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Seneca Army Depot Activity
Romulus, NY

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ANNUAL REPORT 2014 – YEAR 7
ABANDONED DEACTIVATION FURNACE (SEAD-16)
AND ACTIVE DEACTIVATION FURNACE (SEAD-17)
SENECA ARMY DEPOT ACTIVITY

Contract No. W912DY-08-D-0003
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PARSONS

July 2015

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ANNUAL REPORT 2014 – YEAR 7

FOR THE ABANDONED DEACTIVATION FURNACE (SEAD-16) AND THE ACTIVE DEACTIVATION FURNACE (SEAD-17) SENECA ARMY DEPOT ACTIVITY, ROMULUS, NY

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1.0 INTRODUCTION

This Draft Annual Report – Year 7 for the former Abandoned Deactivation Furnace (SEAD-16) and the former Active Deactivation Furnace (SEAD-17) sites at the Seneca Army Depot Activity (SEDA or the Depot) in Romulus, Seneca County, New York provides a review of annual groundwater monitoring data collected in December 2014, comparisons of the 2014 data to other pre- and post-remedial action (RA) groundwater sampling events, recommendations for future long-term monitoring (LTM) at SEAD-16 and SEAD-17, and the annual review of the effectiveness of the remedy implemented at the sites in 2007.

In accordance with the Record of Decision (ROD) for SEAD-16 and SEAD-17 (Parsons, 2006) and the *Remedial Design Work Plan and Design Report* (Parsons, 2007) (Final Work Plan), a RA was completed in August 2007 at SEAD-16 and SEAD-17 [the areas of concern (AOCs)]. The RA consisted of the excavation and disposal of soil, from both AOCs, which was contaminated with selected metals (antimony, arsenic, cadmium, copper, lead, mercury, thallium, and zinc) at levels above identified risk-based action levels. In addition, soil at SEAD-16 was also contaminated with polyaromatic hydrocarbons (PAHs) at concentrations in excess of risk-based action levels. The PAH impacted soil was excavated and was disposed of at a licensed landfill. The RA implemented at SEAD-16 and SEAD-17 is documented in the *Final Construction Completion Report for the Abandoned Deactivation Furnace (SEAD-16) and Active Deactivation Furnace (SEAD-17)* (Parsons, 2008). The RA at SEAD-16 involved the removal of approximately 1,862 cubic yards (cy) of soil which was impacted with metals and PAHs. The RA at SEAD-17 involved the removal of approximately 2,565 cy of metals-impacted soil.

The ROD for SEAD-16 and SEAD-17 also requires the implementation, maintenance, inspection, and periodic reporting of land use controls (LUCs) prohibiting use of the land at the AOCs for residential purposes and access to and use of groundwater until applicable cleanup standards are met. Applicable cleanup standards refer to the lowest enforceable standard associated with either the New York State Class GA (NYS Class GA) Ambient Water Quality Standards or United States Environmental Protection Agency (EPA) maximum contaminant levels (EPA MCLs). Once groundwater cleanup standards are achieved, the groundwater use restrictions may be eliminated upon approval of the EPA and the New York State Department of Environmental Conservation (NYSDEC). SEAD-16 and SEAD-17 are located within the Planned Industrial/Office Development and Warehousing (PID) area. The PID area has area-wide LUCs that prohibit the development and use of the property for residential housing, elementary and secondary schools, childcare facilities, and playgrounds; and, prohibits access to and use of groundwater until concentrations have been reduced to levels that allow for unlimited exposure and unrestricted use.

The Land Use Control Remedial Design (LUC RD) Addendum #4 identifies and implements the LUCs required by the SEAD-16 and SEAD-17 ROD at the identified AOCs, as well as other AOCs (SEADs 1, 2, 5, 59, 71, 121C, and 121I) in the PID area. The LUC objectives for SEAD-16 and SEAD-17 are to prevent access to or use of groundwater until New York State GA groundwater standards are achieved, and to prohibit residential housing, elementary and secondary schools, child care facilities and playground activities at the sites. Implementation of the LUCs at SEAD-16 and SEAD-17 may include lease restrictions, an environmental easement, deed restrictions, zoning, periodic certification, and a five-year review as is defined in the *Final Land Use Control Design for SEAD-27, 66, and 64A* (Army, 2006). The

LUC RD for SEAD-27, 66 and 64A is also known as the *LUC RD for the Planned Industrial/Office Development or Warehousing Area* that proposed the establishment of an area-wide set of land use restrictions for the PID/Warehouse Area to simplify institutional control implementation by having a single set of land use restrictions for the PID/Warehouse Area, which are consistent with its anticipated industrial land use. The periodic certification will be submitted to the NYSDEC and EPA to document that the LUCs at SEAD-16 and SEAD-17 are unchanged and that no activities have occurred that impair or violate the ability of the LUCs to protect public health and the environment.

Long-term groundwater monitoring is being performed at SEAD-16 and SEAD-17 as part of the post-closure monitoring and maintenance (PCMM) operations in accordance with the ROD and as outlined in the Final Work Plan (Parsons, 2007). LTM results are summarized in annual reports beginning in December 2007 (**Exhibit 1.1**). No LTM sampling event was conducted in 2011 due to budgetary constraints. This Year 7 report presents and discusses the results for the Year 7 LTM event which was conducted in December 2014.

Exhibit 1.1 – LTM and Inspection Summary

Round Number	Event	Date	Report Title
1	LTM	December 2007	Final Construction Completion Report for the Abandoned Deactivation Furnace (SEAD-16) and Active Deactivation Furnace (SEAD-17) (Parsons, 2008).
2	LTM	December 2008	Final Annual Report – Year 2 (Parsons, 2009)
3	LTM	November 2009	Final Annual Report – Year 3 (Parsons, 2010)
4	LTM	December 2010	Draft Final Annual Report – Year 4 (Parsons, 2013)
5	LTM	December 2012	Final Annual Report – Year 5 (Parsons, 2014a)
6	LTM	December 2013	Draft Annual Report – Year 6 (Parsons, 2014b)
7	LTM	December 2014	Draft Annual Report – Year 7

2.0 SITE BACKGROUND

2.1 Site Description

SEDA, a 10,587-acre former military facility located in Seneca County near Romulus, New York, is located between Seneca Lake and Cayuga Lake in Seneca County, and is bordered by New York State Highway 96 to the east, New York State Highway 96A to the west, and sparsely populated farmland to the north and south. The facility was wholly owned by the United States Government and was operated by the Department of the Army between 1941 and 2000; since 2000, portions of the Depot have been transferred to other parties for reuse. The primary mission of SEDA was the receipt, storage, maintenance, and supply of military items. A location map of SEDA is presented as **Figure 1**.

SEAD-16 and SEAD-17 are located in the east-central portion of the SEDA within the former ammunition storage area in an area where vehicular and pedestrian access is restricted. SEAD-16 and SEAD-17 are located in the portion of SEDA where land is presently designated for future PID uses. The locations of SEAD-16 and SEAD-17 are shown in **Figure 2**.

Both AOCs were historically used for the demilitarization of various small arms munitions. The munitions deactivation process involved heating the munitions in a rotating steel kiln. The heat would cause the munitions to detonate once the detonation temperature was reached. The byproducts produced during this detonation were then either swept out of the kiln through the stack or expelled from the kiln as bottom ash or debris.

SEAD-16, the former Abandoned Deactivation Furnace, was used from approximately 1945 until the mid 1960s when its use ceased and the site was vacated. The site consisted of 2.6 acres of fenced land with grasslands in the north, east, and west; a storage area for empty boxes and wooden debris located to the west; and an unpaved roadway in the south. Building S-311, which previously housed the deactivation furnace, was located at the approximate center of this area, and was demolished as part of the RA at SEAD-16. Documentation of demolition activities is presented in the *Building Cleaning and Building Demolition Completion Report* (Parsons, 2008). Building S-366, known as the Process Support Building, is located to the northeast of former Building S-311, and is currently unused and vacant. In addition to Building S-366, two sets of SEDA railroad tracks and utilities are presently on-site.

SEAD-17, the former Active Deactivation Furnace, was constructed to replace the Abandoned Deactivation Furnace at SEAD-16. However, SEAD-17 was inactive after 1989 as a result of Resource Conservation and Recovery Act (RCRA) permitting issues. SEAD-17 formerly consisted of the deactivation furnace, associated air pollution control equipment, and a support building (Building S-367), which were demolished or dismantled during the RA. Details and results of the demolition are documented in the *Building Cleaning and Building Demolition Completion Report* (Parsons, 2008). The former SEAD-17 deactivation furnace facility and support building were surrounded by a crushed shale road, beyond which lie grasslands. An unpaved gravel road to the north permits vehicular access to SEAD-17.

2.2 Site Hydrology

The hydrogeologic setting of SEAD-16 and SEAD-17 is described in detail in Sections 3.1.6 and 3.2.6, respectively, of the *Final Remedial Investigation (RI) Report at the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17)* (Parsons, 1999). A brief summary of the hydrogeologic conditions and chemical impacts, as described in the RI Report, is presented below.

2.2.1 SEAD-16

Three groundwater monitoring wells (MW16-1, MW16-2, and MW16-3) were installed as part of the Expanded Site Investigation (ESI) conducted at SEAD-16 in 1993/1994. Four additional groundwater monitoring wells (MW16-4, MW16-5, MW16-6, and MW16-7) were installed during the RI. As summarized in the *Final Construction Completion Report for the Abandoned Deactivation Furnace (SEAD-16) and Active Deactivation Furnace (SEAD-17)* (Parsons, 2008), MW16-3 was destroyed during the RA construction activities, and was not replaced as groundwater conditions on the southwest side of Building S-311 are adequately characterized by MW16-2 and MW16-5. The locations of the six existing groundwater monitoring wells and the former MW16-3 are shown on **Figure 3**.

Prior to the completion of the RA in August 2007, depth to groundwater was measured at SEAD-16 three times (April 1994, August 1996, and December 1996). Groundwater flow generally trends to the west based on previous subsurface investigations conducted at SEDA. Data from previous investigations suggest that a groundwater divide exists near, and approximately parallel to, Route 96 near Romulus, New York, indicating that the groundwater in the SEAD-16 area flows west. Based on available groundwater elevation data, it appears that there may be a regional groundwater high southwest of former Building S-311, which may contribute to local fluctuations in groundwater flow for the Site.

Horizontal hydraulic conductivities were determined for five wells screened in the till/weathered shale zone at SEAD-16. The saturated thickness in the till/weathered shale aquifer measured less than 2 feet when tested in September 1996. Hydraulic conductivity values for the shallow till/weathered shale aquifer ranged from 2.8×10^{-3} cm/sec to 2.5×10^{-2} cm/sec; the geometric mean was 7.3×10^{-3} cm/sec.

2.2.2 SEAD-17

Four groundwater monitoring wells (MW17-1, MW17-2, MW17-3, and MW17-4) were installed as part of the ESI conducted at SEAD-17. One additional groundwater monitoring well, MW17-5, was installed during the RI. The locations of the five groundwater monitoring wells installed at SEAD-17 are shown on **Figure 4**. Prior to the completion of the RA, depth to groundwater was measured at SEAD-17 in April 1994, August 1996, and December 1996 (the same time groundwater levels were measured at SEAD-16). Interpretation of groundwater elevation data indicates that groundwater flows to the southwest.

A horizontal hydraulic gradient of 0.01ft/ft was calculated between monitoring wells MW17-1 and MW17-3. Hydraulic conductivities were found to range from 2.9×10^{-3} cm/sec to 1.4×10^{-2} cm/sec.

2.3 Pre-Remedial Action Soil and Groundwater Conditions for SEAD-16

Pre-Remedial Action Soil Conditions

The primary historic constituents of concern (COCs) at SEAD-16 for soil included arsenic, copper, lead,

and zinc. The highest concentrations of soil contamination resulted from operations that were performed within and in close proximity to the former Abandoned Deactivation Furnace Building (S-311) and the Process Support Building (Bld. 366). Carcinogenic PAHs were detected in soils found at discrete locations within the AOC, with the highest concentrations detected in the surface soil samples collected adjacent to the northwestern corner of the former Abandoned Deactivation Furnace Building. Metals (antimony, copper, lead, mercury, and zinc) were found at concentrations greater than the site-specific cleanup goals in soil located in portions of the surrounding man-made drainage ditches.

Pre-Remedial Action Groundwater Conditions

Prior to completion of the RA, three rounds of low-flow groundwater sampling were conducted at SEAD-16, including one round in April 1994 as part of the ESI investigation activities, and two rounds in August and December 1996 as part of the RI activities. Compounds detected in the ESI and RI groundwater samples are presented in **Appendix A** (refer to the RI Report for complete groundwater analyses). Total metals were detected above either the applicable NYS Class GA standards or EPA MCLs. Concentrations exceeding applicable standards were less than or close to SEDA background concentrations, except for the exceedances of sodium. A summary of SEDA background groundwater data providing summary statistics (including maximum and average concentrations, the standard deviation for the collected data, and the frequency of detection) is provided in **Appendix B**. The Final Work Plan summarized that although metals had been detected in the groundwater above their respective standards during previous sampling events, the groundwater was not impacted by site activities (Parsons, 2007). This conclusion was based on a comparison of results to the background groundwater data collected from unaffected parts of SEDA.

ESI and RI Data

Review of SEAD-16 data presented in the RI Report indicated that one or more concentrations measured for 14 metals (including arsenic, antimony, barium, beryllium, chromium, copper, iron, lead, manganese, mercury, nickel, selenium, sodium, and thallium) in 19 unfiltered groundwater samples collected during the ESI (performed in 1993/1994) and/or the RI (performed in 1999) exceeded NYS Class GA or EPA MCL standards in effect at the time of analysis. Of the 39 total instances where groundwater concentrations exceeded NYS Class GA or EPA MCL standards, 22 exceedances were associated with samples collected with peristaltic pumps (e.g., for the ESI sampling event) while the remaining 17 exceedances were found in samples collected using low-flow sampling with a bladder pump. Sample turbidities recorded during the RI sampling events were significantly lower than those recorded during the ESI sampling event, and thus are believed to be more representative of the water quality located at the site prior to the RA. Examination of the RI groundwater data shows that six metals were detected at concentrations in excess of NYS Class GA or EPA MCL standards in effect at the time of analysis:

- antimony (detected 2 times);
- iron (detected 5 times);
- lead (detected 1 time);

- manganese (detected 2 times);
- sodium (detected 3 times); and
- thallium (detected 4 times) EPA MCL.

Of these detections, antimony was detected at concentrations above the applicable NYS Class GA standard only in well MW16-3, with a maximum concentration of 12.3 µg/L. Iron was found at elevated concentrations in three wells: MW16-1 (at a maximum concentration of 2,400 J µg/L), MW16-2, and MW16-3. Lead was detected only in MW16-3 at a maximum concentration of 24.1 J µg/L; manganese was detected at elevated concentrations only in MW16-6 with a maximum level of 1,380 µg/L; sodium was detected in two wells (MW16-5 and MW16-6) with a maximum concentration of 409,000 µg/L detected at MW16-6; and thallium was detected in three wells including (MW16-2, MW16-5, and MW16-6), with a maximum concentration of 11 µg/L detected at MW16-6.

2.4 Pre-Remedial Action Soil and Groundwater Conditions for SEAD-17

Pre-Remedial Action Soil Conditions

The primary historic COCs in the soil at SEAD-17 were metals including antimony, arsenic, copper, lead, mercury, and zinc. The concentrations of metals were highest in samples collected closest to the location of the former Active Deactivation Furnace and its support building, particularly near the southwestern corner of the building.

Pre-Remedial Action Groundwater Conditions

Prior to the completion of the RA, three rounds of groundwater sampling were conducted at SEAD-17, concurrent with the sampling conducted at SEAD-16. Compounds detected in the groundwater samples collected during the low-flow sampling events in 1996 for SEAD-17 are presented in **Appendix A**. Total metals were detected at concentrations above the applicable NYS Class GA standards or EPA MCLs; however, except for sodium, these concentrations were lower than SEDA background metal concentrations (see SEDA background groundwater data summary in **Appendix B.**) The Final Work Plan summarized that, although metals had been detected in the groundwater above their respective standards during previous sampling events, the groundwater was not impacted by site activities. This conclusion is based on a comparison of results to groundwater data collected from non-impacted areas of SEDA.

ESI and RI Data

Review of SEAD-17 data presented in the RI Report indicated that one or more concentrations measured for four metals (i.e., iron, lead, sodium, and thallium) in 12 unfiltered groundwater samples exceeded NYS Class GA or EPA MCL standards in effect at the time of analysis. Of the 16 instances where groundwater concentrations exceeded the NYS Class GA or EPA MCL standards, 10 were associated with samples collected with a peristaltic pump (ESI sampling event) while the remaining six were found in samples collected using low-flow sampling with a bladder pump. As was indicated above for SEAD-16, sample turbidities recorded during the RI sampling events were lower than those recorded during the ESI sampling event, and thus the analytical results from the RI samples are believed to be more representative of the water quality present at SEAD-17. Examination of the RI groundwater data indicates

that only three metals (iron, sodium, and thallium) were detected at concentrations above NYS Class GA or EPA MCL standards in effect at the time of analysis. Of these detections, iron was detected at an elevated concentration in one well (MW17-1 at a concentration of 572 J µg/L); sodium was detected in two wells (MW17-3, at a maximum concentration of 30,100 µg/L, and at MW17-4); and thallium was detected in two wells (MW17-1 at a maximum concentration of 7.1 µg/L, and at MW17-5).

2.5 Remedial Action Summary

The selected remedy for SEAD-16 and SEAD-17 required the following:

- Excavation of soil impacted with metals and PAHs at concentrations greater than the site-specific cleanup standards;
- Stabilization of excavated soil exceeding the toxicity characteristic leaching procedure;
- Disposal of the material in an off-site landfill;
- Backfilling the excavated areas with clean backfill;
- Performing groundwater monitoring for select metals until groundwater concentrations do not exceed the applicable NYS Class GA or EPA MCL standards;
- Establishing and maintaining LUCs to prevent access to or use of groundwater and to prevent residential use of the land until cleanup standards are met; and
- Performing a review of the selected remedy every five years to evaluate if the remedy remains protective of the public health and the environment in accordance with Section 121(c) of the Comprehensive Environmental Remediation and Cleanup Liability Act (CERCLA).

The excavation of the impacted soil at SEAD-16 and SEAD-17 began on July 9, 2007 and was completed on August 2, 2007. Approximately 1,862 cy of impacted soil was removed from SEAD-16 and approximately 2,565 cy of impacted soil was removed from SEAD-17. The limit of the excavations performed at SEAD-16 is shown on **Figure 3** and for SEAD-17 on **Figure 4**.

Soil was excavated from both SEAD-16 and SEAD-17 until confirmatory soil samples collected from the sidewalls (when appropriate), the excavation floor, and the perimeter yielded analytical results below site-specific cleanup standards. The depth of excavation completed at SEAD-16 varied from approximately 1 to 3 feet below ground surface (bgs) and the excavation depth at SEAD-17 varied from approximately 1 to 2 feet bgs. The impacted soil from SEAD-16 and SEAD-17 was transported off-site and was disposed as non-hazardous material at the Ontario County Landfill in Flint, New York.

Deeper excavations at SEAD-16 and SEAD-17, including excavation areas surrounding the railroad tracks, were backfilled with clean bank-run gravel. SEAD-16 and SEAD-17 were graded to promote positive drainage. The areas at SEAD-17 that were vegetated prior to the RA were seeded to restore the vegetation. SEAD-16 was not seeded since it was not previously vegetated.

3.0 LONG TERM MONITORING RESULTS

3.1 Year 7 LTM Event

The Year 7 post-RA LTM event was conducted at SEAD-16 and SEAD-17 from December 20, 2014 through December 21, 2014. Filtered and unfiltered groundwater samples were collected from six monitoring wells (MW16-1, MW16-2, MW16-4, MW16-5, MW16-6, and MW16-7) located at SEAD-16 and from five monitoring wells (MW17-1, MW17-2, MW17-3, MW17-4, and MW17-5) located at SEAD-17. This is the fifth sampling event that includes the collection of filtered and unfiltered samples. Field forms completed for the Year 7 sampling event are included in **Appendix C**. Groundwater data results for each LTM event are presented in **Appendix D,** and the laboratory analytical report for Year 7 is included as **Appendix E**. A discussion of data validation results is presented in **Appendix F**; there were no non-compliance issues reported.

3.1.1 Year 7 Groundwater Elevations for SEAD-16 and SEAD-17

Prior to the collection of groundwater samples from each of the monitoring wells, groundwater elevation measurements were collected at each of the wells to be sampled. Groundwater elevation data for the Year 7 LTM event and historic data from past events are presented in **Table 1** and **Table 2** for SEAD-16 and SEAD-17, respectively. Groundwater elevations were measured on December 15, 2014 at SEAD-16 and SEAD-17.

Groundwater elevation data collected during previous investigations indicate that groundwater generally flows to the southwest at SEAD-16; however, historical groundwater elevation data also indicate that localized variation in groundwater flow direction may be due to higher groundwater elevations observed to the northeast and southwest of the former Building S-311. During the most recent (Year 7) LTM event, and similar with Years 4, 5, and 6 LTM groundwater flow observations at SEAD-16, groundwater elevation data suggest that there is a groundwater low in the vicinity of the former Building S-311 location. The higher groundwater elevations to the northeast and southwest of the apparent groundwater low in the vicinity of Building S-311 result in two apparent local groundwater flow directions (to the southwest and northeast, respectively) (**Figure 5**).

Based on the most recent elevation data (December 2014), groundwater at SEAD-17 appears to flow generally to the west-southwest, which is consistent with historical groundwater flow observations at SEAD-17 (**Figure 5**).

3.1.2 Year 7 LTM Sample Collection

Samples for the Year 7 LTM event were collected using low-flow sampling techniques. A peristaltic pump was used in place of a bladder pump to collect the groundwater samples during this event due to winter weather conditions, including standing air temperatures below 32 degrees Fahrenheit (0 degrees Celsius). A peristaltic pump is recommended for freezing conditions since the bladder pump recharge cycle sequence allows water to freeze in the exposed portion of the sample tubing, which may inhibit sample collection efforts due to ice plugs forming in the tubing.

Sample collection, handling and custody, holding times, and field parameter collection procedures were conducted in accordance with the *Revised Final Sampling and Analysis Plan for Seneca Army Depot Activity* (SAP) (Parsons, 2006c). Samples collected from the six SEAD-16 wells and the five SEAD-17 wells were submitted to TestAmerica (Savannah, GA) for the following analyses:

- Total and dissolved Target Analyte List (TAL) metals, exclusive of mercury, by USEPA SW846 Method 6020; and
- Total and dissolved mercury by USEPA SW846 7470A.

The TestAmerica Savannah, GA laboratory is certified by the Department of Defense (DoD) Environmental Laboratory Accreditation Program (ELAP) and the NELAC National Environmental Laboratory Accreditation Program (NELAP) for the above analyses/analytical methods for both potable and non-potable water.

Quality control (QC) samples, including one duplicate and one matrix spike/matrix spike duplicate (MS/MSD) pair, were collected at MW16-7. In the field, pH, oxidation-reduction potential (ORP), dissolved oxygen (DO), conductivity, temperature, and turbidity data were collected from each well during the purging cycle.

3.1.3 Year 7 LTM Sample Filtering

As documented in previous reports, there was the concern that elevated metal concentrations in SEAD-16 and SEAD-17 wells may be associated with higher groundwater turbidity values. With this in mind, both unfiltered and filtered samples were collected for the Year 3 through 7 LTM events: after the purging was complete, a sample was collected directly from the well as an unfiltered sample and then another sample was collected and filtered through a 0.45-micron membrane filter in the field and submitted as the filtered sample.

For contaminants that may be biased by the presence of turbidity, turbidity levels that stabilize below 10 Nephelometric Turbidity Units (NTUs) are considered acceptable for sampling without filtration (EPA, 2002 and 2013). Low turbidity values (< 5 NTU) have been consistently observed in past rounds and during the Year 7 LTM event. Samples collected from the wells during the Year 7 monitoring event had turbidity levels less than or equal to 3.55 NTU (MW16-6); all other samples were less than 1.95 NTU (**Appendix C**). Based on the low turbidity values, and the similarity in the results between the filtered and unfiltered concentrations, especially among the analytes which exceed their screening criteria (e.g., antimony, sodium), the LTM data suggests that particulates present in the groundwater samples do not appear to be significantly contributing to the measured concentrations. Complete data (filtered and unfiltered) results are available in **Appendix D**. In the discussion below, for the sake of simplicity, unless specified, only the total (unfiltered) results will be discussed.

3.1.4 Year 7 Groundwater Results for SEAD-16

A summary of metals detected in groundwater during the Year 7 LTM event for SEAD-16 is presented in **Table 3A**. Groundwater data results for each LTM event are presented in **Appendix D** and the laboratory analytical report for Year 7 is included as **Appendix E**. A discussion of data validation results is

presented in **Appendix F**; there were no non-compliance issues reported. Data validation utilized the EPA Region 2 Standard Operating Procedures (SOPs) revised in March 2013.

Within SEAD-16, total concentrations of antimony and sodium were detected above applicable NYS Class GA standards; the total concentration of iron and the sum of iron and manganese was detected above their applicable NYS Class GA standards. In general, the concentrations from total sample results versus dissolved sample results were comparable. Two exceptions to this were the exceedances of iron and the sum of iron and manganese in the sample from well MW16-5 (**Table 3A**). In these cases, the total and dissolved results were approximately equal to their applicable screening levels; however, the dissolved results were uncharacteristically higher than the total results and exceeded their screening criteria.

Antimony (total) exceeded the NYS Class GA standard of 3 µg/L in three wells (MW16-2, MW16-4, and MW16-7). The highest concentration of antimony (total) was found at well MW16-7 with a concentration of 15 µg/L (**Table 3A**). Antimony (total) exceeded the Class GA standard in two other wells (MW16-2 and MW16-4); however, the concentrations were estimated ("J" qualifier) and approximately equal to the GA standard. Antimony was not detected in the other three wells.

Iron (total) did not exceed the NYS Class GA standard (300 µg/L); however, iron (dissolved) exceeded the NYS Class GA standard from one well (MW16-5) at a concentration of 360 J µg/L. The concentration (520 J µg/L) of the sum of iron and manganese (dissolved) in well MW16-5 also exceeded the combined NYS Class GA standard of 500 µg/L with the primary contributing metal being iron (dissolved) (360 J µg/L). Although manganese was detected in the groundwater samples collected from the SEAD-16 wells, it was not detected at concentrations above its NYS Class GA standard (300 µg/L) during the Year 7 LTM event.

Sodium (total) was detected at concentrations above the NYS Class GA standard (20,000 µg/L) in wells MW16-1, MW16-4, and MW16-7. The highest concentration was detected in well MW16-4 (300,000 µg/L). Sodium (total) exceedances were also found in both well MW16-1 (63,000 µg/L) and in well MW16-7 sample and duplicate (29,0000 µg/L and 33,000 µg/L, respectively).

In summary, concentrations (total) of two select metals (antimony and sodium) continue to be detected in the groundwater at SEAD-16 at levels that exceed NYS Class GA standards. Iron (dissolved) exceeded its NYS Class GA standard in one well.

3.1.5 Year 7 Groundwater Results for SEAD-17

A summary of metals detected in the Year 7 groundwater samples event for SEAD-17 is presented in **Table 3B**. Groundwater analytical results for each LTM event are presented in **Appendix D** and the laboratory analytical report for Year 7 is included as **Appendix E**. A discussion of data validation results is presented in **Appendix F**; there were no non-compliance issues reported. Data validation utilized the EPA Region 2 SOPs revised in March 2013.

Antimony (total) was detected at a concentration (3.3 J µg/L) above its NYS Class GA standard (3 µg/L) in one well (MW17-2) at SEAD-17. In general, dissolved concentrations versus total concentrations were

comparable. No other metals (total or dissolved) exceeded applicable groundwater standards in Year 7 at SEAD-17 (**Table 3B**).

3.1.6 LTM Groundwater Data Trends

An examination of the data trends from the Year 1 to 7 LTM events is provided for SEAD-16 and SEAD-17 in the following discussions. The LTM trends were examined to determine if the LTM results show: 1) an overall decreasing trend; 2) overall compliance with groundwater standards; and 3) their similarity to SEDA background values. Filtered (dissolved) samples have been collected and analyzed since the Year 3 LTM event. Since Year 3, the results from filtered (dissolved) and unfiltered (total) samples have not shown evidence of a connection between concentrations and turbidity. As such, the discussion below will focus on unfiltered (total) results as they are representative of the groundwater conditions at SEAD-16/17. Summaries of metal exceedances detected during the Year 7 groundwater monitoring event for SEAD-16 and SEAD-17 are provided in **Tables 3A** and **3B**, respectively. The data results for the Year 1 through Year 7 LTM events are included as **Appendix D**.

3.1.6.1 LTM Groundwater Trends for SEAD-16

Over the seven years since the completion of the RA at SEAD-16, 49 unfiltered (total) groundwater samples were collected from the six wells located at SEAD-16. The full LTM data set is provided in **Appendix D**. During the seven years of LTM sampling, five metals have exceeded NYS Class GA or EPA MCL standards: antimony, iron, lead, manganese, and sodium.

Groundwater at three wells (MW16-2, MW16-4 and MW16-7) frequently had detections of antimony (total) above the NYS Class GA standard of 3 µg/L. A plot of antimony concentration versus time illustrates that at MW16-7 antimony was detected above the standard in each event at concentrations ranging from 9.58 µg/L to 16.3 µg/L (**Figure 6A**). The concentrations of antimony (total) detected at MW16-2 have fluctuated from just above the standard to a maximum concentration of 7.1 µg/L; and, concentrations of antimony (total) at MW16-4 have varied from non-detect to a maximum of 6.3 µg/L (**Figure 6A**). The maximum concentration at both MW16-2 and MW16-4 is below the SEDA average background concentration of 8.2 µg/L. Examination of **Figure 6A** illustrates that the elevated concentrations of antimony above background and above the standard are isolated to MW16-7.

Lead (total) is not a persistent COC in any of the wells at SEAD-16, as shown in **Figure 6B**. Lead (total) has exceeded the EPA MCL twice during seven years of post-RA monitoring at MW16-7 during the first and second LTM sampling events. Since the last exceedance at MW16-7 in 2008, lead (total) concentrations have remained below the EPA MCL for the last five events. The plot in **Figure 6B** illustrates that with the exception of the noted spike of lead concentrations in events 1 and 2, the concentrations are below the standards, and lead is not a COC.

Exceedances of the NYS Class GA standard for iron (total) were noted 13 times, predominantly in well MW16-5. The highest concentration of iron (total) detected in the groundwater at SEAD-16 was 1,300 J µg/L at MW16-5 during the Year 5 LTM sampling event, which is less than the SEDA background value for iron of 4,476 µg/L (**Appendix B**). In general, iron (total) concentrations have decreased below, or are

approaching, the NYS Class GA standard. All of the concentrations are below the SEDA background value (**Appendix B**).

Sodium is a persistent contaminant identified in SEAD-16 wells. It has been detected in every sample collected from the site and exceeded its NYS Class GA standard in 31 of the 49 samples (sodium was analyzed in 49 samples (total), but two of the results were rejected during the 2007 data validation). Sodium concentrations detected in the groundwater are currently higher than what was found prior to the RA. The concentrations are possibly affected by the known salt pile operation that is operated by the Seneca County Highway Department (located approximately 1,000 feet upgradient to the east-northeast of SEAD-16). The location of the Seneca County Highway Department salt piles are indicated on **Figure 5**.

The trend over time in the LTM data shows that there is no evidence of an area-wide or expanding plume at SEAD-16. Antimony is a COC at one well, MW16-7; at all other wells, it is below the SEDA site-wide average background concentration, and fluctuating close to or below the NYS Class GA standard. Using the USEPA's statistical program ProUCL, version 5.0.00 (USEPA 2015), a 95% UCL was calculated for the SEAD-16 LTM data set for antimony (**Appendix G**). The value, 5.9 µg/L, is above the NYS GA Standard, but below the SEDA background value for antimony (**Figure 6A**).

Lead is not considered a COC as all concentrations have been below the EPA MCL for the last five events. Iron is not considered a COC, as iron concentrations are common in the groundwater at Seneca, and the SEAD-16 iron groundwater concentrations are below SEDA site-wide background values. Sodium concentrations are not related to site activities and are likely a result of salt pile operations; sodium is not considered a COC.

3.1.6.2 LTM Groundwater Trends for SEAD-17

Since the completion of the RA at SEAD-17, a total of 35 unfiltered (total) groundwater samples were collected from the five wells located within SEAD-17 (**Appendix D**). During the seven years of LTM sampling, five metals have exceeded NYS Class GA or EPA MCL standards including antimony (total), iron (total), lead (total), manganese (total), and sodium (total) (**Appendix D**). Lead (total) and manganese (total) exceeded their applicable screening levels once and twice, respectively. Sodium (total) exceeded its screening criterion in three wells. Lead (total), manganese (total), and sodium (total) are not persistent COCs at SEAD-17 and are therefore not discussed below.

Exceedances of the 3 µg/L NYS Class GA standard for antimony (total) are limited to well MW17-2, as illustrated in **Figure 6A**. The maximum concentration (4.4 J µg/L) reported for antimony (total) was detected in Year 5 from MW17-2. The concentrations of antimony (total) show a declining trend through time with detected concentrations from the last two monitoring events approximately equal to, or below, the NYS GA standard. All of the antimony concentrations detected during LTM have been below the SEDA background value for antimony (8.2 µg/L) (**Appendix D**).

Lead (total) is not a persistent COC in any of the wells at SEAD-17, as shown in **Figure 6B**. Lead (total) exceeded the EPA MCL once during seven years of post-RA monitoring at MW17-2 during the third LTM sampling event. Since the last exceedance, lead (total) concentrations have remained below the EPA

MCL. The plot in **Figure 6B** illustrates that with the exception of the noted spike in concentration of lead in event 3, the concentrations are below the standards, and lead is not a COC.

Eight exceedances of the NYS Class GA standard for iron (total) were found in samples collected from four wells (MW17-1 with one exceedance, MW17-2 with two exceedances; MW17-3 with three exceedances; and MW17-4 with two exceedances) (**Appendix D**). The maximum concentration (25,500 J µg/L) of iron (total) was detected in well MW17-2 during the Year 3 LTM event. Except for the maximum detected concentration, all of the concentrations of iron have been below the SEDA background (4,476 µg/L).

Overall, post-RA LTM results indicate that groundwater quality at SEAD-17 is not impacted by historic operations conducted in this area. Many of the identified groundwater quality exceedances of sodium appeared either as random occurrences (e.g., sodium at MW17-5 in Year 3) or may be attributable to iron and manganese groundwater concentrations that are identified regionally in Seneca County and consistent with the Seneca groundwater background levels presented in **Appendix B**.

The SEAD-17 Year 7 data continues to support that the groundwater at SEAD-17 has not been impacted by metals released from the former Active Deactivation Furnace site. The most recent concentration of antimony (3.3 J µg/L), which exceeds the NYS Class GA standard, is an estimated concentration approximately equal to the GA standard and only detected in one well. The 95% UCL for the SEAD-17 LTM data set for antimony is 1.3 µg/L, which is below both the NYS GA Standard and the SEDA background value for antimony (**Appendix G**).

3.2 Routine Inspections of SEAD-16 and SEAD-17 Monitoring Wells

Observation of the wells at SEAD-16 and SEAD-17 during the Year 7 LTM event indicates that the wells located on the site are in acceptable condition. No obstructions were encountered in the wells at SEAD-16 and SEAD-17 during the Year 7 sampling event.

4.0 REMEDY EVALUATION

As discussed above in **Section 2.5**, approximately 4,427 cy of metal and PAH impacted soil were removed from SEAD-16 and SEAD-17 during the RA conducted in the summer of 2007. The impacted soil was removed to minimize or eliminate the migration of hazardous contaminants from soil to groundwater. Soil that exceeded the site-specific cleanup standards, as based on the confirmatory soil data, was removed from SEAD-16 and SEAD-17.

The long-term groundwater monitoring performed over seven years following the completion of the 2007 RA shows that the soil removal remedy has been effective in minimizing the migration of select metals from soil to groundwater. Pre-RA groundwater quality concerns associated with arsenic, barium, beryllium, chromium, copper, iron, lead, mercury, nickel and thallium have been eliminated, as each of these metals, with the exception of iron and lead, have not been detected in the groundwater at SEAD-16 in excess of the applicable NYS Class GA or EPA MCL standards since the RA was completed. Lead was found twice at levels in excess of the applicable EPA MCL, but these exceedances were confined to a single well (MW16-7) during the Year 1 and Year 2 post-RA LTM sampling events; lead exceedances in MW16-7 have not been detected during subsequent sampling events. While iron and manganese concentrations in excess of NYS Class GA groundwater quality standards are still present, these results appear to be partially affected by turbidity issues or are attributable to the regional groundwater quality, and are not attributable to site activities. Noted sodium exceedances found in the groundwater at SEAD16 appear to originate from the salt storage area located upgradient of SEAD-16 which is operated by the Seneca County Highway Department and are not attributable to site activities. Antimony continues to be detected at concentrations above the applicable NYS Class GA standard, but these exceedances appear to be predominantly limited to two wells (MW16-2 and MW16-7) where concentrations have remained generally consistent since the RA was completed.

The groundwater quality at SEAD-17 has improved since the completion of the RA. The few noted groundwater quality exceedances for metals other than iron and manganese appear to be limited to the initial Year 1 or Year 2 post-RA sampling events or to a sample where a turbidity impact is suspected (e.g., the sample collected from MW17-2 during the Year 3 LTM event) and where groundwater quality has improved since the exceedances were reported. Although the concentrations of iron were identified at concentrations above the applicable NYS Class GA standards and the results are greater than what has been observed historically at the site, there is not sufficient trend information to indicate that there a significant change in groundwater conditions. Iron exceedances reported for SEAD-17 are isolated and are most likely attributable to regional groundwater quality and are not attributable to site activities. Historically (Events 1, 3, 5, and 7) within SEAD-17, antimony has exceeded the NYS Class GA standard in one well (MW17-2) in both unfiltered and filtered samples. All of the exceedances have been less than 1.5 µg/L over the NYS Class GA standard and the last two exceedances, in Events 5 and 7, the concentrations were estimated. Although antimony has limited exceedances over the NYS Class GA standard, there is no trend in these data or evidence to suggest that these concentrations are different than background (**Appendix B**).

The remedy for SEAD-16 and SEAD-17 includes the implementation and maintenance of LUCs consisting of:

- Prevention of residential housing, elementary and secondary schools, childcare facilities and playground activities; and
- Prevention of access to or uses of the groundwater until concentrations are below the NYS Class GA Groundwater or EPA MCL standards.

As part of the LTM program, SEAD-16 and SEAD-17 were inspected to determine if the LUCs are being maintained. During the Year 7 event, it was confirmed that no residential housing, elementary and/or secondary schools, childcare facilities, or playgrounds have been constructed or established in these AOCs, and no access to or use of groundwater, beyond that which is gained by the existing monitoring well network, was evident at either SEAD-16 or SEAD-17. Access to and use of the groundwater is restricted at the AOC under the terms of the ROD and is not being used as a potable water source. A non-groundwater sourced municipal water supply is available for the Depot and includes the PID area. The groundwater access/use restriction will remain in effect at the PID and SEAD-16/17 until select metal concentrations in groundwater have been reduced to levels below applicable NYS Class GA and EPA MCL standards and until data demonstrating acceptable groundwater quality in the AOC is provided to and approved by the applicable regulatory agencies.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

- The soil excavation remedy at SEAD-16 and SEAD-17 was an effective method for controlling, and in some cases eliminating, the migration of select metals from soil to groundwater based on the evaluation of the results of the seven post-RA LTM sampling events.
- The historical results (Events 3-7) from the LTM data demonstrates that the concentrations of field filtered samples (dissolved) are similar to unfiltered (total) groundwater analytical data. The elevated concentrations of metals observed in earlier events were in some cases the result of elevated turbidity; however, turbidities have been below 10 NTU and total (unfiltered) results are representative of groundwater conditions.
- Post-remediation groundwater monitoring results indicate that there was a limited impact on the groundwater at SEAD-16/17. Iron, lead, and sodium were detected above groundwater standards in a limited number of wells; however, they currently are not considered COCs as they are below SEDA background levels and/or have not been detected above guidance values in the past several events.
- Antimony is a COC in one well, MW16-7; the concentrations at this well are not increasing. The 95% UCL values for the LTM dataset antimony results at SEAD-16 and SEAD-17 are below the background value for antimony at SEDA. Antimony is not a concern at the other wells at SEAD-16 or at SEAD-17.
- The land use and groundwater use restrictions imposed at SEAD-16 and SEAD-17 are maintained as part of both the approved RODs for SEAD 16/17 and the larger Planned Industrial/Office or Warehousing Area ("PID Area") (Parsons, 2004; 2006). There are no signs of unauthorized use or access to the AOCs.

5.2 Recommendations

Based on the current area-wide LUC prohibiting the use of groundwater within the PID Area (includes SEADs 16/17), the Army plans to conclude annual LTM at these sites because of the following:

- Groundwater use is prohibited by the area-wide LUC and an alternate potable water source is available;
- Periodic LUC inspections will continue to insure that the groundwater is not accessed;
- The 95% UCLs for antimony at SEAD-16 and SEAD-17 are below the regional/site background level for antimony;
- There is no ongoing treatment process at either site to continue monitoring for concentration reductions;
- Trends demonstrate that the remedial action performed did not adversely impact groundwater;
- The COCs concentrations are not increasing; and,

- Antimony is not migrating, as evidenced by absence of increasing antimony concentrations in other wells.

Upon acceptance of these recommendations, the wells will not be decommissioned at this time, but will be sampled during the 2021 5-year review. If the trends remain the same or conditions have improved, the wells will be decommissioned.

6.0 REFERENCES

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TABLES

Table 1
SEAD-16 - Groundwater Table Elevations Summary
Draft Annual Report - Year 6 for SEAD-16 and SEAD-17
Seneca Army Depot Activity

Pre-Remedial Action Groundwater Elevation Data

Monitoring Well	Top of PVC Elevation [1] (feet)	April 4, 1994		August 27, 1996		December 6, 1996	
		Depth to Water (feet)	Water Table Elevation (feet)	Depth to Water (feet)	Water Table Elevation (feet)	Depth to Water (feet)	Water Table Elevation (feet)
MW 16-1	735.54	3.52	732.02	6.45	729.09	3.25	732.29
MW 16-2	734.56	3.65	730.91	4.50	730.06	3.71	730.85
MW 16-3	735.48	4.60	730.88	5.43	730.05	4.64	730.84
MW 16-4	733.93	NA	NA	4.83	729.10	2.93	731.00
MW 16-5	733.40	NA	NA	4.76	728.64	2.20	731.20
MW 16-6	733.56	NA	NA	4.54	729.02	2.90	730.66
MW 16-7	734.42	NA	NA	5.06	729.36	4.23	730.19

Post-Remedial Action Groundwater Elevation Data

Monitoring Well	Top of PVC Elevation [1] (feet)	December 20, 2007		2008 Top of PVC Elevation [4, 5] (feet)	December 9, 2008		November 13, 2009		December 13, 2010	
		Depth to Water (feet)	Water Table Elevation (feet)		Depth to Water (feet)	Water Table Elevation [4,5] (feet)	Depth to Water (feet)	Water Table Elevation [5] (feet)	Depth to Water (feet)	Water Table Elevation [5] (feet)
MW 16-1	735.54	4.25	731.29	735.54	4.28	731.26	5.76	729.78	3.16	732.38
MW 16-2	734.56	4.20	730.36	733.48	4.20	729.28	4.35	729.13	4.08	729.40
MW 16-3	735.48	NA	NA	735.48	NA	NA	NA	NA	NA	NA
MW 16-4	733.93	3.00	730.93	733.93	3.42	730.51	3.91	730.02	2.78	731.15
MW 16-5	733.40	1.90	731.50	735.82	3.32	732.50	3.10	732.72	1.68	734.14
MW 16-6	733.56	2.66	730.90	733.56	3.47	730.09	3.68	729.88	2.53	731.03
MW 16-7	734.42	4.45	729.97	734.42	4.63	729.79	4.75	729.67	4.41	730.01

Monitoring Well	2012 Top of PVC Elevation [6] (feet)	December 10, 2012		December 9, 2013		December 15, 2014	
		Depth to Water (feet)	Water Table Elevation [6] (feet)	Depth to Water (feet)	Water Table Elevation [6] (feet)	Depth to Water (feet)	Water Table Elevation [6] (feet)
MW 16-1	735.53	3.15	732.38	2.94	732.59	2.96	732.57
MW 16-2	734.86	4.08	730.78	4.18	730.68	3.8	731.06
MW 16-3	NA	NA	NA	NA	NA	NA	NA
MW 16-4	734.51	2.71	731.80	2.64	731.87	2.66	731.85
MW 16-5	735.36	1.63	733.73	2.26	733.10	1.64	733.72
MW 16-6	734.25	2.37	731.88	2.65	731.60	2.33	731.92
MW 16-7	734.96	4.28	730.68	4.38	730.58	4.08	730.88

(1) Elevations are relative to the North American Vertical Datum (NAVD) 1988.
(2) April 4, 1994 data were collected as a part of the ESI and August 1996 and December 1996 were collected during the Remedial Investigation phase.
(3) Monitoring well MW16-3 was destroyed during the remedial action conducted at SEAD-16.
(4) PVC riser pipe for wells MW16-2 and MW16-5 was necessary to be cut during December 2008 sampling event due to the PVC preventing the metal casing lid from opening.
(5) MW16-2 and MW16-5 were re-surveyed in Dec 2008 and this data was used for water table elevation calculations for December 9, 2008 through December 13, 2010. MW16-2 Top of PVC elevation is 733.48 ft, and MW16-5 Top of PVC elevation is 735.82 ft.
(6) Wells were re-surveyed with GPS RTK equipment in November 2012. New ground surface and top of the PVC elevations were used for the December 2012 water table elevation calculation.
NA = Not Available.

Table 2
SEAD-17 - Groundwater Table Elevations Summary
Draft Annual Report - Year 6 for SEAD-16 and SEAD-17
Seneca Army Depot Activity

Pre-Remedial Action Groundwater Elevation Data

Monitoring Well	2008 Top of PVC Elevation	Top of PVC Elevation [1] (feet)	April 4, 1994		August 29, 1996		December 6, 1996	
			Depth to Water (feet)	Water Table Elevation (feet)	Depth to Water (feet)	Water Table Elevation (feet)	Depth to Water (feet)	Water Table Elevation (feet)
MW 17-1		736.30	2.80	733.50	7.64	728.66	3.01	733.29
MW 17-2		733.75	3.19	730.56	7.24	726.51	3.45	730.30
MW 17-3	732.625	732.15	2.38	729.77	7.14	725.01	2.47	729.68
MW 17-4		734.59	3.00	731.59	7.23	727.36	3.13	731.46
MW 17-5		733.58	NA	NA	6.92	726.66	2.65	730.93

Post Remedial Action Groundwater Elevation Data

Monitoring Well	Top of PVC Elevation [1] (feet)	December 19, 2007		2008 Top of PVC Elevation	December 9, 2008		November 11, 2009		December 13, 2010	
		Depth to Water (feet)	Water Table Elevation (feet)		Depth to Water (feet)	Water Table Elevation [3,4] (feet)	Depth to Water (feet)	Water Table Elevation [4] (feet)	Depth to Water (feet)	Water Table Elevation [4] (feet)
MW 17-1	736.30	3.33	732.97	736.30	4.25	732.05	5.60	730.70	3.32	732.98
MW 17-2	733.75	3.31	730.44	733.75	4.07	729.68	5.27	728.48	2.2	731.55
MW 17-3	732.15	2.67	729.48	732.625	3.96	728.67	6.15	726.48	2.51	730.12
MW 17-4	734.59	3.40	731.19	734.59	4.05	730.54	5.75	728.84	3.4	731.19
MW 17-5	733.58	2.90	730.68	733.58	3.46	730.12	4.65	728.93	2.79	730.79

Monitoring Well	2012 Top of PVC Elevation [5] (feet)	December 10, 2012		December 9, 2013		December 15, 2014	
		Depth to Water (feet)	Water Table Elevation [5] (feet)	Depth to Water (feet)	Water Table Elevation [5] (feet)	Depth to Water (feet)	Water Table Elevation [5] (feet)
MW 17-1	736.39	3.19	733.20	3.52	732.87	3.26	733.13
MW 17-2	733.65	2.79	730.86	3.15	730.50	2.77	730.88
MW 17-3	732.05	2.4	729.65	2.73	729.32	2.38	729.67
MW 17-4	734.62	3.18	731.44	3.2	731.42	3.22	731.40
MW 17-5	734.12	2.64	731.48	2.79	731.33	2.64	731.48

Notes:
(1) Elevations are relative to the North American Vertical Datum (NAVD) 1988.
(2) April 4, 1994 data were collected as a part of the ESI and August 1996 and December 1996 were collected during the Remedial Investigation Phase.
(3) PVC riser pipe for MW17-3 was necessary to be cut during December 2008 sampling event due to the PVC preventing the metal casing lid from opening.
(4) MW17-3 was re-surveyed in December 2008 and this data was used for water table elevation calculations for December 9, 2008 through December 13, 2010. MW17-3 Top of PVC elevation is 732.63 ft.
(5) Wells were re-surveyed with GPS RTK equipment in November 2012. New ground surface and top of the PVC elevations were used for December 2012 water table elevation calculation.
NA = Not Available.

Table 3A
SEAD-16 - Detected Compounds
Filtered and Unfiltered Groundwater Analyses
Draft Annual Report - Year 7 for SEAD-16 and SEAD-17
Seneca Army Depot Activity

Area			SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16
Loc ID			MW16-1	MW16-1	MW16-2	MW16-2	MW16-4	MW16-4	MW16-5	MW16-5
Matrix			GW	GW	GW	GW	GW	GW	GW	GW
Sample ID			16LM20042F	16LM20042U	16LM20043F	16LM20043U	16LM20044F	16LM20044U	16LM20045F	16LM20045U
Sample Date			12/21/2014	12/21/2014	12/21/2014	12/21/2014	12/21/2014	12/21/2014	12/20/2014	12/20/2014
QC Type			SA	SA	SA	SA	SA	SA	SA	SA
Study ID			LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM
Sample Round			7	7	7	7	7	7	7	7
Filtered			Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved	Total
Parameter	**Unit**	**Criteria Level**	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual
Aluminum	UG/L		23 U	50 U	23 U	50 U	23 U	50 U	23 U	53 J
Antimony	UG/L	3	2.3 U	2 U	**4.8 J**	**4.8 J**	**3.3 J**	**3.2 J**	2.3 U	2 U
Arsenic	UG/L	10	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.8 J	1.3 J
Barium	UG/L	1,000	99	94	72	68	170	160	49 J	40 J
Cadmium	UG/L	5	0.095 U	0.13 U	0.095 U	0.13 U	0.11 J	0.13 U	0.095 U	0.13 U
Calcium	UG/L		160,000	150,000	110,000	100,000	220,000	210,000	110,000	92,000
Cobalt	UG/L		0.15 U	0.12 U	0.15 U	0.12 U	1.1	1.1	0.15 U	0.12 U
Copper	UG/L	200	1.3 J	1.9 J	3.3 J	4.2 J	4.3 J	5.8	1.1 U	3.1 J
Iron	UG/L	300	33 U	79 J	33 J	44 U	170	290	**360 J**	280 J
Iron and Manganese	UG/L	500	11	91 J	33 J	2 UJ	370 J	490 J	**520 J**	410 J
Lead	UG/L	15	0.2 U	0.5 U	0.2 U	0.87 J	0.27 J	1.5	0.2 U	0.5 U
Magnesium	UG/L		25,000	24,000	12,000	11,000	33,000	32,000	11,000	9,000
Manganese	UG/L	300	11 J	12 J	1 UJ	2 UJ	200 J	200 J	160 J	130 J
Nickel	UG/L	100	2 J	2 U	2.2 J	2.3 J	4 J	3.5 J	2.1 J	2.3 J
Potassium	UG/L		950	890 J	1,500	1,400	2,000	1,900	3,500 J	2,800 J
Sodium	UG/L	20,000	**63,000**	**63,000**	11,000	9,900	**300,000**	**300,000**	1,900	1,600
Zinc	UG/L		8.3 U	8.4 U	13 J	12 J	14 J	12 J	8.3 U	8.4 U

1. The criteria values (where available) are NYS Class GA Groundwater Standards (TOGS 1.1.1, June 1998) and EPA Maximum Contamination Limit (MCL), Source http://www.epa.gov/safewater/mcl.html#inorganic.html
2. Shading indicates a concentration above the GA or MCL groundwater standard.
3. Dissolved samples were field filtered using a 0.45 micron filter.
4. A blank in the Criteria Level column indicates no standard established for that compound.

U = compound was not detected
J = the reported value is an estimated cocentration
SA = Sample
DU = Duplicate Sample

Table 3A
SEAD-16 - Detected Compounds
Filtered and Unfiltered Groundwater Analyses
Draft Annual Report - Year 7 for SEAD-16 and SEAD-17
Seneca Army Depot Activity

Area			SEAD-16		SEAD-16		SEAD-16		SEAD-16	
Loc ID			MW16-6		MW16-6		MW16-7		MW16-7	
Matrix			GW		GW		GW		GW	
Sample ID			16LM20046F		16LM20046U		16LM20047F		16LM20048F	
Sample Date			12/21/2014		12/21/2014		12/20/2014		12/20/2014	
QC Type			SA		SA		SA		DU	
Study ID			LTM		LTM		LTM		LTM	
Sample Round			7		7		7		7	
Filtered			Dissolved		Total		Dissolved		Total	
Parameter	**Unit**	**Criteria Level**	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Aluminum	UG/L		23	U	140		29	J	50	U
Antimony	UG/L	3	2.3	U	2	U	**16**		**15**	
Arsenic	UG/L	10	1.3	U	1.3	U	1.3	U	1.3	U
Barium	UG/L	1,000	58		58		110		95	
Cadmium	UG/L	5	0.095	U	0.13	U	0.095	U	0.13	U
Calcium	UG/L		83,000		83,000		110,000		100,000	
Cobalt	UG/L		0.15	U	0.12	U	0.25	J	0.12	U
Copper	UG/L	200	2.3	J	2.8	J	3.2	J	3.6	J
Iron	UG/L	300	57	J	140		52	J	44	U
Iron and Manganese	UG/L	500	59	J	148	J	28	J	23	J
Lead	UG/L	15	0.2	U	0.5	U	1.8		4.2	
Magnesium	UG/L		8,300		8,500		23,000		22,000	
Manganese	UG/L	300	1.8	J	8.4	J	28	J	23	J
Nickel	UG/L	100	2.2	J	2	U	3.2	J	2.4	J
Potassium	UG/L		2,100		2,000		3,700	J	3,500	J
Sodium	UG/L	20,000	8,500		8,300		**30,000**		**29,000**	
Zinc	UG/L		8.3	U	8.4	U	8.3	U	8.4	U

Area			SEAD-16		SEAD-16	
Loc ID			MW16-7		MW16-7	
Matrix			GW		GW	
Sample ID			16LM20048F		16LM20048U	
Sample Date			12/20/2014		12/20/2014	
QC Type			DU		DU	
Study ID			LTM		LTM	
Sample Round			7		7	
Filtered			Dissolved		Total	
Parameter	**Unit**	**Criteria Level**	Value	Qual	Value	Qual
Aluminum	UG/L		23	U	50	U
Antimony	UG/L	3	**15**		**14**	
Arsenic	UG/L	10	1.3	U	1.3	U
Barium	UG/L	1,000	110		100	
Cadmium	UG/L	5	0.095	U	0.13	U
Calcium	UG/L		110,000		110,000	
Cobalt	UG/L		0.15	U	0.12	U
Copper	UG/L	200	3.3	J	3.8	J
Iron	UG/L	300	33	U	44	U
Iron and Manganese	UG/L	500	38	J	33	J
Lead	UG/L	15	1.8		4.1	
Magnesium	UG/L		23,000		21,000	
Manganese	UG/L	300	38	J	33	J
Nickel	UG/L	100	2	J	2	U
Potassium	UG/L		4,600	J	3,900	J
Sodium	UG/L	20,000	**36,000**		**33,000**	
Zinc	UG/L		8.7	J	8.4	U

1. The criteria values (where available) are NYS Class GA Groundwater Standards (TOGS 1.1.1, June 1998) and EPA Maximum Contamination Limit (MCL), Source http://www.epa.gov/safewater/mcl.html#inorganic.html
2. Shading indicates a concentration above the GA or MCL groundwater standard.
3. Dissolved samples were field filtered using a 0.45 micron filter.
4. A blank in the Criteria Level column indicates no standard established for that compound.

U = compound was not detected
J = the reported value is an estimated cocentration
SA = Sample
DU = Duplicate Sample

Table 3B
SEAD-17 - Detected Compounds
Filtered and Unfiltered Groundwater Analyses
Draft Annual Report - Year 7 for SEAD-16 and SEAD-17
Seneca Army Depot Activity

Area			SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Loc ID			MW17-1		MW17-1		MW17-2		MW17-2		MW17-3		MW17-3	
Matrix			GW		GW		GW		GW		GW		GW	
Sample ID			17LM20030F		17LM20030U		17LM20031F		17LM20031U		17LM20032F		17LM20032U	
Sample Date			12/20/2014		12/20/2014		12/20/2014		12/20/2014		12/20/2014		12/20/2014	
QC Type			SA		SA		SA		SA		SA		SA	
Study ID			LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round			7		7		7		7		7		7	
Filtered			Dissolved		Total		Dissolved		Total		Dissolved		Total	
Parameter	Unit	Criteria Level	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics														
Aluminum	UG/L		23	U	50	U	23	U	50	U	23	U	180	
Antimony	UG/L	3	2.3	U	2	U	3.2	J	3.3	J	2.3	U	2	U
Barium	UG/L	1,000	44		41		63		57		41		38	
Cadmium	UG/L	5	0.095	U	0.13	U	0.12	J	0.14	J	0.095	U	0.13	U
Calcium	UG/L		81,000		77,000		130,000		120,000		73,000		69,000	
Cobalt	UG/L		0.19	J	0.16	J	0.15	U	0.13	J	0.15	U	0.12	J
Copper	UG/L	200	3.5	J	3.6	J	6.4		6.3		13		15	
Iron	UG/L	300	190		79	J	33	U	46	J	33	U	160	
Iron and Manganese	UG/L	500	200		88	J	2	J	50	J	2.6	J	162	J
Lead	UG/L	15	0.23	J	0.5	U	0.2	U	0.5	U	0.2	U	1.1	J
Magnesium	UG/L		14,000		13,000		13,000		11,000		5,800		5,600	
Manganese	UG/L	300	9.6		8.7		2	J	4.1	J	5.1		6.1	
Nickel	UG/L	100	2.5	J	2	U	2	U	2.2	J	2.6	J	2	J
Potassium	UG/L		280	J	330	U	1,600		1,600		1,400		1,500	
Sodium	UG/L	20,000	3,700		3,500		8,800		7,800		1,900		1,900	
Zinc	UG/L		12	J	9	J	28		40		42		44	

1. The criteria values (where available) are NYS Class GA Groundwater Standards (TOGS 1.1.1, June 1998) and EPA Maximum Contamination Limit (MCL), Source http://www.epa.gov/safewater/mcl.html#inorganic.html
2. Shading indicates a concentration above the GA or MCL groundwater standard.
3. Dissolved samples were field filtered using a 0.45 micron filter.
4. A blank in the Criteria Level column indicates no standard established for that compound.

U = compound was not detected
J = the reported value is an estimated cocentration
J+ = result is an estimated quantity, biased high
SA = Sample
DU = Duplicate Sample

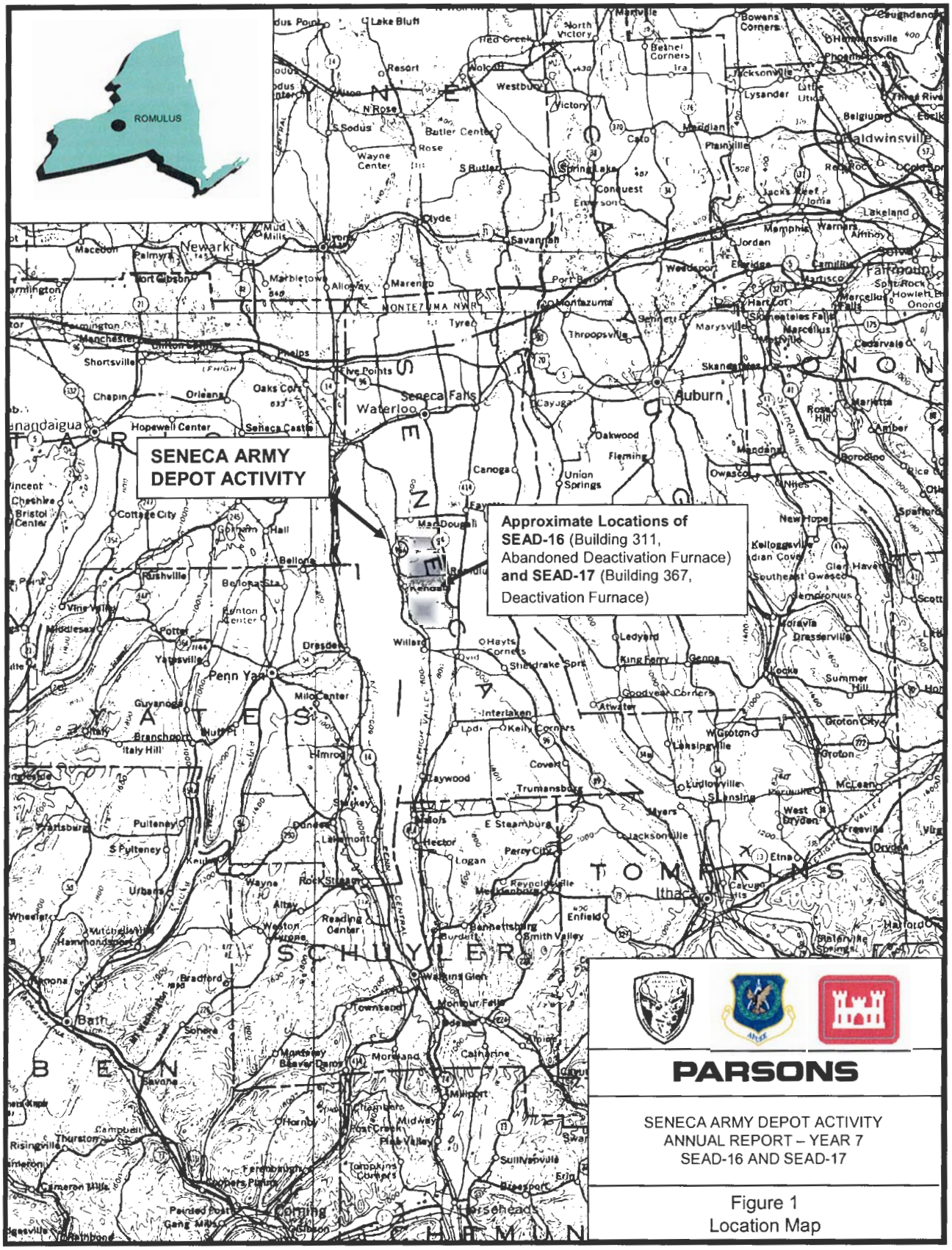
Table 3B
SEAD-17 - Detected Compounds
Filtered and Unfiltered Groundwater Analyses
Draft Annual Report - Year 7 for SEAD-16 and SEAD-17
Seneca Army Depot Activity

Area			SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Loc ID			MW17-4		MW17-4		MW17-5		MW17-5	
Matrix			GW		GW		GW		GW	
Sample ID			17LM20033F		17LM20033U		17LM20034F		17LM20034U	
Sample Date			12/20/2014		12/20/2014		12/20/2014		12/20/2014	
QC Type			SA		SA		SA		SA	
Study ID			LTM		LTM		LTM		LTM	
Sample Round			7		7		7		7	
Filtered			Dissolved		Total		Dissolved		Total	
Parameter	Unit	Criteria Level	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics										
Aluminum	UG/L		23	U	50	U	23	U	50	U
Antimony	UG/L	3	2.3	U	2	U	2.3	U	2	U
Barium	UG/L	1,000	27		27		83		92	
Cadmium	UG/L	5	0.095	U	0.13	U	0.095	U	0.13	U
Calcium	UG/L		80,000		75,000		91,000		100,000	
Cobalt	UG/L		0.31	J	0.24	J	0.15	U	0.12	U
Copper	UG/L	200	2.3	J	2.8	J	1.5	J B	2.6	J
Iron	UG/L	300	120		130		33	U	55	J
Iron and Manganese	UG/L	500	260		250		33	U	55	J
Lead	UG/L	15	0.2	U	0.5	U	0.2	U	0.5	U
Magnesium	UG/L		12,000		11,000		14,000		15,000	
Manganese	UG/L	300	140		120		1	U	2	U
Nickel	UG/L	100	3	J	2	J	2.8	J	2	U
Potassium	UG/L		480	J	420	J	810		860	J
Sodium	UG/L	20,000	7,700		7,300		4,900		4,900	
Zinc	UG/L		8.3	U	8.4	U	8.3	U	8.4	U

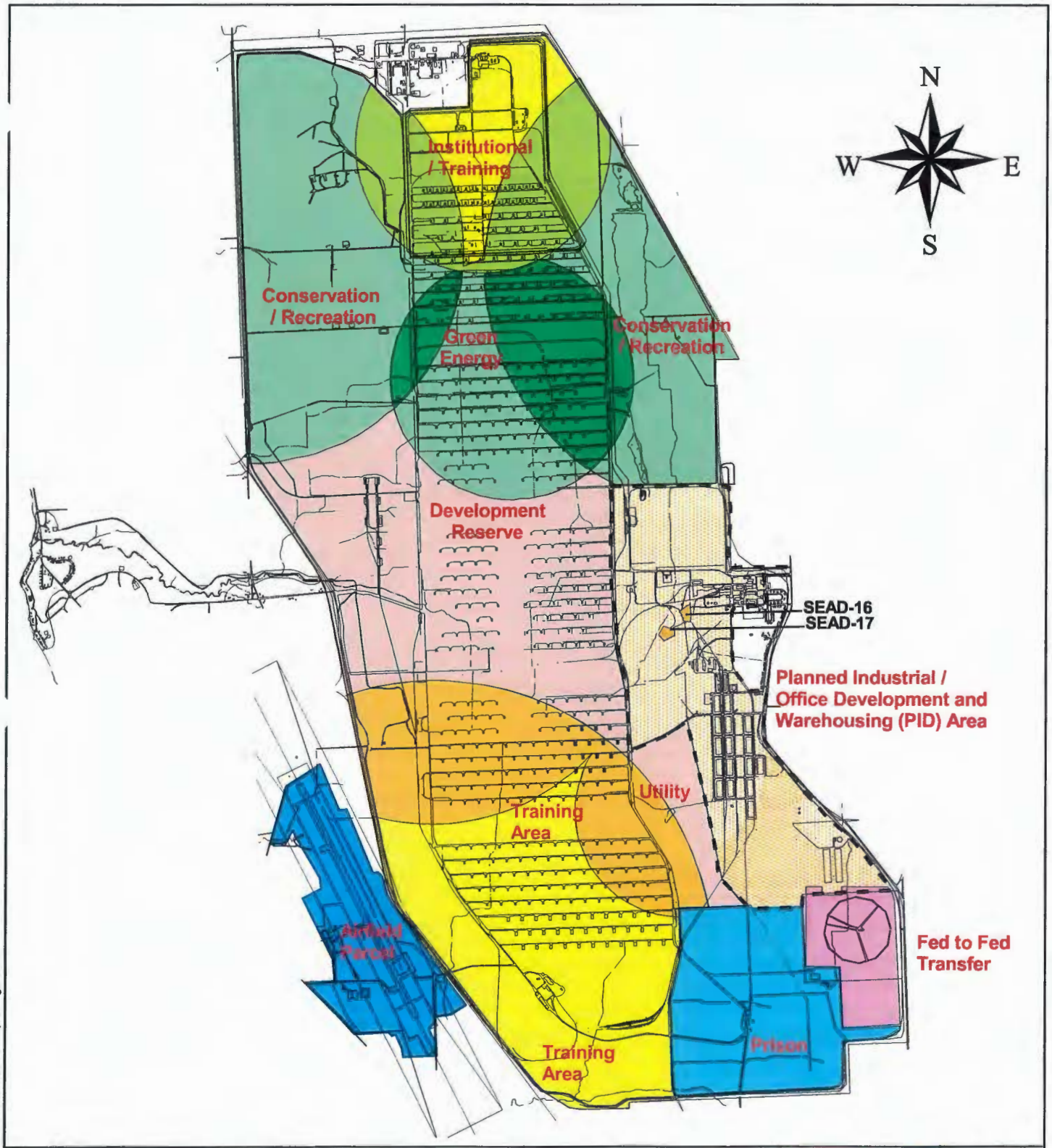
1. The criteria values (where available) are NYS Class GA Groundwater Standards (TOGS 1.1.1, June 1998) and EPA Maximum Contamination Limit (MCL), Source http://www.epa.gov/safewater/mcl.html#inorganic.html
2. Shading indicates a concentration above the GA or MCL groundwater standard.
3. Dissolved samples were field filtered using a 0.45 micron filter.
4. A blank in the Criteria Level column indicates no standard established for that compound.

U = compound was not detected
J = the reported value is an estimated cocentration
J+ = result is an estimated quantity, biased high
SA = Sample
DU = Duplicate Sample

FIGURES



P:\PIT\Projects\Huntsville Cont W912DY-08-D-0003\TO#15 - LTM and LUC\SEAD 16 and 17 LTM\Annual Report - Yr 7 Dec 2014\Draft\Figures\Figure 1 Loc Map.ppt



1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 11000 Feet

Area Covered by PID-wide Land Use Restrictions

- Prohibit the development and use of property for residential housing, elementary and secondary schools, childcare facilities and playgrounds.
- Prevent access to or use of the groundwater until the NYS Class GA Groundwater Standards are met.

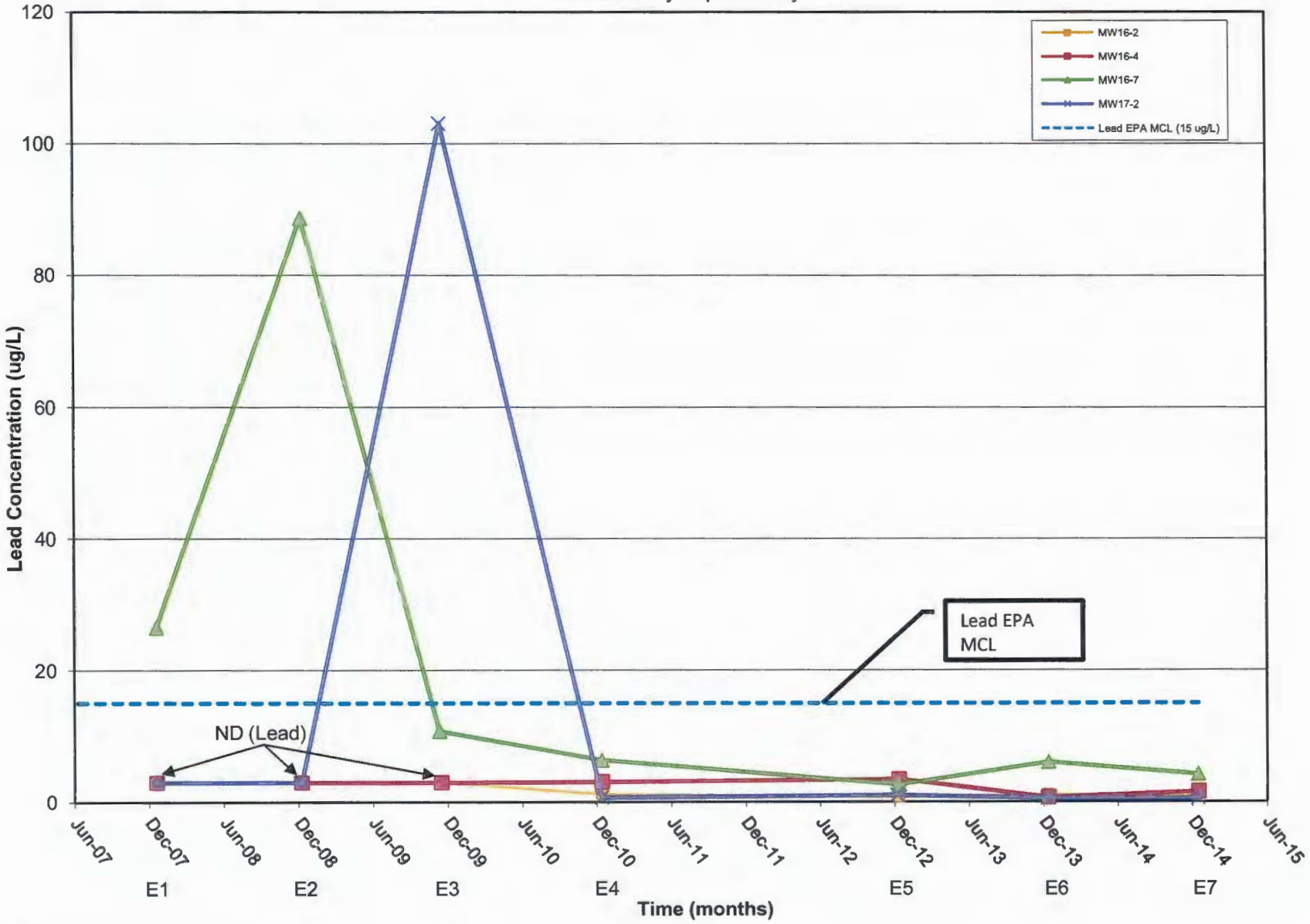
PARSONS

SENECA ARMY DEPOT ACTIVITY
ANNUAL REPORT - YEAR 7
FOR SEAD-16 AND SEAD-17

FIGURE 2
Location of SEAD-16 and SEAD-17
at Seneca Army Depot Activity

c:\seneca\pic\sead-16&17 annual report.apr\sead-16&17 Annual Report Figure 2

Figure 6B
Concentration of Lead Over Time at MW16-2, MW16-4, MW16-7 and MW17-2
SEAD 16/17 Annual Report, Year 7
Seneca Army Depot Activity



Note:
ND = not detected (MDL plotted).

APPENDICES

APPENDIX A

PRE-REMEDIAL ACTION MONITORING DATA

APPENDIX C

FIELD FORMS - YEAR 7 LTM GROUNDWATER SAMPLING ACTIVITIES

GROUNDWATER ELEVATION REPORT

PARSONS	CLIENT: PARSONS	DATE: 12/15/14
PROJECT: SEAD 16/17		PROJECT NO:
LOCATION: SENECA ARMY DEPOT, ROMULUS NY		INSPECTOR: T. BRANGER + S. DILLMAN

MONITORING EQUIPMENT:

INSTRUMENT	DETECTOR	BGD	TIME	REMARKS

WATER LEVEL INDICATOR:

INSTRUMENT	CORRECTION FACTOR
HELON DIPPER-T	
AD1584	

COMMENTS: OVERCAST, MID 30's 2-7" SNOW MELTED

WELL	TIME	DEPTH TO WATER	DEPTH TO ~~BOTTOM~~ PRODUCT	CORRECTED WATER LEVEL	MEASURED POW	INSTALLED POW	PRODUCT SPEC. GRAV.	WELL STATUS / COMMENTS (Lock?, Well #?, Surface Disturbance?, Riser marked?, Condition of: riser, concrete, protective casing, etc.)
16-1	1455	2.96	7.99					OK. LOCKED
16-2	1440	3.80	5.86					PVC CUTTED HARD TO OPEN CASING, LOCKED
16-4	1453	2.66	7.05					B LOCKED, OK
16-5	1443	1.64	5.07					LOCKED. WELL CAP BROKEN
16-6	1450	2.33	6.97					LOCKED OK
16-7	1447	4.08	6.78					LOCKED. STIFF.
17-1	1510	3.26	10.20					PVC TOO LONG, HARD TO OPEN CASING
17-2	1524	2.77	7.90					LOCKED. OK
17-3	1519	2.38	7.47					OK. LOCKED.
17-4	1516	3.22	8.41					LOCKED. PVC HEAVED. TOO LOW. HARD TO OPEN CASING.
17-5	1513	2.64	10.13					LOCKED. OK

(ALL DEPTH MEASUREMENTS FROM MARKED LOCATION ON RISER)

7.9

3.26 10.20

S-1617 GW SAMPLING RECORD

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW 16-1
PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 7		DATE: 12/2/14
LOCATION: ROMULUS, NY		INSPECTORS: Dillman
		PUMP #: 22893
		SAMPLE ID #: 16LM20042

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	(FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	DETECTOR

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.654	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)]

HISTORIC DATA	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND
	8.80 Steel					

DATA COLLECTED AT WELL SITE	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC) Steel	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
		4.27			

RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cps)		PUMP AFTER SAMPLING (cps)	

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
8:44	4.27	Start pump		YSI-85 6122 →		Horiba-U52	23066 →		Hach
8:52	4.40	170		0.09	7.5	1.01	6.22	82	
8:57	4.38	110		0.07	7.6	1.02	7.92	82	
9:02	4.38	110		0.07	7.6	1.04	7.82	83	
9:07	4.40	126		0.09	7.5	1.04	7.77	62	19.8
9:12	4.39	125		0.09	7.5	1.05	7.75	65	15.2
9:17	4.40	125	1 gal	0.10	7.5	1.05	7.73	72	9.86
9:22	4.40	125		0.08	7.5	1.05	7.71	84	7.64
9:27	4.40	125		0.07	7.5	1.06	7.72	78	7.01
9.32	4.40	125		0.06	7.5	1.07	7.70	81	6.09
9.37	4.40	125		0.06	7.5	1.07	7.70	81	5.15
9.42	4.40	125	2 gal	0.06	7.5	1.07	7.69	83	4.63
9.47	4.40	125		0.06	7.5	1.07	7.70	83	3.71
9.52	4.40	125		0.06	7.5	1.07	7.69	85	3.25
9.57	4.40	125		0.06	7.5	1.07	7.70	86	2.82
10.02	4.40	125	2.75 gals	0.06	7.5	1.07	7.69	86	1.85
10:10	Collect Sample for Total & Dissolved Metals								
1010		16LM	20042U	TOTAL					
1015		16LM	20042F	DISS					

S-1617 GW SAMPLING RECORD

SAMPLING ORDER			PRESERVATIVES		BOTTLES COUNT	BOTTLES VOLUME	BOTTLES TYPE	SAMPLE NUMBER	TIME	CHECKED BY/ DATE
1	Metals 6020 & Hg 7470		4 deg. C	HNO2	1	x 250 mL	HDPE			
2	Metals 6020 & Hg 7470	filtered	4 deg. C	HNO2	1	x 250 mL	HDPE			
7										

COMMENTS: (QA/QC?)

HORIBA 23066
YSI 65 6122
HACH TURB 12358

IDW INFORMATION:

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW16-2

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 7
LOCATION: ROMULUS, NY

DATE: 12/21/14
INSPECTORS: T. BELANGER
PUMP #: PERI
SAMPLE ID #: 16LM20043U/F

WEATHER/ FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	WIND (FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	MONITORING DETECTOR
1100	28	P.C.	Low	—	—	FROZEN		
						PLACE SNOW		

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.654	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)]

HISTORIC DATA	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND
	5.86					

DATA COLLECTED AT WELL SITE	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
		4.32			1100

RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cps)		PUMP AFTER SAMPLING (cps)	

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
1.7 1100	4.32	150		YSI 85	YSI	H 0	RI	BA	HACH
1120	4.34	150		6.59	4.3	0.293	7.58	132	—
1130	4.34	130		7.74	4.3	0.347	7.53	~~31~~ 133	20.9
1140	4.37	120	~1.0	6.08	4.3	0.404	7.48	134	17.8
1150	4.36	115		6.48	4.2	0.469	7.46	137	6.27
1200	4.36	120		5.79	4.2	0.516	7.44	139	4.14
1205	4.36	115		5.53	4.2	0.534	7.42	139	2.82
1210	4.37	170	~2.0	5.76	4.3	0.546	7.43	139	1.51
1215	4.37	170		4.84	4.3	0.542	7.44	139	1.72
1220	4.36	155		4.43	4.3	0.545	7.43	141	1.51
1225	4.36	150	~2.5	4.41	4.3	0.550	7.46	140	0.74
1230	4.36	135		4.38	4.3	0.549	7.43	141	0.72
1235	4.36	135		4.42	4.3	0.551	7.43	141	0.62
1240	4.35	135	~3.0	4.43	4.3	0.552	7.43	140	0.59
1245	4.35	135	~3.25	4.41	4.3	0.551	7.43	140	0.55
1250			* 16LM20043U	TOTAL	metals				
1255			16LM20043F	DISS	met.				
		*	CANNOT CLOSE WELL COVER						

S-1617 GW SAMPLING RECORD

SAMPLING ORDER			PRESERVATIVES		BOTTLES		SAMPLE NUMBER	TIME	CHECKED BY/ DATE
					COUNT/ VOLUME	TYPE			
1	Metals 6020 & Hg 7470		4 deg. C	HNO2	1 x 250 mL	HDPE			
2	Metals 6020 & Hg 7470	filtered	4 deg. C	HNO2	1 x 250 mL	HDPE			
7									

COMMENTS: (QA/QC?)

HORIBA 19276/21395
YSI #5 003217
HACH TURB 15613

IDW INFORMATION:

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW 16-4

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 7
LOCATION: ROMULUS, NY

DATE: 12/21/14
INSPECTORS: D. Hamm
PUMP #: 22893
SAMPLE ID #: 16LM 20044

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	WIND (FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	MONITORING DETECTOR

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.654	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)]

HISTORIC DATA	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND
	7.08					

DATA COLLECTED AT WELL SITE	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
		2.82			

RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cps)		PUMP AFTER SAMPLING (cps)	

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
1105	2.83	Start + Pump		45E-85 61 22		Horiba U52 02	3066 →		Hach 0 12358
1110	2.93	130		0.09	7.0	1.98	7.65	34	14.58
1115	2.93	110		0.07	7.0	1.94	7.72	16	
1120	2.93	110		0.06	6.8	2.06	7.74	-17	8.31
1125	2.93	110		0.06	6.8	2.10	7.72	-17	6.43
1130	2.93	110		0.05	6.7	2.15	7.72	-22	4.45
1135	2.93	120		0.04	6.7	2.17	7.72	-22	3.31
1140	2.95	125	1 gal	0.04	6.6	2.23	7.72	-23	2.74
1145	2.95	125		0.04	6.6	2.31	7.73	-15	2.27
1150	2.94	125		0.04	6.6	2.34	7.73	-20	2.09
1155	2.95	128		0.04	6.6	2.35	7.73	-20	1.89
1200	2.95	130	2 gal	0.04	6.6	2.40	7.72	-18	1.49
1205	2.95	130		0.04	6.6	2.43	7.73	-19	1.48
1210	2.94	130		0.04	6.6	2.46	7.74	-19	1.45
1215	2.94	140	2.4 gal	0.04	6.6	2.47	7.75	-19	1.12
1220	2.94	125		0.04	6.6	2.45	7.77	-12	0.89
1225	2.94	125		0.04	6.6	2.44	7.77	-13	1.68
1230	2.94	125		0.04	6.7	2.44	7.77	-10	0.93
1235	2.94	125		0.04	6.7	2.44	7.77	-9	0.95
1240	2.94	125		0.04	6.6	2.46	7.77	-7	0.99
1245	2.94	125	3.2 gal	0.04	6.6	2.46	7.77	-6	1.02

S-1617 GW SAMPLING RECORD

SAMPLING ORDER			PRESERVATIVES		BOTTLES		SAMPLE NUMBER	TIME	CHECKED BY/ DATE
					COUNT VOLUME	TYPE			
1	Metals 6020 & Hg 7470		4 deg. C	HNO2	1 x 250 mL	HDPE			
2	Metals 6020 & Hg 7470	filtered	4 deg. C	HNO2	1 x 250 mL	HDPE			
7									

COMMENTS: (QA/QC?)

HORIBA 23066
YSI 85 G122
HACH TURB 12358

IDW INFORMATION:

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW 16-4

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 7
LOCATION: ROMULUS, NY

DATE: 12/21/14
INSPECTORS: Dillman
PUMP #: 22813
SAMPLE ID #: 16LM 20044

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	WIND (FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	MONITORING DETECTOR

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.654	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)]

HISTORIC DATA	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND
	7.08					

DATA COLLECTED AT WELL SITE	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
		2.82			

RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cps)		PUMP AFTER SAMPLING (cps)	

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
1250	2.94	125		0.03	6.6	2.45	7.77	-1	1.20
1255	2.94	125		0.03	6.6	2.43	7.77	-3	1.00
1300	2.94	125	3.6	0.03	6.6	2.43	7.77	-3	0.96
Collect sample 1305 for total & dissolved metals									
			16LM20044U at 1305						
			16LM20044F at 1310						

S-1617 GW SAMPLING RECORD

SAMPLING ORDER			PRESERVATIVES		BOTTLES		SAMPLE NUMBER	TIME	CHECKED BY/ DATE
					COUNT/ VOLUME	TYPE			
1	Metals 6020 & Hg 7470		4 deg. C	HNO2	1 x 250 mL	HDPE			
2	Metals 6020 & Hg 7470	filtered	4 deg. C	HNO2	1 x 250 mL	HDPE			
7									

COMMENTS: (QA/QC?)

IDW INFORMATION:

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW16-5

PROJECT:	SEAD-16/17 LTM Groundwater Sampling - Round 7	DATE: 12/20/14
LOCATION:	ROMULUS, NY	INSPECTORS: D. Illman
		PUMP #: 22893
		SAMPLE ID #: 16LM20045 U/F

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	WIND (FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	MONITORING DETECTOR

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.654	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)]

5.05-2.64 = 2.41 x .16 = 0.39 x 3 = 1.16

HISTORIC DATA	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND
	5.05					

DATA COLLECTED AT WELL SITE	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
		2.64			

RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cps)		PUMP AFTER SAMPLING (cps)	

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
2:53	2.59			YSI-85 6122		Horiba-U52	23066	———	HACH 12358
2:55	start pump								
3:08	3.38	118		3.96	3.2	0.411	7.94	-63	
3:12	3.42	102		3.81	3.3	0.396	8.02	-69	3.20
317	3.48	104		3.32	3.4	0.386	7.97	-80	2.63
325	3.54	104		2.47	3.5	0.382	7.94	-97	1.31
330	3.67	104	1 gal	2.24	3.6	0.383	7.94	-103	1.03
335	3.78	106		1.60	3.7	0.387	7.91	-113	0.91
340	3.88	106		2.01	3.8	0.394	7.93	-121	0.77
345	3.95	100		1.71 ~~2.22~~	3.9	0.409	7.89	-130	0.79
350	4.03	100		1.36	4.0	0.419	7.88	-136	0.79
355	4.09	100		1.20 ~~1.44~~	4.1	0.426	7.86	-142	0.81
400	4.20	100		1.32	4.1	0.438	7.85	-151	1.47
405	4.28	100	2 gal	1.37	4.3	0.447	7.83	-160	1.19
415	4.28	100		1.27	4.4	0.473	7.92	-172	
420	4.43	100		1.27	4.5	0.462	7.82	-177	1.66
425	4.52	100		1.18	4.7	0.465	7.82	-183	1.08
430	4.58	100		1.09	4.6	0.467	7.81	-186	1.04
435			2.5 gal	1.07	4.6	0.468	7.81	-188	0.75
1640	Sample		for metals	- total	16LM20045U			1640	
				- dissolved	16LM20045F			1645	

Pause pump - Restart

S-1617 GW SAMPLING RECORD

SAMPLING ORDER			PRESERVATIVES		BOTTLES		SAMPLE NUMBER	TIME	CHECKED BY/ DATE
					COUNT/ VOLUME	TYPE			
1	Metals 6020 & Hg 7470		4 deg. C	HNO2	1 x 250 mL	HDPE			
2	Metals 6020 & Hg 7470	filtered	4 deg. C	HNO2	1 x 250 mL	HDPE			
7									

COMMENTS: (QA/QC?)

HO2.3A 23066

VSI 85 6122

HACH TURB 12350

IDW INFORMATION:

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW16-6

PROJECT:	SEAD-16/17 LTM Groundwater Sampling - Round 7	DATE: 12/21/14
LOCATION:	ROMULUS, NY	INSPECTORS: T BELANGER
		PUMP #: PERI
		SAMPLE ID #: 16LM20046 U/F

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	WIND (FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	MONITORING DETECTOR
0820	28	MOSTLY CLOUDY	100	–	–	DRY, FROZEN NO SNOW		

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.654	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)]

(6.87-2.54) x .163 x 3 = 2.11 gal

HISTORIC DATA	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND
	6.87					

DATA COLLECTED AT WELL SITE	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
		2.54			0830

RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cps)		PUMP AFTER SAMPLING (cps)	

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
0830	2.54	–	–	YSI	YSI	H0	RI	BA	HACH
0850	3.84	150		4.05	5.4	0.430	7.76	227	13.5
0900	4.41	120		3.64	5.2	0.416	7.51	223	8.93
0905	4.53	115		3.61	5.3	0.417	7.58	215	5.36
0910	4.62	110	1.0	3.56	5.3	0.417	7.52	214	4.10
0920	5.00	150		3.87	5.5	0.421	7.52	205	3.82
0925	5.08	130		3.67	5.6	0.423	7.54	202	2.73
0930	5.15	120		3.40	5.6	0.426	7.52	202	2.56
0935	5.25	120		3.33	5.7	0.426	7.48	202	2.43
0940	5.37	120	2.0	3.35	5.7	0.426	7.49	199	2.01
0945	5.47	95		2.93	6.2	0.426	7.46	197	3.66
0950	5.57	110		3.70	6.3	0.436	7.48	185	2.99
0955	5.61	110		3.78	6.4	0.435	7.48	175	2.89
1000	5.64	120	2.5	3.80	6.5	0.438	7.47	173	2.79
1005	5.85	130		3.81	6.4	0.436	7.48	158	3.55
			2.75						
1015			16LM20046	U	UNFILT	TOTAL METALS			
1020			16LM20046	F	FILTERED	DIS			

Margin notes: IT @ 1.60; FF. KEEPING RI UP RUNNING AT W ENERGY ECO; MICRO PROBE

S-1617 GW SAMPLING RECORD

SAMPLING ORDER			PRESERVATIVES		BOTTLES		SAMPLE NUMBER	TIME	CHECKED BY/ DATE
					COUNT/ VOLUME	TYPE			
1	Metals 6020 & Hg 7470		4 deg. C	HNO2	1 x 250 mL	HDPE			
2	Metals 6020 & Hg 7470	filtered	4 deg. C	HNO2	1 x 250 mL	HDPE			
7									

COMMENTS: (QA/QC?)

HORIBA 1976 HACH TURB 15613
YSI 603217

IDW INFORMATION:

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW16-7

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 7
LOCATION: ROMULUS, NY

DATE: 12/20/14
INSPECTORS: T. Bellanca
PUMP #: Peri
SAMPLE ID #: 16LM20047 MS MSD

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	WIND (FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	MONITORING DETECTOR
1430	27	M. Cloudy	Low	-	-	Frozen		

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.654	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)]

HISTORIC DATA	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND

DATA COLLECTED AT WELL SITE	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
		4.51			1450

RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cps)		PUMP AFTER SAMPLING (cps)	

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
1450	4.51	-	-	Y51 85	Y31	H0	R 1	PA	Hach
1500	3.71	150		4.35	5.8	0.620	7.54	100	1.88
1505	4.80	100		4.42	6.1	0.624	7.51	104	0.73
1515	4.88	100	0.5	3.84	6.3	0.640	7.51	109	0.39
1525	4.90	105		3.90	6.3	0.638	7.51	109	0.43
1530	4.97	130	1.0	3.58	6.4	0.662	7.49	112	0.39
1535	4.97	120		2.78	6.5	0.664	7.51	112	0.20
1540	4.96	100		2.18	6.5	0.665	7.51	112	0.18
1545	4.96	~100	Peri Pump stopped	1.86	6.6	0.678	7.53	111	0.23
1550	4.94	115	1.75	0.69	6.6	0.676	7.53	112	0.37
1555	4.95	115		0.30	6.6	0.686	7.53	113	0.31
1600	4.91	115	2.0	0.34	6.6	0.691	7.52	114	0.22
1605	4.91	110		0.31	6.6	0.692	7.52	113	0.16
1610	4.97	110		0.25	6.7	0.699	7.52	113	0.22
1615	4.91	110	~2.5	0.22	6.7	0.702	7.52	114	0.34
1620	4.97	110		0.28	6.7	0.703	7.53	114	0.30
1630		16LM20047U		1635 16LM20047F					
1637		16LM20047U MS		1640 16LM20047F MS					
1637		16LM20047U MSD		1640 16LM20047F MSD					
1645		16LM20048U		1650 16LM20048F					

S-1617 GW SAMPLING RECORD

SAMPLING ORDER			PRESERVATIVES		BOTTLES COUNT/ VOLUME	BOTTLES TYPE	SAMPLE NUMBER	TIME	CHECKED BY/ DATE
1	Metals 6020 & Hg 7470		4 deg. C	HNO2	1 x 250 mL	HDPE			
2	Metals 6020 & Hg 7470	filtered	4 deg. C	HNO2	1 x 250 mL	HDPE			
7									

COMMENTS: (QA/QC?)

ITURBA 19276 HACH TURB 15613

YSI 95 003217

IDW INFORMATION:

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW17-1

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 7
LOCATION: ROMULUS, NY

DATE: 12/20/14
INSPECTORS: T. BELANGER
PUMP #: PERI
SAMPLE ID #: 17LM20030U/F

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	WIND (FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	MONITORING DETECTOR
1215	27	MOSTLY CLOUDY	LOW	5	325	TRACE SNOW		

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.654	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)]

HISTORIC DATA	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND

DATA COLLECTED AT WELL SITE	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
		3.73			1230

RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cps)		PUMP AFTER SAMPLING (cps)	

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
1230	3.73		—	Y.S.I	Y.S.I	H O	R I	B A	HACH
1240	4.20	250		1.88	6.1	0.293	7.81	120	6.08
1245	4.12	120		1.78	6.1	0.287	7.73	114	5.94
1255	4.08	130		1.58	6.8	0.286	7.69	91	3.26
1300	4.02	100	0.5	1.69	6.8	0.288	7.69	61	3.12
1305	4.05	100		1.62	6.9	0.287	7.68	56	3.02
1310	4.05	105		1.62	6.9	0.289	7.66	53	2.67
1315	4.06	100	1.0	1.61	6.9	.290	7.65	48	2.42
1320	4.07	100		1.61	6.9	0.292	7.64	41	2.16
1325	4.08	100		1.57	6.8	0.295	7.66	26	1.93
1330	4.07	100		1.59	6.8	0.299	7.63	22	1.79
1335	4.07	100	1.5	1.58	6.7	0.323	7.59	12	1.63
1340	4.07	100		1.57	6.5	0.346	7.57	6	1.52
1345	4.07	95		1.58	6.5	0.350	7.57	5	1.48
1350	4.07	100		1.59	6.5	0.371	7.57	6	1.30
1355	4.07	100	2.25	1.60	6.5	0.376	7.56	7	
1400		SAMPLE	17LM20030U	UNFILTERED					
1405			17LM20030F	FILTERED					

S-1617 GW SAMPLING RECORD

SAMPLING ORDER			PRESERVATIVES		BOTTLES		SAMPLE NUMBER	TIME	CHECKED BY/ DATE
					COUNT/ VOLUME	TYPE			
1	Metals 6020 & Hg 7470		4 deg. C	HNO2	1 x 250 mL	HDPE			
2	Metals 6020 & Hg 7470	filtered	4 deg. C	HNO2	1 x 250 mL	HDPE			
7									

COMMENTS: (QA/QC?)

HORIBA 19276 HACH TURB 15613

YSI 003217

IDW INFORMATION:

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW17-2

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 7
LOCATION: ROMULUS, NY

DATE: 12/20/14
INSPECTORS: T BRANAGER
PUMP #: PERI
SAMPLE ID #: ~~17LM2003U/F~~

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	WIND (FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	MONITORING DETECTOR
1015	27	M.C.	LOW	0	0	TRACE SNOW		
						FROSTY		

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.654	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)]

HISTORIC DATA	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND
	7.90					

DATA COLLECTED AT WELL SITE	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
		3.41			1035

RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cps)		PUMP AFTER SAMPLING (cps)	

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
WT 0.31 1035	3.41	—	—	YSI 86	YSI	#	ORION	BA	HACH
1040	4.44	170	0	0.55	6.3	.596	7.60	144	4.43
1050	4.45	115		0.66	5.9	0.597	7.59	147	3.87
1100	4.92	150	0.75	0.60	6.0	0.596	7.57	139	2.45
1105	5.25	140		0.56	6.0	0.579	7.56	137	1.96
1110	5.64	150	1.0	0.65	6.0	0.595	7.57	134	1.22
1115	5.82	130		0.67	6.0	0.594	7.58	131	1.02
1120	5.91	130		0.63	6.1	0.596	7.57	131	0.97
1125	5.94	130	1.5	0.62	6.1	0.599	7.55	130	0.75
			~ 1.75						
1130			SAMPLE	~~17LM~~	2003	1U	UNFILTERED		
				TOT + DISS	METALS				
1135				17LM	2003	1F	FILTERED		

S-1617 GW SAMPLING RECORD

SAMPLING ORDER			PRESERVATIVES		BOTTLES		SAMPLE NUMBER	TIME	CHECKED BY/ DATE
					COUNT/ VOLUME	TYPE			
1	Metals 6020 & Hg 7470		4 deg. C	HNO2	1 x 250 mL	HDPE			
2	Metals 6020 & Hg 7470	filtered	4 deg. C	HNO2	1 x 250 mL	HDPE			
7									

COMMENTS: (QA/QC?)

HORIBA 19276 HACH TURB 15613

YSI 85 003217

IDW INFORMATION:

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW17-3

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 7
LOCATION: ROMULUS, NY

DATE: 12-20-14
INSPECTORS: T. Beamer
PUMP #: Peri
SAMPLE ID #: 17LM20032 U/F

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	WIND (FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	MONITORING DETECTOR
0830	27	OVERCAST	LOW	0	0	LT SNOW		

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.654	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)]

HISTORIC DATA	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND

DATA COLLECTED AT WELL SITE	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
		2.59			0845

RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cps)		PUMP AFTER SAMPLING (cps)	

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
0845	2.59		—	~~YSI 85~~	YSI	HORIBA	HORIBA	HORIBA	HACH
0855	3.39	155	0	2.94	6.9	0.340	7.23	187	2.34
0900	3.48	120		3.02	6.8	0.330	7.34	191	1.68
0905	3.62	140	0.5	3.40	6.8	0.334	7.38	188	1.73
0910	3.64	115		3.44	6.8	0.336	7.41	184	1.84
0915	3.62	95		3.45	6.5	0.338	7.44	180	3.52
0920	3.58	115		3.08	6.5	0.350	7.42	178	3.67
0925	3.60	115	1.0	3.06	6.4	0.348	7.48	172	2.07
0930	3.61	80		3.07	6.3	0.349	7.46	173	2.12
0935	3.47	80		2.87	6.3	0.350	7.46	169	2.01
0940	3.48	75		2.78	6.3	0.349	7.46	168	2.04
0945	3.46	75		2.80	6.1	0.350	7.47	164	1.80
0950	3.49	75	~ 1.5	2.78	6.1	0.350	7.47	164	1.76
0955	3.50	80		2.73	6.1	0.349	7.47	164	1.95
			~2.0						
1000			SAMPLE	17LM20032 U		METALS			
1005				17LM20032 F		FILER	DISS		
						NON-FILT	TOTAL		

S-1617 GW SAMPLING RECORD

SAMPLING ORDER			PRESERVATIVES		BOTTLES		SAMPLE NUMBER	TIME	CHECKED BY/ DATE
					COUNT VOLUME	TYPE			
1	Metals 6020 & Hg 7470		4 deg. C	HNO2	1 x 250 mL	HDPE			
2	Metals 6020 & Hg 7470	filtered	4 deg. C	HNO2	1 x 250 mL	HDPE			
7									

COMMENTS: (QA/QC?)

HACH TURB 19276

HACH TURB 15613

YSI 003217

IDW INFORMATION:

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW 17-4

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 7
LOCATION: ROMULUS, NY

DATE: 12/20/14
INSPECTORS: DJ/mon
PUMP #:
SAMPLE ID #: 17LMW20033

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	WIND (FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	MONITORING DETECTOR

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.654	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)]

HISTORIC DATA	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND

DATA COLLECTED AT WELL SITE	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
		3.38			

RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cps)		PUMP AFTER SAMPLING (cps)	

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
11:30	3.38	start Pump							
11:35	3.89	170							
11:41	3.89	170		1.91	5.9				
11:44	3.90	170		1.76	5.9	0.572	7.96	81	
11:50	3.90	170		1.83	6.0	0.576	7.94	75	
11:55	3.96	165		2.40	6.0	0.574	7.91	59	
1200	3.98	165		2.03	6.1	0.567	7.92	50	
1205	4.00	165	1.5 gal	2.00	6.1	0.566	7.92	51	2.92
1210	4.03	165		2.47	6.1	0.559	7.92	51	1.52
1215	4.05	165		2.68	6.1	0.549	7.92	54	
1220	4.07	165		2.59	6.0	0.531	7.91	49	
1225	4.09	165	2.4 gal	2.92	6.0	0.517	7.91	45	1.86
1230	4.11	165		2.61	6.0	0.500	7.93	41	1.68
1235	4.16	165		2.75	6.0	0.472	7.94	40	1.73
1240	4.18	165		2.98	6.0	0.461	7.94	37	1.70
1245	4.19	165	3.2 gal	3.32	5.9	0.450	7.94	35	1.75
1250	4.20	168		3.49	5.9	0.436	7.96	31	1.34
1255	4.22	168		3.63	5.8	0.428	7.95	30	1.36
1300	4.25	165	3.9 gal	3.67	5.8	0.424	7.94	31	1.32
1305	4.27	165		3.96	5.8	4.20	7.96	29	1.44
1310	4.29	165		3.48	5.9	0.412	7.96	27	

S-1617 GW SAMPLING RECORD

SAMPLING ORDER			PRESERVATIVES		BOTTLES		SAMPLE NUMBER	TIME	CHECKED BY/ DATE
					COUNT VOLUME	TYPE			
1	Metals 6020 & Hg 7470		4 deg. C	HNO2	1 x 250 mL	HDPE			
2	Metals 6020 & Hg 7470	filtered	4 deg. C	HNO2	1 x 250 mL	HDPE			
7									

COMMENTS: (QA/QC?)

HORIBA 23066

YSI 85 6122

HACH TURB 12358

IDW INFORMATION:

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW17-4

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 7
LOCATION: ROMULUS, NY

DATE: 12/20/14
INSPECTORS: Dillman
PUMP #: 22393
SAMPLE ID #: 17LM 20033

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	WIND (FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	MONITORING DETECTOR

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.654	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)]

HISTORIC DATA	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND

DATA COLLECTED AT WELL SITE	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME

RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cps)		PUMP AFTER SAMPLING (cps)	

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
1315	4.30	165		4.51	5.7	0.409	7.94	28	1.45
1320	4.31	165	5 gal	4.80	5.7	0.406	7.93	28	1.92
1325	4.32	165		4.94	5.7	0.406	8.06	19	1.91
1330	4.33	165		4.92	5.7	0.406	7.96	25	1.87
1335	4.32	165		5.12	5.7	0.402	7.97	24	1.71
1340	4.35	165		5.08	5.7	0.398	7.98	23	1.52
1345	4.39	165	5.7 gal	4.46	5.7	0.395	7.97	23	1.51
1350	4.41	170		4.45	5.7	0.395	7.97	23	1.41
1355	4.42	170	6.5 gal	4.69	5.7	0.394	7.96	24	1.38
1400	Collect unfiltered sample 17LM 20033 U								
1405	Collect filtered sample 17LM 20033 F								

S-1617 GW SAMPLING RECORD

SAMPLING ORDER			PRESERVATIVES		BOTTLES		SAMPLE NUMBER	TIME	CHECKED BY/ DATE
					COUNT/ VOLUME	TYPE			
1	Metals 6020 & Hg 7470		4 deg. C	HNO2	1 x 250 mL	HDPE			
2	Metals 6020 & Hg 7470	filtered	4 deg. C	HNO2	1 x 250 mL	HDPE			
7									

COMMENTS: (QA/QC?)

IDW INFORMATION:

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW17-5

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 7
LOCATION: ROMULUS, NY

DATE: 12/20/14
INSPECTORS: D.T./mon
PUMP #:
SAMPLE ID #: 17LM 20034U/F

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES)

TIME (24 HR)	TEMP (APPRX)	WEATHER (APPRX)	REL. HUMIDITY (GEN)	WIND VELOCITY (APPRX)	(FROM) DIRECTION (0 - 360)	GROUND / SITE SURFACE CONDITIONS	MONITORING INSTRUMENT	MONITORING DETECTOR

WELL VOLUME CALCULATION FACTORS

DIAMETER (INCHES):	0.25	1	2	3	4	6
GALLONS / FOOT:	0.0026	0.041	0.163	0.367	0.654	1.47
LITERS/FOOT	0.010	0.151	0.617	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)]

HISTORIC DATA	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND
	10.14					

DATA COLLECTED AT WELL SITE	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
		2.84			

RADIATION SCREENING DATA	PUMP PRIOR TO SAMPLING (cps)		PUMP AFTER SAMPLING (cps)	

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVED OXYGEN (mg/L)	TEMP (C)	SPEC. COND (umhos)	pH	ORP (mV)	TURBIDITY (NTU)
953	2.84	8:55	start Pump 45E 61	22	Horiba U52	023666	→	Hach 2100P 12358	
9.09	3.00			11.64	7.3		7.38	164	
9.15	2.97	190		12.25	7.3	0.437	7.58	137	
9:25	2.96	180		5.35	7.9	0.457	7.67	125	
9:35	2.96	170		3.69	7.8	0.461	7.75	117	
9.45	2.96	165		3.07	7.7	0.464	7.78	118	8.23
9'50	2.96	160		3.54	7.7	0.465	7.82	109	8.01
9:55	2.96	160	2.1 gal	3.28	7.8	0.464	7.83	108	6.14
10:00	2.96	160		3.36	7.8	0.467	7.83	107	5.11
10:05	2.96	170		3.42	7.7	0.469	7.85	105	4.65
1010	2.96	170	3 gal	3.56	7.7	0.473	7.86	167	3.41
1015	2.97	170		3.45	7.7	0.474	7.87	103	2.78
1020	2.97	175		3.41	7.7	0.475	7.88	103	2.91
1025	2.97	175	3.3 gal	3.32	7.8	0.476	7.87	164	3.65
1030	2.97	170		3.36	7.8	0.478	7.86	105	2.73
1035	2.97	170		3.35	7.8	0.478	7.85	103	1.78
1040	2.97	170	4.1 gal	3.36	7.8	0.479	7.86	104	1.74
10	45	collect	sample for Total &	Dissolved	metals				
10	45		17LM20034U	UNFILTERED					
10	50		17LM20034F	FILTERED					

moved DO probe

S-1617 GW SAMPLING RECORD

SAMPLING ORDER			PRESERVATIVES		BOTTLES		SAMPLE NUMBER	TIME	CHECKED BY/ DATE
					COUNT/ VOLUME	TYPE			
1	Metals 6020 & Hg 7470		4 deg. C	HNO2	1 x 250 mL	HDPE			
2	Metals 6020 & Hg 7470	filtered	4 deg. C	HNO2	1 x 250 mL	HDPE			
7									

COMMENTS: (QA/QC?)

ITORIBA 23066

YSI 85 6122

HACH TURB 12358

IDW INFORMATION:

APPENDIX D

POST-REMEDIAL ACTION MONITORING RESULTS (YEARS 1 THROUGH 7)

Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 7)
Draft Annual Report - Year 7 for SEAD 16 and SEAD 17
Seneca Army Depot Activity

Area								SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16
Loc ID								MW16-1	MW16-1	MW16-1	MW16-1	MW16-1	MW16-1	MW16-1
Matrix								GW	GW	GW	GW	GW	GW	GW
Sample ID								16LM20000	16LM20001	16LM20013	16LM20014FIL	16LM20014UNFIL	16LM20021FIL	16LM20021UNF
Sample Date								12/20/2007	12/20/2007	12/9/2008	11/13/2009	11/13/2009	12/16/2010	12/16/2010
QC Type								SA	DU	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM	LTM
Sample Round								1	1	2	3	3	4	4
Filtered								Total	Total	Total	Dissolved	Total	Dissolved	Total
Parameter	Unit	Maximum Value	Criteria Source	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual
Inorganics														
Aluminum	UG/L	577				30	84	61.4 J	91.6 J	148 J	24 U	45 J	23 U	50 U
Antimony	UG/L	16.3	GA	3	40	47	84	1 U	1.02	0.95 J	1 U	1 U	2.3 U	2 U
Arsenic	UG/L	2.7	MCL	10	0	8	84	4.2 U	4.2 U	3.7 U	3.7 U	3.7 U	1.3 U	1.3 U
Barium	UG/L	290	GA	1,000	0	84	84	60.4	59	125	105	104	110	97 J
Beryllium	UG/L	0	MCL	4	0	0	84	0.27 U	0.27 U	0.33 U	0.3 U	0.3 U	0.25 U	0.15 U
Cadmium	UG/L	0.46	GA	5	0	4	84	0.36 U	0.36 U	0.33 U	0.3 U	0.3 U	0.095 U	0.13 U
Calcium	UG/L	275,000				84	84	107,000 J	105,000 J	176,000	111,000 J	110,000 J	140,000	130,000
Chromium	UG/L	3.6	GA	50	0	5	84	0.84 U	0.84 U	0.88 U	0.9 U	0.9 U	2.5 U	2.5 U
Cobalt	UG/L	2				32	84	0.89 U	0.89 U	1.1 U	1.1 U	1.1 U	1.1	1.1
Copper	UG/L	34.7	GA	200	0	64	84	1.3 U	1.3 U	1.3 U	1.6 J	1.6 J	1.1 U	1.1 U
Iron	UG/L	1,300	GA	300	21	58	84	35.8 J	68.3	93.3	19 UJ	19 UJ	77 J	100 J
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	39 J	73	105	1 J	2.4 J	131	152
Lead	UG/L	88.6	MCL	15	2	37	84	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	0.2 U	0.5 U
Magnesium	UG/L	35,200				81	81	16,100 J	15,900 J	25,800	18,000	17,900	21,000	20,000 J
Manganese	UG/L	631	GA	300	1	78	84	3.3	5	11.8	1 J	2.4 J	54	52
Mercury	UG/L	0.507	GA	0.7	0	3	84	0.12 U	0.12 U	0.12 U	0.1 U	0.1 U	0.091 U	0.091 U
Nickel	UG/L	5.5	GA	100	0	49	84	1.2 U	1.2 U	1 U	1.8 J	1.2 J	2.8 J	2.7 J
Potassium	UG/L	7,010				78	78	886 R	907 R	1,340 J	1,110	1,100	1,200	1,100
Selenium	UG/L	0	GA	10	0	0	84	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	1 U	1.1 U
Silver	UG/L	0	GA	50	0	0	84	1 U	1 U	1.3 U	1.3 U	1.3 U	0.25 U	0.18 U
Sodium	UG/L	550,000	GA	20,000	52	82	82	**24,200 J**	**25,300 J**	**182,000**	8,000 J	8,000 J	**170,000 J**	**160,000 J**
Thallium	UG/L	0.03	MCL	2	0	1	84	0.03 U	0.03 U	0.09 U	0.2 U	0.2 U	0.5 U	0.25 U
Vanadium	UG/L	2.3				7	84	0.78 U	0.78 U	0.98 U	1 U	1 U	3.8 U	3.2 U
Zinc	UG/L	34.4				33	84	4.4 J	7.8 J	5.8 J	3.6 U	3.6 U	8.3 U	8.8 J

Notes:
1. The lowest value for either the New York Class GA Groundwater Standards (TOGS 1.1.1, June 1998, et al.) or the EPA Maximum Contaminant Limit (MCL), source http://www.epa.gov/safewater/mcl.html#inorganic.html is used. A blank cell indicates no criteria value available.
2. Data validation qualifier.
   [empty cell] = data is not qualified
   U = compound not detected at concentration listed
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3. Shading indicates a concentration above the identified criteria value.
   SA = Sample
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Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 7)
Draft Annual Report - Year 7 for SEAD 16 and SEAD 17
Seneca Army Depot Activity

Area								SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16	
Loc ID								MW16-1		MW16-1		MW16-1		MW16-1		MW16-1		MW16-2	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								16LM20028F		16LM20028U		16LM20035F		16LM20035U		16LM20042F		16LM20002	
Sample Date								12/15/2012		12/15/2012		12/17/2013		12/17/2013		12/21/2014		12/20/2007	
QC Type								SA		SA		SA		SA		SA		SA	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								5		5		6		6		7		1	
Filtered								Dissolved		Total		Dissolved		Total		Dissolved		Total	
Parameter	Unit	Maximum Value	Criteria Source	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																			
Aluminum	UG/L	577				30	84	23	UJ	50	UJ	23	UJ	50	UJ	23	U	50	U	98.8	J
Antimony	UG/L	16.3	GA	3	40	47	84	2.3	UJ	2	UJ	2.3	UJ	2	UJ	2.3	U	2	U	3.56	
Arsenic	UG/L	2.7	MCL	10	0	8	84	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ	1.3	U	1.3	U	4.2	U
Barium	UG/L	290	GA	1,000	0	84	84	78	J	78	J	63	J	69	J	99		94		64.6	
Beryllium	UG/L	0	MCL	4	0	0	84	0.25	UJ	0.15	UJ	0.25	UJ	0.15	UJ	0.25	U	0.15	U	0.27	U
Cadmium	UG/L	0.46	GA	5	0	4	84	0.095	UJ	0.13	UJ	0.095	UJ	0.13	UJ	0.095	U	0.13	U	0.36	U
Calcium	UG/L	275,000				84	84	120,000	J	120,000	J	140,000	J	130,000	J	160,000		150,000		143,000	J
Chromium	UG/L	3.6	GA	50	0	5	84	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	2.5	U	2.5	U	0.84	U
Cobalt	UG/L	2				32	84	0.15	UJ	0.16	J	0.9	J	0.94	J	0.15	U	0.12	U	0.89	U
Copper	UG/L	34.7	GA	200	0	64	84	5.2	J	5	UJ	1.2	J	1.1	UJ	1.3	J	1.9	J	4.5	J
Iron	UG/L	1,300	GA	300	21	58	84	33	UJ	44	UJ	260	J	280	J	33	U	79	J	49.5	J
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	34	U	46	U	352	J	378	J	11		91		53	J
Lead	UG/L	88.6	MCL	15	2	37	84	0.2	UJ	0.5	UJ	0.2	UJ	0.5	UJ	0.2	U	0.5	U	2.9	U
Magnesium	UG/L	35,200				81	81	18,000	J	18,000	J	22,000	J+	22,000	J	25,000		24,000		15,600	J
Manganese	UG/L	631	GA	300	1	78	84	1	UJ	2	UJ	92	J	98	J	11		12		3.4	
Mercury	UG/L	0.507	GA	0.7	0	3	84	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ	0.091	U	0.091	U	0.12	U
Nickel	UG/L	5.5	GA	100	0	49	84	2.3	J	2	UJ	3.6	J	2	UJ	2	J	2	U	1.2	U
Potassium	UG/L	7,010				78	78	900	J	870	J	810	J	790	J	950		890	J	2,050	R
Selenium	UG/L	0	GA	10	0	0	84	1	UJ	1.1	UJ	1	UJ	1.1	UJ	1	U	1.1	U	6.1	U
Silver	UG/L	0	GA	50	0	0	84	0.25	UJ	0.18	UJ	0.25	UJ	0.18	UJ	0.25	U	0.18	U	1	U
Sodium	UG/L	550,000	GA	20,000	52	82	82	63,000	J	62,000	J	57,000	J	60,000	J	63,000		63,000		49,600	J
Thallium	UG/L	0.03	MCL	2	0	1	84	0.5	UJ	0.25	UJ	0.5	UJ	0.25	UJ	0.5	U	0.25	U	0.03	U
Vanadium	UG/L	2.3				7	84	3.8	UJ	3.2	UJ	3.8	UJ	3.2	UJ	3.8	U	3.2	U	0.78	U
Zinc	UG/L	34.4				33	84	8.3	UJ	8.4	UJ	8.3	UJ	8.4	UJ	8.3	U	8.4	U	8.2	J

Notes:
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Appendix D
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Draft Annual Report - Year 7 for SEAD 16 and SEAD 17
Seneca Army Depot Activity

Area								SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16
Loc ID								MW16-2	MW16-2	MW16-2	MW16-2	MW16-2	MW16-2	MW16-2
Matrix								GW	GW	GW	GW	GW	GW	GW
Sample ID								16LM20007	16LM20015FIL	16LM20015UNFIL	16LM20022FIL	16LM20022UNF	16LM20023FIL	16LM20023UNF
Sample Date								12/9/2008	11/11/2009	11/11/2009	12/15/2010	12/15/2010	12/15/2010	12/15/2010
QC Type								SA	SA	SA	SA	SA	DU	DU
Study ID								LTM	LTM	LTM	LTM	LTM	LTM	LTM
Sample Round								2	3	3	4	4	4	4
Filtered								Total	Dissolved	Total	Dissolved	Total	Dissolved	Total
Parameter	Unit	Maximum Value	Criteria Source	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual
Inorganics														
Aluminum	UG/L	577				30	84	97.1 J	24 U	205	23 U	50 U	23 U	50 U
Antimony	UG/L	16.3	GA	3	40	47	84	5.53	3.6	3.8	6.1	6.6	6.1	6
Arsenic	UG/L	2.7	MCL	10	0	8	84	3.7 U	3.7 U	3.7 U	1.3 U	1.3 U	1.3 U	1.3 U
Barium	UG/L	290	GA	1,000	0	84	84	69.7	71.9	72.7	68	77 J	67	69 J
Beryllium	UG/L	0	MCL	4	0	0	84	0.33 U	0.3 U	0.3 U	0.25 U	0.15 U	0.25 U	0.15 U
Cadmium	UG/L	0.46	GA	5	0	4	84	0.33 U	0.3 U	0.3 U	0.095 U	0.13 U	0.095 U	0.13 U
Calcium	UG/L	275,000				84	84	138,000	118,000 J	117,000 J	100,000 J	110,000 J	96,000	100,000
Chromium	UG/L	3.6	GA	50	0	5	84	0.88 U	0.9 U	0.9 U	2.5 U	2.5 U	2.5 U	2.5 U
Cobalt	UG/L	2				32	84	1.1 U	1.1 U	1.1 U	0.15 U	0.12 U	0.15 U	0.12 U
Copper	UG/L	34.7	GA	200	0	64	84	4 J	3.4 J	5.1 J	4.4 J	5.9	4.5 J	5.1
Iron	UG/L	1,300	GA	300	21	58	84	26.1 J	19 UJ	197 J	33 U	89 J	33 U	63 J
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	27	39.5	260.7 J	12	105	12	76
Lead	UG/L	88.6	MCL	15	2	37	84	2.9 U	2.9 U	2.9 U	0.21 J	1.3 J	0.2 U	0.97 J
Magnesium	UG/L	35,200				81	81	15,700	12,600	12,300	12,000	14,000 J	11,000	12,000 J
Manganese	UG/L	631	GA	300	1	78	84	0.84 J	39.5	63.7	12	16	12	13
Mercury	UG/L	0.507	GA	0.7	0	3	84	0.148 J	0.1 U	0.1 U	0.091 U	0.091 U	0.091 U	0.091 U
Nickel	UG/L	5.5	GA	100	0	49	84	1.6 J	2.2 J	2.6 J	2 U	2 J	2.2 J	2.2 J
Potassium	UG/L	7,010				78	78	2,410 J	3,170	3,140	2,300 J	2,500 J	2,200 J	2,200 J
Selenium	UG/L	0	GA	10	0	0	84	6.1 U	6.1 U	6.1 U	1 U	1.1 U	1 U	1.1 U
Silver	UG/L	0	GA	50	0	0	84	1.3 U	1.3 U	1.3 U	0.25 U	0.18 U	0.25 U	0.18 U
Sodium	UG/L	550,000	GA	20,000	52	82	82	63,500	19,500 J	18,800 J	33,000 J	34,000 J	31,000 J	32,000 J
Thallium	UG/L	0.03	MCL	2	0	1	84	0.09 U	0.2 U	0.2 U	0.5 U	0.25 U	0.5 U	0.25 U
Vanadium	UG/L	2.3				7	84	0.98 U	1 U	1 U	3.8 U	3.2 U	3.8 U	3.2 U
Zinc	UG/L	34.4				33	84	10.2	11.1	11.3	11 J	14 J	12 J	12 J

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Area								SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16	
Loc ID								MW16-2		MW16-2		MW16-2		MW16-2		MW16-2		MW16-4	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								16LM20029F		16LM20029U		16LM20036F		16LM20036U		16LM20043F		16LM20003	
Sample Date								12/15/2012		12/15/2012		12/16/2013		12/16/2013		12/21/2014		12/20/2007	
QC Type								SA		SA		SA		SA		SA		SA	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								5		5		6		6		7		1	
Filtered								Dissolved		Total		Dissolved		Total		Dissolved		Total	
Parameter	Unit	Maximum Value	Criteria Source	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																			
Aluminum	UG/L	577				30	84	23	UJ	50	UJ	23	UJ	50	UJ	23	U	50	U	167	J
Antimony	UG/L	16.3	GA	3	40	47	84	7.6	J	7.1	J	3.6	J	3.2	J	4.6	J	4.6	J	5.11	
Arsenic	UG/L	2.7	MCL	10	0	8	84	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ	1.3	U	1.3	U	4.2	U
Barium	UG/L	290	GA	1,000	0	84	84	65	J	62	J	70	J	66	J	72		68		44.5	
Beryllium	UG/L	0	MCL	4	0	0	84	0.25	UJ	0.15	UJ	0.25	UJ	0.15	UJ	0.25	U	0.15	U	0.27	U
Cadmium	UG/L	0.46	GA	5	0	4	84	0.095	UJ	0.13	UJ	0.095	UJ	0.13	UJ	0.095	U	0.13	U	0.36	U
Calcium	UG/L	275,000				84	84	110,000	J	100,000	J	120,000	J	100,000	J	110,000		100,000		87,100	J
Chromium	UG/L	3.6	GA	50	0	5	84	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	2.5	U	2.5	U	1	J
Cobalt	UG/L	2				32	84	0.15	UJ	0.12	UJ	0.23	J	0.23	J	0.15	U	0.12	U	0.89	U
Copper	UG/L	34.7	GA	200	0	64	84	4.5	J	5	J	4	J	4.7	J	3.3	J	4.2	J	5.4	J
Iron	UG/L	1,300	GA	300	21	58	84	33	UJ	44	UJ	33	UJ	44	UJ	33	J	44	U	95.4	
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	34	U	46	U	19	J	19	J	34	U	46	U	127	
Lead	UG/L	88.6	MCL	15	2	37	84	0.24	J	0.66	J	0.38	J	1.1	J	0.2	U	0.87	J	2.9	U
Magnesium	UG/L	35,200				81	81	13,000	J	11,000	J	14,000	J+	13,000	J	12,000		11,000		9,440	R
Manganese	UG/L	631	GA	300	1	78	84	1	UJ	2	UJ	19	J	19	J	1	U	2	U	31.2	
Mercury	UG/L	0.507	GA	0.7	0	3	84	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ	0.091	U	0.091	U	0.12	U
Nickel	UG/L	5.5	GA	100	0	49	84	2.2	J	2	UJ	2	UJ	2	UJ	2.2	J	2.3	J	1.2	U
Potassium	UG/L	7,010				78	78	2,200	J	1,900	J	1,800	J	1,700	J	1,500		1,400		1,300	R
Selenium	UG/L	0	GA	10	0	0	84	1	UJ	1.1	UJ	1	UJ	1.1	UJ	1	U	1.1	U	6.1	U
Silver	UG/L	0	GA	50	0	0	84	0.25	UJ	0.18	UJ	0.25	UJ	0.18	UJ	0.25	U	0.18	U	1	U
Sodium	UG/L	550,000	GA	20,000	52	82	82	20,000	J	17,000	J	22,000	J	21,000	J	11,000		9,900		40,800	J
Thallium	UG/L	0.03	MCL	2	0	1	84	0.5	UJ	0.25	UJ	0.5	UJ	0.25	UJ	0.5	U	0.25	U	0.03	U
Vanadium	UG/L	2.3				7	84	3.8	UJ	3.2	UJ	3.8	UJ	3.2	UJ	3.8	U	3.2	U	0.78	U
Zinc	UG/L	34.4				33	84	9.5	J	8.8	J	24	J	12	J	13	J	12	J	5.3	J

Notes:
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Area								SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16	
Loc ID								MW16-4		MW16-4		MW16-4		MW16-4		MW16-4		MW16-4	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								16LM20008		16LM20009		16LM20016FIL		16LM20016UNFIL		16LM20024FIL		16LM20024UNF		16LM20030F	
Sample Date								12/9/2008		12/9/2008		11/17/2009		11/17/2009		12/16/2010		12/16/2010		12/15/2012	
QC Type								SA		DU		SA		SA		SA		SA		SA	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								2		2		3		3		4		4		5	
Filtered								Total		Total		Dissolved		Total		Dissolved		Total		Dissolved	
Parameter	Unit	Maximum Value	Criteria Source	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																					
Aluminum	UG/L	577				30	84	104	J	101	J	24	U	68	J	23	U	50	U	23	UJ
Antimony	UG/L	16.3	GA	3	40	47	84	2.89		2.94		6		6.3		2.3	U	2	U	4	J
Arsenic	UG/L	2.7	MCL	10	0	8	84	3.7	U	3.7	U	3.7	U	3.7	U	1.3	U	1.3	U	1.5	J
Barium	UG/L	290	GA	1,000	0	84	84	290		279		129		123		220		240	J	240	J
Beryllium	UG/L	0	MCL	4	0	0	84	0.33	U	0.33	U	0.3	U	0.3	U	0.25	U	0.15	U	0.25	UJ
Cadmium	UG/L	0.46	GA	5	0	4	84	0.33	U	0.33	U	0.3	U	0.3	U	0.095	U	0.13	U	0.095	UJ
Calcium	UG/L	275,000				84	84	275,000		267,000		130,000	J	125,000	J	210,000		210,000		230,000	J
Chromium	UG/L	3.6	GA	50	0	5	84	0.88	U	0.88	U	0.9	U	0.9	U	2.5	U	2.5	U	2.5	UJ
Cobalt	UG/L	2				32	84	1.1	U	1.1	U	1.8	J	2	J	0.7		0.71		1.9	J
Copper	UG/L	34.7	GA	200	0	64	84	4.4	J	4.2	J	2.4	J	6.2	J	1.4	J	2.8	J	4.1	J
Iron	UG/L	1,300	GA	300	21	58	84	57	J	38.4	J	329	J	419	J	130	J	150	J	130	J
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	65		46	J	417.7	J	513.5	J	260		290		270	J
Lead	UG/L	88.6	MCL	15	2	37	84	2.9	U	2.9	U	2.9	U	2.9	U	0.7	J	3		0.2	UJ
Magnesium	UG/L	35,200				81	81	35,200		34,500		16,800		16,000		31,000		32,000	J	34,000	J
Manganese	UG/L	631	GA	300	1	78	84	7.7		8		88.7		94.5		130		140		140	J
Mercury	UG/L	0.507	GA	0.7	0	3	84	0.12	U	0.12	U	0.1	U	0.1	U	0.091	U	0.091	U	0.091	UJ
Nickel	UG/L	5.5	GA	100	0	49	84	2.2	J	1.9	J	1.7	J	1.4	J	2.2	J	2.3	J	2.6	J
Potassium	UG/L	7,010				78	78	3,830	J	3,690	J	3,270		3,270		2,600	J	2,600	J	3,200	J
Selenium	UG/L	0	GA	10	0	0	84	6.1	U	6.1	U	6.1	U	6.1	U	1	U	1.1	U	1	UJ
Silver	UG/L	0	GA	50	0	0	84	1.3	U	1.3	U	1.3	U	1.3	U	0.25	U	0.18	U	0.25	UJ
Sodium	UG/L	550,000	GA	20,000	52	82	82	434,000		419,000		380,000	J	363,000	J	540,000	J	550,000	J	340,000	J
Thallium	UG/L	0.03	MCL	2	0	1	84	0.09	U	0.09	U	0.2	U	0.2	U	0.5	U	0.25	U	0.5	UJ
Vanadium	UG/L	2.3				7	84	0.98	U	0.98	U	1.1	J	1.1	J	3.8	U	3.2	U	3.8	UJ
Zinc	UG/L	34.4				33	84	14.6	J	9.8	J	3.6	U	3.6	U	9.2	J	13	J	12	J

Notes:
1. The lowest value for either the New York Class GA Groundwater Standards (TOGS 1.1.1, June 1998, et al.) or the EPA Maximum Contaminant Limit (MCL), source http://www.epa.gov/safewater/mcl.html#inorganic.html is used. A blank cell indicates no criteria value available.
2.Data validation qualifier.
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U = compound not detected at concentration listed
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Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 7)
Draft Annual Report - Year 7 for SEAD 16 and SEAD 17
Seneca Army Depot Activity

Area								SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16	
Loc ID								MW16-4		MW16-4		MW16-4		MW16-4		MW16-4		MW16-5	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								16LM20030U		16LM20037F		16LM20037U		16LM20044F		16LM20044U		16LM20004	
Sample Date								12/15/2012		12/17/2013		12/17/2013		12/21/2014		12/21/2014		12/20/2007	
QC Type								SA		SA		SA		SA		SA		SA	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								5		6		6		7		7		1	
Filtered								Total		Dissolved		Total		Dissolved		Total		Total	
Parameter	Unit	Maximum Value	Criteria Source	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																			
Aluminum	UG/L	577				30	84	50	UJ	23	UJ	50	UJ	23	U	50	U	160	J
Antimony	UG/L	16.3	GA	3	40	47	84	3.9	J	2.3	UJ	2	UJ	3.3	J	3.2	J	1.82	
Arsenic	UG/L	2.7	MCL	10	0	8	84	1.3	J	1.3	UJ	1.3	UJ	1.3	U	1.3	U	4.2	U
Barium	UG/L	290	GA	1,000	0	84	84	230	J	140	J	150	J	170		160		38.9	
Beryllium	UG/L	0	MCL	4	0	0	84	0.15	UJ	0.25	UJ	0.15	UJ	0.25	U	0.15	U	0.27	U
Cadmium	UG/L	0.46	GA	5	0	4	84	0.23	J	0.095	UJ	0.15	J	0.11	J	0.13	U	0.36	U
Calcium	UG/L	275,000				84	84	220,000	J	210,000	J	190,000	J	220,000		210,000		89,000	J
Chromium	UG/L	3.6	GA	50	0	5	84	2.5	UJ	2.5	UJ	3.6	J	2.5	U	2.5	U	1.1	J
Cobalt	UG/L	2				32	84	1.9	J	1	J	0.94	J	1.1		1.1		0.89	U
Copper	UG/L	34.7	GA	200	0	64	84	11	J	1.2	J	1.5	J	4.3	J	5.8		3.1	J
Iron	UG/L	1,300	GA	300	21	58	84	140	J	350	J	380	J	170		290		1,200	
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	280	J	580	J	590	J	370		490		1,238	
Lead	UG/L	88.6	MCL	15	2	37	84	3.4	J	0.28	J	0.65	J	0.27	J	1.5		2.9	U
Magnesium	UG/L	35,200				81	81	32,000	J	33,000	J+	31,000	J	33,000		32,000		9,380	R
Manganese	UG/L	631	GA	300	1	78	84	140	J	230	J	210	J	200		200		37.6	
Mercury	UG/L	0.507	GA	0.7	0	3	84	0.091	UJ	0.091	UJ	0.091	UJ	0.091	U	0.091	U	0.12	U
Nickel	UG/L	5.5	GA	100	0	49	84	3.2	J	3.3	J	2.9	J	4	J	3.5	J	1.2	U
Potassium	UG/L	7,010				78	78	3,100	J	2,500	J	2,400	J	2,000		1,900		4,420	R
Selenium	UG/L	0	GA	10	0	0	84	1.1	UJ	1	UJ	1.1	UJ	1	U	1.1	U	6.1	U
Silver	UG/L	0	GA	50	0	0	84	0.18	UJ	0.25	UJ	0.18	UJ	0.25	U	0.18	U	1	U
Sodium	UG/L	550,000	GA	20,000	52	82	82	310,000	J	290,000	J	270,000	J	300,000		300,000		8,410	R
Thallium	UG/L	0.03	MCL	2	0	1	84	0.25	UJ	0.5	UJ	0.25	UJ	0.5	U	0.25	U	0.03	U
Vanadium	UG/L	2.3				7	84	3.2	UJ	3.8	UJ	3.2	UJ	3.8	U	3.2	U	1.2	J
Zinc	UG/L	34.4				33	84	11	J	8.3	UJ	8.4	UJ	14	J	12	J	34.4	

Area								SEAD-16		SEAD-16	
Loc ID								MW16-5		MW16-5	
Matrix								GW		GW	
Sample ID								16LM20010		16LM20010	
Sample Date								12/10/2008		12/10/2008	
QC Type								SA		SA	
Study ID								LTM		LTM	
Sample Round								2		2	
Filtered								Total		Total	
Parameter	Unit	Maximum Value	Criteria Source	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual
Inorganics											
Aluminum	UG/L	577				30	84	563			
Antimony	UG/L	16.3	GA	3	40	47	84	4.23			
Arsenic	UG/L	2.7	MCL	10	0	8	84	3.7	U		
Barium	UG/L	290	GA	1,000	0	84	84	22			
Beryllium	UG/L	0	MCL	4	0	0	84	0.33	U		
Cadmium	UG/L	0.46	GA	5	0	4	84	0.33	U		
Calcium	UG/L	275,000				84	84	53,100			
Chromium	UG/L	3.6	GA	50	0	5	84	1.2	J		
Cobalt	UG/L	2				32	84	1.1	U		
Copper	UG/L	34.7	GA	200	0	64	84	10.6			
Iron	UG/L	1,300	GA	300	21	58	84	699			
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	731			
Lead	UG/L	88.6	MCL	15	2	37	84	10.1			
Magnesium	UG/L	35,200				81	81	6,050			
Manganese	UG/L	631	GA	300	1	78	84	32.4			
Mercury	UG/L	0.507	GA	0.7	0	3	84	0.12	U		
Nickel	UG/L	5.5	GA	100	0	49	84	2.6	J		
Potassium	UG/L	7,010				78	78	2,610	J		
Selenium	UG/L	0	GA	10	0	0	84	6.1	U		
Silver	UG/L	0	GA	50	0	0	84	1.3	U		
Sodium	UG/L	550,000	GA	20,000	52	82	82	2,180			
Thallium	UG/L	0.03	MCL	2	0	1	84	0.09	U		
Vanadium	UG/L	2.3				7	84	2.3	J		
Zinc	UG/L	34.4				33	84	10.3			

Notes:
1. The lowest value for either the New York Class GA Groundwater Standards (TOGS 1.1.1, June 1998, et al.) or the EPA Maximum Contaminant Limit (MCL), source http://www.epa.gov/safewater/mcl.html#inorganic.html is used. A blank cell indicates no criteria value available.
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Draft Annual Report - Year 7 for SEAD 16 and SEAD 17
Seneca Army Depot Activity

Area								SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16	
Loc ID								MW16-5		MW16-5		MW16-5		MW16-5		MW16-5		MW16-5	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								16LM20017FIL		16LM20017UNFIL		16LM20025FIL		16LM20025UNF		16LM20031F		16LM20031U		16LM20038F	
Sample Date								11/16/2009		11/16/2009		12/15/2010		12/15/2010		12/15/2012		12/15/2012		12/16/2013	
QC Type								SA		SA		SA		SA		SA		SA		SA	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								3		3		4		4		5		5		6	
Filtered								Dissolved		Total		Dissolved		Total		Dissolved		Total		Dissolved	
Parameter	Unit	Maximum Value	Criteria Source	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																					
Aluminum	UG/L	577				30	84	24	U	164	J	23	U	160		23	UJ	50	UJ	23	UJ
Antimony	UG/L	16.3	GA	3	40	47	84	1	U	1	U	2.3	U	2	U	2.3	UJ	2	UJ	2.3	UJ
Arsenic	UG/L	2.7	MCL	10	0	8	84	3.7	U	3.7	U	1.3	U	1.3	U	2.6	J	2.7	J	1.3	UJ
Barium	UG/L	290	GA	1,000	0	84	84	42.8		42		34		33	J	34	J	39	J	40	J
Beryllium	UG/L	0	MCL	4	0	0	84	0.3	U	0.3	U	0.25	U	0.15	U	0.25	UJ	0.15	UJ	0.25	UJ
Cadmium	UG/L	0.46	GA	5	0	4	84	0.3	U	0.3	U	0.095	U	0.13	U	0.095	UJ	0.13	UJ	0.095	UJ
Calcium	UG/L	275,000				84	84	115,000	J	110,000	J	90,000		86,000		97,000	J	96,000	J	100,000	J
Chromium	UG/L	3.6	GA	50	0	5	84	0.9	U	0.9	U	2.5	U	2.5	U	2.5	UJ	2.5	UJ	2.5	UJ
Cobalt	UG/L	2				32	84	1.1	U	1.1	U	0.15	U	0.12	U	0.22	J	0.23	J	0.15	UJ
Copper	UG/L	34.7	GA	200	0	64	84	1.3	U	1.3	U	1.1	U	1.1	U	1.1	J	5	UJ	1.1	UJ
Iron	UG/L	1,300	GA	300	21	58	84	**800**	**J**	**1,150**	**J**	**480**	**J**	**660**	**J**	**1,100**	**J**	**1,300**	**J**	**440**	**J**
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	**970**	**J**	**1,323**	**J**	**680**		**820**		**1,230**	**J**	**1,430**	**J**	**670**	**J**
Lead	UG/L	88.6	MCL	15	2	37	84	2.9	U	2.9	U	0.2	U	0.77	J	0.2	UJ	0.5	UJ	0.2	UJ
Magnesium	UG/L	35,200				81	81	12,200		11,800		10,000		9,700	J	9,900	J	9,800	J	10,000	J+
Manganese	UG/L	631	GA	300	1	78	84	170		173		200		160		130	J	130	J	230	J
Mercury	UG/L	0.507	GA	0.7	0	3	84	0.1	U	0.1	U	0.091	U	0.091	U	0.1	J	0.091	UJ	0.091	UJ
Nickel	UG/L	5.5	GA	100	0	49	84	1.8	J	2	J	2	U	2	U	2.1	J	2	UJ	2	UJ
Potassium	UG/L	7,010				78	78	2,370		2,380		2,200	J	2,100	J	2,100	J	2,100	J	2,300	J
Selenium	UG/L	0	GA	10	0	0	84	6.1	U	6.1	U	1	U	1.1	U	1	UJ	1.1	UJ	1	UJ
Silver	UG/L	0	GA	50	0	0	84	1.3	U	1.3	U	0.25	U	0.18	U	0.25	UJ	0.18	UJ	0.25	UJ
Sodium	UG/L	550,000	GA	20,000	52	82	82	2,700	J	2,800	J	1,800	J	1,800	J	1,600	J	1,500	J	1,400	J
Thallium	UG/L	0.03	MCL	2	0	1	84	0.2	U	0.2	U	0.5	U	0.25	U	0.5	UJ	0.25	UJ	0.5	UJ
Vanadium	UG/L	2.3				7	84	1	U	1.1	J	3.8	U	3.2	U	3.8	UJ	3.2	UJ	3.8	UJ
Zinc	UG/L	34.4				33	84	3.6	U	3.6	U	8.3	U	8.4	U	8.3	UJ	8.4	UJ	8.3	UJ

Notes:
1. The lowest value for either the New York Class GA Groundwater Standards (TOGS 1.1.1, June 1998, et al.) or the EPA Maximum Contaminant Limit (MCL), source http://www.epa.gov/safewater/mcl.html#inorganic.html is used. A blank cell indicates no criteria value available.
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Area								SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16	
Loc ID								MW16-5		MW16-5		MW16-5		MW16-5		MW16-6		MW16-6	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								16LM20038U		16LM20039F		16LM20039U		16LM20045F		16LM20005		16LM20011	
Sample Date								12/16/2013		12/17/2013		12/17/2013		12/20/2014		12/20/2007		12/9/2008	
QC Type								SA		DU		DU		SA		SA		SA	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								6		6		6		7		1		2	
Filtered								Total		Dissolved		Total		Dissolved		Total		Total	
Parameter	Unit	Maximum Value	Criteria Source	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																			
Aluminum	UG/L	577				30	84	50	UJ	23	UJ	50	UJ	23	U	53	J	168	J	189	J
Antimony	UG/L	16.3	GA	3	40	47	84	2	UJ	2.3	UJ	2	UJ	2.3	U	2	U	1	U	0.92	J
Arsenic	UG/L	2.7	MCL	10	0	8	84	1.3	UJ	1.3	UJ	1.3	UJ	1.8	J	1.3	J	4.2	U	3.7	U
Barium	UG/L	290	GA	1,000	0	84	84	38	J	41	J	41	J	49	J	40	J	31.8		39.1	
Beryllium	UG/L	0	MCL	4	0	0	84	0.15	UJ	0.25	UJ	0.15	UJ	0.25	U	0.15	U	0.27	U	0.33	U
Cadmium	UG/L	0.46	GA	5	0	4	84	0.13	UJ	0.095	UJ	0.13	UJ	0.095	U	0.13	U	0.36	U	0.33	U
Calcium	UG/L	275,000				84	84	88,000	J	110,000	J	95,000	J	110,000		92,000		80,400	J	84,300	
Chromium	UG/L	3.6	GA	50	0	5	84	2.5	UJ	2.5	UJ	2.5	UJ	2.5	U	2.5	U	0.84	U	0.88	U
Cobalt	UG/L	2				32	84	0.12	UJ	0.15	UJ	0.12	UJ	0.15	U	0.12	U	0.89	U	1.1	U
Copper	UG/L	34.7	GA	200	0	64	84	1.1	UJ	1.1	UJ	1.1	UJ	1.1	U	3.1	J	3.4	J	2.1	J
Iron	UG/L	1,300	GA	300	21	58	84	510	J	490	J	530	J	360	J	280	J	418		153	
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	680	J	710	J	720	J	520	J	410	J	441		158	
Lead	UG/L	88.6	MCL	15	2	37	84	0.5	UJ	0.22	J	0.5	UJ	0.2	U	0.5	U	2.9	U	2.9	U
Magnesium	UG/L	35,200				81	81	9,500	J	11,000	J+	10,000	J	11,000		9,000		7,100	R	7,380	
Manganese	UG/L	631	GA	300	1	78	84	170	J	220	J	190	J	160	J	130	J	23.3		4.8	
Mercury	UG/L	0.507	GA	0.7	0	3	84	0.091	UJ	0.091	UJ	0.091	UJ	0.091	U	0.091	U	0.12	U	0.12	U
Nickel	UG/L	5.5	GA	100	0	49	84	2	UJ	2	UJ	2	UJ	2.1	J	2.3	J	1.2	U	1	U
Potassium	UG/L	7,010				78	78	1,900	J	2,300	J	2,100	J	3,500	J	2,800	J	2,690	R	2,310	J
Selenium	UG/L	0	GA	10	0	0	84	1.1	UJ	1	UJ	1.1	UJ	1	U	1.1	U	6.1	U	6.1	U
Silver	UG/L	0	GA	50	0	0	84	0.18	UJ	0.25	UJ	0.18	UJ	0.25	U	0.18	U	1	U	1.3	U
Sodium	UG/L	550,000	GA	20,000	52	82	82	1,300	J	1,400	J	1,300	J	1,900		1,600		6,110	R	9,200	
Thallium	UG/L	0.03	MCL	2	0	1	84	0.25	UJ	0.5	UJ	0.25	UJ	0.5	U	0.25	U	0.03	U	0.09	U
Vanadium	UG/L	2.3				7	84	3.2	UJ	3.8	UJ	3.2	UJ	3.8	U	3.2	U	0.86	J	0.98	U
Zinc	UG/L	34.4				33	84	8.4	UJ	8.3	UJ	8.4	UJ	8.3	U	8.4	U	5.5	J	3.7	J

Notes:
1. The lowest value for either the New York Class GA Groundwater Standards (TOGS 1.1.1, June 1998, et al.) or the EPA Maximum Contaminant Limit (MCL), source http://www.epa.gov/safewater/mcl.html#inorganic.html is used. A blank cell indicates no criteria value available.
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Area								SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16	
Loc ID								MW16-6		MW16-6		MW16-6		MW16-6		MW16-6		MW16-6	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								16LM20018FIL		16LM20018UNFIL		16LM20026FIL		16LM20026UNF		16LM20032F		16LM20032U		16LM20040F	
Sample Date								11/17/2009		11/17/2009		12/15/2010		12/15/2010		12/15/2012		12/15/2012		12/17/2013	
QC Type								SA		SA		SA		SA		SA		SA		SA	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								3		3		4		4		5		5		6	
Filtered								Dissolved		Total		Dissolved		Total		Dissolved		Total		Dissolved	
Parameter	Unit	Maximum Value	Criteria Source	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																					
Aluminum	UG/L	577				30	84	107	J	442		23	U	61	J	23	UJ	300	J	23	UJ
Antimony	UG/L	16.3	GA	3	40	47	84	0.9	J	1	U	2.3	U	2	U	2.3	UJ	2	UJ	2.3	UJ
Arsenic	UG/L	2.7	MCL	10	0	8	84	3.7	U	3.7	U	1.3	U	1.3	U	1.3	UJ	1.3	J	1.3	UJ
Barium	UG/L	290	GA	1,000	0	84	84	78.5		80.2		44		50	J	41	J	45	J	53	J
Beryllium	UG/L	0	MCL	4	0	0	84	0.3	U	0.3	U	0.25	U	0.15	U	0.25	UJ	0.15	UJ	0.25	UJ
Cadmium	UG/L	0.46	GA	5	0	4	84	0.3	U	0.3	U	0.095	U	0.13	U	0.095	UJ	0.13	UJ	0.095	UJ
Calcium	UG/L	275,000				84	84	112,000	J	112,000	J	68,000		78,000		70,000	J	74,000	J	92,000	J
Chromium	UG/L	3.6	GA	50	0	5	84	0.9	U	0.9	U	2.5	U	2.5	U	2.5	UJ	2.5	UJ	2.5	UJ
Cobalt	UG/L	2				32	84	1.1	U	1.1	U	0.15	U	0.12	U	0.18	J	0.43	J	0.35	J
Copper	UG/L	34.7	GA	200	0	64	84	1.9	J	2.5	J	1.5	J	2	J	4.5	J	5	UJ	1.1	UJ
Iron	UG/L	1,300	GA	300	21	58	84	55	J	**440**	**J**	33	U	110	J	33	J	**790**	**J**	180	J
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	153.4	J	**515**	**J**	2.1	J	113.5	J	43	J	**816**	**J**	340	J
Lead	UG/L	88.6	MCL	15	2	37	84	2.9	U	2.9	U	0.2	U	0.5	U	0.2	UJ	0.5	UJ	0.2	UJ
Magnesium	UG/L	35,200				81	81	9,970		9,950		6,600		7,600	J	7,200	J	7,600	J	9,500	J+
Manganese	UG/L	631	GA	300	1	78	84	98.4		75		2.1	J	3.5	J	10	J	26	J	160	J
Mercury	UG/L	0.507	GA	0.7	0	3	84	0.1	U	0.1	U	0.091	U	0.091	U	0.091	UJ	0.091	UJ	0.091	UJ
Nickel	UG/L	5.5	GA	100	0	49	84	1.2	J	2.6	J	2	U	2	U	2	UJ	2	J	2	UJ
Potassium	UG/L	7,010				78	78	2,380		2,580		1,500		1,800		2,400	J	2,400	J	1,900	J
Selenium	UG/L	0	GA	10	0	0	84	6.1	U	6.1	U	1	U	1.1	U	1	UJ	1.1	UJ	1	UJ
Silver	UG/L	0	GA	50	0	0	84	1.3	U	1.3	U	0.25	U	0.18	U	0.25	UJ	0.18	UJ	0.25	UJ
Sodium	UG/L	550,000	GA	20,000	52	82	82	**22,000**	**J**	**20,600**	**J**	7,600	J	8,400	J	8,700	J	8,000	J	14,000	J
Thallium	UG/L	0.03	MCL	2	0	1	84	0.008	U	0.008	U	0.5	U	0.25	U	0.5	UJ	0.25	UJ	0.5	UJ
Vanadium	UG/L	2.3				7	84	1	U	1.3	J	3.8	U	3.2	U	3.8	UJ	3.2	UJ	3.8	UJ
Zinc	UG/L	34.4				33	84	3.6	U	3.6	U	8.3	U	8.4	U	8.3	UJ	8.4	UJ	8.3	UJ

Notes:
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Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 7)
Draft Annual Report - Year 7 for SEAD 16 and SEAD 17
Seneca Army Depot Activity

Area								SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16	
Loc ID								MW16-6		MW16-6		MW16-6		MW16-7		MW16-7		MW16-7	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								16LM20040U		16LM20046F		16LM20046U		16LM20006		16LM20012		16LM20019FIL		16LM20019UNFIL	
Sample Date								12/17/2013		12/21/2014		12/21/2014		12/20/2007		12/10/2008		11/12/2009		11/12/2009	
QC Type								SA		SA		SA		SA		SA		SA		SA	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								6		7		7		1		2		3		3	
Filtered								Total		Dissolved		Total		Total		Total		Dissolved		Total	
Parameter	Unit	Maximum Value	Criteria Source	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																					
Aluminum	UG/L	577				30	84	50	UJ	23	U	140		45.9	J	577		32	J	182	J
Antimony	UG/L	16.3	GA	3	40	47	84	2	UJ	2.3	U	2	U	9.56		13.6		15.2		15.7	
Arsenic	UG/L	2.7	MCL	10	0	8	84	1.3	UJ	1.3	U	1.3	U	4.2	U	3.7	U	3.7	U	3.7	U
Barium	UG/L	290	GA	1,000	0	84	84	58	J	58		58		170		122		83.6		81.6	
Beryllium	UG/L	0	MCL	4	0	0	84	0.15	UJ	0.25	U	0.15	U	0.27	U	0.33	U	0.3	U	0.3	U
Cadmium	UG/L	0.46	GA	5	0	4	84	0.13	UJ	0.095	U	0.13	U	0.46	J	0.33	U	0.3	U	0.3	U
Calcium	UG/L	275,000				84	84	84,000	J	83,000		83,000		194,000		133,000		85,000	J	84,600	J
Chromium	UG/L	3.6	GA	50	0	5	84	2.5	UJ	2.5	U	2.5	U	0.84	U	1.6	J	0.9	U	0.9	U
Cobalt	UG/L	2				32	84	0.34	J	0.15	U	0.12	U	1.6	J	1.1	J	1.1	U	1.1	U
Copper	UG/L	34.7	GA	200	0	64	84	1.1	UJ	2.3	J	2.8	J	34.7		20.2		3.1	J	5	J
Iron	UG/L	1,300	GA	300	21	58	84	210	J	57	J	140		29.2	J	770		19	UJ	135	J
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	360	J	58.8	J	148.4		660	J	990		136		244	J
Lead	UG/L	88.6	MCL	15	2	37	84	0.54	J	0.2	U	0.5	U	26.5		88.6		4.4	J	12.1	
Magnesium	UG/L	35,200				81	81	9,500	J	8,300		8,500		32,000	J	25,100		15,900		16,500	
Manganese	UG/L	631	GA	300	1	78	84	150	J	1.8	J	8.4		631		220		136		109	
Mercury	UG/L	0.507	GA	0.7	0	3	84	0.091	UJ	0.091	U	0.091	U	0.507		0.12	U	0.1	U	0.1	U
Nickel	UG/L	5.5	GA	100	0	49	84	2	UJ	2.2	J	2	U	5.5	J	2.6	J	1.9	J	1.7	J
Potassium	UG/L	7,010				78	78	1,800	J	2,100		2,000		5,480	J	5,670	J	6,520		5,780	
Selenium	UG/L	0	GA	10	0	0	84	1.1	UJ	1	U	1.1	U	6.1	U	6.1	U	6.1	U	6.1	U
Silver	UG/L	0	GA	50	0	0	84	0.18	UJ	0.25	U	0.18	U	1	U	1.3	U	1.3	U	1.3	U
Sodium	UG/L	550,000	GA	20,000	52	82	82	13,000	J	8,500		8,300		68,400	J	74,900		62,100	J	47,100	J
Thallium	UG/L	0.03	MCL	2	0	1	84	0.25	UJ	0.5	U	0.25	U	0.03	J	0.09	U	0.2	U	0.2	U
Vanadium	UG/L	2.3				7	84	3.2	UJ	3.8	U	3.2	U	0.78	U	0.98	U	1	U	1	U
Zinc	UG/L	34.4				33	84	8.4	UJ	8.3	U	8.4	U	3.6	U	8.6	J	3.6	U	3.6	U

Notes:
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Area								SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16
Loc ID								MW16-7	MW16-7	MW16-7	MW16-7	MW16-7	MW16-7	MW16-7
Matrix								GW	GW	GW	GW	GW	GW	GW
Sample ID								16LM20020FIL	16LM20020UNFIL	16LM20027FIL	16LM20027UNF	16LM20033F	16LM20033U	16LM20034F
Sample Date								11/12/2009	11/12/2009	12/15/2010	12/15/2010	12/15/2012	12/15/2012	12/15/2012
QC Type								DU	DU	SA	SA	SA	SA	DU
Study ID								LTM	LTM	LTM	LTM	LTM	LTM	LTM
Sample Round								3	3	4	4	5	5	5
Filtered								Dissolved	Total	Dissolved	Total	Dissolved	Total	Dissolved
Parameter	Unit	Maximum Value	Criteria Source	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual
Inorganics														
Aluminum	UG/L	577				30	84	25 J	116 J	23 U	50 U	23 UJ	50 UJ	23 UJ
Antimony	UG/L	16.3	GA	3	40	47	84	13.9	16.3	15	16	13 J	13 J	13 J
Arsenic	UG/L	2.7	MCL	10	0	8	84	3.7 U	3.7 U	1.3 U	1.3 U	1.3 J	1.3 UJ	1.3 UJ
Barium	UG/L	290	GA	1,000	0	84	84	83.9	80.3	69	71 J	100 J	100 J	99 J
Beryllium	UG/L	0	MCL	4	0	0	84	0.3 U	0.3 U	0.25 U	0.15 U	0.25 UJ	0.15 UJ	0.25 UJ
Cadmium	UG/L	0.46	GA	5	0	4	84	0.3 U	0.3 U	0.095 U	0.13 U	0.095 UJ	0.13 UJ	0.095 UJ
Calcium	UG/L	275,000				84	84	81,900 J	82,800 J	82,000	86,000	110,000 J	100,000 J	100,000 J
Chromium	UG/L	3.6	GA	50	0	5	84	0.9 U	0.9 U	2.5 U	2.5 U	2.5 UJ	2.5 UJ	2.5 UJ
Cobalt	UG/L	2				32	84	1.1 U	1.1 U	0.15 U	0.12 U	0.23 J	0.22 J	0.24 J
Copper	UG/L	34.7	GA	200	0	64	84	3.5 J	4.1 J	1.8 J	2.7 J	4.1 J	8.3 J	1.7 J
Iron	UG/L	1,300	GA	300	21	58	84	19 UJ	61 J	33 U	45 J	33 UJ	44 UJ	33 UJ
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	152	168 J	35	79	92 J	90 J	98 J
Lead	UG/L	88.6	MCL	15	2	37	84	4.9 J	9.4	1 J	6.3	1.3 J	2.5 J	2.3 J
Magnesium	UG/L	35,200				81	81	14,800	16,200	18,000	19,000 J	21,000 J	21,000 J	20,000 J
Manganese	UG/L	631	GA	300	1	78	84	152	107	35	34	92 J	90 J	98 J
Mercury	UG/L	0.507	GA	0.7	0	3	84	0.1 U	0.1 U	0.091 U	0.091 U	0.091 UJ	0.091 UJ	0.091 UJ
Nickel	UG/L	5.5	GA	100	0	49	84	2 J	1.1 J	2 U	2 U	2 UJ	2.2 J	2 UJ
Potassium	UG/L	7,010				78	78	7,010	5,630	2,800 J	2,700 J	5,300 J	5,200 J	5,100 J
Selenium	UG/L	0	GA	10	0	0	84	6.1 U	6.1 U	1 U	1.1 U	1 UJ	1.1 UJ	1 UJ
Silver	UG/L	0	GA	50	0	0	84	1.3 U	1.3 U	0.25 U	0.18 U	0.25 UJ	0.18 UJ	0.25 UJ
Sodium	UG/L	550,000	GA	20,000	52	82	82	55,900 J	46,100 J	29,000 J	28,000 J	35,000 J	32,000 J	33,000 J
Thallium	UG/L	0.03	MCL	2	0	1	84	0.2 U	0.2 U	0.5 U	0.25 U	0.5 UJ	0.25 UJ	0.5 UJ
Vanadium	UG/L	2.3				7	84	1 U	1 U	3.8 U	3.2 U	3.8 UJ	3.2 UJ	3.8 UJ
Zinc	UG/L	34.4				33	84	3.6 U	3.6 U	8.3 U	8.4 U	8.3 UJ	8.4 UJ	8.3 UJ

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Area								SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16
Loc ID								MW16-7	MW16-7	MW16-7	MW16-7	MW16-7	MW16-7	MW16-7
Matrix								GW	GW	GW	GW	GW	GW	GW
Sample ID								16LM20034U	16LM20041F	16LM20041U	16LM20047F	16LM20047U	16LM20048F	16LM20048U
Sample Date								12/15/2012	12/17/2013	12/17/2013	12/20/2014	12/20/2014	12/20/2014	12/20/2014
QC Type								DU	SA	SA	SA	SA	DU	DU
Study ID								LTM	LTM	LTM	LTM	LTM	LTM	LTM
Sample Round								5	6	6	7	7	7	7
Filtered								Total	Dissolved	Total	Dissolved	Total	Dissolved	Total
Parameter	Unit	Maximum Value	Criteria Source	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual
Inorganics														
Aluminum	UG/L	577				30	84	50 UJ	23 UJ	50 UJ	29 J	50 U	23 U	50 U
Antimony	UG/L	16.3	GA	3	40	47	84	14 J	16 J	15 J	16	15	15	14
Arsenic	UG/L	2.7	MCL	10	0	8	84	1.3 UJ	1.3 UJ	1.3 UJ	1.3 U	1.3 U	1.3 U	1.3 U
Barium	UG/L	290	GA	1,000	0	84	84	100 J	100 J	100 J	110	95	110	100
Beryllium	UG/L	0	MCL	4	0	0	84	0.15 UJ	0.25 UJ	0.15 UJ	0.25 U	0.15 U	0.25 U	0.15 U
Cadmium	UG/L	0.46	GA	5	0	4	84	0.13 UJ	0.095 UJ	0.13 UJ	0.095 U	0.13 U	0.095 U	0.13 U
Calcium	UG/L	275,000				84	84	110,000 J	120,000 J	110,000 J	110,000	100,000	110,000	110,000
Chromium	UG/L	3.6	GA	50	0	5	84	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 U	2.5 U	2.5 U
Cobalt	UG/L	2				32	84	0.24 J	0.19 J	0.2 J	0.25 J	0.12 U	0.15 U	0.12 U
Copper	UG/L	34.7	GA	200	0	64	84	5.6 J	3.4 J	2.5 J	3.2 J	3.6 J	3.3 J	3.8 J
Iron	UG/L	1,300	GA	300	21	58	84	44 UJ	33 UJ	44 UJ	52 J	44 U	33 U	44 U
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	91 J	16 J	15 J	80 J	23 J	38 J	33 J
Lead	UG/L	88.6	MCL	15	2	37	84	2.6 J	1.9 J	6 J	1.8	4.2	1.8	4.1
Magnesium	UG/L	35,200				81	81	22,000 J	26,000 J+	27,000 J	23,000	22,000	23,000	21,000
Manganese	UG/L	631	GA	300	1	78	84	91 J	16 J	15 J	28 J	23 J	38 J	33 J
Mercury	UG/L	0.507	GA	0.7	0	3	84	0.091 UJ	0.091 UJ	0.091 UJ	0.091 U	0.091 U	0.091 U	0.091 U
Nickel	UG/L	5.5	GA	100	0	49	84	2.4 J	2 UJ	2 UJ	3.2 J	2.4 J	2 J	2 U
Potassium	UG/L	7,010				78	78	5,400 J	3,100 J	2,900 J	3,700	3,500	4,600	3,900
Selenium	UG/L	0	GA	10	0	0	84	1.1 UJ	1 UJ	1.1 UJ	1 U	1.1 U	1 U	1.1 U
Silver	UG/L	0	GA	50	0	0	84	0.18 UJ	0.25 UJ	0.18 UJ	0.25 U	0.18 U	0.25 U	0.18 U
Sodium	UG/L	550,000	GA	20,000	52	82	82	32,000 J	28,000 J	27,000 J	30,000	29,000	36,000	33,000
Thallium	UG/L	0.03	MCL	2	0	1	84	0.25 UJ	0.5 UJ	0.25 UJ	0.5 U	0.25 U	0.5 U	0.25 U
Vanadium	UG/L	2.3				7	84	3.2 UJ	3.8 UJ	3.2 UJ	3.8 U	3.2 U	3.8 U	3.2 U
Zinc	UG/L	34.4				33	84	8.4 UJ	8.3 UJ	8.4 UJ	8.3 U	8.4 U	8.7 J	8.4 U

Notes:
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Area								SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Loc ID								MW17-1		MW17-1		MW17-1		MW17-1		MW17-1		MW17-1	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								17LM20000		17LM20005		17LM20010FIL		17LM20010UNFIL		17LM20016FIL		17LM20016UNF	17LM20020F
Sample Date								12/20/2007		12/11/2008		11/18/2009		11/18/2009		12/17/2010		12/17/2010	12/11/2012
QC Type								SA		SA		SA		SA		SA		SA	SA
Study ID								LTM		LTM		LTM		LTM		LTM		LTM	LTM
Sample Round								1		2		3		3		4		4	5
Filtered								Total		Total		Dissolved		Total		Dissolved		Total	Dissolved
Parameter	Unit	Maximum Value	Criteria Source	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																					
Aluminum	UG/L	19,600				22	60	204		219		37	J	59	J	23	U	50	U	23	UJ
Antimony	UG/L	4.4	GA	3	6	14	60	1	U	1	U	1	U	1	U	2.3	U	2	U	2.3	UJ
Arsenic	UG/L	7.8	MCL	10	0	2	60	4.2	U	3.7	U	3.7	U	3.7	U	1.3	U	1.3	U	1.3	UJ
Barium	UG/L	251	GA	1,000	0	60	60	70		79		99.1		99		61		63	J	28	J
Beryllium	UG/L	1.2	MCL	4	0	1	60	0.27	U	0.33	U	0.3	U	0.3	U	0.25	U	0.15	U	0.25	UJ
Cadmium	UG/L	1.7	GA	5	0	4	60	0.36	U	0.33	U	0.3	U	0.3	U	0.095	U	0.13	U	0.095	UJ
Calcium	UG/L	195,000				60	60	98,300	J	95,600		109,000	J	108,000	J	96,000		100,000		53,000	J
Chromium	UG/L	37.2	GA	50	0	4	60	0.84	U	0.88	U	0.9	U	0.9	U	2.5	U	2.5	U	2.5	UJ
Cobalt	UG/L	10.5				39	60	0.89	U	1.1	U	1.1	U	1.1	U	0.15	U	0.3	J	0.32	J
Copper	UG/L	46.7	GA	200	0	32	60	1.3	U	1.3	U	1.3	U	1.3	U	1.1	U	1.1	J	4.7	J
Iron	UG/L	25,500	GA	300	14	46	60	106		126		19	UJ	42	J	33	U	270	J	47	J
Iron+Manganese	UG/L	25,929	GA	500	13	56	60	119		141		38.9		67.6	J	4.2	J	312		54.2	J
Lead	UG/L	103	MCL	15	1	10	60	2.9	U	2.9	U	2.9	U	2.9	U	0.2	U	0.5	U	0.2	UJ
Magnesium	UG/L	27,300				57	57	21,800	J	20,600		24,300		24,000		19,000		20,000	J	7,200	J
Manganese	UG/L	911	GA	300	2	56	60	13.2		14.9		38.9		25.6		4.2	J	42		7.2	J
Mercury	UG/L	0.14	GA	0.7	0	2	60	0.12	U	0.12	U	0.1	U	0.1	U	0.091	U	0.091	U	0.14	J
Nickel	UG/L	34	GA	100	0	21	60	1.2	U	1.3	J	1	U	1	U	2	U	2	U	2	UJ
Potassium	UG/L	7,810				54	55	614	R	462	J	260	J	254	J	690		690	J	380	J
Selenium	UG/L	0	GA	10	0	0	60	6.1	U	6.1	U	6.1	U	6.1	U	1	U	1.1	U	1	UJ
Silver	UG/L	0	GA	50	0	0	60	1	U	1.3	U	1.3	U	1.3	U	0.25	U	0.18	U	0.25	UJ
Sodium	UG/L	366,000	GA	20,000	4	56	56	7,790	R	8,380		7,300	J	7,400	J	6,000	J	6,200	J	2,400	J
Thallium	UG/L	0.08	MCL	2	0	2	60	0.03	U	0.09	U	0.008	U	0.008	U	0.5	U	0.25	U	0.5	UJ
Vanadium	UG/L	32.8				2	60	0.78	U	0.98	U	1	U	1	U	3.8	U	3.2	U	3.8	UJ
Zinc	UG/L	935				33	60	4.7	J	4	J	3.6	U	3.6	U	8.3	U	8.4	U	8.3	UJ

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Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 7)
Draft Annual Report - Year 7 for SEAD 16 and SEAD 17
Seneca Army Depot Activity

Area								SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17
Loc ID								MW17-1	MW17-1	MW17-1	MW17-1	MW17-1	MW17-2	MW17-2
Matrix								GW	GW	GW	GW	GW	GW	GW
Sample ID								17LM20020U	17LM20025F	17LM20025U	17LM20030F	17LM20030U	17LM20001	17LM20006
Sample Date								12/11/2012	12/15/2013	12/15/2013	12/20/2014	12/20/2014	12/20/2007	12/10/2008
QC Type								SA	SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM	LTM
Sample Round								5	6	6	7	7	1	2
Filtered								Total	Dissolved	Total	Dissolved	Total	Total	Total
Parameter	Unit	Maximum Value	Criteria Source	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual
Inorganics														
Aluminum	UG/L	19,600				22	60	50 UJ	23 UJ	50 UJ	23 U	50 U	110 J	142 J
Antimony	UG/L	4.4	GA	3	6	14	60	2.7 J	2.3 UJ	2 UJ	2.3 U	2 U	3.44	2.76
Arsenic	UG/L	7.8	MCL	10	0	2	60	1.3 UJ	1.3 J	1.3 UJ	1.3 U	1.3 U	4.2 U	3.7 U
Barium	UG/L	251	GA	1,000	0	60	60	28 J	60 J	56 J	44	41	58.8	51.8
Beryllium	UG/L	1.2	MCL	4	0	1	60	0.15 UJ	0.25 UJ	0.15 UJ	0.25 U	0.15 U	0.27 U	0.33 U
Cadmium	UG/L	1.7	GA	5	0	4	60	0.44 J	0.095 UJ	0.13 UJ	0.095 U	0.13 U	0.36 U	0.33 U
Calcium	UG/L	195,000				60	60	55,000 J	120,000 J	91,000 J	81,000	77,000	110,000 J	112,000
Chromium	UG/L	37.2	GA	50	0	4	60	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 U	0.84 U	2.9 J
Cobalt	UG/L	10.5				39	60	0.37 J	0.34 J	0.29 J	0.19 J	0.16 J	0.89 U	1.1 U
Copper	UG/L	46.7	GA	200	0	32	60	5.4 J	1.1 UJ	1.1 UJ	3.5 J	3.6 J	6.2 J	4.4 J
Iron	UG/L	25,500	GA	300	14	46	60	90 J	600 J	680 J	190	79 J	140	115
Iron+Manganese	UG/L	25,929	GA	500	13	56	60	98.1 J	897 J	765 J	199.6	87.7	160	121
Lead	UG/L	103	MCL	15	1	10	60	1.1 J	0.2 UJ	0.5 UJ	0.23 J	0.5 U	2.9 U	2.9 U
Magnesium	UG/L	27,300				57	57	7,700 J	24,000 J+	19,000 J	14,000	13,000	11,000 R	11,200
Manganese	UG/L	911	GA	300	2	56	60	8.1 J	97 J	85 J	9.6	8.7	20.5	6.1
Mercury	UG/L	0.14	GA	0.7	0	2	60	0.091 UJ	0.091 UJ	0.091 UJ	0.091 U	0.091 U	0.12 U	0.12 U
Nickel	UG/L	34	GA	100	0	21	60	2 UJ	2 UJ	2 UJ	2.5 J	2 U	1.2 U	2.8 J
Potassium	UG/L	7,810				54	55	410 J	500 J	400 J	280 J	330 U	1,690 R	1,260 J
Selenium	UG/L	0	GA	10	0	0	60	1.1 UJ	1 UJ	1.1 UJ	1 U	1.1 U	6.1 U	6.1 U
Silver	UG/L	0	GA	50	0	0	60	0.18 UJ	0.25 UJ	0.18 UJ	0.25 U	0.18 U	1 U	1.3 U
Sodium	UG/L	366,000	GA	20,000	4	56	56	2,500 J	6,000 J	4,800 J	3,700	3,500	6,620 R	7,860
Thallium	UG/L	0.08	MCL	2	0	2	60	0.25 UJ	0.5 UJ	0.25 UJ	0.5 U	0.25 U	0.03 U	0.09 U
Vanadium	UG/L	32.8				2	60	3.2 UJ	3.8 UJ	3.2 UJ	3.8 U	3.2 U	0.78 U	0.98 U
Zinc	UG/L	935				33	60	8.4 UJ	8.3 UJ	8.4 UJ	12 J	9 J	72 J	27.6

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Seneca Army Depot Activity

Area								SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Loc ID								MW17-2		MW17-2		MW17-2		MW17-2		MW17-2		MW17-2	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								17LM20011FIL		17LM20011UNFIL		17LM20015FIL		17LM20015UNF		17LM20021F		17LM20021U		17LM20026F	
Sample Date								11/17/2009		11/17/2009		12/16/2010		12/16/2010		12/11/2012		12/11/2012		12/15/2013	
QC Type								SA		SA		SA		SA		SA		SA		SA	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								3		3		4		4		5		5		6	
Filtered								Dissolved		Total		Dissolved		Total		Dissolved		Total		Dissolved	
Parameter	Unit	Maximum Value	Criteria Source	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																					
Aluminum	UG/L	19,600				22	60	88	J	19,600		23	U	51	J	23	UJ	50	UJ	23	UJ
Antimony	UG/L	4.4	GA	3	6	14	60	2.2		3.7		2.3	U	2	U	4	J	4.4	J	2.3	UJ
Arsenic	UG/L	7.8	MCL	10	0	2	60	3.7	U	7.8	J	1.3	U	1.3	U	1.3	UJ	1.3	UJ	1.3	UJ
Barium	UG/L	251	GA	1,000	0	60	60	82.3		251		54		58	J	69	J	68	J	46	J
Beryllium	UG/L	1.2	MCL	4	0	1	60	0.3	U	1.2	J	0.25	U	0.15	U	0.25	UJ	0.15	UJ	0.25	UJ
Cadmium	UG/L	1.7	GA	5	0	4	60	0.3	U	1.7		0.095	U	0.13	U	0.095	UJ	0.13	UJ	0.095	UJ
Calcium	UG/L	195,000				60	60	154,000	J	195,000	J	140,000		150,000		120,000	J	120,000	J	180,000	J
Chromium	UG/L	37.2	GA	50	0	4	60	0.9	U	37.2		2.5	U	2.5	U	2.5	UJ	2.5	UJ	2.5	UJ
Cobalt	UG/L	10.5				39	60	1.1	U	10.5		0.32	J	0.46	J	0.39	J	0.42	J	0.44	J
Copper	UG/L	46.7	GA	200	0	32	60	2.9	J	46.7		1.5	J	1.9	J	7.7	J	7.8	J	1.1	UJ
Iron	UG/L	25,500	GA	300	14	46	60	19	UJ	25,500	J	33	U	130	J	33	UJ	44	UJ	520	J
Iron+Manganese	UG/L	25,929	GA	500	13	56	60	1.5	J	25,929	J	23		173		12	J	14	J	594	J
Lead	UG/L	103	MCL	15	1	10	60	2.9	U	103		0.2	U	0.6	J	0.2	UJ	0.99	J	0.2	UJ
Magnesium	UG/L	27,300				57	57	18,200		23,300		18,000		19,000	J	12,000	J	12,000	J	24,000	J+
Manganese	UG/L	911	GA	300	2	56	60	1.5	J	429		23		43		12	J	14	J	74	J
Mercury	UG/L	0.14	GA	0.7	0	2	60	0.1	U	0.1	U	0.091	U	0.091	U	0.091	UJ	0.091	UJ	0.091	UJ
Nickel	UG/L	34	GA	100	0	21	60	1.2	J	34		2	U	2	U	2	UJ	2	UJ	2	UJ
Potassium	UG/L	7,810				54	55	2,390		7,810		1,300	J	1,300		2,500	J	2,500	J	1,100	J
Selenium	UG/L	0	GA	10	0	0	60	6.1	U	6.1	U	1	U	1.1	U	1	UJ	1.1	UJ	1	UJ
Silver	UG/L	0	GA	50	0	0	60	1.3	U	1.3	U	0.25	U	0.18	U	0.25	UJ	0.18	UJ	0.25	UJ
Sodium	UG/L	366,000	GA	20,000	4	56	56	19,800	J	20,300	J	14,000	J	14,000	J	8,400	J	8,400	J	16,000	J
Thallium	UG/L	0.08	MCL	2	0	2	60	0.008	U	0.2	U	0.5	U	0.25	U	0.5	UJ	0.25	UJ	0.5	UJ
Vanadium	UG/L	32.8				2	60	1	U	32.8		3.8	U	3.2	U	3.8	UJ	3.2	UJ	3.8	UJ
Zinc	UG/L	935				33	60	28.6		935		17	J	21		24	J	26	J	11	J

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Area								SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Loc ID								MW17-2		MW17-2		MW17-2		MW17-3		MW17-3		MW17-3	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								17LM20026U		17LM20031F		17LM20031U		17LM20002		17LM20007		17LM20012FIL		17LM20012UNFIL	
Sample Date								12/15/2013		12/20/2014		12/20/2014		12/20/2007		12/10/2008		11/18/2009		11/18/2009	
QC Type								SA		SA		SA		SA		SA		SA		SA	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								6		7		7		1		2		3		3	
Filtered								Total		Dissolved		Total		Total		Total		Dissolved		Total	
Parameter	Unit	Maximum Value	Criteria Source	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																					
Aluminum	UG/L	19,600				22	60	50	UJ	23	U	50	U	106	J	386		141	J	1,550	J
Antimony	UG/L	4.4	GA	3	6	14	60	2	UJ	3.2	J	3.3	J	1	U	1	U	1	U	1.5	
Arsenic	UG/L	7.8	MCL	10	0	2	60	1.3	UJ	1.3	U	1.3	U	4.2	U	3.7	U	3.7	U	3.7	U
Barium	UG/L	251	GA	1,000	0	60	60	47	J	63		57		39		29.3		49.4		54.5	
Beryllium	UG/L	1.2	MCL	4	0	1	60	0.15	UJ	0.25	U	0.15	U	0.27	U	0.33	U	0.3	U	0.3	U
Cadmium	UG/L	1.7	GA	5	0	4	60	0.13	UJ	0.12	J	0.14	J	0.36	U	0.33	U	0.3	U	0.3	U
Calcium	UG/L	195,000				60	60	150,000	J	130,000		120,000		69,000	J	67,200		99,400	J	95,900	J
Chromium	UG/L	37.2	GA	50	0	4	60	2.5	UJ	2.5	U	2.5	U	0.84	U	0.88	U	0.9	U	5.2	
Cobalt	UG/L	10.5				39	60	0.38	J	0.15	U	0.13	J	0.89	U	1.1	U	1.5	J	1.7	J
Copper	UG/L	46.7	GA	200	0	32	60	1.1	UJ	6.4		6.3		2.6	J	2.8	J	2.5	J	7.9	J
Iron	UG/L	25,500	GA	300	14	46	60	470	J	33	U	46	J	133		1,300		827	J	2,690	J
Iron+Manganese	UG/L	25,929	GA	500	13	56	60	534	J	2	J	50.1	J	170		1,573		968	J	2,858	J
Lead	UG/L	103	MCL	15	1	10	60	0.5	UJ	0.2	U	0.5	U	2.9	U	2.9	U	2.9	U	8.6	
Magnesium	UG/L	27,300				57	57	22,000	J	13,000		11,000		7,560	R	7,400		9,850		9,170	
Manganese	UG/L	911	GA	300	2	56	60	64	J	2	J	4.1	J	36.7		273		141		168	
Mercury	UG/L	0.14	GA	0.7	0	2	60	0.091	UJ	0.091	U	0.091	U	0.12	U	0.12	U	0.1	U	0.1	U
Nickel	UG/L	34	GA	100	0	21	60	2	UJ	2	U	2.2	J	1.2	U	1.8	J	3.1	J	4.5	J
Potassium	UG/L	7,810				54	55	1,000	J	1,600		1,600		2,620	R	1,840	J	1,290		1,590	
Selenium	UG/L	0	GA	10	0	0	60	1.1	UJ	1	U	1.1	U	6.1	U	6.1	U	6.1	U	6.1	U
Silver	UG/L	0	GA	50	0	0	60	0.18	UJ	0.25	U	0.18	U	1	U	1.3	U	1.3	U	1.3	U
Sodium	UG/L	366,000	GA	20,000	4	56	56	14,000	J	8,800		7,800		4,550	R	5,500		7,500	J	6,200	J
Thallium	UG/L	0.08	MCL	2	0	2	60	0.25	UJ	0.5	U	0.25	U	0.03	U	0.09	U	0.008	U	0.008	U
Vanadium	UG/L	32.8				2	60	3.2	UJ	3.8	U	3.2	U	0.78	U	0.98	U	1	U	1.7	J
Zinc	UG/L	935				33	60	9.3	J	28	J	40	J	27	J	14.2		21.1		45.7	

Notes:
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								SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Area								MW17-3		MW17-3		MW17-3		MW17-3		MW17-3		MW17-3	
Loc ID								GW		GW		GW		GW		GW		GW	
Matrix								17LM20017FIL		17LM20017UNF		17LM20022F		17LM20022U		17LM20027F		17LM20027U		17LM20032F
Sample ID								12/16/2010		12/16/2010		12/11/2012		12/11/2012		12/15/2013		12/15/2013		12/20/2014
Sample Date								SA		SA		SA		SA		SA		SA		SA
QC Type								LTM		LTM		LTM		LTM		LTM		LTM		LTM
Study ID								4		4		5		5		6		6		7
Sample Round								Dissolved		Total		Dissolved		Total		Dissolved		Total		Dissolved
Filtered																				
Parameter	Unit	Maximum Value	Criteria Source	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																					
Aluminum	UG/L	19,600				22	60	23	U	50	U	23	UJ	50	UJ	23	UJ	50	UJ	23	U
Antimony	UG/L	4.4	GA	3	6	14	60	2.3	U	2	U	2.3	UJ	2	UJ	2.3	UJ	2	UJ	2.3	U
Arsenic	UG/L	7.8	MCL	10	0	2	60	1.3	U	1.3	U	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ	1.3	U
Barium	UG/L	251	GA	1,000	0	60	60	37		38	J	37	J	36	J	52	J	53	J	41	
Beryllium	UG/L	1.2	MCL	4	0	1	60	0.25	U	0.15	U	0.25	UJ	0.15	UJ	0.25	UJ	0.15	UJ	0.25	U
Cadmium	UG/L	1.7	GA	5	0	4	60	0.095	U	0.13	U	0.095	UJ	0.13	UJ	0.095	UJ	0.13	UJ	0.095	U
Calcium	UG/L	195,000				60	60	90,000		93,000		74,000	J	67,000	J	130,000	J	110,000	J	73,000	
Chromium	UG/L	37.2	GA	50	0	4	60	2.5	U	2.5	U	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	2.5	U
Cobalt	UG/L	10.5				39	60	0.63		0.7		0.15	UJ	0.12	UJ	0.31	J	0.3	J	0.15	U
Copper	UG/L	46.7	GA	200	0	32	60	1.1	U	1.1	U	3.3	J	5	UJ	1.3	J	1.1	J	13	
Iron	UG/L	25,500	GA	300	14	46	60	730	J	770	J	33	UJ	44	UJ	33	UJ	110	J	33	U
Iron+Manganese	UG/L	25,929	GA	500	13	56	60	890		940		34	U	46	U	2.3	J	112	J	5.1	
Lead	UG/L	103	MCL	15	1	10	60	0.2	U	0.5	U	0.24	J	0.78	J	0.35	J	0.5	UJ	0.2	U
Magnesium	UG/L	27,300				57	57	9,900		10,000	J	6,100	J	5,800	J	15,000	J+	15,000	J	5,800	
Manganese	UG/L	911	GA	300	2	56	60	160		170		1	UJ	2	UJ	2.3	J	2	J	5.1	
Mercury	UG/L	0.14	GA	0.7	0	2	60	0.091	U	0.091	U	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ	0.091	U
Nickel	UG/L	34	GA	100	0	21	60	2	U	2	U	2	UJ	2	UJ	2	UJ	2	UJ	2.6	J
Potassium	UG/L	7,810				54	55	1,200	J	1,200		1,800	J	1,700	J	870	J	840	J	1,400	
Selenium	UG/L	0	GA	10	0	0	60	1	U	1.1	U	1	UJ	1.1	UJ	1	UJ	1.1	UJ	1	U
Silver	UG/L	0	GA	50	0	0	60	0.25	U	0.18	U	0.25	UJ	0.18	UJ	0.25	UJ	0.18	UJ	0.25	U
Sodium	UG/L	366,000	GA	20,000	4	56	56	6,000	J	6,100	J	3,300	J	3,100	J	11,000	J	10,000	J	1,900	
Thallium	UG/L	0.08	MCL	2	0	2	60	0.5	U	0.25	U	0.5	UJ	0.25	UJ	0.5	UJ	0.25	UJ	0.5	U
Vanadium	UG/L	32.8				2	60	3.8	U	3.2	U	3.8	UJ	3.2	UJ	3.8	UJ	3.2	UJ	3.8	U
Zinc	UG/L	935				33	60	8.3	U	12	J	29	J	26	J	35	J	33	J	42	J

Notes:
1. The lowest value for either the New York Class GA Groundwater Standards (TOGS 1.1.1, June 1998, et al.) or the EPA Maximum Contaminant Limit (MCL), source http://www.epa.gov/safewater/mcl.html#inorganic.html is used. A blank cell indicates no criteria value available.
2.Data validation qualifier.
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Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 7)
Draft Annual Report - Year 7 for SEAD 16 and SEAD 17
Seneca Army Depot Activity

Area								SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Loc ID								MW17-3		MW17-4		MW17-4		MW17-4		MW17-4		MW17-4		MW17-4	
Matrix								GW		GW		GW		GW		GW		GW		GW	
Sample ID								17LM20032U		17LM20003		17LM20008		17LM20013FIL		17LM20013UNFIL		17LM20018FIL		17LM20018UNF	
Sample Date								12/20/2014		12/20/2007		12/10/2008		11/17/2009		11/17/2009		12/16/2010		12/16/2010	
QC Type								SA		SA		SA		SA		SA		SA		SA	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								7		1		2		3		3		4		4	
Filtered								Total		Total		Total		Dissolved		Total		Dissolved		Total	
Parameter	Unit	Maximum Value	Criteria Source	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																					
Aluminum	UG/L	19,600				22	60	180		50.2	J	125	J	28	J	70	J	23	U	50	U
Antimony	UG/L	4.4	GA	3	6	14	60	2	U	1	U	0.62	J	1	U	1	U	2.3	U	2	U
Arsenic	UG/L	7.8	MCL	10	0	2	60	1.3	U	4.2	U	3.7	U	3.7	U	3.7	U	1.3	U	1.3	U
Barium	UG/L	251	GA	1,000	0	60	60	38		32.5		35.9		36.3		36.6		27		28	J
Beryllium	UG/L	1.2	MCL	4	0	1	60	0.15	U	0.27	U	0.33	U	0.3	U	0.3	U	0.25	U	0.15	U
Cadmium	UG/L	1.7	GA	5	0	4	60	0.13	U	0.36	U	0.33	U	0.3	U	0.3	U	0.095	U	0.13	U
Calcium	UG/L	195,000				60	60	69,000		74,900	J	74,700		96,600	J	97,600	J	90,000		88,000	
Chromium	UG/L	37.2	GA	50	0	4	60	2.5	U	1	J	0.88	U	0.9	U	0.9	U	2.5	U	2.5	U
Cobalt	UG/L	10.5				39	60	0.12	J	0.89	U	2.4	J	1.5	J	1.3	J	0.96		1.1	
Copper	UG/L	46.7	GA	200	0	32	60	15		1.8	J	1.8	J	1.3	U	1.3	U	1.1	U	1.1	U
Iron	UG/L	25,500	GA	300	14	46	60	160		45.4	J	1,760		60	J	142	J	240	J	260	J
Iron+Manganese	UG/L	25,929	GA	500	13	56	60	166.1		59	J	2,671		258	J	355	J	370		400	
Lead	UG/L	103	MCL	15	1	10	60	1.1	J	2.9	U	2.9	U	2.9	U	2.9	U	0.2	U	0.5	U
Magnesium	UG/L	27,300				57	57	5,600		10,400	R	10,200		12,900		13,000		13,000		13,000	J
Manganese	UG/L	911	GA	300	2	56	60	6.1		13.7		911		198		213		130		140	
Mercury	UG/L	0.14	GA	0.7	0	2	60	0.091	U	0.12	U	0.12	U	0.1	U	0.1	U	0.091	U	0.091	U
Nickel	UG/L	34	GA	100	0	21	60	2	J	1.2	U	2.6	J	2.2	J	2.4	J	2	U	2	U
Potassium	UG/L	7,810				54	55	1,500		838	R	1,190	J	844		866		540		530	J
Selenium	UG/L	0	GA	10	0	0	60	1.1	U	6.1	U	6.1	U	6.1	U	6.1	U	1	U	1.1	U
Silver	UG/L	0	GA	50	0	0	60	0.18	U	1	U	1.3	U	1.3	U	1.3	U	0.25	U	0.18	U
Sodium	UG/L	366,000	GA	20,000	4	56	56	1,900		28,500	J	15,500		10,400	J	10,500	J	12,000	J	12,000	J
Thallium	UG/L	0.08	MCL	2	0	2	60	0.25	U	0.03	U	0.09	U	0.008	U	0.008	U	0.5	U	0.25	U
Vanadium	UG/L	32.8				2	60	3.2	U	0.78	U	0.98	U	1	U	1	U	3.8	U	3.2	U
Zinc	UG/L	935				33	60	44	J	5.1	J	6.7	J	3.6	U	3.6	U	8.7	J	8.4	U

Notes:
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Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 7)
Draft Annual Report - Year 7 for SEAD 16 and SEAD 17
Seneca Army Depot Activity

Area								SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Loc ID								MW17-4		MW17-4		MW17-4		MW17-4		MW17-4		MW17-5	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								17LM20023F		17LM20023U		17LM20028F		17LM20028U		17LM20033F		17LM20033U		17LM20004	
Sample Date								12/11/2012		12/11/2012		12/15/2013		12/15/2013		12/20/2014		12/20/2014		12/20/2007	
QC Type								SA		SA		SA		SA		SA		SA		SA	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								5		5		6		6		7		7		1	
Filtered								Dissolved		Total		Dissolved		Total		Dissolved		Total		Total	
Parameter	Unit	Maximum Value	Criteria Source	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																					
Aluminum	UG/L	19,600				22	60	23	UJ	50	UJ	23	UJ	50	UJ	23	U	50	U	98.5	J
Antimony	UG/L	4.4	GA	3	6	14	60	2.3	UJ	2	UJ	2.3	UJ	2	UJ	2.3	U	2	U	1	U
Arsenic	UG/L	7.8	MCL	10	0	2	60	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ	1.3	U	1.3	U	4.2	U
Barium	UG/L	251	GA	1,000	0	60	60	65	J	67	J	20	J	23	J	27		27		86.7	
Beryllium	UG/L	1.2	MCL	4	0	1	60	0.25	UJ	0.15	UJ	0.25	UJ	0.15	UJ	0.25	U	0.15	U	0.27	U
Cadmium	UG/L	1.7	GA	5	0	4	60	0.095	UJ	0.13	UJ	0.095	UJ	0.13	UJ	0.095	U	0.13	U	0.36	U
Calcium	UG/L	195,000				60	60	83,000	J	87,000	J	96,000	J	93,000	J	80,000		75,000		97,100	J
Chromium	UG/L	37.2	GA	50	0	4	60	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	2.5	U	2.5	U	0.84	U
Cobalt	UG/L	10.5				39	60	0.21	J	0.25	J	1	J	1.1	J	0.31	J	0.24	J	0.89	U
Copper	UG/L	46.7	GA	200	0	32	60	1.1	J	5	UJ	1.1	UJ	1.1	UJ	2.3	J	2.8	J	1.3	U
Iron	UG/L	25,500	GA	300	14	46	60	33	UJ	72	J	**810**	**J**	**810**	**J**	120		130		91.7	
Iron+Manganese	UG/L	25,929	GA	500	13	56	60	9.5	J	83	J	**1,090**	**J**	**1,090**	**J**	260		250		128	
Lead	UG/L	103	MCL	15	1	10	60	0.2	UJ	0.5	UJ	0.2	UJ	0.5	UJ	0.2	U	0.5	U	2.9	U
Magnesium	UG/L	27,300				57	57	15,000	J	15,000	J	15,000	J+	15,000	J	12,000		11,000		15,800	J
Manganese	UG/L	911	GA	300	2	56	60	9.5	J	11	J	280	J	280	J	140		120		36.5	
Mercury	UG/L	0.14	GA	0.7	0	2	60	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ	0.091	U	0.091	U	0.12	U
Nickel	UG/L	34	GA	100	0	21	60	2	UJ	2.1	J	2	UJ	2	UJ	3	J	2	J	1.2	U
Potassium	UG/L	7,810				54	55	750	J	780	J	450	J	430	J	480	J	420	J	972	R
Selenium	UG/L	0	GA	10	0	0	60	1	UJ	1.1	UJ	1	UJ	1.1	UJ	1	U	1.1	U	6.1	U
Silver	UG/L	0	GA	50	0	0	60	0.25	UJ	0.18	UJ	0.25	UJ	0.18	UJ	0.25	U	0.18	U	1	U
Sodium	UG/L	366,000	GA	20,000	4	56	56	8,900	J	8,600	J	7,800	J	7,800	J	7,700		7,300		7,950	R
Thallium	UG/L	0.08	MCL	2	0	2	60	0.5	UJ	0.25	UJ	0.5	UJ	0.25	UJ	0.5	U	0.25	U	0.03	U
Vanadium	UG/L	32.8				2	60	3.8	UJ	3.2	UJ	3.8	UJ	3.2	UJ	3.8	U	3.2	U	0.78	U
Zinc	UG/L	935				33	60	8.3	UJ	8.4	UJ	8.3	UJ	8.4	UJ	8.3	U	8.4	U	4.7	J

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Draft Annual Report - Year 7 for SEAD 16 and SEAD 17
Seneca Army Depot Activity

Area								SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Loc ID								MW17-5		MW17-5		MW17-5		MW17-5		MW17-5		MW17-5	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								17LM20009		17LM20014FIL		17LM20014UNFIL		17LM20019FIL		17LM20019UNF		17LM20024U	
Sample Date								12/11/2008		11/17/2009		11/17/2009		12/16/2010		12/16/2010		12/11/2012	
QC Type								SA		SA		SA		SA		SA		SA	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								2		3		3		4		4		5	
Filtered								Total		Dissolved		Total		Dissolved		Total		Total	
Parameter	Unit	Maximum Value	Criteria Source	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics																			
Aluminum	UG/L	19,600				22	60	125	J	29	J	98	J	23	U	50	U	23	UJ	50	UJ
Antimony	UG/L	4.4	GA	3	6	14	60	0.56	J	1		1		2.3	U	2	U	2.3	UJ	2	UJ
Arsenic	UG/L	7.8	MCL	10	0	2	60	3.7	U	3.7	U	3.7	U	1.3	U	1.3	U	1.3	UJ	1.3	UJ
Barium	UG/L	251	GA	1,000	0	60	60	82.9		166		168		81		82	J	24	J	26	J
Beryllium	UG/L	1.2	MCL	4	0	1	60	0.33	U	2	U	2	U	0.25	U	0.15	U	0.25	UJ	0.15	UJ
Cadmium	UG/L	1.7	GA	5	0	4	60	0.33	U	0.3	U	0.3	U	0.095	U	0.13	U	0.095	UJ	0.13	UJ
Calcium	UG/L	195,000				60	60	97,300		184,000	J	185,000	J	100,000		110,000		68,000	J	75,000	J
Chromium	UG/L	37.2	GA	50	0	4	60	0.88	U	0.9	U	0.9	U	2.5	U	2.5	U	2.5	UJ	2.5	UJ
Cobalt	UG/L	10.5				39	60	1.1	U	1.1	U	1.1	U	0.17	J	0.19	J	0.31	J	0.31	J
Copper	UG/L	46.7	GA	200	0	32	60	1.5	J	1.3	U	1.3	U	1.1	U	1.1	U	3.7	J	5	UJ
Iron	UG/L	25,500	GA	300	14	46	60	76		19	UJ	34	J	83	J	110	J	44	J	160	J
Iron+Manganese	UG/L	25,929	GA	500	13	56	60	85		24.3		61.4	J	118		145		82	J	219	J
Lead	UG/L	103	MCL	15	1	10	60	2.9	U	2.9	U	2.9	U	0.2	U	0.5	U	0.2	UJ	0.5	UJ
Magnesium	UG/L	27,300				57	57	15,600		27,100		27,300		17,000		18,000	J	9,900	J	11,000	J
Manganese	UG/L	911	GA	300	2	56	60	8.9		24.3		27.4		35		35		38	J	59	J
Mercury	UG/L	0.14	GA	0.7	0	2	60	0.12	U	0.1	U	0.1	U	0.091	U	0.091	U	0.12	J	0.091	UJ
Nickel	UG/L	34	GA	100	0	21	60	1.2	J	1.7	J	1.8	J	2	U	2	U	2	UJ	2	UJ
Potassium	UG/L	7,810				54	55	824	J	1,920		1,960		1,600	J	1,600		460	J	460	J
Selenium	UG/L	0	GA	10	0	0	60	6.1	U	6.1	U	6.1	U	1	U	1.1	U	1	UJ	1.1	UJ
Silver	UG/L	0	GA	50	0	0	60	1.3	U	1.3	U	1.3	U	0.25	U	0.18	U	0.25	UJ	0.18	UJ
Sodium	UG/L	366,000	GA	20,000	4	56	56	7,360		364,000	J	366,000	J	8,200	J	8,300	J	9,400	J	9,100	J
Thallium	UG/L	0.08	MCL	2	0	2	60	0.09	U	0.08	J	0.08	J	0.5	U	0.25	U	0.5	UJ	0.25	UJ
Vanadium	UG/L	32.8				2	60	0.98	U	1	U	1	U	3.8	U	3.2	U	3.8	UJ	3.2	UJ
Zinc	UG/L	935				33	60	41.6		3.6	U	3.6	U	20		8.4	U	8.3	UJ	8.4	UJ

Notes:
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Area								SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Loc ID								MW17-5		MW17-5		MW17-5		MW17-5	
Matrix								GW		GW		GW		GW	
Sample ID								17LM20029F		17LM20029U		17LM20034F		17LM20034U	
Sample Date								12/15/2013		12/15/2013		12/20/2014		12/20/2014	
QC Type								SA		SA		SA		SA	
Study ID								LTM		LTM		LTM		LTM	
Sample Round								6		6		7		7	
Filtered								Dissolved		Total		Dissolved		Total	
Parameter	Unit	Maximum Value	Criteria Source	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Analyzed	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Inorganics															
Aluminum	UG/L	19,600				22	60	23	UJ	50	UJ	23	U	50	U
Antimony	UG/L	4.4	GA	3	6	14	60	2.3	UJ	2	UJ	2.3	U	2	U
Arsenic	UG/L	7.8	MCL	10	0	2	60	1.3	UJ	1.3	UJ	1.3	U	1.3	U
Barium	UG/L	251	GA	1,000	0	60	60	75	J	86	J	83		92	
Beryllium	UG/L	1.2	MCL	4	0	1	60	0.25	UJ	0.15	UJ	0.25	U	0.15	U
Cadmium	UG/L	1.7	GA	5	0	4	60	0.095	UJ	0.13	UJ	0.095	U	0.13	U
Calcium	UG/L	195,000				60	60	110,000	J	100,000	J	91,000		100,000	
Chromium	UG/L	37.2	GA	50	0	4	60	2.5	UJ	2.5	UJ	2.5	U	2.5	U
Cobalt	UG/L	10.5				39	60	0.2	J	0.22	J	0.15	U	0.12	U
Copper	UG/L	46.7	GA	200	0	32	60	1.1	UJ	1.1	UJ	1.1	U	2.6	J
Iron	UG/L	25,500	GA	300	14	46	60	350	J	140	J	33	U	55	J
Iron+Manganese	UG/L	25,929	GA	500	13	56	60	374	J	167	J	34	U	46	U
Lead	UG/L	103	MCL	15	1	10	60	0.2	UJ	0.5	UJ	0.2	U	0.5	U
Magnesium	UG/L	27,300				57	57	18,000	J+	17,000	J	14,000		15,000	
Manganese	UG/L	911	GA	300	2	56	60	24	J	27	J	1	U	2	U
Mercury	UG/L	0.14	GA	0.7	0	2	60	0.091	UJ	0.091	UJ	0.091	U	0.091	U
Nickel	UG/L	34	GA	100	0	21	60	2	UJ	2	UJ	2.8	J	2	U
Potassium	UG/L	7,810				54	55	1,200	J	1,100	J	810		860	J
Selenium	UG/L	0	GA	10	0	0	60	1	UJ	1.1	UJ	1	U	1.1	U
Silver	UG/L	0	GA	50	0	0	60	0.25	UJ	0.18	UJ	0.25	U	0.18	U
Sodium	UG/L	366,000	GA	20,000	4	56	56	5,400	J	5,300	J	4,900		4,900	
Thallium	UG/L	0.08	MCL	2	0	2	60	0.5	UJ	0.25	UJ	0.5	U	0.25	U
Vanadium	UG/L	32.8				2	60	3.8	UJ	3.2	UJ	3.8	U	3.2	U
Zinc	UG/L	935				33	60	8.3	UJ	8.4	UJ	8.3	U	8.4	U

Notes:
1. The lowest value for either the New York Class GA Groundwater Standards (TOGS 1.1.1, June 1998, et al.) or the EPA Maximum Contaminant Limit (MCL), source http://www.epa.gov/safewater/mcl.html#inorganic.html is used. A blank cell indicates no criteria value available.
2.Data validation qualifier.
[empty cell] = data is not qualified
U = compound not detected at concentration listed
J = the reported value is an estimated concentration
J+ = result is an estimated quantity, biased high
R = the result was rejected due to QA/QC considerations
UJ = detection limit is estimated.
3. Shading indicates a concentration above the identified criteria value.
SA = Sample
DU = Duplicate Sample
4. Rejected values are not included in the number of samples analyzed.

APPENDIX E

LABORATORY ANALYTICAL REPORT

Laboratory Reports have been provided on the CD version of this report.

APPENDIX F

DATA VALIDATION

PROJECT NAME/NO. USACE - Seneca Army Depot SEAD-16/17 LTM Event 7
LAB: TestAmerica
SDG: 680-108543-1 (aka J108543)
FRACTION: Metals (SW846 6020A)
MEDIA: Groundwater
NUMBER OF SAMPLES: 12 Unfiltered and 12 Filtered

CRITERIA	Did Analyses Meet all criteria as specified in the SOPS?	Region 2 Acceptable limits / criteria	Comments/Qualifying Actions	Qualifiers Added?
Data Completeness, Holding Times & Preservation	Yes	Cooler temp < 10 C. pH < 2. Holding Time Hg < 28 days, all other metals < 180 days from collection.	Coolers were received at 2.5°C by the laboratory. All samples were received in good condition based on the laboratory login report. Samples were properly preserved and had pH < 2. Samples were analyzed within 12 days from collection.	No
Calibration	Yes	r^2 ≥ 0.995 CCV every 10 samps or 2 hours ICV/CCV %R btw 90-110%	Calibrations available, taken every ten samples, and within recovery limits (90-110%). Initial Calibration Verification (Batch #680-365321) for Total metals was conducted on 12/29/14 at 13:09. The ICV and subsequent CCVs for metals were all within accetance criteria. Associated samples -1 through -9. ICV (Batch #680-365538) for Total metals was conducted on 12/29/14 at 13:09. The ICV and subsequent CCVs for metals were all within accetance criteria. Associated samples -10 through -13. ICV (Batch #680-365878) for Dissolved metals was conducted on 1/2/15 at 13:37. The ICV and subsequent CCVs for metals were all within accetance criteria. ICV (Batch #680-366197) for Dissolved metals was conducted on 1/6/15 at 13:37. The ICV and subsequent CCVs for metals were all within accetance criteria.	No
Blanks (prep blank, ICB, CCB)	No	Method blanks: 1 per 20 project samples.	Initial Calibration Blank (ICB) (Batch #680-365321) analyzed on 12/29/14 at 13:14 for Total metals and all metals were non-detected. CCBs (Batch #680-365321) were analyzed from 12/30/13 at 00:54 to 14:10 for Total metals every ten samples; all CCBs were non-detect for Total metals. ICB (Batch #680-365538) analyzed on 12/29/14 at 23:28 for Total metals and all metals were non-detected. CCBs (Batch #680-365538) were analyzed from 12/29/14 at 12:02 to 13:02 for Total metals every ten samples; all CCBs were non-detect for Total metals. ICB (Batch #680-365878) analyzed on 1/2/15 at 13:43 for Dissolved metals and all metals were non-detected. CCBs (Batch #680-365878) were analyzed from 1/2/15 at 15:41 to 19:50 for Dissolved metals every ten samples; all CCBs were non-detect for Dissolved metals except Na (68.9 J ug/L, CCB at 19:18). No action was taken on sample -25 since the sample result was greater than 9x the CRQL. ICB (Batch #680-366197) analyzed on 1/6/15 at 13:43 for Dissolved metals and all metals were non-detected. CCBs (Batch #680-366197) were analyzed from 1/6/15 at 18:02 to 19:27 for Dissolved metals every ten samples; all CCBs were non-detect for Dissolved metals. Two Preparation blank were analyzed for Total metals and all results were non-detect. Three Preparation blank were analyzed for Dissolved metals and all results were non-detect except in MB 680-365318/1-A (on 1/2 at 17:13) detected Cu at 2.33 J ug/L. Sample -25 was analyzed after the MB was analyzed and detected Cu at 1.5 J ug/L. Qualify sample -25 Cu results as the CRQL and change to non-detect (5 U).	Yes
CRDL Standard	Yes	CRDL results btw 70-130%	CRDL analyses for all remaining metals conducted at the beginning and end of the analysis. All met requirements.	No
Laboratory Control Sample	Yes	LCS/LCSD: 1 per 20 project samples or each preparation batch. LCS limits within 80-120%.	Two aqueous LCS results were within the limits for Total metals (of 12 unfiltered project samples). Three aqueous LCS results were within the limits for Dissolved metals (of 12 filtered project samples).	No
Duplicates	No	RPD < 20% or Absolute Diff < RL when samp/dup value < 5x RL	Two field duplicate pairs were collected for this SDG; a unfiltered and filtered sample. Unfiltered sample 16LM20047U and its duplicate 16LM20048U, and filtered sample 16LM20047F and its duplicate 16LM20048F. All RPDs were within acceptance limits except for the following: Mn for 16LM20047/48 had RPDs 36% (unfiltered) and 30% (filtered), qualify results as J for all samples; K for 16LM20047F/48F had 22% RPD, qualify results as J for both samples. A lab duplicate was not analyzed for this SDG.	Yes

PROJECT NAME/NO. USACE - Seneca Army Depot SEAD-16/17 LTM Event 7
LAB: TestAmerica
SDG: 680-108543-1 (aka J108543)
FRACTION: Metals (SW846 6020A)
MEDIA: Groundwater
NUMBER OF SAMPLES: 12 Unfiltered and 12 Filtered

CRITERIA	Did Analyses Meet all criteria as specified in the SOPS?	Region 2 Acceptable limits / criteria	Comments/Qualifying Actions	Qualifiers Added?
Matrix Spike/Matrix Spike Duplicates	No	MS/MSD: 1 per 20 project samples or each preparation batch. Recoveries within lab limits. MS/MSD %RPDs <= 20%. Spike Recovery limits 75-125%	Two unfiltered MS/MSD samples were associated with this SDG; sample 16LM20047U and 17LM20032U. All spike metal recoveries were within the recovery except Zn (MSD 140%) with 29% RPD, and Ca, Mg, and Na initial conc was >4x spike conc. The RPD limits were within the limits except for Zn. One filtered MS/MSD sample was associated with this SDG; sample 16LM20047F. All spike metal recoveries were within the recovery, and Ca, Mg, and Na initial conc was >4x spike conc. The RPD limits were within the limits. The post digestion spike was performed on unfiltered 16LM20047U and 17LM20032U. Only sample 17LM20032U had recoveries were above the limit for Ca (128%). The post digestion spike was performed on filtered 16LM20047F. All recoveries were within the limits. Qualify Zn results as J if > MDL. No action was taken since Ca, Mg, and Mn results were > 4x the spike amount.	Yes
ICP Interference Check Sample (ICS)	Yes	ICS results within 80-120%.	All concentrations detected in all samples within the ICP Linear Range. No action was taken.	No
ICP Tune Analysis	Yes	RSD < 5%	Tune Analysis was conducted on 12/29/14. All isotopes of each analyte had a RSD < 5%.	No
Internal Standard	Yes	Intensity within 60-125%	IS from 12/29/14 to 12/30/14 had %RI within acceptance limits. IS from 1/2/15 to 1/3/15 had %RI within acceptance limits. IS from 1/6/15 to 1/7/15 had %RI within acceptance limits.	No
Serial Dilution	Yes	Performed on samples of a similar matrix or 1 per 20 samples. %D ≤ 10% conc ≥ 25xDL (7470A/7471A) and 10x IDL (6010B) for 5-fold dilution.	Sample 16LM20047U serial dilution for all metal with %D < 10% and sample conc > 50xMDL met requirements. Sample 17LM20032U serial dilution for all metal with %D < 10% and sample conc > 50xMDL met requirements. Sample 16LM20047F serial dilution for all metal with %D < 10% and sample conc > 50xMDL met requirements.	No
Total/Dissolved Comparison	No	%RPD less than 20%	Samples with Total and Dissolved results that have detected Dissolved concentrations greater than the Total and have a Dissolved concentration > 5xMDL. All sample results met this requiment except for in samples: 16LM20045U/16LM20045F for Ba (20%), Fe (25%), Mn (21%), and K (22%). Qualify these samples results as J.	Yes
Field Duplicate Precision	No	%RPD less than 20%	Two field duplicate pairs were collected for this SDG; a unfiltered and filtered sample. Unfiltered sample 16LM20047U and its duplicate 16LM20048U, and filtered sample 16LM20047F and its duplicate 16LM20048F. All RPDs were within acceptance limits except for: 16LM20047/48U for Mn (36% RPD), where the parent (23 ug/L) and the duplicate (33 ug/L) were both detected; 16LM20047/48F for: Al (23% RPD), where the parent sample had detect (29 J ug/L) but the duplicate was non-detect (23 U ug/L); Co (50% RPD), where the parent sample had detect (0.25 J ug/L) but the duplicate was non-detect (0.15 U ug/L); Fe (45% RPD), where the parent sample had detect (52 J ug/L) but the duplicate was non-detect (33 U ug/L); Mn (30% RPD), where the parent (28 ug/L) and the duplicate (38 ug/L) were both detected; Ni (46% RPD), where the parent (3.2 J ug/L) and the duplicate (2 J ug/L) were both detected; and K (22% RPD), where the parent (3700 ug/L) and the duplicate (4600 ug/L) were both detected.	No

RT = Retention Time; %D = Percent Deviation; %RPD = Relative Percent Difference; %RSD = Percent Relative Standard Deviation; RRF = Relative Response Factor; CCV = Continuing Calibration Verification
TCL = Target Compound List; MS = Matrix Spike; MSD = Matrix Spike Duplicate;

PROJECT NAME/NO. USACE - Seneca Army Depot SEAD-16/17 LTM Event 7
LAB: TestAmerica
SDG: 680-108543-1 (aka J108543)
FRACTION: Metals (SW846 7470A)
MEDIA: Groundwater
NUMBER OF SAMPLES: 12 Unfiltered and 12 Filtered

CRITERIA	Did Analyses Meet all criteria as specified in the SOPS?	Region 2 Acceptable limits / criteria	Comments/Qualifying Actions	Qualifiers Added?
Data Completeness, Holding Times & Preservation	Yes	Cooler temp < 10 C. Holding Time Hg < 28 days, all other metals < 180 days from collection.	Coolers were received at 2.5°C by the laboratory. All samples were received in good condition based on the laboratory login report. Samples were properly preserved and had pH < 2. Samples were analyzed within 10 days from collection.	No
Calibration	Yes	r^2 ≥ 0.995 CCV every 10 samps or 2 hours ICV/CCV %R btw 80-120% (specific to Hg)	Calibrations available, taken every ten samples, and within recovery limits (80-120%). Initial Calibration Verification (ICV) for Total Hg associated was conducted on 12/29/14 at 17:46. The ICV and subsequent CCVs for Total Hg were all within acceptance criteria. ICV for Dissolved Hg associated was conducted on 12/30/14 at 17:08. The ICV and subsequent CCVs for Dissolved Hg were all within acceptance criteria.	No
Blanks (prep blank, ICB, CCB)	Yes	Method blanks: 1 per 20 project samples.	ICB analyzed on 12/29/14 at 17:49 for Hg Method 7470A. CCBs were analyzed from 12/29/14 at 19:28 to 20:46 for Total and Dissolved Hg every ten samples; all CCBs were non-detect for Hg (MDL = 0.1 and RL = 0.2 ug/L). ICB analyzed on 12/30/14 at 17:11 for Hg Method 7470A. CCBs were analyzed from 12/30/14 at 17:33 to 18:01 for Dissolved Hg every ten samples; all CCBs were non-detect for Hg (MDL = 0.1 and RL = 0.2 ug/L). One Preparation blank analyzed for Total Hg, it was non-detect. One Preparation blank analyzed for Dissolved Hg, it was non-detect.	No
CRDL Standard	Yes	CRDL results btw 70-130%	CRDL analyses for Hg conducted at the beginning and end of the analysis. All met requirements.	No
Laboratory Control Sample	Yes	LCS/LCSD: 1 per 20 project samples or each preparation batch. LCS limits within 80-120%.	One aqueous LCS/LCSD set were analyzed and their results were within the limits for Total Hg (of 12 unfiltered project samples). One aqueous LCS/LCSD set were analyzed and their results were within the limits for Dissolved Hg (of 12 filtered project samples).	No
Duplicates	No	RPD < 20% or Absolute Diff < RL when samp/dup value < 5x RL	Two field duplicate pairs were collected for this SDG; a unfiltered and filtered sample. Unfiltered sample 16LM20047U and its duplicate 16LM20048U, and filtered sample 16LM20047F and its duplicate 16LM20048F. Both sample duplicate pairs Hg results were non-detect; therefore no action was taken. A lab duplicate was not analyzed for this SDG.	No
Matrix Spike/Matrix Spike Duplicates	Yes	MS/MSD: 1 per 20 project samples or each preparation batch. Recoveries within lab limits. MS/MSD %RPDs <= 20%. Spike Recovery limits 75-125%	Two spike samples were associated with this SDG; samples 16LM20047U and 16LM20047F. All spike metal recoveries were within the recovery and RPD limits, and did not have a initial conc >4x spike conc.	No
ICP Interference Check Sample (ICS)	Yes	ICS results within 80-120%.	ICP Interference Check was performed and all recoveries were within acceptance limits.	No
Serial Dilution	NA	Performed on samples of a similar matrix or 1 per 20 samples. %D ≤ 10% conc ≥ 25xDL (7470A/7471A) and 10x IDL (6010B) for 5-fold dilution.	A serial dilution was not performed on this analysis.	NA
Total/Dissolved Comparison	Yes	%RPD less than 20%	All samples Total and Dissolved results were non-detect. No action was taken.	No
Field Duplicate Precision	Yes	%RPD less than 20%	Two field duplicate pairs were collected for this SDG; a unfiltered and filtered sample. Unfiltered sample 16LM20047U and its duplicate 16LM20048U, and filtered sample 16LM20047F and its duplicate 16LM20048F. Both sample duplicate pairs Hg results were non-detect; therefore no action was taken.	No

RT = Retention Time; %D = Percent Deviation; %RPD = Relative Percent Difference; %RSD = Percent Relative Standard Deviation; RRF = Relative Response Factor; CCV = Continuing Calibration Verification
TCL = Target Compound List; MS = Matrix Spike; MSD = Matrix Spike Duplicate;

APPENDIX G

PROUCL OUTPUT SHEETS

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	6/26/2015 11:48:10 AM
From File	SEAD16_Antimony4UCL.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Result

General Statistics

Total Number of Observations	84	Number of Distinct Observations	36
Number of Detects	48	Number of Non-Detects	36
Number of Distinct Detects	34	Number of Distinct Non-Detects	3
Minimum Detect	0.9	Minimum Non-Detect	1
Maximum Detect	16.3	Maximum Non-Detect	2.3
Variance Detects	29.19	Percent Non-Detects	42.86%
Mean Detects	7.916	SD Detects	5.403
Median Detects	6.05	CV Detects	0.683
Skewness Detects	0.365	Kurtosis Detects	-1.508
Mean of Logged Detects	1.762	SD of Logged Detects	0.877

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.847	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.947	Detected Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.181	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.128	Detected Data Not Normal at 5% Significance Level

Detected Data Not Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	4.951	Standard Error of Mean	0.585
SD	5.299	95% KM (BCA) UCL	5.988
95% KM (t) UCL	5.924	95% KM (Percentile Bootstrap) UCL	5.927
95% KM (z) UCL	5.913	95% KM Bootstrap t UCL	5.963
90% KM Chebyshev UCL	6.706	95% KM Chebyshev UCL	7.501
97.5% KM Chebyshev UCL	8.604	99% KM Chebyshev UCL	10.77

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	1.428	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.764	Detected Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.186	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.13	Detected Data Not Gamma Distributed at 5% Significance Level

Detected Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	1.78	k star (bias corrected MLE)	1.683
Theta hat (MLE)	4.447	Theta star (bias corrected MLE)	4.704
nu hat (MLE)	170.9	nu star (bias corrected)	161.5
MLE Mean (bias corrected)	7.916	MLE Sd (bias corrected)	6.102

52	**Gamma Kaplan-Meier (KM) Statistics**											
53					k hat (KM)	0.873				nu hat (KM)	146.7	
54					**Approximate Chi Square Value (146.67, α)**	119.7				**Adjusted Chi Square Value (146.67, β)**	119.3	
55					95% Gamma Approximate KM-UCL (use when n>=50)	6.067				95% Gamma Adjusted KM-UCL (use when n<50)	6.089	
56												
57	**Gamma ROS Statistics using Imputed Non-Detects**											
58	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
59	GROS may not be used when kstar of detected data is small such as < 0.1											
60	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
61	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
62					Minimum	0.01				Mean	4.942	
63					Maximum	16.3				Median	3.051	
64					SD	5.379				CV	1.088	
65					k hat (MLE)	0.5				k star (bias corrected MLE)	0.49	
66					Theta hat (MLE)	9.889				Theta star (bias corrected MLE)	10.09	
67					nu hat (MLE)	83.96				nu star (bias corrected)	82.29	
68					MLE Mean (bias corrected)	4.942				MLE Sd (bias corrected)	7.061	
69										**Adjusted Level of Significance (β)**	0.0471	
70					**Approximate Chi Square Value (82.29, α)**	62.39				**Adjusted Chi Square Value (82.29, β)**	62.08	
71					95% Gamma Approximate UCL (use when n>=50)	6.519				95% Gamma Adjusted UCL (use when n<50)	6.55	
72												
73	**Lognormal GOF Test on Detected Observations Only**											
74					Shapiro Wilk Test Statistic	0.882				**Shapiro Wilk GOF Test**		
75					5% Shapiro Wilk Critical Value	0.947				Detected Data Not Lognormal at 5% Significance Level		
76					Lilliefors Test Statistic	0.174				**Lilliefors GOF Test**		
77					5% Lilliefors Critical Value	0.128				Detected Data Not Lognormal at 5% Significance Level		
78	**Detected Data Not Lognormal at 5% Significance Level**											
79												
80	**Lognormal ROS Statistics Using Imputed Non-Detects**											
81					Mean in Original Scale	5.086				Mean in Log Scale	1.061	
82					SD in Original Scale	5.246				SD in Log Scale	1.115	
83					95% t UCL (assumes normality of ROS data)	6.039				95% Percentile Bootstrap UCL	5.973	
84					95% BCA Bootstrap UCL	6.106				95% Bootstrap t UCL	6.132	
85					95% H-UCL (Log ROS)	7.166						
86												
87	**DL/2 Statistics**											
88					**DL/2 Normal**					**DL/2 Log-Transformed**		
89					Mean in Original Scale	4.943				Mean in Log Scale	0.983	
90					SD in Original Scale	5.336				SD in Log Scale	1.137	
91					95% t UCL (Assumes normality)	5.911				95% H-Stat UCL	6.853	
92	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											
93												

	A	B	C	D	E	F	G	H	I	J	K	L
94	**Nonparametric Distribution Free UCL Statistics**											
95	**Data do not follow a Discernible Distribution at 5% Significance Level**											
96												
	Suggested UCL to Use											
98	95% KM (t) UCL					5.924	95% KM (% Bootstrap) UCL					5.927
99												
100	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
101	Recommendations are based upon data size, data distribution, and skewness.											
102	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
103	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
104												

UCL Statistics for Data Sets with Non-Detects

User Selected Options	
Date/Time of Computation	6/26/2015 11:36:09 AM
From File	SEAD17_Antimony4UCL.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Result

General Statistics

Total Number of Observations	60	Number of Distinct Observations	15
Number of Detects	14	Number of Non-Detects	46
Number of Distinct Detects	13	Number of Distinct Non-Detects	3
Minimum Detect	0.56	Minimum Non-Detect	1
Maximum Detect	4.4	Maximum Non-Detect	2.3
Variance Detects	1.714	Percent Non-Detects	76.67%
Mean Detects	2.456	SD Detects	1.309
Median Detects	2.73	CV Detects	0.533
Skewness Detects	-0.204	Kurtosis Detects	-1.415
Mean of Logged Detects	0.708	SD of Logged Detects	0.706

Normal GOF Test on Detects Only

Shapiro Wilk Test Statistic	0.925	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.874	Detected Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.153	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.237	Detected Data appear Normal at 5% Significance Level

Detected Data appear Normal at 5% Significance Level

Kaplan-Meier (KM) Statistics using Normal Critical Values and other Nonparametric UCLs

Mean	1.102	Standard Error of Mean	0.143
SD	0.993	95% KM (BCA) UCL	1.499
95% KM (t) UCL	1.341	95% KM (Percentile Bootstrap) UCL	1.473
95% KM (z) UCL	1.337	95% KM Bootstrap t UCL	1.363
90% KM Chebyshev UCL	1.531	95% KM Chebyshev UCL	1.725
97.5% KM Chebyshev UCL	1.995	99% KM Chebyshev UCL	2.524

Gamma GOF Tests on Detected Observations Only

A-D Test Statistic	0.672	**Anderson-Darling GOF Test**
5% A-D Critical Value	0.743	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.212	**Kolmogrov-Smirnoff GOF**
5% K-S Critical Value	0.231	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics on Detected Data Only

k hat (MLE)	2.783	k star (bias corrected MLE)	2.234
Theta hat (MLE)	0.883	Theta star (bias corrected MLE)	1.099
nu hat (MLE)	77.91	nu star (bias corrected)	62.55
MLE Mean (bias corrected)	2.456	MLE Sd (bias corrected)	1.643

	A	B	C	D	E	F	G	H	I	J	K	L
52	**Gamma Kaplan-Meier (KM) Statistics**											
53					k hat (KM)	1.23				nu hat (KM)		147.6
54					Approximate Chi Square Value (147.55, α)	120.5				Adjusted Chi Square Value (147.55, β)		119.9
					95% Gamma Approximate KM-UCL (use when n>=50)	1.349				95% Gamma Adjusted KM-UCL (use when n<50)		1.356
56												
57	**Gamma ROS Statistics using Imputed Non-Detects**											
58	GROS may not be used when data set has > 50% NDs with many tied observations at multiple DLs											
59	GROS may not be used when kstar of detected data is small such as < 0.1											
60	For such situations, GROS method tends to yield inflated values of UCLs and BTVs											
61	For gamma distributed detected data, BTVs and UCLs may be computed using gamma distribution on KM estimates											
62					Minimum	0.01				Mean		1.033
63					Maximum	4.4				Median		0.684
64					SD	1.132				CV		1.096
65					k hat (MLE)	0.54				k star (bias corrected MLE)		0.524
66					Theta hat (MLE)	1.914				Theta star (bias corrected MLE)		1.972
67					nu hat (MLE)	64.74				nu star (bias corrected)		62.84
68					MLE Mean (bias corrected)	1.033				MLE Sd (bias corrected)		1.427
69										Adjusted Level of Significance (β)		0.046
70					Approximate Chi Square Value (62.84, α)	45.6				Adjusted Chi Square Value (62.84, β)		45.24
71					95% Gamma Approximate UCL (use when n>=50)	1.423				95% Gamma Adjusted UCL (use when n<50)		1.434
72												
73	**Lognormal GOF Test on Detected Observations Only**											
74					Shapiro Wilk Test Statistic	0.867				**Shapiro Wilk GOF Test**		
75					5% Shapiro Wilk Critical Value	0.874				Detected Data Not Lognormal at 5% Significance Level		
76					Lilliefors Test Statistic	0.228				**Lilliefors GOF Test**		
					5% Lilliefors Critical Value	0.237				Detected Data appear Lognormal at 5% Significance Level		
78	**Detected Data appear Approximate Lognormal at 5% Significance Level**											
79												
80	**Lognormal ROS Statistics Using Imputed Non-Detects**											
81					Mean in Original Scale	1.135				Mean in Log Scale		-0.199
82					SD in Original Scale	1.023				SD in Log Scale		0.799
83					95% t UCL (assumes normality of ROS data)	1.356				95% Percentile Bootstrap UCL		1.364
84					95% BCA Bootstrap UCL	1.398				95% Bootstrap t UCL		1.402
85					95% H-UCL (Log ROS)	1.409						
86												
87	**UCLs using Lognormal Distribution and KM Estimates when Detected data are Lognormally Distributed**											
88					KM Mean (logged)	-0.157				95% H-UCL (KM -Log)		1.225
89					KM SD (logged)	0.629				95% Critical H Value (KM-Log)		1.984
90					KM Standard Error of Mean (logged)	0.102						
91												
92	**DL/2 Statistics**											
93	**DL/2 Normal**									**DL/2 Log-Transformed**		
94					Mean in Original Scale	1.293				Mean in Log Scale		0.0801
95					SD in Original Scale	0.92				SD in Log Scale		0.564
96					95% t UCL (Assumes normality)	1.492				95% H-Stat UCL		1.464
97	**DL/2 is not a recommended method, provided for comparisons and historical reasons**											

	A	B	C	D	E	F	G	H	I	J	K	L
99	**Nonparametric Distribution Free UCL Statistics**											
100	**Detected Data appear Normal Distributed at 5% Significance Level**											
101												
102	**Suggested UCL to Use**											
103	95% KM (t) UCL					1.341	95% KM (Percentile Bootstrap) UCL					1.473
104												
105	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
106	Recommendations are based upon data size, data distribution, and skewness.											
107	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
108	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
109												