichloroethane	0.75U	ug/L	1.0
1,1-Dichloroethene	0.75U	ug/L	1.0
cis-1,2-Dichloroethene	0.75U	ug/L	1.0
trans-1,2-Dichloroethene	0.75U	ug/L	1.0
1,1,1,2-Tetrachloroethane	0.75U	ug/L	1.0
1,1,2,2-Tetrachloroethane	0.75U	ug/L	1.0
Tetrachloroethene	0.75U	ug/L	1.0
Toluene	0.75U	ug/L	1.0
1,1,1-Trichloroethane	0.75U	ug/L	1.0
1,1,2-Trichloroethane	0.75U	ug/L	1.0
Trichloroethene	0.75U	ug/L	1.0
Vinyl Chloride	0.75U	ug/L	1.0
1,2-Dichloroethane-d4 (S)	105	%	81 - 118
4-Bromofluorobenzene (S)	107	%	85 - 114
Dibromofluoromethane (S)	101	%	80 - 119
Toluene-d8 (S)	97.6	%	89 - 112

LABORATORY CONTROL SAMPLE: 3061716

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Carbon Tetrachloride	111	ug/L	20	22.2	72 - 136
1,1-Dichloroethane	119	ug/L	20	23.7	77 - 125
1,2-Dichloroethane	113	ug/L	20	22.5	73 - 128
1,1-Dichloroethene	129	ug/L	20	25.8	71 - 131
cis-1,2-Dichloroethene	115	ug/L	20	23.1	78 - 123
trans-1,2-Dichloroethene	126*	ug/L	20	25.2	75 - 124
1,1,1,2-Tetrachloroethane	111	ug/L	20	22.1	78 - 124
1,1,2,2-Tetrachloroethane	107	ug/L	20	21.4	71 - 121
Tetrachloroethene	117	ug/L	20	23.5	74 - 129
Toluene	117	ug/L	20	23.3	80 - 121
1,1,1-Trichloroethane	118	ug/L	20	23.6	74 - 131
1,1,2-Trichloroethane	108	ug/L	20	21.6	80 - 119
Trichloroethene	114	ug/L	20	22.7	79 - 123

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

QUALITY CONTROL DATA

Workorder: 3075513 ASN055|60440641

Vinyl Chloride	96.8	ug/L	20	19.4	58 - 137
1,2-Dichloroethane-d4 (S)	103	%			81 - 118
4-Bromofluorobenzene (S)	106	%			85 - 114
Dibromofluoromethane (S)	102	%			80 - 119
Toluene-d8 (S)	99.1	%			89 - 112

MATRIX SPIKE: 3062294 DUPLICATE: 3062295 ORIGINAL: 3075513001

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Carbon Tetrachloride	0	ug/L	20	22.6047	23.7224	113	119	72 - 136	4.83	30
1,1-Dichloroethane	0	ug/L	20	24.2271	25.5678	121	128*	77 - 125	5.38	30
1,2-Dichloroethane	0	ug/L	20	22.5835	23.448	113	117	73 - 128	3.76	30
1,1-Dichloroethene	0	ug/L	20	26.7485	28.3759	134*	142*	71 - 131	5.9	30
cis-1,2-Dichloroethene	0	ug/L	20	23.4366	24.6507	117	123	78 - 123	5.05	30
trans-1,2-Dichloroethene	0	ug/L	20	25.6957	26.9336	128*	135*	75 - 124	4.7	30
1,1,1,2-Tetrachloroethane	0	ug/L	20	23.2957	23.4909	116	117	78 - 124	.83	30
1,1,2,2-Tetrachloroethane	0	ug/L	20	22.4467	21.1754	112	106	71 - 121	5.83	30
Tetrachloroethene	0	ug/L	20	24.058	23.9599	120	120	74 - 129	.41	30
Toluene	0	ug/L	20	24.9788	25.1102	125*	126*	80 - 121	.52	30
1,1,1-Trichloroethane	0	ug/L	20	24.6227	25.2931	123	126	74 - 131	2.69	30
1,1,2-Trichloroethane	0	ug/L	20	33.7048	23.4105	169*	117	80 - 119	36	30
Trichloroethene	0	ug/L	20	23.4251	24.4369	117	122	79 - 123	4.23	30
Vinyl Chloride	0	ug/L	20	20.8319	22.1502	104	111	58 - 137	6.13	30
1,2-Dichloroethane-d4 (S)	102	%				102	103	81 - 118		
4-Bromofluorobenzene (S)	110	%				110	109	85 - 114		
Dibromofluoromethane (S)	102	%				102	102	80 - 119		
Toluene-d8 (S)	101	%				101	98.3	89 - 112		

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State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

QUALITY CONTROL DATA

Workorder: 3075513 ASN055|60440641

QC Batch: WETC/231869 **Analysis Method:** EPA 300.0

QC Batch Method: EPA 300.0

Associated Lab Samples: 3075513001, 3075513002, 3075513003

METHOD BLANK: 3060314

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.25U	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 3060316

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Chloride	103	mg/L	20	20.7	87 - 111
Nitrate-N	101	mg/L	2.5	2.5	88 - 111
Sulfate	104	mg/L	20	20.8	87 - 112

MATRIX SPIKE: 3060320 DUPLICATE: 3060321 ORIGINAL: 3075513001

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Chloride	1.7	mg/L	40	41.14	41.32	98.6	99.1	87 - 111	.44	15
Nitrate-N	.84	mg/L	5	5.7	5.76	97.2	98.4	88 - 111	1.05	15
Sulfate	71.1	mg/L	40	111.86	112.46	102	103	87 - 112	.53	15

METHOD BLANK: 3060319

Parameter	Blank Result	Units	Reporting Limit
Chloride	0.25U	mg/L	1.0
Nitrate-N	0.030U	mg/L	0.10
Sulfate	0.25U	mg/L	1.0

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

QUALITY CONTROL DATA

Workorder: 3075513 ASN055|60440641

QC Batch: WETC/231931 **Analysis Method:** SM5310B-2011

QC Batch Method: 415.1/9060/5310B

Associated Lab Samples: 3075513001, 3075513002, 3075513003

METHOD BLANK: 3060891

Parameter	Blank Result	Units	Reporting Limit
Total Organic Carbon (TOC)	0.50U	mg/L	1.0

LABORATORY CONTROL SAMPLE: 3060892

Parameter	LCS % Rec	Units	Spike Conc.	LCS Result	% Rec Limit
Total Organic Carbon (TOC)	96.2	mg/L	1	0.96J	85 - 115

MATRIX SPIKE: 3060893 DUPLICATE: 3060894 ORIGINAL: 3074540002

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	13.79	mg/L	30	44.17	44.575	101	103	85 - 115	.91	20

MATRIX SPIKE: 3060895 DUPLICATE: 3060896 ORIGINAL: 3075513001

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Parameter	Original Result	Units	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limit	RPD	Max RPD
Total Organic Carbon (TOC)	.884	mg/L	6	7.09	6.982	103	102	85 - 115	1.53	20

QUALITY CONTROL DATA

Workorder: 3075513 ASN055|60440641

QC Batch: WETC/232196 **Analysis Method:** SM2320B-2011

QC Batch Method: SM2320B-2011

Associated Lab Samples: 3075513001, 3075513002, 3075513003

METHOD BLANK: 3063693

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

METHOD BLANK: 3063699

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

SAMPLE DUPLICATE: 3063701 ORIGINAL: 3075513001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	296.37	mg/L	294.23	.72	20

METHOD BLANK: 3063703

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

METHOD BLANK: 3063707

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

SAMPLE DUPLICATE: 3063709 ORIGINAL: 3075593001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD

QUALITY CONTROL DATA

Workorder: 3075513 ASN055|60440641

Alkalinity, Total	381.47	mg/L	379.37	.55	20

METHOD BLANK: 3063711

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

SAMPLE DUPLICATE: 3063713 ORIGINAL: 3075690004

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	7.68	mg/L	9.74	23.7*	20

METHOD BLANK: 3063715

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

SAMPLE DUPLICATE: 3063717 ORIGINAL: 3075716004

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	175.19	mg/L	176.06	.5	20

METHOD BLANK: 3063719

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

SAMPLE DUPLICATE: 3063721 ORIGINAL: 3075739001

Parameter	Original Result	Units	DUP Result	RPD	Max RPD
Alkalinity, Total	124.19	mg/L	123.04	.93	20

QUALITY CONTROL DATA

Workorder: 3075513 ASN055|60440641

METHOD BLANK: 3063723

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

METHOD BLANK: 3063727

Parameter	Blank Result	Units	Reporting Limit
Alkalinity, Total	5U	mg/L	5

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 3075513 ASN055|60440641

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
3075513001	MW-16 121219			EPA 300.0	WETC/231869
3075513002	MW-26 121219			EPA 300.0	WETC/231869
3075513003	MW-24 121219			EPA 300.0	WETC/231869
3075513001	MW-16 121219			SM5310B-2011	WETC/231931
3075513002	MW-26 121219			SM5310B-2011	WETC/231931
3075513003	MW-24 121219			SM5310B-2011	WETC/231931
3075513001	MW-16 121219			SW846 8260C	VOMS/53408
3075513002	MW-26 121219			SW846 8260C	VOMS/53408
3075513003	MW-24 121219			SW846 8260C	VOMS/53408
3075513001	MW-16 121219			RSK 175	SVGC/55478
3075513002	MW-26 121219			RSK 175	SVGC/55478
3075513003	MW-24 121219			RSK 175	SVGC/55478
3075513001	MW-16 121219			SM2320B-2011	WETC/232196
3075513002	MW-26 121219			SM2320B-2011	WETC/232196
3075513003	MW-24 121219			SM2320B-2011	WETC/232196

ALS Environmental

34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

* 3 0 7 5 5 1 3 *

COC# 3075513

Co. Name: AECOM
Contact (Report to): Gerlinde Wolf
Phone:
Address: 40 British American Blvd Latham, NY 12110
Bill to (if different than Report to):
PO#:
Project Name/#: 60440641
ALS Quote #:
TAT: [X] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALS approval and surcharges.
Date Required:
Approved By:
Email? [X] Y gerlinde.wolf@aecom.com
Fax? [ ] Y No.:

	CG	CG	AG	PE	PE
***Container Type	CG	CG	AG	PE	PE
***Container Size	40ml	40ml	40ml	8oz	8oz
***Preservative	HCl	HCl	HCl	—	—

ANALYSES/METHOD REQUESTED: 8260C | RSK 175 | TOC | Alkalinity | Cl, NO_3, SO_4

Enter Number of Containers Per Analysis

	Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	8260C	RSK 175	TOC	Alkalinity	Cl, NO_3, SO_4
1	MW-16 121219	*MS/MSD here	12/12/19	1000	G	GW	2	2	2	1	1
2	MW-26 121219		↓	1145	↓	↓	2	2	2	1	1
3	MW-24 121219		↓	1350	↓	↓	2	2	2	1	1
4	MS		↓	–	↓	↓	2	2	2	1	1
5	MSD		↓	–	↓	↓	2	2	2	1	1
6	AH										
7											
8											

Receipt Information (completed by Sample Receiving)
Performed by: | INITIAL HERE
Cooler Temp:
Therm. ID:
No. of Coolers:
Notes:

Circle appropriate Y or N.

Correct containers?	Y	N
Correct sample volume?	Y	N
Correct preservation?	Y	N
Headspace/Volatiles?	Y	N
Custody seals Present?	Y	N
(if present) Seals intact?	Y	N
Received on ice?	Y	N
COC/Labels complete/accurate?	Y	N
Container in good condition?	Y	N

SAMPLED BY (Please Print): Alexandra Golden

Project Comments:

	Relinquished By / Company Name	Date	Time		Received By / Company Name	Date	Time
1	Alexandra Golden / AECOM	12/12/19	1500	2	Daniel Hagen / ALS	12/12/19	1510
3	Daniel Hagen / ALS	12/12/19	1700	4	COMMON COURIER / ALS COURIER		
5	COMMON COURIER / ALS COURIER			6	Cottiny Sheppard	12/13/19	0920
7				8			
9				10			

Data Deliverables: [ ] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ]
SDWA Forms? yes [ ] yes [ ] yes [ ] yes [ ]
State Samples Collected In? MD [ ] NJ [ ] NY [X] PA [ ]
EDDs Required? [ ] If yes, format type: Other
DOD Criteria Required?

ALS FIELD SERVICES
[X] Pickup
[ ] Labor
[ ] Composite Sampling
[ ] Rental Equipment
[ ] Other:

* G=Grab; C=Composite
**Matrix: AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater
***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY

Rev 01-2013

ALS

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
AECOM	3075513	CLS	12/13

1. Were airbills / tracking numbers present and recorded? .... NONE YES NO
   Tracking number: 4888 8630 1034

2. Are Custody Seals on shipping containers intact?	NONE	YES	NO
3. Are Custody Seals on sample containers intact?	NONE	YES	NO
4. Is there a COC (Chain-of-Custody) present?		YES	NO
5. Are the COC and bottle labels complete, legible and in agreement?		YES	NO
5a. Does the COC contain sample locations?		YES	NO
5b. Does the COC contain date and time of sample collection for all samples?		YES	NO
5c. Does the COC contain sample collectors name?		YES	NO
5d. Does the COC note the type(s) of preservation for all bottles?		YES	NO
5e. Does the COC note the number of bottles submitted for each sample?		YES	NO
5f. Does the COC note the type of sample, composite or grab?		YES	NO
5g. Does the COC note the matrix of the sample(s)?		YES	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		YES	NO
8. Are all samples within holding times for the requested analyses?		YES	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		YES	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	N/A	YES	NO
11. Were the samples received on ice?		YES	NO
12. Were sample temperatures measured at 0.0-6.0°C		YES	~~NO~~
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below.		YES	NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	NO
13b. Did the client provide a SDWA PWS ID#?	N/A	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO

Cooler #: ______

Temperature (°C): 1

Thermometer ID: 525

Radiological (μCi): ______

COMMENTS (Required for all NO responses above and any sample non-conformance):

Rev. 4/29/2019

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

December 30, 2019

Gerlinde Wolf
AECOM
40 British American Blvd
Latham, NY 12110

RE: **SCOTIA NAVY DEPOT**

Pace Workorder: 32426

Dear Gerlinde Wolf:

Enclosed are the analytical results for sample(s) received by the laboratory on Friday, December 13, 2019. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Emma Louis 12/30/2019
Emma.Louis@pacelabs.com

Customer Service Representative

Enclosures

As a valued client we would appreciate your comments on our service.
Please email PAESfeedback@pacelabs.com.

Total Number of Pages 13

CERTIFICATE OF ANALYSIS

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238

Phone: (412) 826-5245
Fax: (412) 826-3433

LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor:	Pennsylvania Department of Environmental Protection, Bureau of Laboratories
Accreditation ID:	02-00538
Scope:	NELAP Non-Potable Water
Accreditor:	West Virginia Department of Environmental Protection, Division of Water and Waste Management
Accreditation ID:	395
Scope:	Non-Potable Water
Accreditor:	South Carolina Department of Health and Environmental Control, Office of Environmental Laboratory Certification
Accreditation ID:	89009003
Scope:	Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)
Accreditor:	State of Virginia
Accreditation ID:	460201
Scope:	Non-Potable Water
Accreditor:	NELAP: New Jersey, Department of Environmental Protection
Accreditation ID:	PA026
Scope:	Non-Potable Water
Accreditor:	NELAP: New York, Department of Health Wadsworth Center
Accreditation ID:	11815
Scope:	Non-Potable Water
Accreditor:	State of Connecticut, Department of Public Health, Division of Environmental Health
Accreditation ID:	PH-0263
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: Texas, Commission on Environmental Quality
Accreditation ID:	T104704453-09-TX
Scope:	Non-Potable Water
Accreditor:	State of New Hampshire
Accreditation ID:	299409
Scope:	Non-potable water
Accreditor:	State of Georgia
Accreditation ID:	Chapter 391-3-26
Scope:	As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

SAMPLE SUMMARY

Workorder: 32426 SCOTIA NAVY DEPOT

Lab ID	Sample ID	Matrix	Date Collected	Date Received
324260001	MW-30 121019	Bubble Strip	12/10/2019 14:00	12/13/2019 10:30
324260002	MW-31 121019	Bubble Strip	12/10/2019 14:05	12/13/2019 10:30
324260003	MW-28 121019	Bubble Strip	12/10/2019 11:45	12/13/2019 10:30
324260004	MW-34 121119	Bubble Strip	12/11/2019 10:30	12/13/2019 10:30
324260005	MW-32 121119	Bubble Strip	12/11/2019 14:20	12/13/2019 10:30

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ANALYTICAL RESULTS

Workorder: 32426 SCOTIA NAVY DEPOT

Lab ID:	**324260001**	Date Received:	12/13/2019 10:30	Matrix:	Bubble Strip
Sample ID:	**MW-30 121019**	Date Collected:	12/10/2019 14:00		

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Hydrogen	**10**	nM	1.0	0.75	1	12/24/2019 12:01	MM	n

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ANALYTICAL RESULTS

Workorder: 32426 SCOTIA NAVY DEPOT

Lab ID:	**324260002**	Date Received:	12/13/2019 10:30	Matrix:	Bubble Strip
Sample ID:	**MW-31 121019**	Date Collected:	12/10/2019 14:05		

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**2.2**	nM	1.0	0.75	1	12/24/2019 12:17	MM	n

CERTIFICATE OF ANALYSIS

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ANALYTICAL RESULTS

Workorder: 32426 SCOTIA NAVY DEPOT

Lab ID:	**324260003**	Date Received:	12/13/2019 10:30	Matrix:	Bubble Strip
Sample ID:	**MW-28 121019**	Date Collected:	12/10/2019 11:45		

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Hydrogen	**1.8**	nM	1.0	0.75	1	12/24/2019 12:32	MM	n

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ANALYTICAL RESULTS

Workorder: 32426 SCOTIA NAVY DEPOT

Lab ID:	**324260004**	Date Received:	12/13/2019 10:30	Matrix:	Bubble Strip
Sample ID:	**MW-34 121119**	Date Collected:	12/11/2019 10:30		

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**3.0**	nM	1.0	0.75	1	12/24/2019 12:46	MM	n

CERTIFICATE OF ANALYSIS

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ANALYTICAL RESULTS

Workorder: 32426 SCOTIA NAVY DEPOT

Lab ID:	**324260005**	Date Received:	12/13/2019 10:30	Matrix:	Bubble Strip
Sample ID:	**MW-32 121119**	Date Collected:	12/11/2019 14:20		

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Hydrogen	**5.0**	nM	1.0	0.75	1	12/24/2019 13:00	MM	n

CERTIFICATE OF ANALYSIS

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ANALYTICAL RESULTS QUALIFIERS

Workorder: 32426 SCOTIA NAVY DEPOT

DEFINITIONS/QUALIFIERS

MDL	Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.
PQL	Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.
ND	Not detected at or above reporting limit.
DF	Dilution Factor.
S	Surrogate.
RPD	Relative Percent Difference.
% Rec	Percent Recovery.
U	Indicates the compound was analyzed for, but not detected at or above the noted concentration.
J	Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).
n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.

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QUALITY CONTROL DATA

Workorder: 32426 SCOTIA NAVY DEPOT

QC Batch: DISG/8003 Analysis Method: AM20GAX
QC Batch Method: AM20GAX
Associated Lab Samples: 324260001, 324260002, 324260003, 324260004, 324260005

METHOD BLANK: 65096

Parameter	Units	Blank Result	Reporting Limit	Qualifiers
RISK				
Hydrogen	nM	<1.0	1.0	n

LABORATORY CONTROL SAMPLE & LCSD: 65097 65098

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limit	RPD	Max RPD	Qualifiers
Hydrogen	nM	24	23	25	96	102	80-120	6.1	20	n

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QUALITY CONTROL DATA QUALIFIERS

Workorder: 32426 SCOTIA NAVY DEPOT

QUALITY CONTROL PARAMETER QUALIFIERS

n	The laboratory does not hold NELAP/TNI accreditation for this method or analyte.

Pace Analytical Energy Services LLC
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Phone: (412) 826-5245
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 32426 SCOTIA NAVY DEPOT

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
324260001	MW-30 121019			AM20GAX	DISG/8003
324260002	MW-31 121019			AM20GAX	DISG/8003
324260003	MW-28 121019			AM20GAX	DISG/8003
324260004	MW-34 121119			AM20GAX	DISG/8003
324260005	MW-32 121119			AM20GAX	DISG/8003

Pace Analytical®

CHAIN-OF-CUSTODY Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

Company: AECOM

Address: 40 British American Blvd

Report To: Gerlinde Wolf

Copy To: Dan Servetas

Customer Project Name/Number: Scotia Navy Depot / 60440641

Phone: 518 951 2370

Email: gerlinde.wolf@aecom.com

Collected By (print): Alex Golden

Collected By (signature): Alex Golden

Sample Disposal: [X] Dispose as appropriate [ ] Return [ ] Archive: ______ [ ] Hold: ______

Billing Information: 60440641.17

Email To: gerlinde.wolf@aecom.com

Site Collection Info/Address: Scotia, NY

State: NY/ County/City: Scotia Time Zone Collected: [ ] PT [ ] MT [ ] CT [X] ET

Site/Facility ID #:

Purchase Order #:

Quote #: 28154

Turnaround Date Required: Standard

Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply)

Compliance Monitoring? [ ] Yes [ ] No

DW PWS ID #:

DW Location Code:

Immediately Packed on Ice: [ ] Yes [ ] No

Field Filtered (if applicable): [ ] Yes [X] No

Analysis: ______

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	Dissolved Hydrogen
MW-30 121019	AR	G	12/10/19	1400				1	↓
MW-31 121019	↓	↓	↓	1405				1	↓
MW-28 121019	↓	↓	↓	1145				1	↓
MW-34 121119	↓	↓	12/11/19	1030				1	↓
MW-32 121119	↓	↓	↓	1420				1	↓

AG

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: Wet Blue Dry None

Packing Material Used: bubble wrap

Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A

Lab Tracking #: n/a 2324577

Samples received via: FEDEX UPS Client Courier Pace Courier

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:
Alexandra Golden / AECOM	12/12/19 1600	[signature]	12/13/19 [illegible]

MTJL LAB USE ONLY

Table #:

Acctnum:

Template:

Prelogin:

PM:

PB:

LAB USE ONLY- Affix Workorder/Login Label Here or List Pace Workorder Number or MTJL Log-in Number Here

32426

ALL SHADED AREAS are for LAB USE ONLY 12/13/19

Container Preservative Type ** V

Lab Project Manager:

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other ______

Analyses

Lab Profile/Line:

Lab Sample Receipt Checklist:

- Custody Seals Present/Intact Y N NA
- Custody Signatures Present Y N NA
- Collector Signature Present Y N NA
- Bottles Intact Y N NA
- Correct Bottles Y N NA
- Sufficient Volume Y N NA
- Samples Received on Ice Y N NA
- VOA - Headspace Acceptable Y N NA
- USDA Regulated Soils Y N NA
- Samples in Holding Time Y N NA
- Residual Chlorine Present Y N NA
- Cl Strips: ______
- Sample pH Acceptable Y N NA
- pH Strips: ______
- Sulfide Present Y N NA
- Lead Acetate Strips: ______

LAB USE ONLY:

Lab Sample # / Comments:

Lab Sample Temperature Info:

Temp Blank Received: Y N NA

Therm ID#: ______

Cooler 1 Temp Upon Receipt: ____oC

Cooler 1 Therm Corr. Factor: ____oC

Cooler 1 Corrected Temp: ____oC

Comments:

Trip Blank Received: Y N NA

HCL MeOH TSP Other

Non Conformance(s): YES / NO

Page: ____ of: ____

APPENDIX E: AECOM Data Usability Summary Report (DUSR)

Prepared for:
U.S. Army Corps of Engineers
Huntsville and New York Districts

Prepared by:
AECOM
Pittsburgh, PA
60440641-17
January 2020

January 6, 2020

Data Usability Summary Report
Defense National Stockpile Center
Scotia Depot
Glenville, New York
Groundwater Sampling Event
December 2019
Final

Prepared for:
U.S. Army Corps of Engineers
Huntsville and New York Districts

Prepared by:
AECOM
Pittsburgh, PA
60440641-17
January 2020

January 6, 2020

Data Usability Summary Report Defense National Stockpile Center Scotia Depot Glenville, New York Groundwater Sampling Event December 2019 Final

Prepared By
Gregory Malzone, Project Chemist
AECOM
Gulf Tower
707 Grant Street, 5th floor
Pittsburgh, PA 15219

Reviewed By
Robert Davis, Data Validator/Database Technician
AECOM
1360 Peachtree Street NE, Suite 500
Atlanta, GA 30309

Contents

List of Appendices

Executive Summary

Overview

Data validation was performed by Gregory A. Malzone of AECOM-Pittsburgh on the fixed-laboratory analytical data for groundwater samples collected from the Defense National Stockpile Center Scotia Depot, Glenville, New York, on December 9-12, 2019. Samples were collected as part of the baseline groundwater sampling round as described in Final Quality Assurance Project Plan for the Defense National Stockpile Center Scotia Depot Glenville, New York (the project-specific QAPP; AECOM, September 2016). Samples were submitted for analysis to ALS Environmental (ALS), 34 Dogwood Lane, Middletown, Pennsylvania 17057.

The list of field and quality control samples submitted, the date sampled, and the laboratory work order numbers are presented in Table 1. Data were reported by ALS in four deliverables. Each laboratory deliverable is identified by a sample delivery group (SDG) number.

The following analytical methods were requested on the chain-of-custody (CoC) records.

- Volatile Organic Compounds (VOCs) by USEPA SW-846 Method 8260C

Monitored Natural Attenuation (MNA) Parameters:

- Methane, Ethane, Ethene, n-Butane, Isobutane and Propane by RSK -175
- Chloride, Nitrate as N and Sulfate by Method EPA Method 300.0
- Alkalinity by Standard Methods 2320B-2011
- Total Organic Carbon by Standard Methods 5310B-2011

Subcontracted Dissolved Hydrogen:

- Dissolved Hydrogen by Bubble Strip (PACE Method AM20GAX)

Total and Dissolved Metals:

- Total and Dissolved Iron by USEPA SW-846 Methods3015/6010D

Table 1 - Sample Submittals

Field ID	ALS ID	Matrix	Field QC	Date Sampled	Analytes				SDG Number
					VOCs	MNA	D Hyd	T&D Fe	
MW-15-120919	3074551001	Groundwater		12/9/2019	x	x			ASN052
MW-29-120919	3074551002	Groundwater		12/9/2019	x	x		x	ASN052
DUP-1-120919	3074551003	Groundwater (QC)	MW-29-120919	12/9/2019	x	x		x	ASN052
MW-28-121019	3074827001	Groundwater		12/10/2019	x	x	x	x	ASN053
MW-30-121019	3074827002	Groundwater		12/10/2019	x	x	x	x	ASN053
MW-31-121019	3074827003	Groundwater		12/10/2019	x	x	x	x	ASN053
MW-35-121119	3075221001	Groundwater		12/11/2019	x	x		x	ASN054
MW-34-121119	3075221002	Groundwater		12/11/2019	x	x	x	x	ASN054
MW-33-121119	3075221003	Groundwater		12/11/2019	x	x		x	ASN054
MW-32-121119	3075221004	Groundwater		12/11/2019	x	x	x	x	ASN054
DUP-2-121119	3075221005	Groundwater (QC)	MW-32-121119	12/11/2019	x	x		x	ASN054
Trip Blank-111219	3075221006	Aqueous (QC)	trip blank	12/12/2019	x				ASN054
MW-16-121219	3075513001	Groundwater	MS/MSD	12/12/2019	x	x			ASN055
MW-26-121219	3075513002	Groundwater		12/12/2019	x	x			ASN055
MW-24-121219	3075513003	Groundwater		12/12/2019	x	x			ASN055

The dissolved hydrogen samples were submitted to Pace Analytical Energy Services LLC (Pace), 220 William Pitt Way, Pittsburgh, PA 15238 for analysis. The dissolved hydrogen samples were analyzed, and the data reported under work order number 32426.

The trip blanks were analyzed for VOCs only. Sample MW-16-121219 was designated in the field to be processed as the quality control sample, that is, as the matrix spike/matrix spike duplicate (MS/MSD). The samples for dissolved iron were filtered and preserved at ALS. Unless otherwise noted, analyses were performed in accordance with the project-specific QAPP which is based on the DoD QSM v5.0.

The data were evaluated for conformance to method specifications and qualifiers were applied using the USEPA Region II SOPs and the validation criteria set forth in the *USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Superfund Methods Data Review*, EPA-540-R-2017-002, January 2017 and *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Methods Data Review*, EPA-540-R-2017-001, January 2017, as they apply to the analytical methods employed.

Field duplicate relative percent difference (RPD) review and applicable control limits were taken from the *USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses*, December 1996 and *USEPA Region I Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses*, June 1988.

Summary

All data have been determined to be useable for the purpose of assessing the presence/absence and quantitative concentrations of the compounds and analytes in the media tested (i.e. groundwater) with the qualifications described below. Completeness of 100% was achieved for this data set. This is within the goal of 90-100% and is acceptable.

A glossary of data qualifier definitions is included in Appendix A of this report. The qualified data summaries are attached as Appendix B of this report.

Each nonconformance with specific data usability criteria is discussed below. Page references for the supporting documentation in the laboratory reports are provided in each item header. Support documentation for data qualifications was included in Appendix C of this report.

1.0 Volatile Organic Compounds

Measurement performance indicators which did not meet criteria for Volatile Organic Compounds (VOCs) analysis is presented below for each of the four laboratory reports. Analytical results for VOCs were reviewed for the following measurement performance indicators:

- Data Completeness
- Chain of Custody
- Sample Preservation
- Holding Time
- GC/MS Tunes
- Initial Calibration
- Initial Calibration Verification
- Continuing Calibration Verification
- Method Blanks
- Trip Blanks
- Surrogates
- Matrix Spike/Matrix Spike Duplicate
- Internal Standards
- Quantitation Limits
- Laboratory Control Samples
- Data package / EDD consistency

Work Order 3074551 (SDG ASN052)

Laboratory Control Sample Recovery (p. 30): The LCS 3059517 (12/13/19) recoveries for 1,1-dichloroethene and trans-1,2-dichloroethene were greater than the upper quality control limits. Samples MW-15-120919, MW-29-120919 and DUP-1 were affected. The positive 1,1-dichloroethene results for samples MW-29-120919 and DUP-1 were qualified "J," as estimated concentrations, because of high method bias. Non-detect results were not qualified on this basis.

Work Order 3074827 (SDG ASN053)

Laboratory Control Sample Recovery (pp. 31-32): The LCS 3059517 (12/13/19) recoveries for 1,1-dichloroethene and trans-1,2-dichloroethene were greater than the upper quality control limits. Samples MW-28-121019, MW-30-121019 and MW-31-121019 were affected. The positive 1,1-dichloroethene result for sample MW-28-121019 was qualified "J," as an estimated concentration, because of high method bias. Non-detect results were not qualified on this basis.

The LCS 3061716 (12/17/19) recoveries for 1,1-dichloroethene and trans-1,2-dichloroethene were greater than the upper quality control limits. Sample MW-28-121019 required analysis at a secondary five-fold dilution to bring the trichloroethene concentration into the calibration range on 12/17/19. The high method bias for 1,1-dichloroethene and trans-1,2-dichloroethene did not affect the five-fold dilution analysis. No data qualifications were required.

Work Order 3075221 (SDG ASN054)

Laboratory Control Sample Recovery (pp. 38-39): The LCS 3059517 (12/13/19) recoveries for 1,1-dichloroethene and trans-1,2-dichloroethene were greater than the upper quality control limits. Samples MW-32-121119, MW-33-121119, MW-34-121119, MW-35-121119 and DUP-2-121119 were affected. The 1,1-dichloroethene and trans-1,2-dichloroethene results for samples MW-32-121119, MW-33-121119, MW-34-121119, MW-35-121119 and DUP-2-121119 were non-detect. No data qualification was required.

The LCS 3061716 (12/17/19) recoveries for 1,1-dichloroethene and trans-1,2-dichloroethene were greater than the upper quality control limits. Sample Trip Blank-111219 was affected. The 1,1-dichloroethene and trans-1,2-dichloroethene results for sample Trip Blank-111219 was non-detect. No data qualification was required.

Work Order 3075513 (SDG ASN055)

Laboratory Control Sample Recovery (p. 31): The LCS 3061716 (12/17/19) recoveries for 1,1-dichloroethene and trans-1,2-dichloroethene were greater than the upper quality control limits. Samples MW-16-121219, MW-24-121219 and MW-26-121219 were affected. The 1,1-dichloroethene and trans-1,2-dichloroethene results for associated samples MW-16-121219, MW-24-121219 and MW-26-121219 were non-detect, except for 1,1-dichloroethene in sample MW-24-121219. The positive 1,1-dichloroethene result for sample MW-24-121219 was qualified “J,” as an estimated concentration, because of high method bias.

Matrix Spike Recovery and RPDs (pp. 32-33): Sample MW-16-121219 was designated in the field to be processed as the quality control sample, that is, as the MS/MSD. The MW-16-121219 MS/MSD recoveries for 1,1-dichloroethene, trans-1,2-dichloroethene and toluene were greater than the upper advisory limits. The MW-16-121219 MS and RPD for 1,1,2-trichloroethane were greater than the upper advisory limits. The 1,1,2-trichloroethane, 1,1-dichloroethene, trans-1,2-dichloroethene and toluene results for sample MW-16-121219 were non-detect. No data qualification was required.

2.0 Hydrocarbon Gases

Measurement performance indicators which did not meet criteria for methane, ethane, ethene, n-butane, isobutane and propane analysis are presented below for each of the three laboratory reports. Analytical results for light hydrocarbon gases were reviewed for the following measurement performance indicators:

- Data Completeness
- Chain of Custody
- Sample Preservation
- Holding Time
- Initial Calibration
- Initial Calibration Verification
- Continuing Calibration Verification
- Method Blanks
- Matrix Spike/Matrix Spike Duplicate
- Laboratory Duplicate
- Quantitation Limits
- Laboratory Control Samples
- Data package / EDD consistency

Work Order 3074551 (SDG ASN052)

No data quality issues were noted. No data qualification was required.

Work Order 3074827 (SDG ASN053)

No data quality issues were noted. No data qualification was required.

Work Order 3075221 (SDG ASN054)

No data quality issues were noted. No data qualification was required.

Work Order 3075513 (SDG ASN055)

No data quality issues were noted. No data qualification was required.

3.0 Total and Dissolved Iron

Measurement performance indicators which did not meet criteria for total and dissolved iron analysis are presented below for each of the three laboratory reports. Analytical results for total and dissolved iron were reviewed for the following measurement performance indicators:

- Chain of Custody
- Sample Preservation
- Holding Time
- Quantitation Limits
- Initial Calibration
- Continuing Calibration Verification
- Method Blanks
- Matrix Spike/Matrix Spike Duplicate
- Laboratory Duplicate
- Laboratory Control Samples
- Data package / EDD consistency

Work Order 3074551 (SDG ASN052)

No data quality issues were noted. No data qualification was required.

Work Order 3074827 (SDG ASN053)

No data quality issues were noted. No data qualification was required.

Work Order 3075221 (SDG ASN054)

No data quality issues were noted. No data qualification was required.

4.0 Chloride, Sulfate, Nitrate as N

Measurement performance indicators which did not meet criteria for chloride, sulfate and nitrate as N analysis are presented below for each of the three laboratory reports. Analytical results for these anions were reviewed for the following measurement performance indicators:

- Chain of Custody
- Sample Preservation
- Holding Time
- Quantitation Limits
- Initial Calibration
- Continuing Calibration Verification
- Method Blanks
- Matrix Spike/Matrix Spike Duplicate
- Laboratory Duplicate
- Laboratory Control Samples
- Data package / EDD consistency

Work Order 3074551 (SDG ASN052)

No data quality issues were noted. No data qualification was required.

Work Order 3074827 (SDG ASN053)

No data quality issues were noted. No data qualification was required.

Work Order 3075221 (SDG ASN054)

Method Blanks (p. 2763): Chloride was detected in method blanks 3059758 (12/13/19 03:22) and 3060242 (12/13/19 07:38) at concentrations estimated to be less than the LOQ. Samples MW-35-121119, MW-34-121119, MW-33-121119, MW-32-121119 and DUP-2-121119 were affected. The chloride results for samples MW-35-121119, MW-34-121119, MW-33-121119, MW-32-121119 and DUP-2-121119 were greater than ten times the method blank concentrations. No data qualification was required.

Work Order 3075513 (SDG ASN055)

No data quality issues were noted. No data qualification was required.

5.0 Alkalinity

Measurement performance indicators which did not meet criteria for alkalinity analysis are presented below for each of the three laboratory reports. Analytical results for alkalinity were reviewed for the following measurement performance indicators:

- Chain of Custody
- Sample Preservation
- Holding Time
- Quantitation Limits
- Initial Calibration
- Continuing Calibration Verification
- Method Blanks
- Matrix Spike/Matrix Spike Duplicate
- Laboratory Duplicate
- Laboratory Control Samples
- Data package / EDD consistency

Work Order 3074551 (SDG ASN052)

Method Blanks (p. 1529): Alkalinity was detected in method preparation blanks 3061836 and 3061847 at concentrations estimated to be less than the LOQ. Samples MW-15-120919, MW-29-120919 and DUP-1-120919 were affected. The total alkalinity results for samples MW-15-120919, MW-29-120919 and DUP-1-120919 were greater than ten times the method blank concentrations. No data qualification was required.

Work Order 3074827 (SDG ASN053)

No data quality issues were noted. No data qualification was required.

Work Order 3075221 (SDG ASN054)

Method Blanks (p. 2753): Alkalinity was detected in method preparation blank 3063045 at concentration 5.9 mg/L, which is greater than the LOQ. Samples MW-35-121119, MW-34-121119, MW-33-121119, MW-32-121119 and DUP-2-121119 were affected. The total alkalinity results for samples MW-35-121119, MW-34-121119, MW-33-121119, MW-32-121119 and DUP-2-121119 were greater than ten times the method blank concentration. No data qualification was required.

Work Order 3075513 (SDG ASN055)

No data quality issues were noted. No data qualification was required.

6.0 Total Organic Carbon

Measurement performance indicators which did not meet criteria for total organic carbon (TOC) analysis are presented below for each of the three laboratory reports. Analytical results for TOC were reviewed for the following measurement performance indicators:

- Chain of Custody
- Sample Preservation
- Holding Time
- Quantitation Limits
- Initial Calibration
- Initial Calibration Verification
- Continuing Calibration Verification
- Method Blanks
- Matrix Spike/Matrix Spike Duplicate
- Laboratory Duplicate
- Laboratory Control Samples
- Data package / EDD consistency

Work Order 3074551 (SDG ASN052)

No data quality issues were noted. No data qualification was required.

Work Order 3074827 (SDG ASN053)

No data quality issues were noted. No data qualification was required.

Work Order 3075221 (SDG ASN054)

No data quality issues were noted. No data qualification was required.

Work Order 3075513 (SDG ASN055)

No data quality issues were noted. No data qualification was required.

7.0 Dissolved Hydrogen

Measurement performance indicators which did not meet criteria for dissolved hydrogen and acetylene analysis are presented below for the Pace laboratory report. Analytical results for dissolved hydrogen and acetylene were reviewed for the following measurement performance indicators:

- Data Completeness
- Chain of Custody
- Sample Preservation
- Holding Time
- Method Blanks
- Quantitation Limits
- Laboratory Control Samples
- Data package / EDD consistency

Work Order 32426

No data quality issues were noted. No data qualification was required.

8.0 Field Duplicate Comparison

Field duplicate samples were collected at groundwater wells MW-29 and MW-33. See Table 2 below for the calculated RPDs for all analytes/compounds for which there were detections. Field duplicate results were evaluated using the following criteria.

Organics: The RPD must be ≤ 30% for groundwaters, for results greater than or equal to two times the LOQ. If one of the results is non-detect or less than two times the LOQ, and the duplicate is greater than two times the LOQ, the difference between the parent and field duplicate results must be less than or equal to two times the LOQ.

Inorganics: The RPD must be ≤ 30% for groundwaters, for results greater than or equal to five times the LOQ. For results less than five times the reporting limit, the difference between the parent and field duplicate results must be less than or equal to two times the LOQ.

Action applies only to the affected analyte in the duplicate sample pair.

Table 2 – Field Duplicate Precision

Parameter	Units	MW-29-120919	DUP-1-120919	RPD (%)	Qual
Carbon tetrachloride	µg/L	0.60 J	0.66 J	9.5	None
1,1-Dichloroethane	µg/L	0.93	0.95	2.1	None
1,1-Dichloroethene	µg/L	0.43	0.45	4.5	None
cis-1,2-Dichloroethene	µg/L	4.6	4.8	4.3	None
Tetrachloroethene	µg/L	27.9	30.3	8.3	None
1,1,1-Trichloroethane	µg/L	9.4	10.1	7.2	None
1,1,2-Trichloroethane	µg/L	0.42	0.44	4.7	None
Trichloroethene	µg/L	149	162	8.4	None
Alkalinity, total	mg/L	303	307	1.3	None
Chloride	mg/L	33.8	33.7	0.30	None
Nitrate	mg/L	0.90	0.90	0	None
Sulfate	mg/L	22.7	22.7	0	None
Total Organic Carbon	mg/L	1.4	1.0	**33**	≤±2LOQ, None
Iron, total	mg/L	0.23	0.099	**80**	≤±2LOQ, None
Parameter	**Units**	**MW-33-121119**	**DUP-2-121119**	**RPD (%)**	**Qual**
Methane	µg/L	1.5 U	1.3 J	**NC**	≤±2LOQ, None
Trichloroethene	µg/L	164	169	3.0	None
Alkalinity, total	mg/L	197	198	0.51	None
Chloride	mg/L	31.6	31.9	0.94	None
Nitrate	mg/L	0.40	0.40	0	None
Sulfate	mg/L	12.1	12.3	1.6	None
Total Organic Carbon	mg/L	0.86 J	0.57 J	**41**	≤±2LOQ, None
Iron, total	mg/L	0.041 J	0.072	**55**	≤±2LOQ, None

The following notations are used in the field precision table.

RPD: Relative percent difference
Qual: Qualification required

≤±2LOQ: The difference between the parent and field duplicate results was less than two times the LOQ. Variation of this magnitude is acceptable.
µg/L: micrograms per liter (ppb) and mg/L: milligrams per liter (ppm)

The parent and field duplicate results met the acceptance criteria. Field sampling/laboratory precision and sample homogeneity were acceptable. No data qualifications were required.

9.0 Notes

Positive organic and inorganic results between the method detection limit (MDL) and LOQ, were qualified “J,” as estimated concentrations, due to increased uncertainty near the MDL. The “J” qualifiers were maintained in the data validation. Sample results reported between the MDL and LOQ are usable as estimated values with an unknown directional bias.

Matrix spike and matrix spike duplicates and laboratory duplicates that were performed on non-project samples were not evaluated because matrix similarity to project samples could not be assumed.

Appendix A

Glossary of Data Qualifier Codes

Glossary of Data Qualifier Codes

U The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

UJ The analyte was analyzed for, but was not detected. The reported quantitation limit is approximated and may be inaccurate or imprecise.

J The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.

J+ The result is an estimated quantity, likely to be biased high. The associated numerical value is the approximate concentration of the analyte in the sample.

J- The result is an estimated quantity, likely to be biased low. The associated numerical value is the approximate concentration of the analyte in the sample.

R The data are unusable. The sample results are rejected due to serious deficiencies in the ability to meet quality control criteria. The presence or absence of the analyte cannot be verified.

N (Organics) The analysis indicates the presence of an analyte for which there is presumptive evidence to make a tentative identification.

NJ (Organics) The analysis indicates the presence of an analyte that has been tentatively identified and the associated numerical value represents its approximate concentration.

Appendix B

Data Qualification Summaries

ANALYTICAL RESULTS

Workorder: 3074551 ASN052|2015-SCOTIA NAVY DEPOT-

Lab ID:	**3074551001**	Date Collected:	12/9/2019 14:45	Matrix:	Ground Water
Sample ID:	**MW-15 120919**	Date Received:	12/10/2019 08:47		

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:16	PDK	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:16	PDK	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:16	PDK	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:16	PDK	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:16	PDK	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:16	PDK	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:16	PDK	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:16	PDK	A
Tetrachloroethene	0.92J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:16	PDK	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:16	PDK	A
1,1,1-Trichloroethane	4.4		ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:16	PDK	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:16	PDK	A
Trichloroethene	105		ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:16	PDK	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:16	PDK	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	81 - 118			SW846 8260C		12/13/19 03:16	PDK	A
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C		12/13/19 03:16	PDK	A
Dibromofluoromethane (S)	97.5		%	80 - 119			SW846 8260C		12/13/19 03:16	PDK	A
Toluene-d8 (S)	94.6		%	89 - 112			SW846 8260C		12/13/19 03:16	PDK	A
LIGHT HYDROCARBON GASES											
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175		12/12/19 08:35	CHS	D
Ethane	3.3U	U	ug/L	3.3	3.3	0.55	RSK 175		12/12/19 08:35	CHS	D
Ethene	2.4U	U	ug/L	2.4	2.4	0.81	RSK 175		12/12/19 08:35	CHS	D
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175		12/12/19 08:35	CHS	D
Methane	1.5U	U	ug/L	1.5	1.5	0.53	RSK 175		12/12/19 08:35	CHS	D
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175		12/12/19 08:35	CHS	D
WET CHEMISTRY											
Alkalinity, Total	200		mg/L	5	5	0.8	SM2320B-2011		12/18/19 18:52	MBW	I
Chloride	34.4		mg/L	2.0	0.50	0.16	EPA 300.0		12/11/19 03:40	CHW	H
Nitrate-N	0.50		mg/L	0.20	0.060	0.020	EPA 300.0		12/11/19 03:40	CHW	H
Sulfate	12.1		mg/L	2.0	0.50	0.20	EPA 300.0		12/11/19 03:40	CHW	H
Total Organic Carbon (TOC)	0.83J	J	mg/L	1.0	0.50	0.18	SM5310B-2011		12/12/19 08:43	PAG	F

ANALYTICAL RESULTS

Workorder: 3074551 ASN052|2015-SCOTIA NAVY DEPOT-

Lab ID: **3074551002** Date Collected: 12/9/2019 15:00 Matrix: Ground Water
Sample ID: **MW-29 120920** Date Received: 12/10/2019 08:47

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.60J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
1,1-Dichloroethane	0.93J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
1,1-Dichloroethene	0.43J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
cis-1,2-Dichloroethene	4.6		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
Tetrachloroethene	27.9		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
1,1,1-Trichloroethane	9.4		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
1,1,2-Trichloroethane	0.42J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
Trichloroethene	149		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 06:40	PDK	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	100		%	81 - 118			SW846 8260C			12/13/19 06:40	PDK	A
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C			12/13/19 06:40	PDK	A
Dibromofluoromethane (S)	97.4		%	80 - 119			SW846 8260C			12/13/19 06:40	PDK	A
Toluene-d8 (S)	95.5		%	89 - 112			SW846 8260C			12/13/19 06:40	PDK	A
LIGHT HYDROCARBON GASES												
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175			12/12/19 09:02	CHS	D
Ethane	3.3U	U	ug/L	3.3	3.3	0.55	RSK 175			12/12/19 09:02	CHS	D
Ethene	2.4U	U	ug/L	2.4	2.4	0.81	RSK 175			12/12/19 09:02	CHS	D
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175			12/12/19 09:02	CHS	D
Methane	1.5U	U	ug/L	1.5	1.5	0.53	RSK 175			12/12/19 09:02	CHS	D
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175			12/12/19 09:02	CHS	D
WET CHEMISTRY												
Alkalinity, Total	303	~~X~~	mg/L	5	5	0.8	SM2320B-2011			12/18/19 19:05	MBW	I
Chloride	33.8		mg/L	2.0	0.50	0.16	EPA 300.0			12/11/19 03:56	CHW	H
Nitrate-N	0.90		mg/L	0.20	0.060	0.020	EPA 300.0			12/11/19 03:56	CHW	H
Sulfate	22.7		mg/L	2.0	0.50	0.20	EPA 300.0			12/11/19 03:56	CHW	H
Total Organic Carbon (TOC)	1.4		mg/L	1.0	0.50	0.18	SM5310B-2011			12/12/19 08:43	PAG	F
METALS												
Iron, Total	0.23		mg/L	0.067	0.045	0.022	SW846 6010C	12/11/19	AHI	12/12/19 08:59	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/17/19	SRT	12/17/19 10:45	SRT	K

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ANALYTICAL RESULTS

Workorder: 3074551 ASN052|2015-SCOTIA NAVY DEPOT-

Lab ID:	**3074551003**	Date Collected:	12/9/2019 15:00	Matrix: Ground Water
Sample ID:	**DUP-1**	Date Received:	12/10/2019 08:47	

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.66J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 07:02	PDK	A
1,1-Dichloroethane	0.95J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 07:02	PDK	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 07:02	PDK	A
1,1-Dichloroethene	0.45J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 07:02	PDK	A
cis-1,2-Dichloroethene	4.8		ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 07:02	PDK	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 07:02	PDK	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 07:02	PDK	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 07:02	PDK	A
Tetrachloroethene	30.3		ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 07:02	PDK	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 07:02	PDK	A
1,1,1-Trichloroethane	10.1		ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 07:02	PDK	A
1,1,2-Trichloroethane	0.44J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 07:02	PDK	A
Trichloroethene	162		ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 07:02	PDK	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 07:02	PDK	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	81 - 118			SW846 8260C		12/13/19 07:02	PDK	A
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C		12/13/19 07:02	PDK	A
Dibromofluoromethane (S)	97.7		%	80 - 119			SW846 8260C		12/13/19 07:02	PDK	A
Toluene-d8 (S)	95.8		%	89 - 112			SW846 8260C		12/13/19 07:02	PDK	A
LIGHT HYDROCARBON GASES											
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175		12/12/19 09:21	CHS	D
Ethane	3.3U	U	ug/L	3.3	3.3	0.55	RSK 175		12/12/19 09:21	CHS	D
Ethene	2.4U	U	ug/L	2.4	2.4	0.81	RSK 175		12/12/19 09:21	CHS	D
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175		12/12/19 09:21	CHS	D
Methane	1.5U	U	ug/L	1.5	1.5	0.53	RSK 175		12/12/19 09:21	CHS	D
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175		12/12/19 09:21	CHS	D
WET CHEMISTRY											
Alkalinity, Total	307		mg/L	5	5	0.8	SM2320B-2011		12/18/19 19:20	MBW	I
Chloride	33.7		mg/L	2.0	0.50	0.16	EPA 300.0		12/11/19 04:11	CHW	H
Nitrate-N	0.90		mg/L	0.20	0.060	0.020	EPA 300.0		12/11/19 04:11	CHW	H
Sulfate	22.7		mg/L	2.0	0.50	0.20	EPA 300.0		12/11/19 04:11	CHW	H
Total Organic Carbon (TOC)	1.0		mg/L	1.0	0.50	0.18	SM5310B-2011		12/12/19 08:43	PAG	F
METALS											
Iron, Total	0.099		mg/L	0.067	0.045	0.022	SW846 6010C	12/11/19 AHI	12/12/19 09:03	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/17/19 SRT	12/17/19 10:48	SRT	K

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ANALYTICAL RESULTS

Workorder: 3074827 ASN053|60440641

Lab ID:	**3074827001**	Date Collected:	12/10/2019 10:40	Matrix:	Ground Water
Sample ID:	**MW-28 121019**	Date Received:	12/11/2019 09:30		

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.51J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:38	PDK	J
1,1-Dichloroethane	0.98J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:38	PDK	J
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:38	PDK	J
1,1-Dichloroethene	0.45J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:38	PDK	J
cis-1,2-Dichloroethene	5.9		ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:38	PDK	J
trans-1,2-Dichloroethene	0.37J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:38	PDK	J
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:38	PDK	J
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:38	PDK	J
Tetrachloroethene	33.6		ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:38	PDK	J
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:38	PDK	J
1,1,1-Trichloroethane	9.5		ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:38	PDK	J
1,1,2-Trichloroethane	0.38J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:38	PDK	J
Trichloroethene	219		ug/L	5.0	3.8	1.7	SW846 8260C		12/18/19 17:41	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 03:38	PDK	J
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	102		%	81 - 118			SW846 8260C		12/13/19 03:38	PDK	J
1,2-Dichloroethane-d4 (S)	104		%	81 - 118			SW846 8260C		12/18/19 17:41	TMP	A
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C		12/13/19 03:38	PDK	J
4-Bromofluorobenzene (S)	109		%	85 - 114			SW846 8260C		12/18/19 17:41	TMP	A
Dibromofluoromethane (S)	98.2		%	80 - 119			SW846 8260C		12/13/19 03:38	PDK	J
Dibromofluoromethane (S)	102		%	80 - 119			SW846 8260C		12/18/19 17:41	TMP	A
Toluene-d8 (S)	95.3		%	89 - 112			SW846 8260C		12/13/19 03:38	PDK	J
Toluene-d8 (S)	97.6		%	89 - 112			SW846 8260C		12/18/19 17:41	TMP	A
LIGHT HYDROCARBON GASES											
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175		12/12/19 09:44	CHS	C
Ethane	3.3U	U	ug/L	3.3	3.3	0.55	RSK 175		12/12/19 09:44	CHS	C
Ethene	2.4U	U	ug/L	2.4	2.4	0.81	RSK 175		12/12/19 09:44	CHS	C
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175		12/12/19 09:44	CHS	C
Methane	1.5U	U	ug/L	1.5	1.5	0.53	RSK 175		12/12/19 09:44	CHS	C
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175		12/12/19 09:44	CHS	C
WET CHEMISTRY											
Alkalinity, Total	307		mg/L	5	5	0.8	SM2320B-2011		12/19/19 05:15	DXC	I
Chloride	38.0		mg/L	2.0	0.50	0.16	EPA 300.0		12/12/19 05:07	CHW	F
Nitrate-N	0.74		mg/L	0.20	0.060	0.020	EPA 300.0		12/12/19 05:07	CHW	F
Sulfate	22.0		mg/L	2.0	0.50	0.20	EPA 300.0		12/12/19 05:07	CHW	F
Total Organic Carbon (TOC)	1.0		mg/L	1.0	0.50	0.18	SM5310B-2011		12/16/19 21:19	PAG	G

ANALYTICAL RESULTS

Workorder: 3074827 ASN053|60440641

Lab ID: **3074827001** Date Collected: 12/10/2019 10:40 Matrix: Ground Water

Sample ID: **MW-28 121019** Date Received: 12/11/2019 09:30

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
METALS											
Iron, Total	0.045U	U	mg/L	0.067	0.045	0.022	SW846 6010C	12/11/19 AHI	12/12/19 09:07	SRT	D
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/17/19 SRT	12/17/19 10:52	SRT	E

Vanessa N. Badman

Mrs. Vanessa N Badman
Project Coordinator

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State Certifications: FL E871113, WA C999, MD 128, VA 460157, WV DW 9961-C, WV 343

ANALYTICAL RESULTS

Workorder: 3074827 ASN053|60440641

Lab ID:	**3074827002**	Date Collected:	12/10/2019 13:20	Matrix:	Ground Water
Sample ID:	**MW-30 121019**	Date Received:	12/11/2019 09:30		

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
Trichloroethene	6.5		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 04:01	PDK	J
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	102		%	81 - 118			SW846 8260C			12/13/19 04:01	PDK	J
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C			12/13/19 04:01	PDK	J
Dibromofluoromethane (S)	98.1		%	80 - 119			SW846 8260C			12/13/19 04:01	PDK	J
Toluene-d8 (S)	95.6		%	89 - 112			SW846 8260C			12/13/19 04:01	PDK	J
LIGHT HYDROCARBON GASES												
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175			12/12/19 10:18	CHS	C
Ethane	23.4		ug/L	3.3	3.3	0.55	RSK 175			12/12/19 10:18	CHS	C
Ethene	2.0J	J	ug/L	2.4	2.4	0.81	RSK 175			12/12/19 10:18	CHS	C
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175			12/12/19 10:18	CHS	C
Methane	5670		ug/L	1.5	1.5	0.53	RSK 175			12/12/19 10:18	CHS	C
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175			12/12/19 10:18	CHS	C
WET CHEMISTRY												
Alkalinity, Total	74	~~↑~~	mg/L	5	5	0.8	SM2320B-2011			12/19/19 05:15	DXC	I
Chloride	38.3		mg/L	2.0	0.50	0.16	EPA 300.0			12/12/19 05:22	CHW	F
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			12/12/19 05:22	CHW	F
Sulfate	0.50U	U	mg/L	2.0	0.50	0.20	EPA 300.0			12/12/19 05:22	CHW	F
Total Organic Carbon (TOC)	8.8		mg/L	1.0	0.50	0.18	SM5310B-2011			12/17/19 04:06	PAG	G
METALS												
Iron, Total	0.42		mg/L	0.067	0.045	0.022	SW846 6010C	12/11/19	AHI	12/12/19 09:10	SRT	D
Iron, Dissolved	0.11		mg/L	0.060	0.040	0.020	SW846 6010C	12/17/19	SRT	12/17/19 10:56	SRT	E

ANALYTICAL RESULTS

Workorder: 3074827 ASN053|60440641

Lab ID: **3074827003** Date Collected: 12/10/2019 13:45 Matrix: Ground Water

Sample ID: **MW-31 121019** Date Received: 12/11/2019 09:30

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:24	PDK	J
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:24	PDK	J
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:24	PDK	J
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:24	PDK	J
cis-1,2-Dichloroethene	0.34J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:24	PDK	J
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:24	PDK	J
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:24	PDK	J
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:24	PDK	J
Tetrachloroethene	0.44J	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:24	PDK	J
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:24	PDK	J
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:24	PDK	J
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:24	PDK	J
Trichloroethene	29.2		ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:24	PDK	J
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:24	PDK	J

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	81 - 118	SW846 8260C			12/13/19 04:24	PDK	J
4-Bromofluorobenzene (S)	102		%	85 - 114	SW846 8260C			12/13/19 04:24	PDK	J
Dibromofluoromethane (S)	97.6		%	80 - 119	SW846 8260C			12/13/19 04:24	PDK	J
Toluene-d8 (S)	94.8		%	89 - 112	SW846 8260C			12/13/19 04:24	PDK	J

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
LIGHT HYDROCARBON GASES											
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175		12/12/19 10:35	CHS	C
Ethane	3.9		ug/L	3.3	3.3	0.55	RSK 175		12/12/19 10:35	CHS	C
Ethene	2.4U	U	ug/L	2.4	2.4	0.81	RSK 175		12/12/19 10:35	CHS	C
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175		12/12/19 10:35	CHS	C
Methane	512		ug/L	1.5	1.5	0.53	RSK 175		12/12/19 10:35	CHS	C
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175		12/12/19 10:35	CHS	C
WET CHEMISTRY											
Alkalinity, Total	146		mg/L	5	5	0.8	SM2320B-2011		12/19/19 05:15	DXC	I
Chloride	44.3		mg/L	2.0	0.50	0.16	EPA 300.0		12/12/19 05:37	CHW	F
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		12/12/19 05:37	CHW	F
Sulfate	8.8		mg/L	2.0	0.50	0.20	EPA 300.0		12/12/19 05:37	CHW	F
Total Organic Carbon (TOC)	0.79J	J	mg/L	1.0	0.50	0.18	SM5310B-2011		12/17/19 04:06	PAG	G
METALS											
Iron, Total	0.98		mg/L	0.067	0.045	0.022	SW846 6010C	12/11/19 AHI	12/12/19 09:14	SRT	D
Iron, Dissolved	0.023J	J	mg/L	0.060	0.040	0.020	SW846 6010C	12/17/19 SRT	12/17/19 10:59	SRT	E

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ANALYTICAL RESULTS

Workorder: 3075221 ASN054|Granville

Lab ID: **3075221001** Date Collected: 12/11/2019 14:05 Matrix: Ground Water
Sample ID: **MW-35** Date Received: 12/12/2019 10:50

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:47	PDK	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:47	PDK	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:47	PDK	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:47	PDK	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:47	PDK	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:47	PDK	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:47	PDK	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:47	PDK	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:47	PDK	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:47	PDK	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:47	PDK	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:47	PDK	A
Trichloroethene	35.4		ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:47	PDK	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 04:47	PDK	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	81 - 118			SW846 8260C		12/13/19 04:47	PDK	A
4-Bromofluorobenzene (S)	103		%	85 - 114			SW846 8260C		12/13/19 04:47	PDK	A
Dibromofluoromethane (S)	97.5		%	80 - 119			SW846 8260C		12/13/19 04:47	PDK	A
Toluene-d8 (S)	96.1		%	89 - 112			SW846 8260C		12/13/19 04:47	PDK	A
LIGHT HYDROCARBON GASES											
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175		12/18/19 08:21	CHS	H
Ethane	3.3U	U	ug/L	3.3	3.3	0.55	RSK 175		12/18/19 08:21	CHS	H
Ethene	2.4U	U	ug/L	2.4	2.4	0.81	RSK 175		12/18/19 08:21	CHS	H
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175		12/18/19 08:21	CHS	H
Methane	166		ug/L	1.5	1.5	0.53	RSK 175		12/18/19 08:21	CHS	H
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175		12/18/19 08:21	CHS	H
WET CHEMISTRY											
Alkalinity, Total	168		mg/L	5	5	0.8	SM2320B-2011		12/20/19 19:18	MBW	G
Chloride	23.1		mg/L	2.0	0.50	0.16	EPA 300.0		12/13/19 04:46	CHW	F
Nitrate-N	0.44		mg/L	0.20	0.060	0.020	EPA 300.0		12/13/19 04:46	CHW	F
Sulfate	9.1		mg/L	2.0	0.50	0.20	EPA 300.0		12/13/19 04:46	CHW	F
Total Organic Carbon (TOC)	1.6		mg/L	1.0	0.50	0.18	SM5310B-2011		12/17/19 14:24	PAG	D
METALS											
Iron, Total	0.30		mg/L	0.067	0.045	0.022	SW846 6010C	12/22/19 SXC	12/23/19 08:25	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/17/19 SRT	12/17/19 11:03	SRT	K

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ANALYTICAL RESULTS

Workorder: 3075221 ASN054|Granville

Lab ID: **3075221002**
Sample ID: **MW-34**

Date Collected: 12/11/2019 09:40
Date Received: 12/12/2019 10:50
Matrix: Ground Water

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By		Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
cis-1,2-Dichloroethene	0.63J	J	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
Trichloroethene	2.9		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:09	PDK	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	102		%	81 - 118	SW846 8260C			12/13/19 05:09	PDK	A
4-Bromofluorobenzene (S)	103		%	85 - 114	SW846 8260C			12/13/19 05:09	PDK	A
Dibromofluoromethane (S)	99.2		%	80 - 119	SW846 8260C			12/13/19 05:09	PDK	A
Toluene-d8 (S)	96.5		%	89 - 112	SW846 8260C			12/13/19 05:09	PDK	A

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
LIGHT HYDROCARBON GASES												
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175			12/18/19 08:40	CHS	H
Ethane	3.3U	U	ug/L	3.3	3.3	0.55	RSK 175			12/18/19 08:40	CHS	H
Ethene	2.4U	U	ug/L	2.4	2.4	0.81	RSK 175			12/18/19 08:40	CHS	H
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175			12/18/19 08:40	CHS	H
Methane	144		ug/L	1.5	1.5	0.53	RSK 175			12/18/19 08:40	CHS	H
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175			12/18/19 08:40	CHS	H
WET CHEMISTRY												
Alkalinity, Total	140		mg/L	5	5	0.8	SM2320B-2011			12/20/19 19:18	MBW	G
Chloride	2.5		mg/L	2.0	0.50	0.16	EPA 300.0			12/13/19 05:00	CHW	F
Nitrate-N	0.22		mg/L	0.20	0.060	0.020	EPA 300.0			12/13/19 05:00	CHW	F
Sulfate	2.5		mg/L	2.0	0.50	0.20	EPA 300.0			12/13/19 05:00	CHW	F
Total Organic Carbon (TOC)	4.3		mg/L	1.0	0.50	0.18	SM5310B-2011			12/17/19 14:24	PAG	D
METALS												
Iron, Total	0.35		mg/L	0.067	0.045	0.022	SW846 6010C	12/22/19	SXC	12/23/19 08:29	SRT	J1
Iron, Dissolved	0.081		mg/L	0.060	0.040	0.020	SW846 6010C	12/17/19	SRT	12/17/19 11:07	SRT	K

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ANALYTICAL RESULTS

Workorder: 3075221 ASN054|Granville

Lab ID: **3075221003** Date Collected: 12/11/2019 13:20 Matrix: Ground Water
Sample ID: **MW-33** Date Received: 12/12/2019 10:50

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
Trichloroethene	164		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:32	PDK	A
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	99.6		%	81 - 118			SW846 8260C			12/13/19 05:32	PDK	A
4-Bromofluorobenzene (S)	102		%	85 - 114			SW846 8260C			12/13/19 05:32	PDK	A
Dibromofluoromethane (S)	97		%	80 - 119			SW846 8260C			12/13/19 05:32	PDK	A
Toluene-d8 (S)	95.5		%	89 - 112			SW846 8260C			12/13/19 05:32	PDK	A
LIGHT HYDROCARBON GASES												
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175			12/18/19 08:58	CHS	H
Ethane	3.3U	U	ug/L	3.3	3.3	0.55	RSK 175			12/18/19 08:58	CHS	H
Ethene	2.4U	U	ug/L	2.4	2.4	0.81	RSK 175			12/18/19 08:58	CHS	H
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175			12/18/19 08:58	CHS	H
Methane	1.5U	U	ug/L	1.5	1.5	0.53	RSK 175			12/18/19 08:58	CHS	H
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175			12/18/19 08:58	CHS	H
WET CHEMISTRY												
Alkalinity, Total	197		mg/L	5	5	0.8	SM2320B-2011			12/20/19 19:18	MBW	G
Chloride	31.6		mg/L	2.0	0.50	0.16	EPA 300.0			12/13/19 05:14	CHW	F
Nitrate-N	0.40		mg/L	0.20	0.060	0.020	EPA 300.0			12/13/19 05:14	CHW	F
Sulfate	12.1		mg/L	2.0	0.50	0.20	EPA 300.0			12/13/19 05:14	CHW	F
Total Organic Carbon (TOC)	0.86J	J	mg/L	1.0	0.50	0.18	SM5310B-2011			12/17/19 14:24	PAG	D
METALS												
Iron, Total	0.041J	J	mg/L	0.067	0.045	0.022	SW846 6010C	12/22/19	SXC	12/23/19 08:32	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/17/19	SRT	12/17/19 11:17	SRT	K

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ANALYTICAL RESULTS

Workorder: 3075221 ASN054|Granville

Lab ID: **3075221004**
Sample ID: **MW-32**

Date Collected: 12/11/2019 00:00
Date Received: 12/12/2019 10:50
Matrix: Ground Water

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
cis-1,2-Dichloroethene	2.0		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
Trichloroethene	101		ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/13/19 05:54	PDK	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	81 - 118	SW846 8260C			12/13/19 05:54	PDK	A
4-Bromofluorobenzene (S)	102		%	85 - 114	SW846 8260C			12/13/19 05:54	PDK	A
Dibromofluoromethane (S)	98.8		%	80 - 119	SW846 8260C			12/13/19 05:54	PDK	A
Toluene-d8 (S)	95.7		%	89 - 112	SW846 8260C			12/13/19 05:54	PDK	A
LIGHT HYDROCARBON GASES										
n-Butane	4.3U	U	ug/L	4.3 / 4.3 / 1.1	RSK 175			12/18/19 09:17	CHS	H

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
LIGHT HYDROCARBON GASES												
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175			12/18/19 09:17	CHS	H
Ethane	9.3		ug/L	3.3	3.3	0.55	RSK 175			12/18/19 09:17	CHS	H
Ethene	0.96J	J	ug/L	2.4	2.4	0.81	RSK 175			12/18/19 09:17	CHS	H
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175			12/18/19 09:17	CHS	H
Methane	1180		ug/L	1.5	1.5	0.53	RSK 175			12/18/19 09:17	CHS	H
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175			12/18/19 09:17	CHS	H
WET CHEMISTRY												
Alkalinity, Total	157		mg/L	5	5	0.8	SM2320B-2011			12/20/19 19:18	MBW	G
Chloride	30.6		mg/L	2.0	0.50	0.16	EPA 300.0			12/13/19 05:27	CHW	F
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0			12/13/19 05:27	CHW	F
Sulfate	8.1		mg/L	2.0	0.50	0.20	EPA 300.0			12/13/19 05:27	CHW	F
Total Organic Carbon (TOC)	0.80J	J	mg/L	1.0	0.50	0.18	SM5310B-2011			12/17/19 14:24	PAG	D
METALS												
Iron, Total	1.1		mg/L	0.067	0.045	0.022	SW846 6010C	12/22/19	SXC	12/23/19 08:36	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/17/19	SRT	12/17/19 11:21	SRT	K

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ANALYTICAL RESULTS

Workorder: 3075221 ASN054|Granville

Lab ID: **3075221005** Date Collected: 12/11/2019 00:00 Matrix: Ground Water

Sample ID: **DUP-2** Date Received: 12/12/2019 10:50

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 06:17	PDK	H
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 06:17	PDK	H
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 06:17	PDK	H
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 06:17	PDK	H
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 06:17	PDK	H
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 06:17	PDK	H
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 06:17	PDK	H
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 06:17	PDK	H
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 06:17	PDK	H
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 06:17	PDK	H
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 06:17	PDK	H
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 06:17	PDK	H
Trichloroethene	169		ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 06:17	PDK	H
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/13/19 06:17	PDK	H

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	101		%	81 - 118	SW846 8260C		12/13/19 06:17	PDK	H
4-Bromofluorobenzene (S)	103		%	85 - 114	SW846 8260C		12/13/19 06:17	PDK	H
Dibromofluoromethane (S)	96.9		%	80 - 119	SW846 8260C		12/13/19 06:17	PDK	H
Toluene-d8 (S)	95.8		%	89 - 112	SW846 8260C		12/13/19 06:17	PDK	H

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
LIGHT HYDROCARBON GASES											
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175		12/18/19 09:35	CHS	H
Ethane	3.3U	U	ug/L	3.3	3.3	0.55	RSK 175		12/18/19 09:35	CHS	H
Ethene	2.4U	U	ug/L	2.4	2.4	0.81	RSK 175		12/18/19 09:35	CHS	H
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175		12/18/19 09:35	CHS	H
Methane	1.3J	J	ug/L	1.5	1.5	0.53	RSK 175		12/18/19 09:35	CHS	H
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175		12/18/19 09:35	CHS	H
WET CHEMISTRY											
Alkalinity, Total	198		mg/L	5	5	0.8	SM2320B-2011		12/20/19 19:18	MBW	G
Chloride	31.9		mg/L	2.0	0.50	0.16	EPA 300.0		12/13/19 05:41	CHW	F
Nitrate-N	0.40		mg/L	0.20	0.060	0.020	EPA 300.0		12/13/19 05:41	CHW	F
Sulfate	12.3		mg/L	2.0	0.50	0.20	EPA 300.0		12/13/19 05:41	CHW	F
Total Organic Carbon (TOC)	0.57J	J	mg/L	1.0	0.50	0.18	SM5310B-2011		12/17/19 14:24	PAG	D
METALS											
Iron, Total	0.072		mg/L	0.067	0.045	0.022	SW846 6010C	12/22/19 SXC	12/23/19 08:40	SRT	J1
Iron, Dissolved	0.040U	U	mg/L	0.060	0.040	0.020	SW846 6010C	12/17/19 SRT	12/17/19 11:25	SRT	K

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ANALYTICAL RESULTS

Workorder: 3075221 ASN054|Granville

Lab ID: **3075221006**
Sample ID: **Trip Blank**

Date Collected: 12/12/2019 09:18
Date Received: 12/12/2019 10:50
Matrix: Ground Water

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared	By	Analyzed	By	Cntr
VOLATILE ORGANICS												
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C			12/18/19 17:18	TMP	A

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared*	*By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	103		%	81 - 118	SW846 8260C			12/18/19 17:18	TMP	A
4-Bromofluorobenzene (S)	107		%	85 - 114	SW846 8260C			12/18/19 17:18	TMP	A
Dibromofluoromethane (S)	101		%	80 - 119	SW846 8260C			12/18/19 17:18	TMP	A
Toluene-d8 (S)	96.8		%	89 - 112	SW846 8260C			12/18/19 17:18	TMP	A

Vanessa N. Badman
Mrs. Vanessa N Badman
Project Coordinator

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NELAP Certifications: NJ PA010, NY 11759, PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113, WA C999, MD 128, VA 460157, WV DW 9961-C, WV 343

ANALYTICAL RESULTS

Workorder: 3075513 ASN055|60440641

Lab ID: **3075513001** Date Collected: 12/12/2019 10:00 Matrix: Ground Water
Sample ID: **MW-16 121219** Date Received: 12/13/2019 09:20

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:04	TMP	C
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:04	TMP	C
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:04	TMP	C
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:04	TMP	C
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:04	TMP	C
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:04	TMP	C
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:04	TMP	C
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:04	TMP	C
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:04	TMP	C
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:04	TMP	C
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:04	TMP	C
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:04	TMP	C
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:04	TMP	C
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:04	TMP	C

Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*	*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	103		%	81 - 118	SW846 8260C		12/18/19 18:04	TMP	C
4-Bromofluorobenzene (S)	109		%	85 - 114	SW846 8260C		12/18/19 18:04	TMP	C
Dibromofluoromethane (S)	99.8		%	80 - 119	SW846 8260C		12/18/19 18:04	TMP	C
Toluene-d8 (S)	97		%	89 - 112	SW846 8260C		12/18/19 18:04	TMP	C

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
LIGHT HYDROCARBON GASES											
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175		12/18/19 09:53	CHS	T
Ethane	3.3U	U	ug/L	3.3	3.3	0.55	RSK 175		12/18/19 09:53	CHS	T
Ethene	2.4U	U	ug/L	2.4	2.4	0.81	RSK 175		12/18/19 09:53	CHS	T
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175		12/18/19 09:53	CHS	T
Methane	1.5U	U	ug/L	1.5	1.5	0.53	RSK 175		12/18/19 09:53	CHS	T
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175		12/18/19 09:53	CHS	T
WET CHEMISTRY											
Alkalinity, Total	296	~~1~~	mg/L	5	5	0.8	SM2320B-2011		12/21/19 22:45	MBW	Q
Chloride	1.7J	J	mg/L	2.0	0.50	0.16	EPA 300.0		12/14/19 07:47	CHW	N
Nitrate-N	0.84		mg/L	0.20	0.060	0.020	EPA 300.0		12/14/19 07:47	CHW	N
Sulfate	71.1		mg/L	2.0	0.50	0.20	EPA 300.0		12/14/19 07:47	CHW	N
Total Organic Carbon (TOC)	0.88J	J	mg/L	1.0	0.50	0.18	SM5310B-2011		12/18/19 00:06	PAG	H

ANALYTICAL RESULTS

Workorder: 3075513 ASN055|60440641

Lab ID:	**3075513002**	Date Collected:	12/12/2019 11:45	Matrix:	Ground Water
Sample ID:	**MW-26 121219**	Date Received:	12/13/2019 09:20		

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:27	TMP	B
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:27	TMP	B
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:27	TMP	B
1,1-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:27	TMP	B
cis-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:27	TMP	B
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:27	TMP	B
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:27	TMP	B
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:27	TMP	B
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:27	TMP	B
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:27	TMP	B
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:27	TMP	B
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:27	TMP	B
Trichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:27	TMP	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:27	TMP	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	102		%	81 - 118			SW846 8260C		12/18/19 18:27	TMP	B
4-Bromofluorobenzene (S)	108		%	85 - 114			SW846 8260C		12/18/19 18:27	TMP	B
Dibromofluoromethane (S)	99.9		%	80 - 119			SW846 8260C		12/18/19 18:27	TMP	B
Toluene-d8 (S)	96.5		%	89 - 112			SW846 8260C		12/18/19 18:27	TMP	B
LIGHT HYDROCARBON GASES											
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175		12/18/19 10:30	CHS	H
Ethane	3.3U	U	ug/L	3.3	3.3	0.55	RSK 175		12/18/19 10:30	CHS	H
Ethene	2.4U	U	ug/L	2.4	2.4	0.81	RSK 175		12/18/19 10:30	CHS	H
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175		12/18/19 10:30	CHS	H
Methane	8.1		ug/L	1.5	1.5	0.53	RSK 175		12/18/19 10:30	CHS	H
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175		12/18/19 10:30	CHS	H
WET CHEMISTRY											
Alkalinity, Total	171	~~1~~	mg/L	5	5	0.8	SM2320B-2011		12/21/19 22:45	MBW	G
Chloride	22.8		mg/L	2.0	0.50	0.16	EPA 300.0		12/14/19 07:16	CHW	F
Nitrate-N	0.060J	J	mg/L	0.20	0.060	0.020	EPA 300.0		12/14/19 07:16	CHW	F
Sulfate	9.6		mg/L	2.0	0.50	0.20	EPA 300.0		12/14/19 07:16	CHW	F
Total Organic Carbon (TOC)	5.4		mg/L	2.0	1.0	0.37	SM5310B-2011		12/18/19 00:06	PAG	D

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ANALYTICAL RESULTS

Workorder: 3075513 ASN055|60440641

Lab ID: **3075513003** Date Collected: 12/12/2019 13:50 Matrix: Ground Water

Sample ID: **MW-24 121219** Date Received: 12/13/2019 09:20

Parameters	Results	Flag	Units	LOQ	LOD	DL	Method	Prepared By	Analyzed	By	Cntr
VOLATILE ORGANICS											
Carbon Tetrachloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:49	TMP	B
1,1-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:49	TMP	B
1,2-Dichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:49	TMP	B
1,1-Dichloroethene	37.2	J	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:49	TMP	B L
cis-1,2-Dichloroethene	10.5		ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:49	TMP	B
trans-1,2-Dichloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:49	TMP	B
1,1,1,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:49	TMP	B
1,1,2,2-Tetrachloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:49	TMP	B
Tetrachloroethene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:49	TMP	B
Toluene	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:49	TMP	B
1,1,1-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:49	TMP	B
1,1,2-Trichloroethane	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:49	TMP	B
Trichloroethene	1.4		ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:49	TMP	B
Vinyl Chloride	0.75U	U	ug/L	1.0	0.75	0.33	SW846 8260C		12/18/19 18:49	TMP	B
Surrogate Recoveries	*Results*	*Flag*	*Units*	*Limits*			*Method*	*Prepared By*	*Analyzed*	*By*	*Cntr*
1,2-Dichloroethane-d4 (S)	105		%	81 - 118			SW846 8260C		12/18/19 18:49	TMP	B
4-Bromofluorobenzene (S)	108		%	85 - 114			SW846 8260C		12/18/19 18:49	TMP	B
Dibromofluoromethane (S)	102		%	80 - 119			SW846 8260C		12/18/19 18:49	TMP	B
Toluene-d8 (S)	97.5		%	89 - 112			SW846 8260C		12/18/19 18:49	TMP	B
LIGHT HYDROCARBON GASES											
n-Butane	4.3U	U	ug/L	4.3	4.3	1.1	RSK 175		12/18/19 10:48	CHS	H
Ethane	5.2		ug/L	3.3	3.3	0.55	RSK 175		12/18/19 10:48	CHS	H
Ethene	2.9		ug/L	2.4	2.4	0.81	RSK 175		12/18/19 10:48	CHS	H
Isobutane	4.6U	U	ug/L	4.6	4.6	0.90	RSK 175		12/18/19 10:48	CHS	H
Methane	103		ug/L	1.5	1.5	0.53	RSK 175		12/18/19 10:48	CHS	H
Propane	3.2U	U	ug/L	3.2	3.2	0.84	RSK 175		12/18/19 10:48	CHS	H
WET CHEMISTRY											
Alkalinity, Total	146	~~1~~	mg/L	5	5	0.8	SM2320B-2011		12/21/19 22:45	MBW	G
Chloride	29.2		mg/L	2.0	0.50	0.16	EPA 300.0		12/14/19 07:31	CHW	F
Nitrate-N	0.060U	U	mg/L	0.20	0.060	0.020	EPA 300.0		12/14/19 07:31	CHW	F
Sulfate	2.3		mg/L	2.0	0.50	0.20	EPA 300.0		12/14/19 07:31	CHW	F
Total Organic Carbon (TOC)	1.4		mg/L	1.0	0.50	0.18	SM5310B-2011		12/18/19 00:06	PAG	D

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 32426 SCOTIA NAVY DEPOT

Lab ID:	**324260001**	Date Received:	12/13/2019 10:30	Matrix:	Bubble Strip
Sample ID:	**MW-30 121019**	Date Collected:	12/10/2019 14:00		

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**10**	nM	1.0	0.75	1	12/24/2019 12:01	MM	n

CERTIFICATE OF ANALYSIS

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ANALYTICAL RESULTS

Workorder: 32426 SCOTIA NAVY DEPOT

Lab ID:	**324260002**	Date Received:	12/13/2019 10:30	Matrix:	Bubble Strip
Sample ID:	**MW-31 121019**	Date Collected:	12/10/2019 14:05		

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**2.2**	nM	1.0	0.75	1	12/24/2019 12:17	MM	n

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ANALYTICAL RESULTS

Workorder: 32426 SCOTIA NAVY DEPOT

Lab ID:	**324260003**	Date Received:	12/13/2019 10:30	Matrix:	Bubble Strip
Sample ID:	**MW-28 121019**	Date Collected:	12/10/2019 11:45		

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX			Analytical Method: AM20GAX					
Hydrogen	**1.8**	nM	1.0	0.75	1	12/24/2019 12:32	MM	n

CERTIFICATE OF ANALYSIS

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220 William Pitt Way
Pittsburgh, PA 15238

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ANALYTICAL RESULTS

Workorder: 32426 SCOTIA NAVY DEPOT

Lab ID:	**324260004**	Date Received:	12/13/2019 10:30	Matrix:	Bubble Strip
Sample ID:	**MW-34 121119**	Date Collected:	12/11/2019 10:30		

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**3.0**	nM	1.0	0.75	1	12/24/2019 12:46	MM	n

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ANALYTICAL RESULTS

Workorder: 32426 SCOTIA NAVY DEPOT

Lab ID:	**324260005**	Date Received:	12/13/2019 10:30 Matrix: Bubble Strip
Sample ID:	**MW-32 121119**	Date Collected:	12/11/2019 14:20

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
RISK - PAES								
Analysis Desc: AM20GAX		Analytical Method: AM20GAX						
Hydrogen	**5.0**	nM	1.0	0.75	1	12/24/2019 13:00	MM	n

CERTIFICATE OF ANALYSIS

Appendix C

Support Documentation

ALS Environmental

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State Certifications: FL E871113, WA C999, MD 128, VA 460157, WV DW 9961-C, WV 343

SAMPLE SUMMARY

Workorder: 3074551 ASN052|2015-SCOTIA NAVY DEPOT-

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3074551001	MW-15 120919	Ground Water	12/9/2019 14:45	12/10/2019 08:47	
3074551002	MW-29 120920	Ground Water	12/9/2019 15:00	12/10/2019 08:47	
3074551003	DUP-1	Ground Water	12/9/2019 15:00	12/10/2019 08:47	

ALS Environmental
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P. 717-944-5541
F. 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Page 1 of 1
Courier: yes
Tracking #:

* 3 0 7 4 5 5 1 *

Co. Name: AECOM
Contact (Report to): Gerinde Wolf
Address: 40 British American Blvd Latham, NY 12110
Phone: 518-951-2370
Bill to (if different than Report to):
PO#:
Project Name/#: 60440641
ALS Quote #:
TAT: [X] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALS approval and surcharges.
Date Required:
Approved By:
Email? [X] Y gerinde.wolf@aecom.com
Fax? [ ] Y No.:

***Container Type	CG	CG	PL	PL	AG	PL	PL
***Container Size	40	40	250	250	40	200	250
***Preservative	HCl	HCl	–	–	H4	HNO3	–

ANALYSES/METHOD REQUESTED

Enter Number of Containers Per Analysis

Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	8260C	RSK175	Alkalinity	Cl, NO_3, SO_4	TOC	Total Fe	Diss Fe
1 MW-15 120919		12/9/19	1445	G	GW	2	2	1	1	2	X	X
2 MW-29 120919		↓	1500			2	2	1	1	2	1	1
3 Dup-1		–	–	↓	↓	2	2	1	1	2	1	1
4												
5 AG												
6												
7												
8												

Condition of Sample (completed by Sample Receiving)
Performed By: [initials]
Cooler Temp: 2
Therm. ID:
No. of Coolers:
Notes:

Circle appropriate Y or N.

	Y	N
Correct containers?	Y	N
Correct sample volume?	Y	N
Correct preservation?	Y	N
Headspace/Volatiles?	Y	N
Custody seals Present?	Y	N
(if present) Seals Intact?	Y	N
Received on Ice?	Y	N
COC/Labels complete/accurate?	Y	N
Container in good condition?	Y	N

SAMPLED BY (Please Print): Alexandra Bolden
Project Comments:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Alexandra Bolden AECOM	12/9/19	1530	2 Daniel Hagen ALS	12/9/19	1530
3 Daniel Hagen ALS	12/9/19	1700	4 fedex		
5 fedex			6 [signature] ALS	12/10/19	0840
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ]
EDDs Required? [ ] If yes, format type:
SDWA Forms? yes [ ] yes [ ] yes [ ] yes [ ]
State Samples Collected In? MD [ ] NJ [ ] NY [✓] PA [ ]
Other
DOD Criteria Required?

ALS FIELD SERVICES
[✓] Pickup
[ ] Labor
[ ] Composite Sampling
[ ] Rental Equipment
[ ] Other:

* G=Grab; C=Composite
**Matrix: AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater
***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY
Rev 01-2013

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
AECOM	3074551	CMS	12/10

1. Were airbills / tracking numbers present and recorded?	NONE	YES	NO
Tracking number: 4888 8630 0910			
2. Are Custody Seals on shipping containers intact?	NONE	YES	NO
3. Are Custody Seals on sample containers intact?	NONE	YES	NO
4. Is there a COC (Chain-of-Custody) present?		YES	NO
5. Are the COC and bottle labels complete, legible and in agreement?		YES	NO
5a. Does the COC contain sample locations?		YES	NO
5b. Does the COC contain date and time of sample collection for all samples?		YES	NO
5c. Does the COC contain sample collectors name?		YES	NO
5d. Does the COC note the type(s) of preservation for all bottles?		YES	NO
5e. Does the COC note the number of bottles submitted for each sample?		YES	NO
5f. Does the COC note the type of sample, composite or grab?		YES	NO
5g. Does the COC note the matrix of the sample(s)?		YES	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		YES	NO
8. Are all samples within holding times for the requested analyses?		YES	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		YES	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	N/A	YES	NO
11. Were the samples received on ice?		YES	NO
12. Were sample temperatures measured at 0.0-6.0°C		YES	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	NO
13b. Did the client provide a SDWA PWS ID#?	N/A	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO

Cooler #:

Temperature (°C): 2

Thermometer ID: 318

Radiological (µCi):

COMMENTS (Required for all NO responses above and any sample non-conformance):

Rev. 4/29/2019

AECOM - Latham, NY
ALS-Middletown
Case Narrative
ASN-052 (3074551)

Sample Management

This report contains the results of the analysis of three (3) ground water samples collected on December 9, 2019. Analytical results and quality control information are summarized in this data package.

Qualifier Symbol Definitions:

U = Qualifier indicates that the analyte was not detected above the LOD.
J = Qualifier indicates that the analyte value is between the DL and the LOQ.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds the calibration range.
P = Qualifier indicates that the RPD between the two analytical columns is > 40%.
NSC = Qualifier indicates that spike recoveries were not calculated based on the spiking concentration.

Result Symbol Definitions:

DL = The smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence.
LOD = The smallest analyte concentration that must be present in a sample in order to be detected at a high level of confidence.
LOQ = The lowest concentration that produces a quantitative result within specified limits of precision or bias.

Manual Integration Symbol Definitions

I = Peak was not integrated properly by chromatographic software. This may be due to baseline irregularities resulting from sample matrix, elevated baseline, or incorrect integration by software on a sample. Integration was adjusted by operator to ensure proper quantitation.
H = The incorrect peak was identified or the chromatographic software did not identify an analyte peak. Operator manually identified the correct peak as the appropriate target analyte. This flag is automatically assigned by the Target software.
SP = Peak was erroneously split. The operator manually integrated the peak to include all the area of the analyte peak to ensure proper quantitation.
MP = Two peaks were erroneously merged. This may include two discrete peaks separated by a distinguishable valley or a larger peak with a clearly identifiable shoulder. Operator manually split peaks.
AB = Integration of group of adjacent peaks did not follow baseline. Operator manually assigned integration to follow baseline.
NP = Negative spike in the baseline resulted in overstating area of analyte peaks. Analyte peaks were re-assigned.
AC = Integration of aggregate or multi-component analyte to include area off all components of the analyte (i.e., toxaphene).

Sample Receipt

Samples arrived at ALS via courier on December 10, 2019. Upon receipt, the samples were inspected and compared to the Chain of Custody. Sample temperature was documented on the enclosed Chain of Custody. Samples were received intact and properly preserved, unless noted on the enclosed Certificate of Analysis and/or Chain of Custody.

Manual Integrations

If manual integrations were performed they are indicated on the raw data quantification files for each method.

Volatile Organics by SW-846 Method 8260

Sample Handling. Three (3) water samples were analyzed by SW-846 Method 8260 for volatile organic compounds. All analyses were performed within the holding time.

Initial Calibrations. Initial calibrations were properly analyzed and met method criteria for all target analytes. **Note**: The batch LCS also serves as a second source (ICV).

Initial Calibration Verifications. Initial calibration verification samples were properly analyzed and met method criteria.

Continuing Calibration Verification. Samples were run immediately following ICAL.

Blanks. Target analytes were not detected in the method blank.

Surrogates. Recoveries were within control limits.

Laboratory control samples. Target analytes were recovered within control limits in the laboratory control samples, except as follows:

- In 3059517 LCS, 1,1-Dichloroethene and trans-1,2-Dichloroethene were recovered above control limits.

Internal Standards. Internal standard results met method criteria

Light Hydrocarbon Gases by RSK-175

Sample Handling. Three (3) water samples were submitted for the analysis of light hydrocarbon gases by Method RSK-175. The samples were analyzed within the method specified holding time of fourteen days.

Calibrations. The initial calibrations met method criteria for all target analytes.

Calibration Verification. Prior to the analysis of samples in this group, the initial calibrations were successfully verified by the analysis of calibration verification standards. The samples were then successfully bracketed with alternating calibration verification standards (CCV) throughout the analysis.

Continuing Calibration. A continuing calibration standard were properly analyzed and met method criteria for all target analytes.

Blanks. Target analytes were not detected in the method blank.

Surrogates: Surrogate recoveries were in control limits.

<u>**Total Metals by SW-846 Method 6010C**</u>

Sample handling. Two (2) water samples were digested by SW-846 method 3015, and the digestates were analyzed for total metals on the ThermoFisher ICP6500_2, using SW-846 method 6010C. The samples were digested and analyzed within the six-month holding time established for the method.

Calibration. All criteria associated with the calibration and calibration verification standards were within control limits.

Blanks. Metals were not detected above the reporting limit in the blanks.

Laboratory Control Samples. Recoveries were within the control limits.

<u>**Dissolved Metals by EPA Method 6010C**</u>

Sample handling. Two (2) water samples were filtered and analyzed for dissolved metals on the ThermoFisher ICP6500_2 using EPA Method 6010C. The samples were analyzed within the six-month holding time established for the method.

Calibration. All criteria associated with the calibration and check standards were within the control limits for this method.

Blanks. Metals were not detected above the reporting limit in the blanks.

Laboratory Control Sample. The LCS recoveries were within the method control limits.

<u>**Anions by EPA 300.0**</u>

Sample handling. Three (3) water samples were analyzed for chloride, nitrate, and sulfate by EPA Method 300.0. The samples were analyzed within the method recommended holding time for each analyte.

Calibration. Initial calibrations, identified as Method A (high range) and Method L (low range), were properly established for instrument IC7 on 12/3/2019. Initial and continuing calibration verification standards were recovered within the QC limits.

Blanks. Initial and continuing blanks were analyzed with the samples. Anions were not detected above the reporting limits in the blanks.

Laboratory Control Samples. Laboratory control samples identified as SSL and 3058125 were analyzed initially and every 20 samples. Recoveries were within the QC limits.

Spikes. A matrix spike and spike duplicate analysis was not performed on any samples from this data deliverable.

<u>**Total Organic Carbon by SM 5310B**</u>

Sample handling. Three (3) water samples were analyzed for total organic carbon by Standard Method 5310B. The preserved samples were analyzed within the 28-day holding time established for the method.

Calibration. Initial calibrations were properly established on the days of analysis. Initial and continuing calibration standards were analyzed for verification, and recoveries were all within the QC limits.

Laboratory Control Spike. A laboratory control spike of 1.0 mg/L was analyzed with the samples. The recovery was within the QC limit of 85-115%.

Blanks. Method blanks were analyzed with the samples. Total organic carbon was not detected above the reporting limit of 0.5 mg/L in the blanks.

Spikes. Matrix spike and matrix spike duplicate analysis was not performed on any samples from this data deliverable.

Total Alkalinity by SM 2320B

Sample handling. Three (3) water samples were analyzed for total alkalinity by Standard Method 2320B. The samples were analyzed within the 14-day holding time established for the method.

Blanks. Method blanks were analyzed with the samples. Total alkalinity was not detected above the reporting limit of 5 mg/L in the blanks.

Calibration. The autotitrator was pH calibrated on the day of analysis and a continuing pH 7 buffer standard was analyzed throughout the run. All standards were found to be within QC limits of ±0.05 pH units.

Total alkalinity standards were analyzed initially and throughout the analysis. The standards recovered within the alkalinity QC limits of 90-110%.

Duplicate. A duplicate analysis was not performed on any samples from this data deliverable.

ANALYTICAL RESULTS

Workorder: 3074551 ASN052|2015-SCOTIA NAVY DEPOT-

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3074551001	1	MW-15 120919	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3074551002	1	MW-29 120920	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3074551003	1	DUP-1	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

3A

WATER VOLATILE LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: ASN-052

Laboratory Control Spike - Sample No: 3059517

COMPOUND	SPIKE ADDED (ug/L)		LCS CONCENTRATION (ug/L)	LCS % REC#	QC LIMIT REC
Carbon Tetrachloride	20		23.2	116	(80-120)
1,1-Dichloroethane	20		23.9	120	(80-120)
1,2-Dichloroethane	20		22.3	112	(80-120)
1,1-Dichloroethene	20		25.8	129*	(80-120)
cis-1,2-Dichloroethene	20		23.1	115	(80-120)
trans-1,2-Dichloroethen	20		24.9	124*	(80-120)
1,1,1,2-Tetrachloroetha	20		22.9	115	(80-120)
1,1,2,2-Tetrachloroetha	20		21.6	108	(80-120)
Tetrachloroethene	20		23.7	118	(80-120)
Toluene	20		23.6	118	(80-120)
1,1,1-Trichloroethane	20		23.7	118	(80-120)
1,1,2-Trichloroethane	20		21.7	109	(80-120)
Trichloroethene	20		23.0	115	(80-120)
Vinyl Chloride	20		21.2	106	(80-120)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 2 out of 14 outside limits

Comments:

Form 4B
Inorganic Blank Summary

Analysis Method: 2320B
Instrument: AutoT

SDG No.: ASN052

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
3061836	Alkalinity, Total	MB	QC-Water	12/18/2019 09:40	4.4	J	mg/L
3061847	Alkalinity, Total	MB	QC-Water	12/18/2019 17:07	2.2	J	mg/L
3061815	Alkalinity, Total	MB	QC-Water	12/18/2019 19:56	5	U	mg/L

(1) The following qualifiers are used:

U: The analyte concentration is less than the reporting limit listed
J: The analyte concentration is less than the reporting limit but greater than the method detection limit

Comments:

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010, NY 11759, PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113, WA C999, MD 128, VA 460157, WV DW 9961-C, WV 343

SAMPLE SUMMARY

Workorder: 3074827 ASN053|60440641

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3074827001	MW-28 121019	Ground Water	12/10/2019 10:40	12/11/2019 09:30	Collected by Client
3074827002	MW-30 121019	Ground Water	12/10/2019 13:20	12/11/2019 09:30	Collected by Client
3074827003	MW-31 121019	Ground Water	12/10/2019 13:45	12/11/2019 09:30	Collected by Client

ALS Environmental

34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F.717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Page 1 of 1
Courier:
Tracking #:

* 3 0 7 4 8 2 7 *

Co. Name: AECOM
Contact (Report to): Gerlinde Wolf   Phone: 518-951-2370
Address: 40 British American Blvd Latham, NY 12110
Bill to (if different than Report to):   PO#:
Project Name/#: 60440641   ALS Quote #:
TAT: [X] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALS approval and surcharges.   Date Required: Approved By:
Email? [X] Y gerlinde.wolf@aecom.com
Fax? [ ] Y No:

***Container Type	CG	CG	PL	PL	PL	PL	AG
***Container Size	40	40	8oz	8oz	8oz	8oz	40ml
***Preservative	HCl	HCl	HNO_3	-	-	-	HCl

ANALYSES/METHOD REQUESTED — Enter Number of Containers Per Analysis

	Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	8260C	RSK 175	Total Fe	Diss Fe	Alkalinity	Cl, NO3, SO4	TOC
1	MW-28 121019		12/10/19	1040	G	GW	2	2	1	1	1	1	2
2	MW-30 121019		↓	1320	↓	↓	2	2	1	1	1	1	2
3	MW-31 121019		↓	1345	↓	↓	2	2	1	1	1	1	2
4													
5	AG												
6													
7													
8													

Relinquished/Received: Cooler Temp: Therm. ID: No. of Coolers: Notes:

Correct containers? Y N
Correct sample volume? Y N
Correct preservation? Y N
Headspace/Volatiles? Y N
Circle appropriate Y or N.
Custody seals Present? Y N
(if present) Seals Intact? Y N
Received on Ice? Y N
COC/Labels complete/accurate? Y N
Container in good condition? Y N

SAMPLED BY (Please Print): Alexandra Golden
Project Comments: Fe lab filter

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 Alexandra Golden AECOM	12/10/19	1513	2 Daniel Hagen ALS	12/10/19	1518
3 Daniel Hagen ALS	12/10/19	1700	4 Fedex		
5 Fedex			6 [illegible]	12/11/19	930
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ] level
EDDs Required? [ ] If yes, format type:
SDWA Forms? yes [ ] yes [ ] yes [ ] yes [ ] Other
State Samples Collected In? MD [ ] NJ [ ] NY [X] PA [ ]
DOD Criteria Required?

ALS FIELD SERVICES: [X] Pickup [ ] Labor [ ] Composite Sampling [ ] Rental Equipment [ ] Other:

* G=Grab; C=Composite
**Matrix: AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater
***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY
Rev 01-2013

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client:	Work Order #:	Initials:	Date:
AEcom	3074877	DN	12/11/19

1. Were airbills / tracking numbers present and recorded?	NONE	YES	NO
Tracking number: 4888 8630 0954			
2. Are Custody Seals on shipping containers intact?	NONE	YES	NO
3. Are Custody Seals on sample containers intact?	NONE	YES	NO
4. Is there a COC (Chain-of-Custody) present?		YES	NO
5. Are the COC and bottle labels complete, legible and in agreement?		YES	NO
5a. Does the COC contain sample locations?		YES	NO
5b. Does the COC contain date and time of sample collection for all samples?		YES	NO
5c. Does the COC contain sample collectors name?		YES	NO
5d. Does the COC note the type(s) of preservation for all bottles?		YES	NO
5e. Does the COC note the number of bottles submitted for each sample?		YES	NO
5f. Does the COC note the type of sample, composite or grab?		YES	NO
5g. Does the COC note the matrix of the sample(s)?		YES	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		YES	NO
8. Are all samples within holding times for the requested analyses?		YES	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		YES	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	N/A	YES	NO
11. Were the samples received on ice?		YES	NO
12. Were sample temperatures measured at 0.0-6.0°C?		YES	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below.		YES	NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	NO
13b. Did the client provide a SDWA PWS ID#?	N/A	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO

Cooler #:								
Temperature (°C):	0							
Thermometer ID:	525							
Radiological (µCi):								

COMMENTS (Required for all NO responses above and any sample non-conformance):

Rev. 4/29/2019

AECOM - Latham, NY
ALS-Middletown
Case Narrative
ASN-053 (3074827)

Sample Management

This report contains the results of the analysis of three (3) ground water samples collected on December 10, 2019. Analytical results and quality control information are summarized in this data package.

Qualifier Symbol Definitions:

U = Qualifier indicates that the analyte was not detected above the LOD.
J = Qualifier indicates that the analyte value is between the DL and the LOQ.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds the calibration range.
P = Qualifier indicates that the RPD between the two analytical columns is > 40%.
NSC = Qualifier indicates that spike recoveries were not calculated based on the spiking concentration.

Result Symbol Definitions:

DL = The smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence.
LOD = The smallest analyte concentration that must be present in a sample in order to be detected at a high level of confidence.
LOQ = The lowest concentration that produces a quantitative result within specified limits of precision or bias.

Manual Integration Symbol Definitions

I = Peak was not integrated properly by chromatographic software. This may be due to baseline irregularities resulting from sample matrix, elevated baseline, or incorrect integration by software on a sample. Integration was adjusted by operator to ensure proper quantitation.
H = The incorrect peak was identified or the chromatographic software did not identify an analyte peak. Operator manually identified the correct peak as the appropriate target analyte. This flag is automatically assigned by the Target software.
SP = Peak was erroneously split. The operator manually integrated the peak to include all the area of the analyte peak to ensure proper quantitation.
MP = Two peaks were erroneously merged. This may include two discrete peaks separated by a distinguishable valley or a larger peak with a clearly identifiable shoulder. Operator manually split peaks.
AB = Integration of group of adjacent peaks did not follow baseline. Operator manually assigned integration to follow baseline.
NP = Negative spike in the baseline resulted in overstating area of analyte peaks. Analyte peaks were re-assigned.
AC = Integration of aggregate or multi-component analyte to include area off all components of the analyte (i.e., toxaphene).

Sample Receipt

Samples arrived at ALS via courier on December 11, 2019. Upon receipt, the samples were inspected and compared to the Chain of Custody. Sample temperature was documented on the enclosed Chain of Custody. Samples were received intact and properly preserved, unless noted on the enclosed Certificate of Analysis and/or Chain of Custody.

Manual Integrations

If manual integrations were performed they are indicated on the raw data quantification files for each method.

Volatile Organics by SW-846 Method 8260

Sample Handling. Three (3) water samples were analyzed by SW-846 Method 8260 for volatile organic compounds. All analyses were performed within the holding time.

Initial Calibrations. Initial calibrations were properly analyzed and met method criteria for all target analytes. **Note**: The batch LCS also serves as a second source (ICV).

Initial Calibration Verifications. Initial calibration verification samples were properly analyzed and met method criteria.

Continuing Calibration Verification. Samples were run immediately following ICAL.

Blanks. Target analytes were not detected in the method blank.

Surrogates. Recoveries were within control limits.

Laboratory control samples. Target analytes were recovered within control limits in the laboratory control samples, except as follows:

- In 3061716 LCS and 3059517 LCS, 1,1-Dichloroethene and trans-1,2-Dichloroethene were recovered above control limits.

Internal Standards. Internal standard results met method criteria

Light Hydrocarbon Gases by RSK-175

Sample Handling. Three (3) water samples were submitted for the analysis of light hydrocarbon gases by Method RSK-175. The samples were analyzed within the method specified holding time of fourteen days.

Calibrations. The initial calibrations met method criteria for all target analytes.

Calibration Verification. Prior to the analysis of samples in this group, the initial calibrations were successfully verified by the analysis of calibration verification standards. The samples were then successfully bracketed with alternating calibration verification standards (CCV) throughout the analysis.

Continuing Calibration. A continuing calibration standard were properly analyzed and met method criteria for all target analytes.

Blanks. Target analytes were not detected in the method blank.

Surrogates: Surrogate recoveries were in control limits.

Total Metals by SW-846 Method 6010C

Sample handling. Three (3) water samples were digested by SW-846 method 3015, and the digestates were analyzed for total metals on the ThermoFisher ICP6500_2, using SW-846 method 6010C. The samples were digested and analyzed within the six-month holding time established for the method.

Calibration. All criteria associated with the calibration and calibration verification standards were within control limits.

Blanks. Metals were not detected above the reporting limit in the blanks.

Laboratory Control Samples. Recoveries were within the control limits.

Dissolved Metals by EPA Method 6010C

Sample handling. Three (3) water samples were filtered and analyzed for dissolved metals on the ThermoFisher ICP6500_2 using EPA Method 6010C. The samples were analyzed within the six-month holding time established for the method.

Calibration. All criteria associated with the calibration and check standards were within the control limits for this method.

Blanks. Metals were not detected above the reporting limit in the blanks.

Laboratory Control Sample. The LCS recoveries were within the method control limits.

Anions by EPA 300.0

Sample handling. Three (3) water samples were analyzed for chloride, nitrate, and sulfate by EPA Method 300.0. The samples were analyzed within the method recommended holding time for each analyte.

Calibration. Initial calibrations, identified as Method A (high range) and Method L (low range), were properly established for instrument IC7 on 12/3/2019. Initial and continuing calibration verification standards were recovered within the QC limits.

Blanks. Initial and continuing blanks were analyzed with the samples. Anions were not detected above the reporting limits in the blanks.

Laboratory Control Samples. Laboratory control samples identified as SSL and 3058913 were analyzed initially and every 20 samples. Recoveries were within the QC limits.

Spikes. A matrix spike and spike duplicate analysis was not performed on any samples from this data deliverable.

Total Organic Carbon by SM 5310B

Sample handling. Three (3) water samples were analyzed for total organic carbon by Standard Method 5310B. The preserved samples were analyzed within the 28-day holding time established for the method.

Calibration. Initial calibrations were properly established on the days of analysis. Initial and continuing calibration standards were analyzed for verification, and recoveries were all within the QC limits.

Laboratory Control Spike. A laboratory control spike of 1.0 mg/L was analyzed with the samples. The recovery was within the QC limit of 85-115%.

Blanks. Method blanks were analyzed with the samples. Total organic carbon was not detected above the reporting limit of 0.5 mg/L in the blanks.

Spikes. Matrix spike and matrix spike duplicate analyses were not performed on any samples from this data deliverable.

Total Alkalinity by SM 2320B

Sample handling. Three (3) water samples were analyzed for total alkalinity by Standard Method 2320B. The samples were analyzed within the 14-day holding time established for the method.

Blanks. Method blanks were analyzed with the samples. Total alkalinity was not detected above the reporting limit of 5 mg/L in the blanks.

Calibration. The autotitrator was pH calibrated on the day of analysis and a continuing pH 7 buffer standard was analyzed throughout the run. All standards were found to be within QC limits of ±0.05 pH units.

Total alkalinity standards were analyzed initially and throughout the analysis. The standards recovered within the alkalinity QC limits of 90-110%.

Duplicate. A duplicate analysis was not performed on any samples from this data deliverable.

ANALYTICAL RESULTS

Workorder: 3074827 ASN053|60440641

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3074827001	1	MW-28 121019	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3074827002	1	MW-30 121019	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3074827003	1	MW-31 121019	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

3A

WATER VOLATILE LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: ASN-053

Laboratory Control Spike - Sample No: 3059517

COMPOUND	SPIKE ADDED (ug/L)		LCS CONCENTRATION (ug/L)	LCS % REC#	QC LIMIT REC
Carbon Tetrachloride	20		23.2	116	(80-120)
1,1-Dichloroethane	20		23.9	120	(80-120)
1,2-Dichloroethane	20		22.3	112	(80-120)
1,1-Dichloroethene	20		25.8	129*	(80-120)
cis-1,2-Dichloroethene	20		23.1	115	(80-120)
trans-1,2-Dichloroethen	20		24.9	124*	(80-120)
1,1,1,2-Tetrachloroetha	20		22.9	115	(80-120)
1,1,2,2-Tetrachloroetha	20		21.6	108	(80-120)
Tetrachloroethene	20		23.7	118	(80-120)
Toluene	20		23.6	118	(80-120)
1,1,1-Trichloroethane	20		23.7	118	(80-120)
1,1,2-Trichloroethane	20		21.7	109	(80-120)
Trichloroethene	20		23.0	115	(80-120)
Vinyl Chloride	20		21.2	106	(80-120)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 2 out of 14 outside limits

Comments:

3A

WATER VOLATILE LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: ALS Global   Contract: VOMS

Lab Code: VOA   Case No.: ____   SAS No.: ____   SDG No.: ASN-053

Laboratory Control Spike - Sample No: 3061716

COMPOUND	SPIKE ADDED (ug/L)		LCS CONCENTRATION (ug/L)	LCS % REC#	QC LIMIT REC
Carbon Tetrachloride	20		22.2	111	(80-120)
1,1-Dichloroethane	20		23.7	119	(80-120)
1,2-Dichloroethane	20		22.5	113	(80-120)
1,1-Dichloroethene	20		25.8	129*	(80-120)
cis-1,2-Dichloroethene	20		23.1	115	(80-120)
trans-1,2-Dichloroethen	20		25.2	126*	(80-120)
1,1,1,2-Tetrachloroetha	20		22.1	111	(80-120)
1,1,2,2-Tetrachloroetha	20		21.4	107	(80-120)
Tetrachloroethene	20		23.5	117	(80-120)
Toluene	20		23.3	117	(80-120)
1,1,1-Trichloroethane	20		23.6	118	(80-120)
1,1,2-Trichloroethane	20		21.6	108	(80-120)
Trichloroethene	20		22.7	114	(80-120)
Vinyl Chloride	20		19.4	96.8	(80-120)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 2 out of 14 outside limits

Comments: ____

ALS Environmental

301 Fulling Mill Road - Middletown, PA 17057 - Phone: 717-944-5541 - Fax: 717-944-1430 - www.alsglobal.com

NELAP Certifications: NJ PA010, NY 11759, PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113, WA C999, MD 128, VA 460157, WV DW 9961-C, WV 343

SAMPLE SUMMARY

Workorder: 3075221 ASN054|Granville

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3075221001	MW-35	Ground Water	12/11/2019 14:05	12/12/2019 10:50	Collected by Client
3075221002	MW-34	Ground Water	12/11/2019 09:40	12/12/2019 10:50	Collected by Client
3075221003	MW-33	Ground Water	12/11/2019 13:20	12/12/2019 10:50	Collected by Client
3075221004	MW-32	Ground Water	12/11/2019 00:00	12/12/2019 10:50	Collected by Client
3075221005	DUP-2	Ground Water	12/11/2019 00:00	12/12/2019 10:50	Collected by Client
3075221006	Trip Blank	Ground Water	12/12/2019 09:18	12/12/2019 10:50	Collected by Client

ALS Environmental

34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F.717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

Page 1 of 1

Courier:

Tracking #:

* 3 0 7 5 2 2 1 *

Co. Name: AECOM

Contact (Report to): Gerlinde Wolf

Phone:

Address: 40 British American Blvd Latham, NY 12110

Bill to (if different than Report to):

PO#:

Project Name/#: 60440641

ALS Quote #:

TAT: [X] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALS approval and surcharges.

Date Required:

Approved By:

Email? [X] Y gerlinde.wolf@aecom.com

Fax? [ ] Y No.

***Container Type	CG	CG	PL	PL	AG	PL	PL
***Container Size	40	40	8oz	8oz	40	8oz	8oz
**Preservative	HCl	HCl	—	—	HCl	HNO3	—

ANALYSES/METHOD REQUESTED

	Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	8260C	RSK 175	Alkalinity	Cl, NO_3, SO_4	TOC	Total Fe	Diss Fe
1	MW-35 121119		12/11/19	0950	G	GW	2	2	1	1	2	1	1
2	MW-34 121119			0940			2	2	1	1	2	1	1
3	MW-33 121119			1320			2	2	1	1	2	1	1
4	MW-32 121119						2	2	1	1	2	1	1
5	DUP-2		—	—			2	2	1	1	2	1	1
6	Trip blank		—	—	—	—	~~X~~ 4	X	X	X	X	X	X
7													
8													

Enter Number of Containers Per Analysis

AG 12/12/19

Cooler Temp:

Therm. ID:

No. of Coolers:

Notes:

	Y	N
Correct containers?	Y	N
Correct sample volume?	Y	N
Correct preservation?	Y	N
Headspace/Volatiles?	Y	N
Circle appropriate Y or N.		
Custody seals Present?	Y	N
(if present) Seals intact?	Y	N
Received on ice?	Y	N
COC/Labels complete/accurate?	Y	N
Container in good condition?	Y	N

SAMPLED BY (Please Print): Alexandra Golden

Project Comments:

	Relinquished By / Company Name	Date	Time		Received By / Company Name	Date	Time
1	[signature] / AECOM	12/11/19	1510	2	Daniel Hagan / ALS	12/11/19	1510
3	Daniel Hagan / ALS	12/11/19	1700	4	Fedex		
5	Fedex			6	[signature]	12/12/19	918
7				8			
9				10			

Data Deliverables: [ ] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ]

EDDs Required? [ ] If yes, format type:

SDWA Forms? yes [ ] yes [ ] yes [ ] yes [ ] Other

State Samples Collected In? MD [ ] NJ [ ] NY [X] PA [ ]

DOD Criteria Required?

ALS FIELD SERVICES

[X] Pickup
[ ] Labor
[ ] Composite Sampling
[ ] Rental Equipment
[ ] Other:

* G=Grab; C=Composite

**Matrix: AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY

Rev 01-2013

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client: AECOM **Work Order #:** 3075221 **Initials:** DN **Date:** 12/12

1. Were airbills / tracking numbers present and recorded?	NONE	YES	NO
Tracking number: 4888 8630 0987			
2. Are Custody Seals on shipping containers intact?	NONE	YES	NO
3. Are Custody Seals on sample containers intact?	NONE	YES	NO
4. Is there a COC (Chain-of-Custody) present?		YES	NO
5. Are the COC and bottle labels complete, legible and in agreement?		YES	NO
5a. Does the COC contain sample locations?		YES	NO
5b. Does the COC contain date and time of sample collection for all samples?		YES	NO
5c. Does the COC contain sample collectors name?		YES	NO
5d. Does the COC note the type(s) of preservation for all bottles?		YES	NO
5e. Does the COC note the number of bottles submitted for each sample?		YES	NO
5f. Does the COC note the type of sample, composite or grab?		YES	NO
5g. Does the COC note the matrix of the sample(s)?		YES	NO
6. Are all aqueous samples requiring preservation preserved correctly?	N/A	YES	NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?		YES	NO
8. Are all samples within holding times for the requested analyses?		YES	NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)		YES	NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?	N/A	YES	NO
11. Were the samples received on ice?		YES	NO
12. Were sample temperatures measured at 0.0-6.0°C		YES	NO
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below		YES	NO
13a. Are the samples required for SDWA compliance reporting?	N/A	YES	NO
13b. Did the client provide a SDWA PWS ID#?	N/A	YES	NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?	N/A	YES	NO
13d. Did the client provide the SDWA sample location ID/Description?	N/A	YES	NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?	N/A	YES	NO

Cooler #:

Temperature (°C): 3

Thermometer ID: 318

Radiological (µCi):

COMMENTS (Required for all NO responses above and any sample non-conformance):

Rev. 4/29/2019

AECOM - Latham, NY
ALS-Middletown
Case Narrative
ASN-054 (3075221)

Sample Management

This report contains the results of the analysis of six (6) ground water samples collected on December 11-12, 2019. Analytical results and quality control information are summarized in this data package.

Qualifier Symbol Definitions:

U = Qualifier indicates that the analyte was not detected above the LOD.
J = Qualifier indicates that the analyte value is between the DL and the LOQ.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds the calibration range.
P = Qualifier indicates that the RPD between the two analytical columns is > 40%.
NSC = Qualifier indicates that spike recoveries were not calculated based on the spiking concentration.

Result Symbol Definitions:

DL = The smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence.
LOD = The smallest analyte concentration that must be present in a sample in order to be detected at a high level of confidence.
LOQ = The lowest concentration that produces a quantitative result within specified limits of precision or bias.

Manual Integration Symbol Definitions

I = Peak was not integrated properly by chromatographic software. This may be due to baseline irregularities resulting from sample matrix, elevated baseline, or incorrect integration by software on a sample. Integration was adjusted by operator to ensure proper quantitation.
H = The incorrect peak was identified or the chromatographic software did not identify an analyte peak. Operator manually identified the correct peak as the appropriate target analyte. This flag is automatically assigned by the Target software.
SP = Peak was erroneously split. The operator manually integrated the peak to include all the area of the analyte peak to ensure proper quantitation.
MP = Two peaks were erroneously merged. This may include two discrete peaks separated by a distinguishable valley or a larger peak with a clearly identifiable shoulder. Operator manually split peaks.
AB = Integration of group of adjacent peaks did not follow baseline. Operator manually assigned integration to follow baseline.
NP = Negative spike in the baseline resulted in overstating area of analyte peaks. Analyte peaks were re-assigned.
AC = Integration of aggregate or multi-component analyte to include area off all components of the analyte (i.e., toxaphene).

Sample Receipt

Samples arrived at ALS via courier on December 12, 2019. Upon receipt, the samples were inspected and compared to the Chain of Custody. Sample temperature was documented on the enclosed Chain of Custody. Samples were received intact and properly preserved, unless noted on the enclosed Certificate of Analysis and/or Chain of Custody.

Manual Integrations

If manual integrations were performed they are indicated on the raw data quantification files for each method.

Volatile Organics by SW-846 Method 8260

Sample Handling. Six (6) water samples were analyzed by SW-846 Method 8260 for volatile organic compounds. All analyses were performed within the holding time.

Initial Calibrations. Initial calibrations were properly analyzed and met method criteria for all target analytes. **Note**: The batch LCS also serves as a second source (ICV).

Initial Calibration Verifications. Initial calibration verification samples were properly analyzed and met method criteria.

Continuing Calibration Verification. Samples were run immediately following ICAL.

Blanks. Target analytes were not detected in the method blank.

Surrogates. Recoveries were within control limits.

Laboratory control samples. Target analytes were recovered within control limits in the laboratory control samples, except as follows:

- In 3061716 LCS and 3059517 LCS, 1,1-Dichloroethene and trans-1,2-Dichloroethene were recovered above control limits.

Internal Standards. Internal standard results met method criteria

Light Hydrocarbon Gases by RSK-175

Sample Handling. Five (5) water samples were submitted for the analysis of light hydrocarbon gases by Method RSK-175. The samples were analyzed within the method specified holding time of fourteen days.

Calibrations. The initial calibrations met method criteria for all target analytes.

Calibration Verification. Prior to the analysis of samples in this group, the initial calibrations were successfully verified by the analysis of calibration verification standards. The samples were then successfully bracketed with alternating calibration verification standards (CCV) throughout the analysis.

Continuing Calibration. A continuing calibration standard were properly analyzed and met method criteria for all target analytes.

Blanks. Target analytes were not detected in the method blank.

Surrogates: Surrogate recoveries were in control limits.

Total Metals by SW-846 Method 6010C

Sample handling. Five (5) water samples were digested by SW-846 method 3015, and the digestates were analyzed for total metals on the ThermoFisher ICP6500_2, using SW-846 method 6010C. The samples were digested and analyzed within the six-month holding time established for the method.

Calibration. All criteria associated with the calibration and calibration verification standards were within control limits.

Blanks. Metals were not detected above the reporting limit in the blanks.

Laboratory Control Samples. Recoveries were within the control limits.

Dissolved Metals by EPA Method 6010C

Sample handling. Five (5) water samples were filtered and analyzed for dissolved metals on the ThermoFisher ICP6500_2 using EPA Method 6010C. The samples were analyzed within the six-month holding time established for the method.

Calibration. All criteria associated with the calibration and check standards were within the control limits for this method.

Blanks. Metals were not detected above the reporting limit in the blanks.

Laboratory Control Sample. The LCS recoveries were within the method control limits.

Anions by EPA 300.0

Sample handling. Five (5) water samples were analyzed for chloride, nitrate, and sulfate by EPA Method 300.0. The samples were analyzed within the method recommended holding time for each analyte.

Calibration. Initial calibrations, identified as Method A (high range) and Method L (low range), were properly established for instrument IC8 on 12/6/2019. Initial and continuing calibration verification standards were recovered within the QC limits.

Blanks. Initial and continuing blanks were analyzed with the samples. Anions were not detected above the reporting limits in the blanks.

Laboratory Control Samples. Laboratory control samples identified as SSL and 3059760 were analyzed initially and every 20 samples. Recoveries were within the QC limits.

Spikes. A matrix spike and spike duplicate analysis was not performed on any samples from this data deliverable.

Total Organic Carbon by SM 5310B

Sample handling. Five (5) water samples were analyzed for total organic carbon by Standard Method 5310B. The preserved samples were analyzed within the 28-day holding time established for the method.

Calibration. Initial calibrations were properly established on the days of analysis. Initial and continuing calibration standards were analyzed for verification, and recoveries were all within the QC limits.

Laboratory Control Spike. A laboratory control spike of 1.0 mg/L was analyzed with the samples. The recovery was within the QC limit of 85-115%.

Blanks. Method blanks were analyzed with the samples. Total organic carbon was not detected above the reporting limit of 0.5 mg/L in the blanks.

Spikes. A matrix spike and matrix spike duplicate analysis was not performed on any samples from this data deliverable.

Total Alkalinity by SM 2320B

Sample handling. Three (3) water samples were analyzed for total alkalinity by Standard Method 2320B. The samples were analyzed within the 14-day holding time established for the method.

Blanks. Method blanks were analyzed with the samples. Total alkalinity was not detected above the reporting limit of 5 mg/L in the blanks, with the following exception:

- MB3063045 was biased high.

Calibration. The autotitrator was pH calibrated on the day of analysis and a continuing pH 7 buffer standard was analyzed throughout the run. All standards were found to be within QC limits of ±0.05 pH units.

Total alkalinity standards were analyzed initially and throughout the analysis. The standards recovered within the alkalinity QC limits of 90-110%.

Duplicate. A duplicate analysis was not performed on any samples from this data deliverable.

ALS Environmental

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NELAP Certifications: NJ PA010, NY 11759, PA 22-293 DoD ELAP: PJ LA 74618
State Certifications: FL E871113, WA C999, MD 128, VA 460157, WV DW 9961-C, WV 343

ANALYTICAL RESULTS

Workorder: 3075221 ASN054|Granville

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3075221001	1	MW-35	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3075221002	1	MW-34	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3075221003	1	MW-33	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3075221004	1	MW-32	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3075221005	1	DUP-2	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

3A

WATER VOLATILE LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: ASN-054

Laboratory Control Spike - Sample No: 3059517

COMPOUND	SPIKE ADDED (ug/L)		LCS CONCENTRATION (ug/L)	LCS % REC#	QC LIMIT REC
Carbon Tetrachloride	20		23.2	116	(80-120)
1,1-Dichloroethane	20		23.9	120	(80-120)
1,2-Dichloroethane	20		22.3	112	(80-120)
1,1-Dichloroethene	20		25.8	129*	(80-120)
cis-1,2-Dichloroethene	20		23.1	115	(80-120)
trans-1,2-Dichloroethen	20		24.9	124*	(80-120)
1,1,1,2-Tetrachloroetha	20		22.9	115	(80-120)
1,1,2,2-Tetrachloroetha	20		21.6	108	(80-120)
Tetrachloroethene	20		23.7	118	(80-120)
Toluene	20		23.6	118	(80-120)
1,1,1-Trichloroethane	20		23.7	118	(80-120)
1,1,2-Trichloroethane	20		21.7	109	(80-120)
Trichloroethene	20		23.0	115	(80-120)
Vinyl Chloride	20		21.2	106	(80-120)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 2 out of 14 outside limits

Comments:

3A

WATER VOLATILE LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: ASN-054

Laboratory Control Spike - Sample No: 3061716

COMPOUND	SPIKE ADDED (ug/L)		LCS CONCENTRATION (ug/L)	LCS % REC#	QC LIMIT REC
Carbon Tetrachloride	20		22.2	111	(80-120)
1,1-Dichloroethane	20		23.7	119	(80-120)
1,2-Dichloroethane	20		22.5	113	(80-120)
1,1-Dichloroethene	20		25.8	129*	(80-120)
cis-1,2-Dichloroethene	20		23.1	115	(80-120)
trans-1,2-Dichloroethen	20		25.2	126*	(80-120)
1,1,1,2-Tetrachloroetha	20		22.1	111	(80-120)
1,1,2,2-Tetrachloroetha	20		21.4	107	(80-120)
Tetrachloroethene	20		23.5	117	(80-120)
Toluene	20		23.3	117	(80-120)
1,1,1-Trichloroethane	20		23.6	118	(80-120)
1,1,2-Trichloroethane	20		21.6	108	(80-120)
Trichloroethene	20		22.7	114	(80-120)
Vinyl Chloride	20		19.4	96.8	(80-120)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 2 out of 14 outside limits

Comments:

Form 4B
Inorganic Blank Summary

Analysis Method: EPA 300.0
Instrument: IC-8

SDG No.: ASN054

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
3059758	Chloride	MB	QC-Water	12/13/2019 03:12	0.17	J	mg/L
3059758	Nitrate-N	MB	QC-Water	12/13/2019 03:12	0.030	U	mg/L
3059758	Sulfate	MB	QC-Water	12/13/2019 03:12	0.25	U	mg/L
3060242	Chloride	MB	QC-Water	12/13/2019 07:38	0.2	J	mg/L
3060242	Nitrate-N	MB	QC-Water	12/13/2019 07:38	0.030	U	mg/L
3060242	Sulfate	MB	QC-Water	12/13/2019 07:38	0.25	U	mg/L

(1) The following qualifiers are used:

U: The analyte concentration is less than the reporting limit listed
J: The analyte concentration is less than the reporting limit but greater than the method detection limit

Comments:

Form 4B
Inorganic Blank Summary

Analysis Method: 2320B
Instrument: AutoT

SDG No.: ASN054

Sample ID	Analyte	Type	Matrix	Analyzed	Result	Q (1)	Units
3063029	Alkalinity, Total	MB	QC-Water	12/20/2019 19:18	5	U	mg/L
3063045	Alkalinity, Total	MB	QC-Water	12/20/2019 19:18	5.9	*	mg/L
3063049	Alkalinity, Total	MB	QC-Water	12/20/2019 19:18	5	U	mg/L

(1) The following qualifiers are used:

U: The analyte concentration is less than the reporting limit listed
J: The analyte concentration is less than the reporting limit but greater than the method detection limit

Comments: *The value is outside of acceptable QC criteria.

SAMPLE SUMMARY

Workorder: 3075513 ASN055|60440641

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collected By
3075513001	MW-16 121219	Ground Water	12/12/2019 10:00	12/13/2019 09:20	Collected by Client
3075513002	MW-26 121219	Ground Water	12/12/2019 11:45	12/13/2019 09:20	Collected by Client
3075513003	MW-24 121219	Ground Water	12/12/2019 13:50	12/13/2019 09:20	Collected by Client

ALS Environmental

34 Dogwood Lane
Middletown, PA 17057
P. 717-944-5541
F. 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT / SAMPLER. INSTRUCTIONS ON THE BACK.

* 3 0 7 5 5 1 3 *

COC# 3075513

Co. Name: AECOM

Contact (Report to): Gerlinde Wolf

Phone:

Address: 40 British American Blvd Latham, NY 12110

Bill to (if different than Report to):

PO#:

Project Name/#: 60440641

ALS Quote #:

TAT: [X] Normal-Standard TAT is 10-12 business days. [ ] Rush-Subject to ALS approval and surcharges.

Date Required:

Approved By:

Email? [X] Y gerlinde.wolf@aecom.com

Fax? [ ] Y No.:

***Container Type	CG	CG	AG	PE	PE
***Container Size	40ml	40ml	40ml	8oz	8oz
***Preservative	HCl	HCl	HCl	—	—

ANALYSES/METHOD REQUESTED

Sample Description/Location (as it will appear on the lab report)	COC Comments	Sample Date	Military Time	*G or C	**Matrix	8260C	RSK 175	TOC	Alkalinity	Cl, NO_3, SO_4
1 MW-16 121219	*MS/MSD here	12/12/19	1000	G	GW	2	2	2	1	1
2 MW-26 121219		↓	1145	↓	↓	2	2	2	1	1
3 MW-24 121219		↓	1350	↓	↓	2	2	2	1	1
4 MS		↓	—	↓	↓	2	2	2	1	1
5 MSD		↓	—	↓	↓	2	2	2	1	1
6 AG										
7										
8										

Enter Number of Containers Per Analysis

Receipt Information (completed by Sample Receiver)

Performed by: INITIAL HERE

Cooler Temp:

Therm. ID:

No. of Coolers:

Notes:

	Y	N
Correct containers?	Y	N
Correct sample volume?	Y	N
Correct preservation?	Y	N
Headspace/Volatiles?	Y	N
Circle appropriate Y or N.		
Custody seals Present?	Y	N
(if present) Seals intact?	Y	N
Received on ice?	Y	N
COC/Labels complete/accurate?	Y	N
Container in good condition?	Y	N

SAMPLED BY (Please Print): Alexandra Golden

Project Comments:

Relinquished By / Company Name	Date	Time	Received By / Company Name	Date	Time
1 [signature] / AECOM	12/12/19	1500	2 Daniel Hogan / ALS	12/12/19	1510
3 Daniel Hogan / ALS	12/12/19	1700	4 COMMON COURIER / ALS COURIER		
5 COMMON COURIER / ALS COURIER			6 [signature]	12/13/19	0920
7			8		
9			10		

Data Deliverables: [ ] Standard [ ] CLP-like [ ] NJ-Reduced [ ] NJ-Full [ ]

EDDs Required? [ ] If yes, format type:

DOD Criteria Required?

SDWA Forms? yes [ ] yes [ ] yes [ ] yes [ ] Other

State Samples Collected In? MD [ ] NJ [ ] NY [X] PA [ ]

ALS FIELD SERVICES: [X] Pickup [ ] Labor [ ] Composite Sampling [ ] Rental Equipment [ ] Other:

* G=Grab; C=Composite **Matrix: AI=Air; DW=Drinking Water; GW=Groundwater; OI=Oil; OL=Other Liquid; SL=Sludge; SO=Soil; WP=Wipe; WW=Wastewater

***Container Type: AG-Amber Glass; CG-Clear Glass, PL-Plastic. Container Size: 250ml, 500ml, 1L, 8oz., etc. Preservative: HCl, HNO3, NaOH, etc.

Copies: WHITE - ORIGINAL CANARY - CUSTOMER COPY

Rev 01-2013

301 Fulling Mill Road
Middletown, PA 17057
P: (717) 944-5541
F: (717) 944-1430

Condition of Sample Receipt Form

Client: AECOM | Work Order #: 3075513 | Initials: CLS | Date: 12/13

1. Were airbills / tracking numbers present and recorded?........ NONE YES NO
Tracking number: 4888 8630 1034
2. Are Custody Seals on shipping containers intact?........ NONE YES NO
3. Are Custody Seals on sample containers intact?........ NONE YES NO
4. Is there a COC (Chain-of-Custody) present?........ YES NO
5. Are the COC and bottle labels complete, legible and in agreement?........ YES NO
5a. Does the COC contain sample locations?........ YES NO
5b. Does the COC contain date and time of sample collection for all samples?........ YES NO
5c. Does the COC contain sample collectors name?........ YES NO
5d. Does the COC note the type(s) of preservation for all bottles?........ YES NO
5e. Does the COC note the number of bottles submitted for each sample?........ YES NO
5f. Does the COC note the type of sample, composite or grab?........ YES NO
5g. Does the COC note the matrix of the sample(s)?........ YES NO
6. Are all aqueous samples requiring preservation preserved correctly?........ N/A YES NO
7. Were all samples placed in the proper containers for the requested analyses, with sufficient volume?........ YES NO
8. Are all samples within holding times for the requested analyses?........ YES NO
9. Were all sample containers received intact and headspace free when required? (not broken, leaking, frozen, etc.)........ YES NO
10. Did we receive trip blanks (applies only for methods EPA 504, EPA 524.2 and 1631E (LL Hg)?........ N/A YES NO
11. Were the samples received on ice?........ YES NO
12. Were sample temperatures measured at 0.0-6.0°C........ YES ~~NO~~
13. Are the samples DW matrix ? If YES, fill out Reportable Drinking Water questions below........ YES NO
13a. Are the samples required for SDWA compliance reporting?........ N/A YES NO
13b. Did the client provide a SDWA PWS ID#?........ N/A YES NO
13c. Are all aqueous unpreserved SDWA samples pH 5-9?........ N/A YES NO
13d. Did the client provide the SDWA sample location ID/Description?........ N/A YES NO
13e. Did the client provide the SDWA sample type (D, E, R, C, P, S)?........ N/A YES NO

Cooler #: ______

Temperature (°C): 1

Thermometer ID: 525

Radiological (μCi): ______

COMMENTS (Required for all NO responses above and any sample non-conformance):

Rev. 4/29/2019

AECOM - Latham, NY
ALS-Middletown
Case Narrative
ASN-055 (3075513)

Sample Management

This report contains the results of the analysis of three (3) ground water samples collected on December 12, 2019. Analytical results and quality control information are summarized in this data package.

Qualifier Symbol Definitions:

U = Qualifier indicates that the analyte was not detected above the LOD.
J = Qualifier indicates that the analyte value is between the DL and the LOQ.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds the calibration range.
P = Qualifier indicates that the RPD between the two analytical columns is > 40%.
NSC = Qualifier indicates that spike recoveries were not calculated based on the spiking concentration.

Result Symbol Definitions:

DL = The smallest analyte concentration that can be demonstrated to be different from zero or a blank concentration at the 99% level of confidence.
LOD = The smallest analyte concentration that must be present in a sample in order to be detected at a high level of confidence.
LOQ = The lowest concentration that produces a quantitative result within specified limits of precision or bias.

Manual Integration Symbol Definitions

I = Peak was not integrated properly by chromatographic software. This may be due to baseline irregularities resulting from sample matrix, elevated baseline, or incorrect integration by software on a sample. Integration was adjusted by operator to ensure proper quantitation.
H = The incorrect peak was identified or the chromatographic software did not identify an analyte peak. Operator manually identified the correct peak as the appropriate target analyte. This flag is automatically assigned by the Target software.
SP = Peak was erroneously split. The operator manually integrated the peak to include all the area of the analyte peak to ensure proper quantitation.
MP = Two peaks were erroneously merged. This may include two discrete peaks separated by a distinguishable valley or a larger peak with a clearly identifiable shoulder. Operator manually split peaks.
AB = Integration of group of adjacent peaks did not follow baseline. Operator manually assigned integration to follow baseline.
NP = Negative spike in the baseline resulted in overstating area of analyte peaks. Analyte peaks were re-assigned.
AC = Integration of aggregate or multi-component analyte to include area off all components of the analyte (i.e., toxaphene).

Sample Receipt

Samples arrived at ALS via courier on December 13, 2019. Upon receipt, the samples were inspected and compared to the Chain of Custody. Sample temperature was documented on the enclosed Chain of Custody. Samples were received intact and properly preserved, unless noted on the enclosed Certificate of Analysis and/or Chain of Custody.

Manual Integrations

If manual integrations were performed they are indicated on the raw data quantification files for each method.

Volatile Organics by SW-846 Method 8260

Sample Handling. Three (3) water samples were analyzed by SW-846 Method 8260 for volatile organic compounds. All analyses were performed within the holding time.

Initial Calibrations. Initial calibrations were properly analyzed and met method criteria for all target analytes. **Note**: The batch LCS also serves as a second source (ICV).

Initial Calibration Verifications. Initial calibration verification samples were properly analyzed and met method criteria.

Continuing Calibration Verification. Samples were run immediately following ICAL.

Blanks. Target analytes were not detected in the method blank.

Surrogates. Recoveries were within control limits.

Laboratory control samples. Target analytes were recovered within control limits in the laboratory control samples, except as follows:

- In 3061716 LCS, 1,1-Dichloroethene and trans-1,2-Dichloroethene were recovered above control limits.

Matrix and Matrix Spike samples. Target analytes were recovered within control limits in the spiked samples, except as follows:

- In 3062294 MS, 1,1-Dichloroethene, trans-1,2-Dichloroethene, Toluene and 1,1,2-Trichloroethane were recovered above control limits.
- In 3062295 MSD, 1,1-Dichloroethane, 1,1-Dichloroethene, trans-1,2-Dichloroethene and Toluene were recovered above control limits.

Also, %RPD for 1,1,2-Trichloroethane was recovered outside control limits.

Internal Standards. Internal standard results met method criteria

Light Hydrocarbon Gases by RSK-175

Sample Handling. Three (3) water samples were submitted for the analysis of light hydrocarbon gases by Method RSK-175. The samples were analyzed within the method specified holding time of fourteen days.

Calibrations. The initial calibrations met method criteria for all target analytes.

Calibration Verification. Prior to the analysis of samples in this group, the initial calibrations were successfully verified by the analysis of calibration verification standards. The samples were then successfully bracketed with alternating calibration verification standards (CCV) throughout the analysis.

Continuing Calibration. A continuing calibration standard were properly analyzed and met method criteria for all target analytes.

Blanks. Target analytes were not detected in the method blank.

Surrogates: Surrogate recoveries were in control limits.

<u>Anions by EPA 300.0</u>

Sample handling. Three (3) water samples were analyzed for chloride, nitrate, and sulfate by EPA Method 300.0. The samples were analyzed within the method recommended holding time for each analyte.

Calibration. Initial calibrations, identified as Method A (high range) and Method L (low range), were properly established for instrument IC7 on 12/3/2019. Initial and continuing calibration verification standards were recovered within the QC limits.

Blanks. Initial and continuing blanks were analyzed with the samples. Anions were not detected above the reporting limits in the blanks.

Laboratory Control Samples. Laboratory control samples identified as SSL and 3060316 were analyzed initially and every 20 samples. Recoveries were within the QC limits.

Spikes. A matrix spike and spike duplicate analysis was performed on sample 3075513001 (MW-16 121219). All recoveries were within QC limits.

<u>Total Organic Carbon by SM 5310B</u>

Sample handling. Three (3) water samples were analyzed for total organic carbon by Standard Method 5310B. The preserved samples were analyzed within the 28-day holding time established for the method.

Calibration. Initial calibrations were properly established on the days of analysis. Initial and continuing calibration standards were analyzed for verification, and recoveries were all within the QC limits.

Laboratory Control Spike. A laboratory control spike of 1.0 mg/L was analyzed with the samples. The recovery was within the QC limit of 85-115%.

Blanks. Method blanks were analyzed with the samples. Total organic carbon was not detected above the reporting limit of 0.5 mg/L in the blanks.

Spikes. Matrix spike and matrix spike duplicate analyses were performed on sample 3075513001 (MW-16 121219). The spike recoveries and the relative percent difference between the spikes were all within the QC limits.

Total Alkalinity by SM 2320B

Sample handling. Three (3) water samples were analyzed for total alkalinity by Standard Method 2320B. The samples were analyzed within the 14-day holding time established for the method.

Blanks. Method blanks were analyzed with the samples. Total alkalinity was not detected above the reporting limit of 5 mg/L in the blanks.

Calibration. The autotitrator was pH calibrated on the day of analysis and a continuing pH 7 buffer standard was analyzed throughout the run. All standards were found to be within QC limits of ±0.05 pH units.

Total alkalinity standards were analyzed initially and throughout the analysis. The standards recovered within the alkalinity QC limits of 90-110%.

Duplicate. A duplicate analysis identified as 3063701 was performed on sample 3075513001 (MW-16 121219). The relative percent difference between the results was within the QC limit of 20%.

ANALYTICAL RESULTS

Workorder: 3075513 ASN055|60440641

PARAMETER QUALIFIERS

Lab ID	#	Sample ID	Analytical Method	Analyte
3075513001	1	MW-16 121219	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3075513002	1	MW-26 121219	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				
3075513003	1	MW-24 121219	SM2320B-2011	Alkalinity, Total
The Total Alkalinity is titrated to a pH of 4.5 and reported as mg CaCO3/L.				

3A

WATER VOLATILE LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: ASN-055

Laboratory Control Spike - Sample No: 3061716

COMPOUND	SPIKE ADDED (ug/L)		LCS CONCENTRATION (ug/L)	LCS % REC#	QC LIMIT REC
Carbon Tetrachloride	20		22.2	111	(80-120)
1,1-Dichloroethane	20		23.7	119	(80-120)
1,2-Dichloroethane	20		22.5	113	(80-120)
1,1-Dichloroethene	20		25.8	129*	(80-120)
cis-1,2-Dichloroethene	20		23.1	115	(80-120)
trans-1,2-Dichloroethen	20		25.2	126*	(80-120)
1,1,1,2-Tetrachloroetha	20		22.1	111	(80-120)
1,1,2,2-Tetrachloroetha	20		21.4	107	(80-120)
Tetrachloroethene	20		23.5	117	(80-120)
Toluene	20		23.3	117	(80-120)
1,1,1-Trichloroethane	20		23.6	118	(80-120)
1,1,2-Trichloroethane	20		21.6	108	(80-120)
Trichloroethene	20		22.7	114	(80-120)
Vinyl Chloride	20		19.4	96.8	(80-120)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 2 out of 14 outside limits

Comments:

3A

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: SAS No.: SDG No.: ASN-055

Matrix Spike - Sample No: MW-16 121219MS

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC#	QC LIMIT REC
Carbon Tetrachloride	20	0	22.6	113	(72-136)
1,1-Dichloroethane	20	0	24.2	121	(77-125)
1,2-Dichloroethane	20	0	22.6	113	(73-128)
1,1-Dichloroethene	20	0	26.7	134*	(71-131)
cis-1,2-Dichloroethene	20	0	23.4	117	(78-123)
trans-1,2-Dichloroethene	20	0	25.7	128*	(75-124)
1,1,1,2-Tetrachloroethane	20	0	23.3	116	(78-124)
1,1,2,2-Tetrachloroethane	20	0	22.4	112	(71-121)
Tetrachloroethene	20	0	24.1	120	(74-129)
Toluene	20	0	25.0	125*	(80-121)
1,1,1-Trichloroethane	20	0	24.6	123	(74-131)
1,1,2-Trichloroethane	20	0	33.7	169*	(80-119)
Trichloroethene	20	0	23.4	117	(79-123)
Vinyl Chloride	20	0	20.8	104	(58-137)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 0 outside limits

Spike Recovery: 4 out of 14 outside limits

Comments:

3A

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Name: ALS Global Contract: VOMS

Lab Code: VOA Case No.: ______ SAS No.: ______ SDG No.: ASN-055

Matrix Spike - Sample No: MW-16 121219MSD

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	MSD % RPD #	QC LIMITS RPD	QC LIMITS REC
Carbon Tetrachloride	20	23.7	119	4.83	30	(72-136)
1,1-Dichloroethane	20	25.6	128*	5.38	30	(77-125)
1,2-Dichloroethane	20	23.4	117	3.76	30	(73-128)
1,1-Dichloroethene	20	28.4	142*	5.9	30	(71-131)
cis-1,2-Dichloroethene	20	24.7	123	5.05	30	(78-123)
trans-1,2-Dichloroethene	20	26.9	135*	4.7	30	(75-124)
1,1,1,2-Tetrachloroethane	20	23.5	117	.83	30	(78-124)
1,1,2,2-Tetrachloroethane	20	21.2	106	5.83	30	(71-121)
Tetrachloroethene	20	24.0	120	.41	30	(74-129)
Toluene	20	25.1	126*	.52	30	(80-121)
1,1,1-Trichloroethane	20	25.3	126	2.69	30	(74-131)
1,1,2-Trichloroethane	20	23.4	117	36*	30	(80-119)
Trichloroethene	20	24.4	122	4.23	30	(79-123)
Vinyl Chloride	20	22.2	111	6.13	30	(58-137)

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 1 out of 14 outside limits

Spike Recovery: 4 out of 14 outside limits

Comments: ______

Sample Description

MW-16 121219

Form 3A
Matrix Spike and Matrix Spike Duplicate Recovery Summary

Analysis Method: EPA 300.0
Matrix (soil/water): Ground Water

SDG No.: ASN055
Units: mg/L
Lab Sample ID: 3075513001
Lab MS Sample ID: 3060320
Lab MSD Sample ID: 3060321

Analyte	Spike Added	Sample Concentration	MS Concentration	MS Recovery (%)	(1)	Acceptable Limits (%)
Chloride	40	1.7	41.1	98.6		87 - 111
Nitrate-N	5	0.84	5.7	97.2		88 - 111
Sulfate	40	71.1	112	102		87 - 112

Analyte	Spike Added	MSD Concentration	MSD Recovery (%)	(1)	Acceptable Limits (%)	RPD (%)	(1)	Acc. Lim. (%)
Chloride	40	41.3	99.1		87 - 111	0.44		15
Nitrate-N	5	5.8	98.4		88 - 111	1.05		15
Sulfate	40	112	103		87 - 112	0.53		15

(1) The following qualifiers are used:

* : Values outside of acceptable limits
D : Spikes diluted out

Comments:

Sample Description

MW-16 121219

Form 7
Duplicate Summary

Analysis Method: SM2320B-2011
Matrix (soil/water): Ground Water

SDG No.: ASN055
Units: mg/L
Lab Sample ID: 3075513001
Lab Sample Dup ID: 3063701

Analyte	Sample Concentration	Duplicate Concentration	Relative Percent Difference (RPD)	(1)	Acceptable Limit (%)
Alkalinity, Total	296	294	0.72		20

(1) The following qualifiers are used:

* : Values outside of acceptable limits

Comments:

Sample Description

MW-16 121219

Form 3A
Matrix Spike and Matrix Spike Duplicate Recovery Summary

Analysis Method: SM5310B-2011
Matrix (soil/water): Ground Water

SDG No.: ASN055
Units: mg/L
Lab Sample ID: 3075513001
Lab MS Sample ID: 3060895
Lab MSD Sample ID: 3060896

Analyte	Spike Added	Sample Concentration	MS Concentration	MS Recovery (%)	(1)	Acceptable Limits (%)
Total Organic Carbon (TOC)	6	0.88	7.1	103		85 - 115

Analyte	Spike Added	MSD Concentration	MSD Recovery (%)	(1)	Acceptable Limits (%)	RPD (%)	(1)	Acc. Lim. (%)
Total Organic Carbon (TOC)	6	7.0	102		85 - 115	1.53		15

(1) The following qualifiers are used:

* : Values outside of acceptable limits
D : Spikes diluted out

Comments:

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

SAMPLE SUMMARY

Workorder: 32426 SCOTIA NAVY DEPOT

Lab ID	Sample ID	Matrix	Date Collected	Date Received
324260001	MW-30 121019	Bubble Strip	12/10/2019 14:00	12/13/2019 10:30
324260002	MW-31 121019	Bubble Strip	12/10/2019 14:05	12/13/2019 10:30
324260003	MW-28 121019	Bubble Strip	12/10/2019 11:45	12/13/2019 10:30
324260004	MW-34 121119	Bubble Strip	12/11/2019 10:30	12/13/2019 10:30
324260005	MW-32 121119	Bubble Strip	12/11/2019 14:20	12/13/2019 10:30

Pace Analytical

CHAIN-OF-CUSTODY Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT - Complete all relevent fields

LAB USE ONLY- Affix Workorder/Login Label Here or List Pace Workorder Number or MTJL Log-in Number Here

32426

ALL SHADED AREAS are for LAB USE ONLY SRG 12/13/19

Company: AECOM

Billing Information: 60440641.17

Address: 40 British American Blvd

Report To: Gerlinde Wolf

Email To: gerlinde.wolf@aecom.com

Copy To: Dan Servetas

Site Collection Info/Address: Scotia, NY

Customer Project Name/Number: Scotia Navy Depot / 60440641

State: NY / County/City: Scotia / Time Zone Collected: [ ] PT [ ] MT [ ] CT [X] ET

Phone: 518951 2370

Email: gerlinde.wolf@aecom.com

Site/Facility ID #:

Compliance Monitoring? [ ] Yes [ ] No

Collected By (print): Alex Golden

Purchase Order #:

Quote #: 28154

DW PWS ID #:

DW Location Code:

Collected By (signature): Alex Golden

Turnaround Date Required: Standard

Immediately Packed on Ice: [ ] Yes [ ] No

Sample Disposal: [X] Dispose as appropriate [ ] Return [ ] Archive: ______ [ ] Hold: ______

Rush: [ ] Same Day [ ] Next Day [ ] 2 Day [ ] 3 Day [ ] 4 Day [ ] 5 Day (Expedite Charges Apply)

Field Filtered (if applicable): [ ] Yes [X] No

Analysis: ______

* Matrix Codes (Insert in Matrix box below): Drinking Water (DW), Ground Water (GW), Wastewater (WW), Product (P), Soil/Solid (SL), Oil (OL), Wipe (WP), Air (AR), Tissue (TS), Bioassay (B), Vapor (V), Other (OT)

Container Preservative Type **: V

Lab Project Manager:

** Preservative Types: (1) nitric acid, (2) sulfuric acid, (3) hydrochloric acid, (4) sodium hydroxide, (5) zinc acetate, (6) methanol, (7) sodium bisulfate, (8) sodium thiosulfate, (9) hexane, (A) ascorbic acid, (B) ammonium sulfate, (C) ammonium hydroxide, (D) TSP, (U) Unpreserved, (O) Other ______

Customer Sample ID	Matrix *	Comp / Grab	Collected (or Composite Start) Date	Collected (or Composite Start) Time	Composite End Date	Composite End Time	Res Cl	# of Ctns	Analyses: Dissolved Hydrogen
MW-30 121019	AR	G	12/10/19	1400				1	
MW-31 121019				1405				1	
MW-28 121019				1145				1	
MW-34 121119			12/11/19	1030				1	
MW-32 121119				1420				1	

AG

Lab Profile/Line:

Lab Sample Receipt Checklist:

- Custody Seals Present/Intact Y N NA
- Custody Signatures Present Y N NA
- Collector Signature Present Y N NA
- Bottles Intact Y N NA
- Correct Bottles Y N NA
- Sufficient Volume Y N NA
- Samples Received on Ice Y N NA
- VOA - Headspace Acceptable Y N NA
- USDA Regulated Soils Y N NA
- Samples in Holding Time Y N NA
- Residual Chlorine Present Y N NA
- Cl Strips: ______
- Sample pH Acceptable Y N NA
- pH Strips: ______
- Sulfide Present Y N NA
- Lead Acetate Strips: ______

LAB USE ONLY:
Lab Sample # / Comments:

Customer Remarks / Special Conditions / Possible Hazards:

Type of Ice Used: Wet Blue Dry None

Packing Material Used: bubblewrap

Radchem sample(s) screened (<500 cpm): Y N NA

SHORT HOLDS PRESENT (<72 hours): Y N N/A

Lab Tracking #: n/a 2324577

Samples received via: FEDEX UPS Client Courier Pace Courier

Lab Sample Temperature Info:
Temp Blank Received: Y N NA
Therm ID#: ______
Cooler 1 Temp Upon Receipt: ____oC
Cooler 1 Therm Corr. Factor: ____oC
Cooler 1 Corrected Temp: ____oC
Comments:

Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	MTJL LAB USE ONLY
Alexandra Golden / AECOM	12/12/19 1600	[signature]	12.13.19 1030	Table #:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	Acctnum: Template: Prelogin:
Relinquished by/Company: (Signature)	Date/Time:	Received by/Company: (Signature)	Date/Time:	PM: PB:

Trip Blank Received: Y N NA
HCL MeOH TSP Other

Non Conformance(s): YES / NO

Page: ______ of: ______

APPENDIX F: Groundwater Concentration Trend Plots

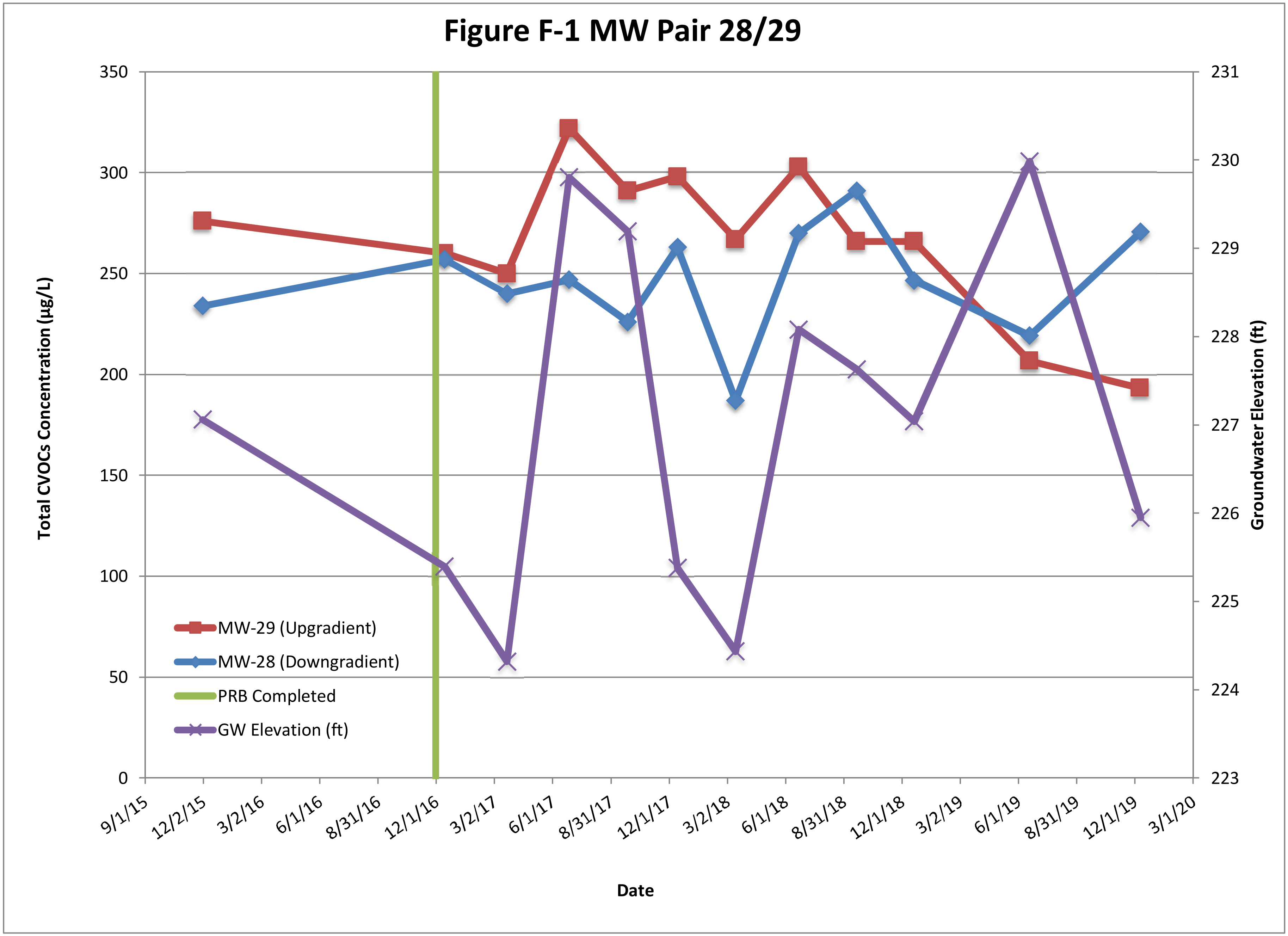

Figure F-1 MW Pair 28/29
Total CVOCs Concentration (µg/L)
Groundwater Elevation (ft)
Date
350
300
250
200
150
100
50
0
231
230
229
228
227
226
225
224
223
9/1/15
12/2/15
3/2/16
6/1/16
8/31/16
12/1/16
3/2/17
6/1/17
8/31/17
12/1/17
3/2/18
6/1/18
8/31/18
12/1/18
3/2/19
6/1/19
8/31/19
12/1/19
3/1/20
MW-29 (Upgradient)
MW-28 (Downgradient)
PRB Completed
GW Elevation (ft)

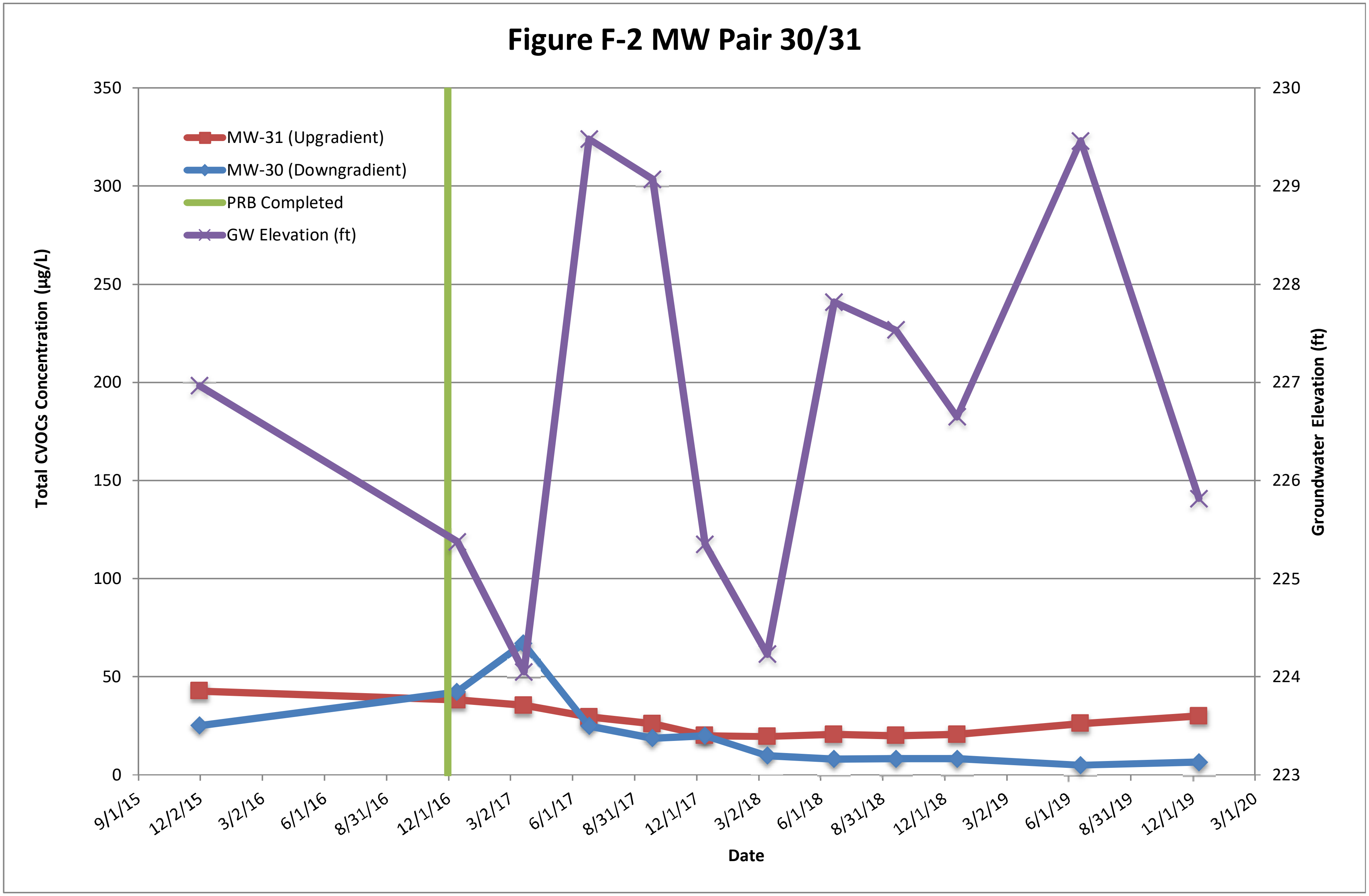

Figure F-2 MW Pair 30/31
MW-31 (Upgradient)
MW-30 (Downgradient)
PRB Completed
GW Elevation (ft)
Total CVOCs Concentration (µg/L)
Groundwater Elevation (ft)
Date
0
50
100
150
200
250
300
350
223
224
225
226
227
228
229
230
9/1/15
12/2/15
3/2/16
6/1/16
8/31/16
12/1/16
3/2/17
6/1/17
8/31/17
12/1/17
3/2/18
6/1/18
8/31/18
12/1/18
3/2/19
6/1/19
8/31/19
12/1/19
3/1/20

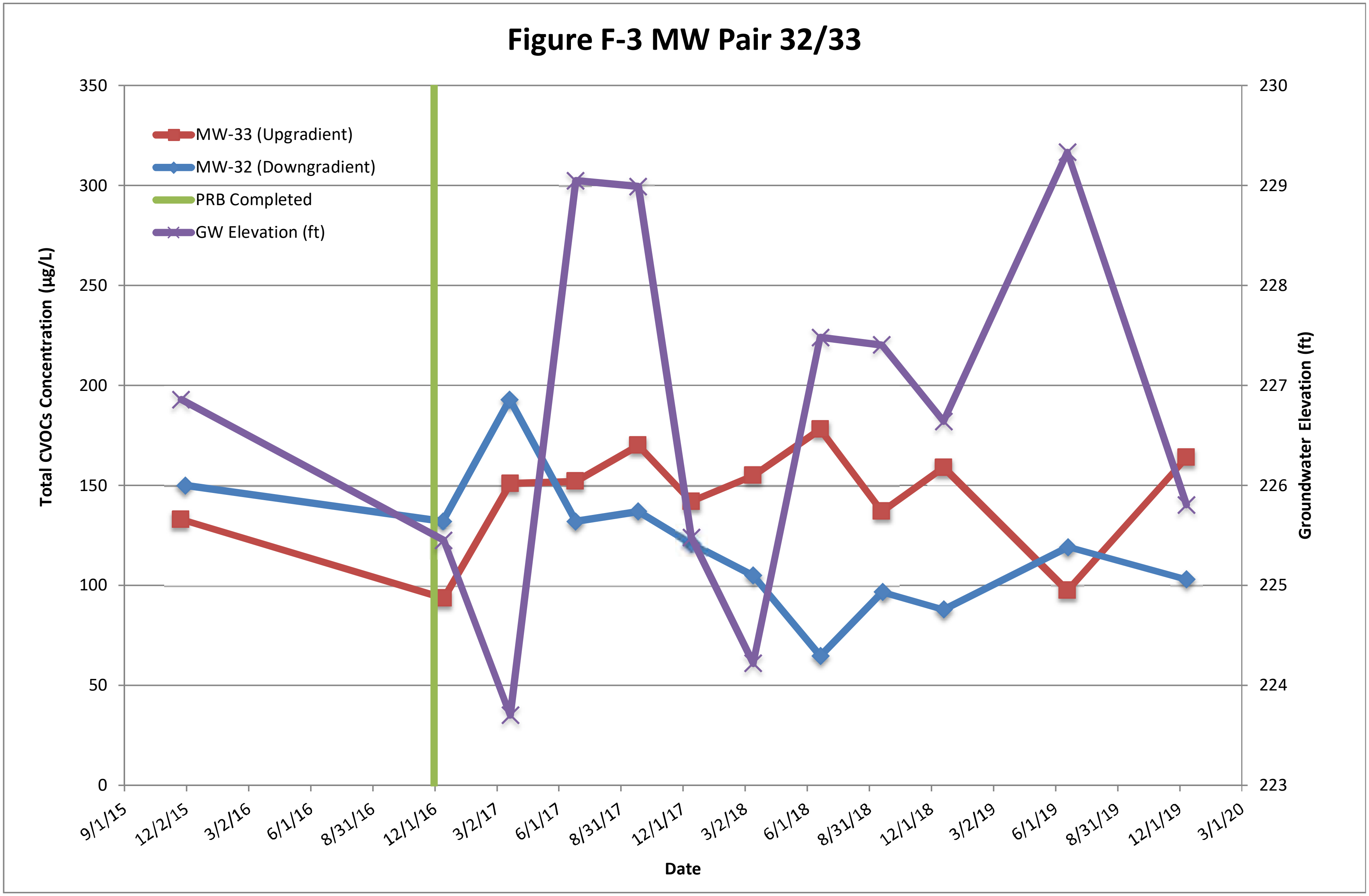

Figure F-3 MW Pair 32/33
MW-33 (Upgradient)
MW-32 (Downgradient)
PRB Completed
GW Elevation (ft)
Total CVOCs Concentration (µg/L)
Groundwater Elevation (ft)
Date
350
300
250
200
150
100
50
0
230
229
228
227
226
225
224
223
9/1/15
12/2/15
3/2/16
6/1/16
8/31/16
12/1/16
3/2/17
6/1/17
8/31/17
12/1/17
3/2/18
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3/2/19
6/1/19
8/31/19
12/1/19
3/1/20

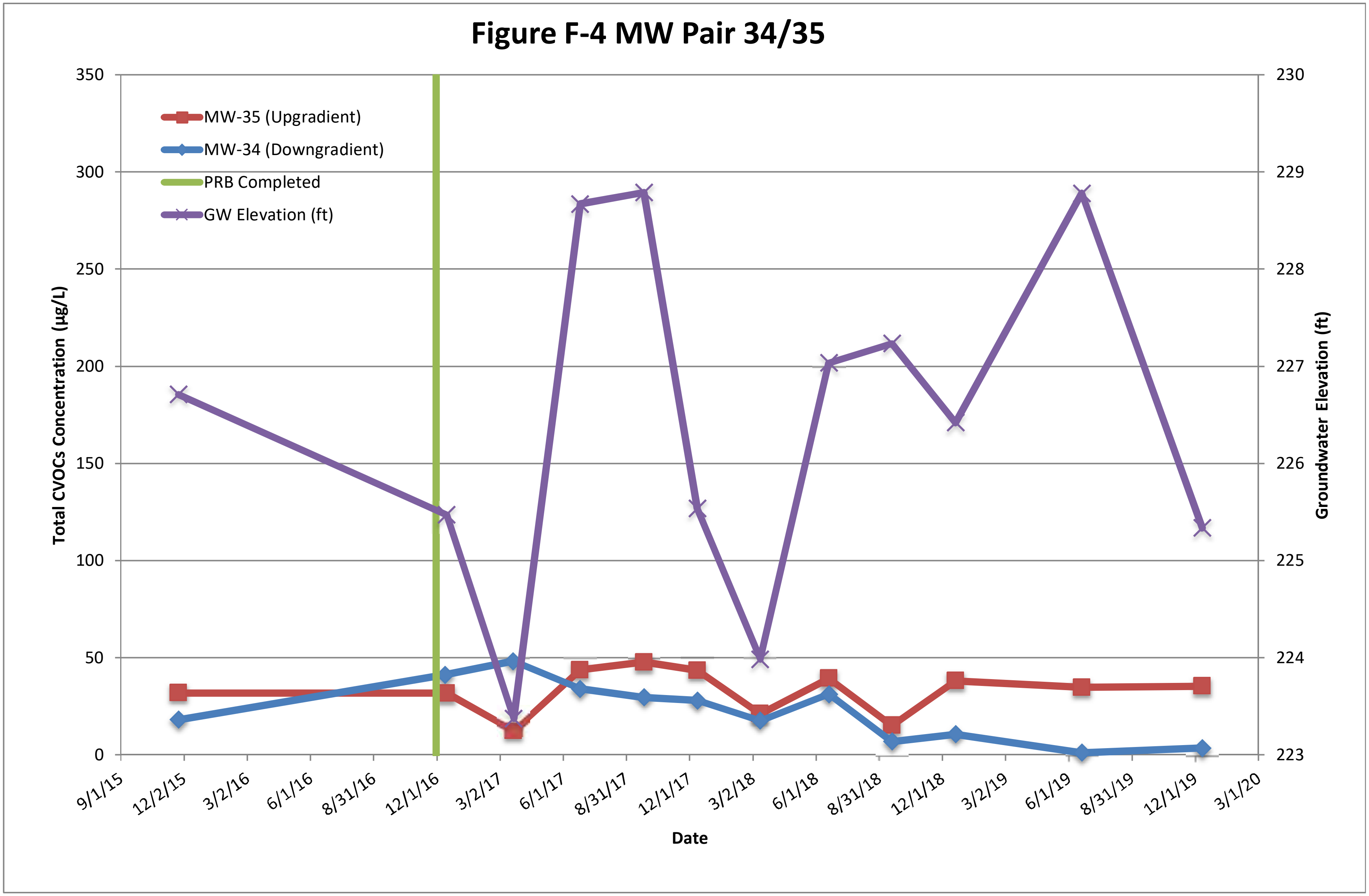


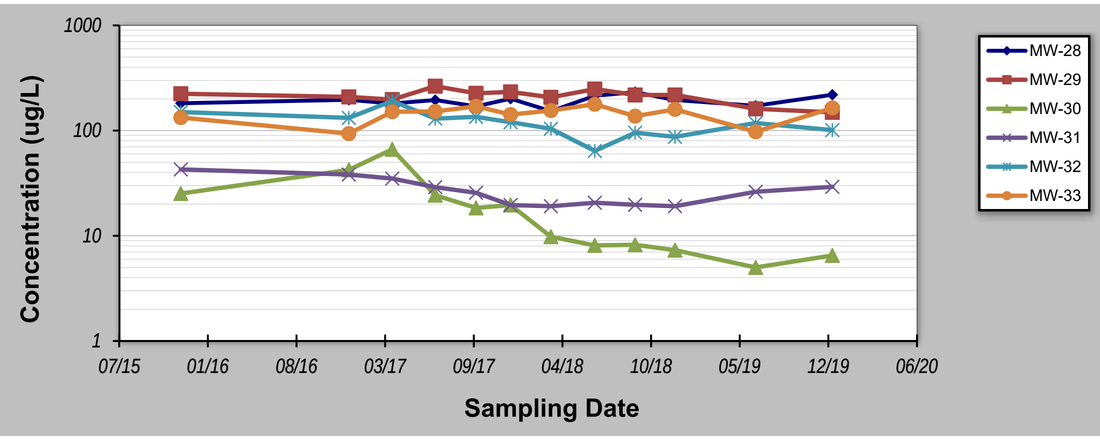
Figure F-4 MW Pair 34/35
MW-35 (Upgradient)
MW-34 (Downgradient)
PRB Completed
GW Elevation (ft)
Total CVOCs Concentration (µg/L)
Groundwater Elevation (ft)
Date
0
50
100
150
200
250
300
350
223
224
225
226
227
228
229
230
9/1/15
12/2/15
3/2/16
6/1/16
8/31/16
12/1/16
3/2/17
6/1/17
8/31/17
12/1/17
3/2/18
6/1/18
8/31/18
12/1/18
3/2/19
6/1/19
8/31/19
12/1/19
3/1/20

APPENDIX G: Mann-Kendall Trend Analysis Results

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date: **December 2019**
Facility Name: **Former Scotia Navy Depot**
Conducted By: **M. Zenker**
Job ID:
Constituent: **TCE**
Concentration Units: **ug/L**

Sampling Event	Sampling Date	MW-28	MW-29	MW-30	MW-31	MW-32	MW-33	
		TCE CONCENTRATION (ug/L)						
1	1-Dec-15	182	224	25.2	42.7	150	133	
2	14-Dec-16	196	209	42.3	38.2	132	93.5	
3	22-Mar-17	181	197	66.3	35	191	151	
4	27-Jun-17	195	264	24.3	29	130	152	
5	27-Sep-17	170	226	18.4	25.6	135	170	
6	14-Dec-17	201	233	19.6	19.6	120	142	
7	15-Mar-18	153	207	9.8	19.1	104	155	
8	22-Jun-18	214	248	8.1	20.6	64.1	178	
9	21-Sep-18	232	218	8.2	19.7	95.4	137	
10	20-Dec-18	195	218	7.3	19.1	87.1	159	
11	20-Jun-19	172	161	5	26.2	118	97.4	
12	10-Dec-19	219	149	6.5	29.2	101	164	
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.12	0.15	0.91	0.30	0.28	0.18	
Mann-Kendall Statistic (S):		13	-19	-54	-29	-40	18	
Confidence Factor:		79.0%	88.9%	>99.9%	97.4%	99.7%	87.5%	
Concentration Trend:		No Trend	Stable	Decreasing	Decreasing	Decreasing	No Trend	



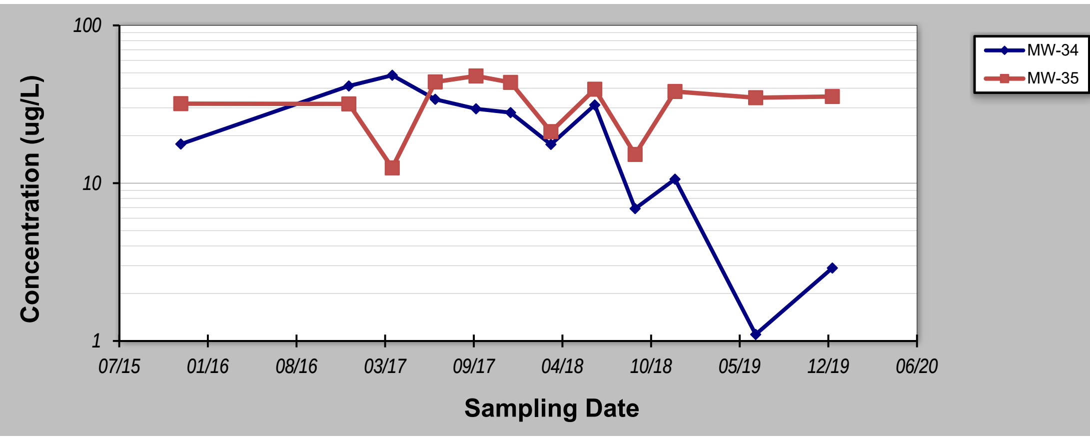
Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	December 2019	Job ID:	
Facility Name:	Former Scotia Navy Depot	Constituent:	TCE
Conducted By:	M. Zenker	Concentration Units:	ug/L

Sampling Point ID:		MW-34	MW-35					
Sampling Event	Sampling Date	TCE CONCENTRATION (ug/L)						
1	1-Dec-15	17.7	31.9					
2	14-Dec-16	41.3	31.8					
3	22-Mar-17	48.3	12.5					
4	27-Jun-17	34	43.8					
5	27-Sep-17	29.6	47.8					
6	14-Dec-17	28	43.5					
7	15-Mar-18	17.6	21.2					
8	22-Jun-18	31.3	39.4					
9	21-Sep-18	6.9	15.2					
10	20-Dec-18	10.6	38.1					
11	20-Jun-19	1.1	34.8					
12	10-Dec-19	2.9	35.4					
13								
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.68	0.34					
Mann-Kendall Statistic (S):		-42	-2					
Confidence Factor:		99.8%	52.7%					
Concentration Trend:		Decreasing	Stable					



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1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
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