US Army
Engineering &
Support Center
Huntsville, AL

FINAL 2015 ANNUAL REPORT YEAR – 8
ABANDONED DEACTIVATION FURNACE (SEAD-16)
ABANDONED DEACTIVATION FURNACE (SEAD-17)
SENECA ARMY DEPOT ACTIVITY

FINAL

MAY
2017

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Seneca Army Depot Activity
Romulus, New York

USACE – New York District
US Army, Engineering & Support Center
Huntsville, AL

Final 2015 Annual Report – Year 8

Abandoned Deactivation Furnace (SEAD-16)
Active Deactivation Furnace (SEAD-17)

Seneca Army Depot Activity

Contract No. W912DY-08-D-0003
Task Order No. 15
EPA SITE ID# NY0213820830
NY Site ID# 8-50-006

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FINAL

ANNUAL REPORT 2015 – YEAR 8

FOR THE ABANDONED DEACTIVATION FURNACE (SEAD-16)

AND THE ACTIVE DEACTIVATION FURNACE (SEAD-17)

SENECA ARMY DEPOT ACTIVITY, ROMULUS, NY

Prepared for:

U.S. ARMY CORPS OF ENGINEERS, ENGINEERING AND SUPPORT CENTER, HUNTSVILLE, ALABAMA

U.S. ARMY, CORPS OF ENGINEERS, NEW YORK DISTRICT NEW YORK, NEW YORK

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SENECA ARMY DEPOT ACTIVITY

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Contract Number W912DY-08-D-0003
Task Order 0015
EPA Site ID# NY0213820830
NY Site ID# 8-50-006

May 2017

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SUBJECT: **Final Annual Report 2015 – Year 8 for the Abandoned Deactivation Furnance (SEAD-16) and the Active Deactivation Furnace (SEAD-17) at Seneca Army Depot Activity in Romulus, NY; EPA Site ID# NY0213820830 and NY Site ID# 8-50-006**

Dear Mr. Vazquez/Ms. Sweet/Mr. Sergott:

On behalf of the Army, Parsons Federal (Parsons) is pleased to submit the Final Annual Report 2015 – Year 8 for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17) at the Seneca Army Depot Activity (SEDA) in Romulus, New York (USEPA Site ID# NY0213820830 and NY Site ID# 8-50-006). The report summarizes the results of the groundwater sampling event that took place in December 2015. Comments from the EPA dated October 2016 were addressed in the Final version.

Parsons appreciates the opportunity to provide you with the report for this work. Should you have any questions, please do not hesitate to call me at (617) 449-1405 to discuss them.

Sincerely,

Beth Badik
Project Manager

Enclosures

cc: R. Battaglia, USACE-NY
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SUBJECT: **Final Annual Report 2015 – Year 8 for the Abandoned Deactivation Furnance (SEAD-16) and the Active Deactivation Furnace (SEAD-17) at Seneca Army Depot Activity in Romulus, NY; Contract W912DY-08-D-0003, Task Order 0015**

Dear Mr. Pommerenck:

Parsons Federal (Parsons) is pleased to submit the Final Annual Report 2015 – Year 8 for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17) at the Seneca Army Depot Activity (SEDA) in Romulus, New York. This report summarizes the results of the groundwater sampling event that took place in December 2015. Comments from the EPA dated October 2016 were addressed in the Final version.

This annual report was prepared in accordance with the Scope of Work (SOW) for Contract No. W912DY-08-D-0003, Task Order 0015.

Parsons appreciates the opportunity to provide you with the report for this work. Should you have any questions, please do not hesitate to call me at (617) 449-1565 to discuss them.

Sincerely,

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1.0 INTRODUCTION

This Draft Annual Report – Year 8 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 2015, comparisons of the 2015 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 8 report presents and discusses the results for the Year 8 LTM event which was conducted in December 2015.

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 (Parsons, 2015)
8	LTM	December 2015	Draft Annual Report – Year 8

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 were 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);

3.0 LONG TERM MONITORING RESULTS

3.1 Year 8 LTM Event

The Year 8 post-RA LTM event was conducted at SEAD-16 and SEAD-17 from December 19, 2015 through December 21, 2015. Groundwater samples were collected at SEAD-16 from six monitoring wells (MW16-1, MW16-2, MW16-4, MW16-5, MW16-6, and MW16-7) and from five monitoring wells (MW17-1, MW17-2, MW17-3, MW17-4, and MW17-5) located at SEAD-17. Field forms completed for the Year 8 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 8 is included as **Appendix E**. A discussion of data validation results is presented in **Appendix F**.

3.1.1 Year 8 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 8 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 19, 2015 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 8) LTM event, and similar with Years 4, 5, 6, and 7 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 2015), 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 8 LTM Sample Collection

Samples for the Year 8 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 Target Analyte List (TAL) metals, exclusive of mercury, by USEPA SW846 Method 6020; and
- Total 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 8 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. Low turbidity values (< 5 Nephelometric Turbidity Units [NTU]) have been consistently observed in past rounds and during the Year 8 LTM event. As turbidity values were low (<5 NTU) during the Year 8 LTM event, filtered samples were determined to not be necessary (**Appendix C**).

3.1.4 Year 8 Groundwater Results for SEAD-16

A summary of metals detected in groundwater during the Year 8 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 8 is included as **Appendix E**. Data validation results are presented in **Appendix F**; sample 16LM20054 (MW16-7, parent sample) was found to be non-compliant for barium, calcium, potassium, magnesium, manganese, sodium, lead and antimony. When compared to the results from the duplicate sample taken at the same location, and to previous rounds, the concentrations are anomalously high. The concentrations of the parent sample were flagged as estimated during data validation and concentrations from the duplicate sample, instead of the parent sample, will be used in the analysis below. Data validation utilized the EPA Region 2 Standard Operating Procedures (SOPs) revised in March 2013.

Within SEAD-16, total concentrations of antimony, iron and sodium were detected above applicable NYS Class GA standards (**Table 3A**). Antimony (total) exceeded the NYS Class GA standard of 3 µg/L in one well (MW16-7). Antimony (total) was detected in four other wells (MW16-2, MW16-4, MW16-5, and MW16-6); however, the concentrations were estimated ("J" qualifier) and below the GA standard. Antimony was not detected in MW16-1.

Iron (total) exceeded the NYS Class GA standard (300 µg/L) in two wells. The highest concentration was detected in well MW16-6 (4,000 µg/L) and the other detection was in well MW16-5 (570 µg/L). The iron concentrations in the other four wells were below the GA standard.

The concentrations (710 and 4,120 µg/L) of the sum of iron and manganese (total) in wells MW16-5 and MW16-6 exceeded the combined NYS Class GA standard of 500 µg/L with the primary contributing metal being iron (total) (570 and 4,000 µg/L, respectively). 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 8 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 (250,000 µg/L). Sodium (total) exceedances were also found in both well MW16-1 (62,000 µg/L) and in well MW16-7 (23,000 J 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 (total) exceeded its NYS Class GA standard in two wells.

3.1.5 Year 8 Groundwater Results for SEAD-17

A summary of metals detected in the Year 8 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 8 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) did not exceed its NYS Class GA standard (3 µg/L) in any of the wells sampled at SEAD-17. Iron (total) was detected at a concentration (360 µg/L) above its NYS Class GA standard (300 µg/L) in one well (MW17-1). No other metals exceeded applicable groundwater standards in Year 8 at SEAD-17 (**Table 3B**).

3.1.6 LTM Groundwater Data Trends

An examination of the data trends from the Year 1 to 8 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. Summaries of metal exceedances detected during the Year 8 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 8 LTM events are included as **Appendix D**.

3.1.6.1 LTM Groundwater Trends for SEAD-16

During the eight years of LTM sampling at SEAD-16, five metals have exceeded NYS Class GA or EPA MCL standards: antimony, iron, lead, manganese, and sodium. The full LTM data set is provided in

Appendix D. A comparison of pre-LTM trends to LTM trends of select metals is presented in **Appendix G**.

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. In the most recent event, antimony only exceeded the NYS Class GA standard in one well (MW16-7). 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 19 J 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 (Event 5); and, concentrations of antimony (total) at MW16-4 have varied from non-detect to a maximum of 6.3 µg/L (Event 3) (**Figure 6A**). The maximum concentrations at both MW16-2 and MW16-4 are below the SEDA average background concentration of 8.2 µg/L and in the past three rounds were below, or approximately equal to, the NYS Class GA standard. 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 (**Figure 6B**). Lead (total) has exceeded the EPA MCL twice during eight 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 six 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) are predominantly in well MW16-5; however, all of the concentrations are below the SEDA background value (4,476 µg/L) (**Appendix B**). The highest concentrations of iron (total) detected in the groundwater at SEAD-16 are typically from well MW16-5. During Year 8, the iron (total) result at well MW16-6 was uncharacteristically higher than historical results from the wells at SEAD-16. This is interpreted as an anomaly in well MW16-5 for Year 8 and concentrations in this well are expected to return to historical averages. Iron concentrations over the course of LTM at SEAD-16 are presented on **Figure 6C**.

Manganese concentrations are historically below its NYS Class GA standard (300 µg/L). One exceedance (631 µg/L) of manganese was detected in well MW16-7 during Event 1.

Sodium is a persistent contaminant identified in SEAD-16 wells. It has been detected in every sample collected from the site. 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 storage area that is operated by the Seneca County Highway Department (located approximately 1,000 feet upgradient to the east-northeast of SEAD-16). As identified on **Figure 5**, the groundwater east (upgradient) of SEAD-16 travels towards the southwest, from the salt pile storage area towards SEAD-16. In satellite photos of the area, the "Unnamed Dirt Road" that originates from the salt storage area and extends towards SEAD-16 appears to have a white coloration; the white coloration is likely due to salt residue from runoff emanating from the salt pile. Historically, the highest concentrations of sodium were found in well MW16-4; this well is the most directly in line with the suspected path of the salt. The location of the Seneca County Highway Department salt pile storage area is indicated on **Figure 5**. Sampling has not

been conducted at the salt pile, or immediately downgradient of it, as it is not a CERCLA release; the Army does not plan on conducting any sampling in this location.

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.

Lead is not considered a COC as all concentrations have been below the EPA MCL for the last six 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

During the eight 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**). Historically, lead (total) and manganese (total) exceeded their applicable screening levels once and twice, respectively; sodium (total) exceeded its screening criterion in three wells. None of these three metals exceeded their respective criteria in Event 8. Lead (total), manganese (total), and sodium (total) are not persistent COCs at SEAD-17 and are therefore not discussed below. A comparison of pre-LTM trends to LTM trends of select metals is presented in **Appendix G**.

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 three 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 (**Figure 6B**). Lead (total) exceeded the EPA MCL once during eight 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.

Nine exceedances of the NYS Class GA standard for iron (total) were found in samples collected from four wells (MW17-1 with two exceedances, 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). The concentrations of iron (total) during the course of the LTM is presented on **Figure 6D**.

Overall, post-RA LTM results indicate that groundwater quality at SEAD-17 is not impacted by historic operations conducted in this area. There are no trends associated with the elevated concentrations of

sodium at SEAD-17 (Appendix D). These concentrations are estimated and, in general, return to the historical baseline condition at each well. Typically, sodium concentrations at SEAD-17 are below the Seneca background (**Appendix B**).

The SEAD-17 Year 8 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 concentrations of antimony were below the NYS Class GA standard.

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 8 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 8 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 eight 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 SEAD-16 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. Antimony was not detected over the NYS Class GA standard in the latest LTM event. 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 8 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 eight post-RA LTM sampling events. Trends demonstrate that the remedial action performed did not adversely impact groundwater.
- There is no ongoing treatment process at either site to continue monitoring for concentration reductions.
- 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 stable.
- Antimony is not migrating, as evidenced by absence of increasing antimony concentrations in other wells.
- Groundwater use is prohibited by the area-wide LUC and an alternate potable water source is available. 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 recommends concluding LTM at these sites because there is no planned future use of the groundwater. The wells will not be decommissioned at this time and sampling at these sites may take place in the future if the need arises (e.g., emerging contaminants, decisions during the 2021 5 Year Review). Annual LUC inspections will continue to insure that the groundwater is not accessed.

Based on this recommendation, agreement was reached between the EPA and Army via email dated 28 October 2016 to conduct the next round of groundwater sampling at SEAD-16/17 in 2019 (year 3 of the FYR cycle). This will allow for an additional round of sampling, if necessary, before the next 2021 five-year review.

6.0 REFERENCES

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TABLES

Table 1
SEAD-16 - Groundwater Table Elevations Summary
Draft Annual Report - 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		December 19, 2015	
		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)	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	3.69	731.84
MW 16-2	734.86	4.08	730.78	4.18	730.68	3.8	731.06	3.33	731.53
MW 16-3	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW 16-4	734.51	2.71	731.80	2.64	731.87	2.66	731.85	3.03	731.48
MW 16-5	735.36	1.63	733.73	2.26	733.10	1.64	733.72	2.2	733.16
MW 16-6	734.25	2.37	731.88	2.65	731.60	2.33	731.92	2.68	731.57
MW 16-7	734.96	4.28	730.68	4.38	730.58	4.08	730.88	3.52	731.44

(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 - 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		December 19, 2015	
		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)	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	3.55	732.84
MW 17-2	733.65	2.79	730.86	3.15	730.50	2.77	730.88	3.5	730.15
MW 17-3	732.05	2.4	729.65	2.73	729.32	2.38	729.67	3.73	728.32
MW 17-4	734.62	3.18	731.44	3.2	731.42	3.22	731.40	3.28	731.34
MW 17-5	734.12	2.64	731.48	2.79	731.33	2.64	731.48	2.96	731.16

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 Groundwater Compounds
Draft Annual Report - 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	MW16-2	MW16-4	MW16-5	MW16-6	MW16-7	MW16-7
Matrix				GW	GW	GW	GW	GW	GW	GW
Sample ID				16LM20049	16LM20050	16LM20051	16LM20052	16LM20053	16LM20054	16LM20055
Sample Date				12/20/2015	12/19/2015	12/20/2015	12/19/2015	12/19/2015	12/19/2015	12/19/2015
QC Type				SA	SA	SA	SA	SA	SA	DU
Study ID				LTM	LTM	LTM	LTM	LTM	LTM	LTM
Sample Round				8	8	8	8	8	8	8
Filtered				Total	Total	Total	Total	Total	Total	Total
Parameter	Unit	Maximum Value	Criteria Level	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual	Value Qual
Aluminum	UG/L	2,400		44 J	58 J	18 U	31 J	2,400	140 J	36 J
Antimony	UG/L	120	3	0.5 U	2.1 J	2 J	0.75 J	1 J	**120 J**	**19 J**
Arsenic	UG/L	1.9	10	1.5 U	1.5 U	1.5 U	1.5 U	1.9 J	7.5 U	1.5 U
Barium	UG/L	600	1,000	81	94	140	41	73	600 J	130 J
Cadmium	UG/L	0.34	5	0.15 U	0.15 U	0.34 J	0.15 U	0.33 J	0.15 U	0.15 U
Calcium	UG/L	510,000		120,000	130,000	160,000	110,000	80,000	510,000 J	110,000 J
Chromium	UG/L	4.6	50	3 J	1.6 U	1.6 U	1.6 U	4.6 J	8 U	1.6 U
Cobalt	UG/L	1.6		0.12 J	0.68	0.28 J	0.12 U	1.6	0.6 U	0.12 J
Copper	UG/L	21	200	1.7 U	3 J	6.8	1.7 U	6.3	21 J	4.2 J
Iron	UG/L	4,000	300	68 J	130	33 J	**570**	**4,000**	**370 J**	62 J
Iron+Manganese	UG/L	4,120	500	76.7 J	193	85 J	**710**	**4120**	396 J	69.4 J
Lead	UG/L	48	15	0.98 U	2.9	1.1 J	0.98 U	2.2 J	**48 J**	10 J
Magnesium	UG/L	98,000		19,000	13,000	25,000	10,000	8,300	98,000 J	20,000 J
Manganese	UG/L	140	300	8.7	63	52	140	120	26 J	7.4 J
Nickel	UG/L	5.1	100	3.8 J	2.6 J	3.7 J	2.3 J	5.1	9.5 U	1.9 U
Potassium	UG/L	15,000		1,000	1,900	1,900	2,500	2,600	15,000 J	3,600 J
Selenium	UG/L	1.1	10	1 U	1 U	1 U	1 U	1.1 J	5 U	1 U
Sodium	UG/L	250,000	20,000	**62,000**	11,000	**250,000**	1,800	10,000	**89,000 J**	**23,000 J**
Zinc	UG/L	18		9.6 U	17 J	16 J	9.6 U	18 J	48 U	9.6 U

Notes:

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. 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 Groundwater Compounds
Draft Annual Report - SEAD 16 and SEAD 17
Seneca Army Depot Activity

Area				SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Loc ID				MW17-1		MW17-2		MW17-3		MW17-4		MW17-5	
Matrix				GW		GW		GW		GW		GW	
Sample ID				17LM20035		17LM20036		17LM20037		17LM20038		17LM20039	
Sample Date				12/21/2015		12/20/2015		12/20/2015		12/21/2015		12/20/2015	
QC Type				SA		SA		SA		SA		SA	
Study ID				LTM		LTM		LTM		LTM		LTM	
Sample Round				8		8		8		8		8	
Filtered				Total		Total		Total		Total		Total	
Parameter	Unit	Maximum Value	Criteria Level	Value	Qual	Value	Qual	Value	Qual	Value	Qual	Value	Qual
Aluminum	UG/L	31		18	J	19	J	31	J	18	U	18	U
Antimony	UG/L	0.63	3	0.5	U	0.63	J	0.5	U	0.56	J	0.5	U
Barium	UG/L	86	1,000	70		66		51		29		86	
Calcium	UG/L	160,000		98,000		160,000		100,000		80,000		100,000	
Cobalt	UG/L	1.1		0.3	J	0.42	J	0.12	U	1.1		0.14	J
Copper	UG/L	2.4	200	1.7	U	2.4	J	1.7	U	1.7	U	1.7	U
Iron	UG/L	360	300	**360**		140		43	J	59	J	43	J
Iron+Manganese	UG/L	449	500	449		175		44.8	J	158	J	48.8	J
Lead	UG/L	1.5	15	0.98	U	0.98	U	0.98	U	1.5	J	0.98	U
Magnesium	UG/L	19,000		19,000		16,000		11,000		11,000		17,000	
Manganese	UG/L	99	300	89		35		1.8	U	99		5.8	
Nickel	UG/L	2.1	100	1.9	U	1.9	U	1.9	U	2.1	J	1.9	U
Potassium	UG/L	1,600		520	J	1,600		810	J	500	J	1,300	
Sodium	UG/L	12,000	20,000	6,400		12,000		8,400		6,000		5,800	
Zinc	UG/L	27		9.6	U	26		27		9.6	U	9.6	U

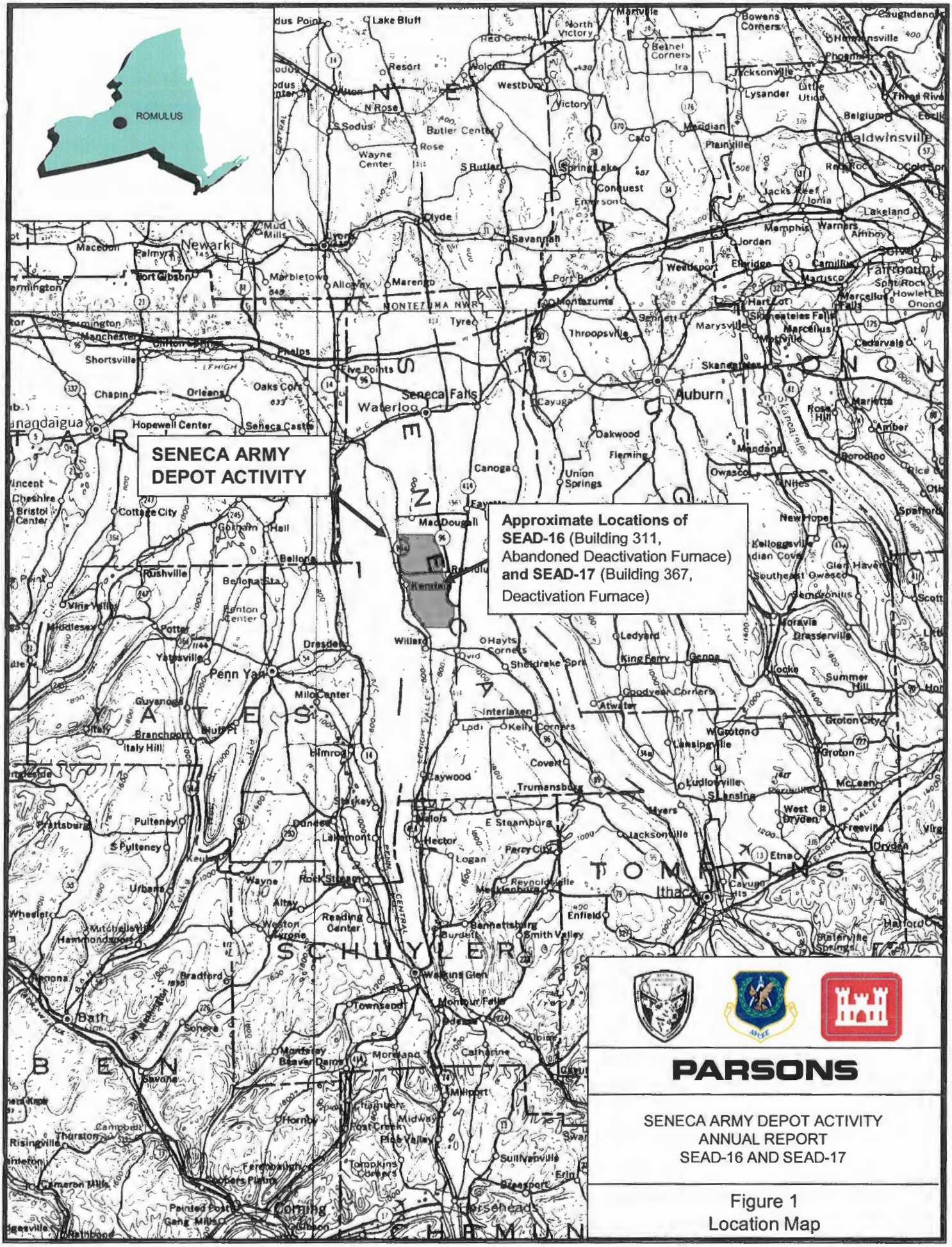
Notes:

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. 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

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

INSTITUTIONAL AREA

DATA STORAGE / TELECOMMUNICATIONS

CONSERVATION / RECREATION

PLANNED INDUSTRIAL / OFFICE DEVELOPMENT AND WAREHOUSING (PID) AREA

SEAD-16

SEAD-17

FARMING

PRISON AREA

FORMER AIRFIELD COUNTY FIRE TRAINING & FACTORY

FED TO FED TRANSFER

N

W E

S

PARSONS

SENECA ARMY DEPOT ACTIVITY
SEAD 16/17 Annual LTM Report

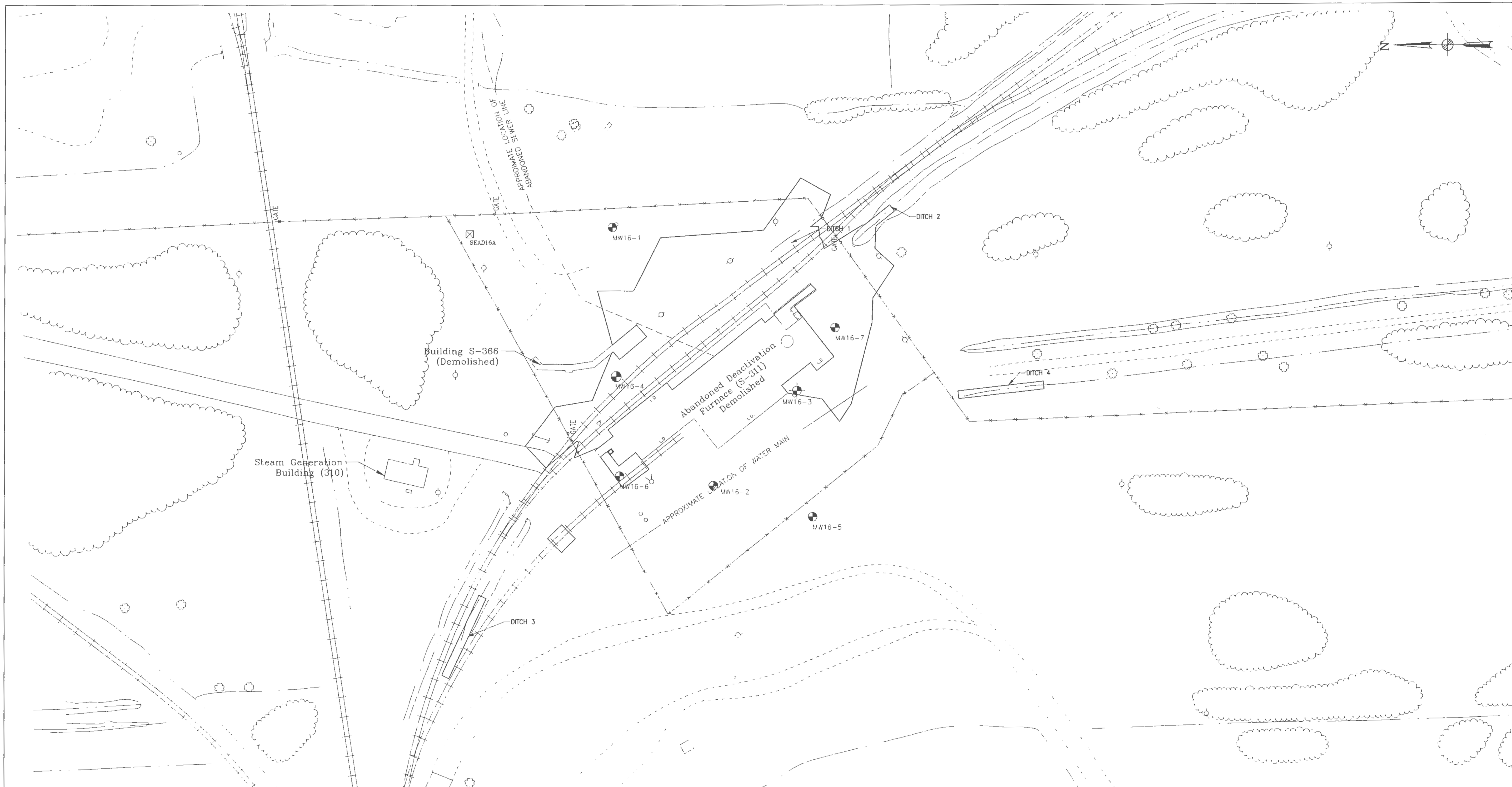
FIGURE 2
Location of SEAD-16/17 and SEDA Future Land Use

January 2017

Legend

- SEAD-16
- SEAD-17
- SEDA Boundary

0 2,000 4,000 8,000
Feet



LEGEND:

	MINOR WATERWAY
	MAJOR WATERWAY
	FENCE
	BRUSH LINE
	RAILROAD
	UNPAVED ROAD

SURVEY MONUMENT

ROAD SIGN — DECIDOUS TREE — L.D. LOADING DOCK

FIRE HYDRANT — MANHOLE — GUIDE POST

POLE — UTILITY BOX

OVERHEAD UTILITY POLE — MAILBOX/RR SIGNAL

MW16-5 — MONITORING WELL LOCATION

LIMITS OF EXCAVATION

MW16-3 — DESTROYED MONITORING WELL LOCATION

NOTE:

MONITORING WELL MW16-3 WAS DESTROYED DURING THE REMEDIAL ACTION.

50 0 50 100

SCALE IN FEET

PARSONS

CLIENT/PROJECT TITLE

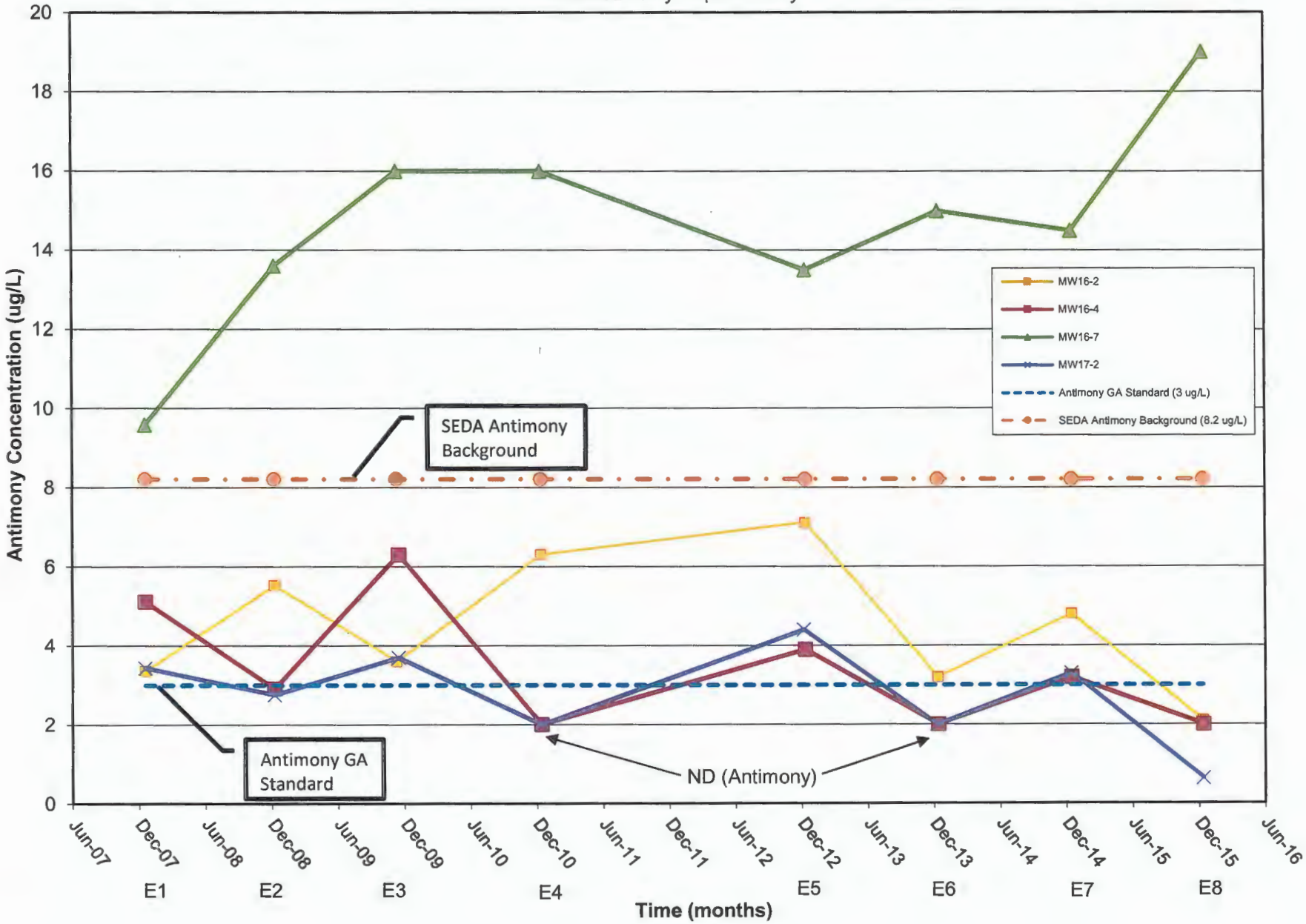
SENECA ARMY DEPOT ACTIVITY
ANNUAL REPORT - YEAR 8
SEAD-16 AND SEAD-17

DEPT. ENVIRONMENTAL ENGINEERING — Dwg. No. 748662-04500

FIGURE 3
SEAD-16
SITE PLAN

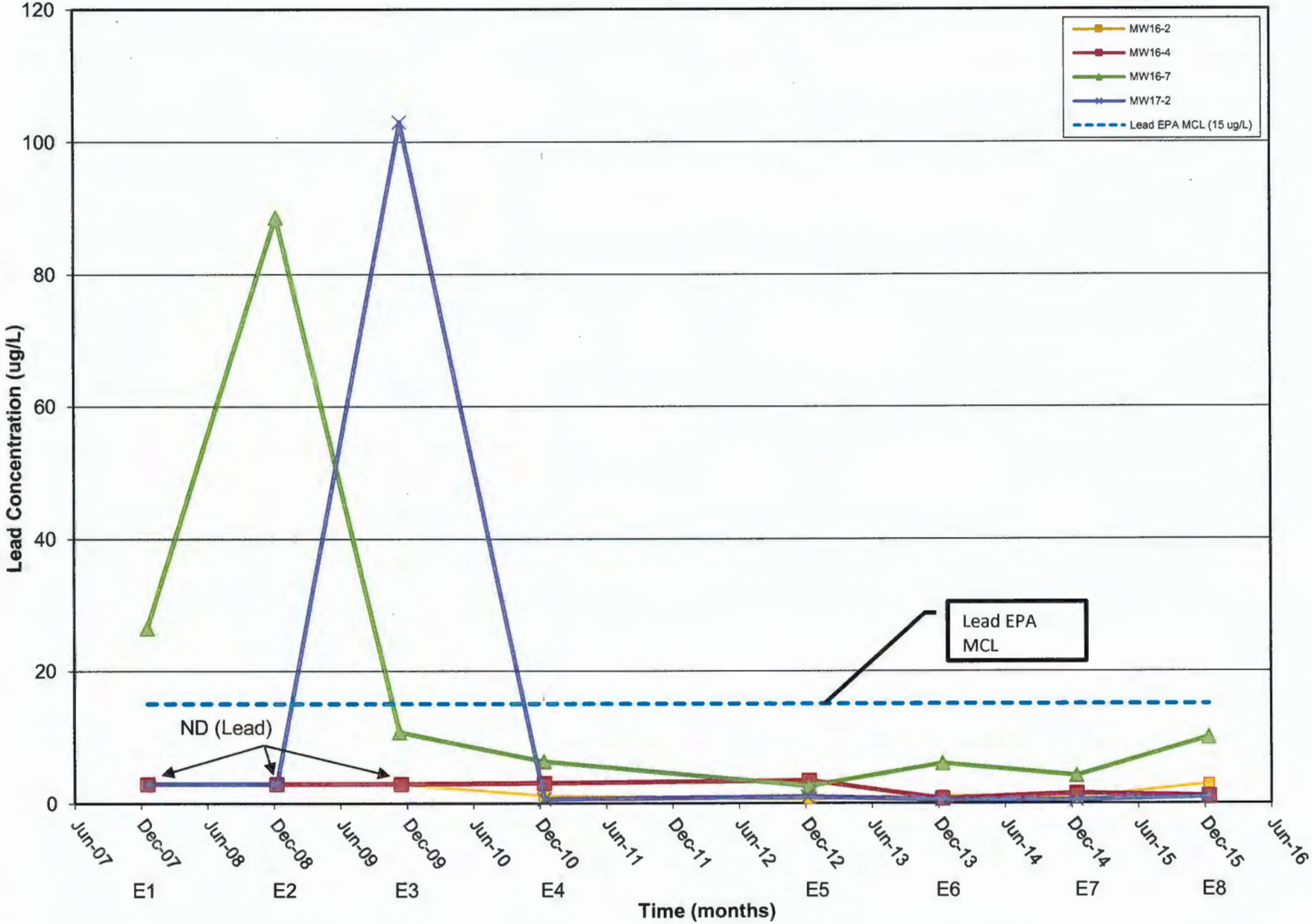
SCALE 1" = 100' — DATE FEBRUARY 2016 — REV --

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



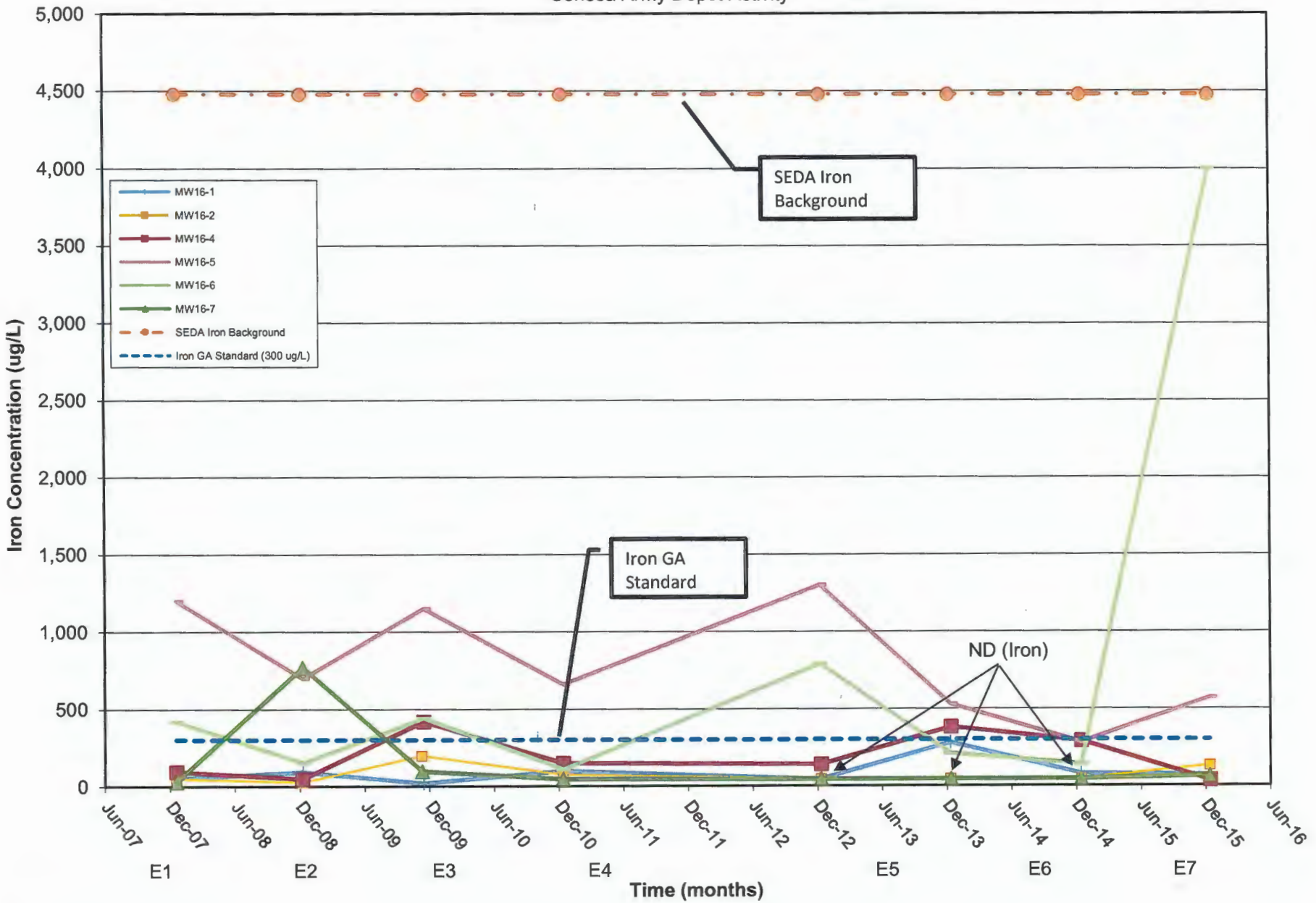
Note:
ND = not detected (MDL plotted).

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



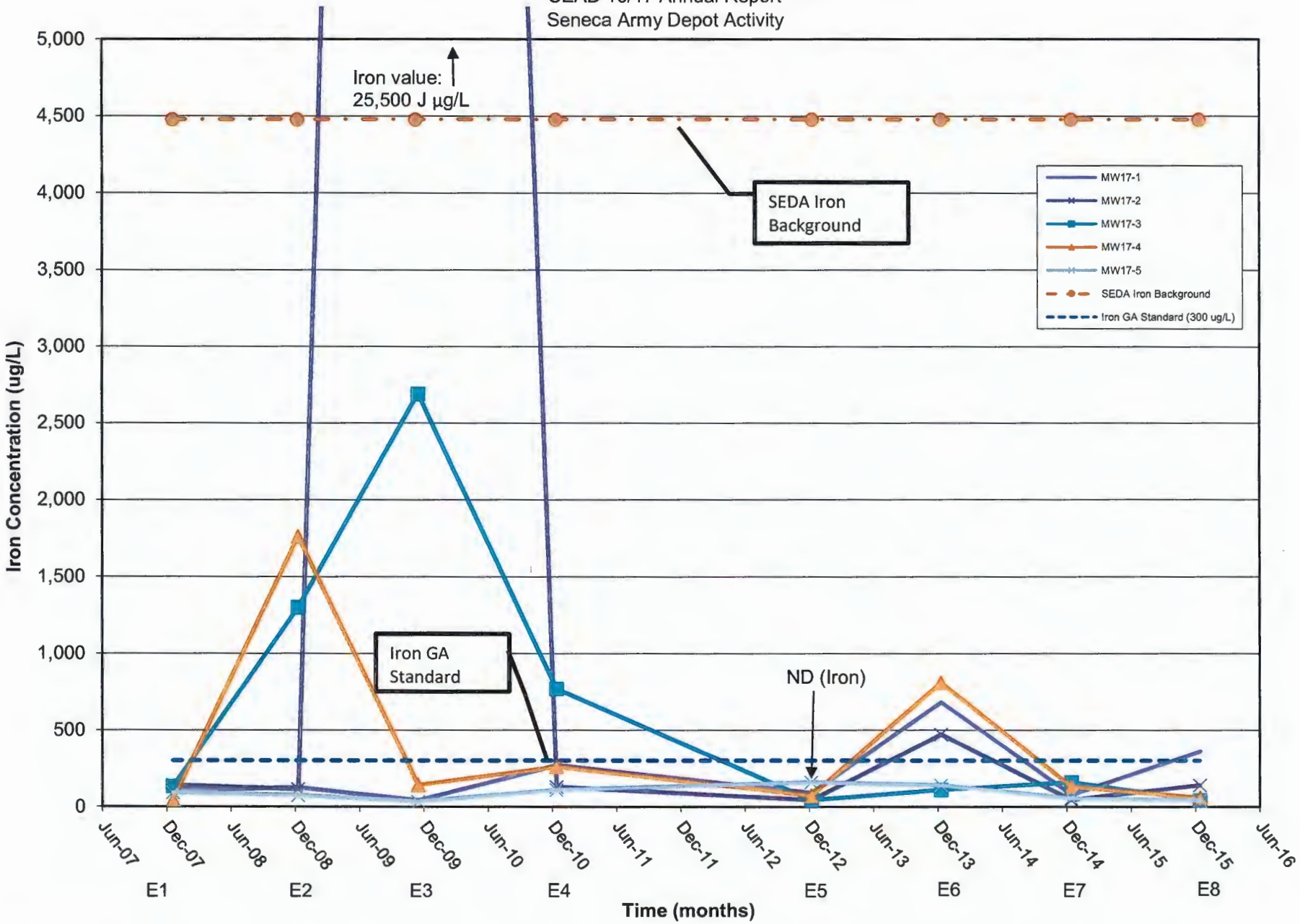
Note:
ND = not detected (MDL plotted).

Figure 6C
Concentration of Iron Over Time at SEAD 16 Monitoring Wells
SEAD 16/17 Annual Report
Seneca Army Depot Activity



Note:
ND = not detected (MDL plotted).

Figure 6D
Concentration of Iron Over Time at SEAD 17 Monitoring Wells
SEAD 16/17 Annual Report
Seneca Army Depot Activity



Note:
ND = not detected (MDL plotted).

APPENDICES

Appendix A
Pre-Remedial Action Groundwater Monitoring Results
Draft Annual Report - SEAD-16 and SEAD-17
Seneca Army Depot Activity

PARAMETER	ACTION LEVEL *	SOURCE (1)	UNIT	LOC_ID:	MW16-1	MW16-1	MW16-2	MW16-2	MW16-3	MW16-3	MW16-4	MW16-4	MW16-5	MW16-6	MW16-6	MW16-7	MW16-7	MW16-7
				SAMP ID:	16101	16152	16102	16150	16110	16165	16105	16156	16162	16111	16155	16104	16158	16159
				QC CODE:	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	DU
				STUDY ID:	RI ROUND1	RI ROUND2	RI ROUND1	RI ROUND2	RI ROUND1	RI ROUND2	RI ROUND1	RI ROUND2	RI ROUND2	RI ROUND1	RI ROUND2	RI ROUND1	RI ROUND2	RI ROUND2
				MATRIX:	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
				SAMPLE DATE:	8/27/1996	12/7/1996	8/27/1996	12/6/1996	8/30/1996	12/10/1996	8/28/1996	12/7/1996	12/9/1996	9/3/1996	12/8/1996	8/28/1996	12/8/1996	12/8/1996
					VALUE Q	VALUE Q	VALUE Q	VALUE Q	VALUE Q	VALUE Q	VALUE Q	VALUE Q	VALUE Q	VALUE Q	VALUE Q	VALUE Q	VALUE Q	VALUE Q
SEMIVOLATILE ORGANICS																		
3-Nitroaniline	5	GA	UG/L		26 UJ	25 U	25 U	25 U	25 U	25 U	26 U	25 U	25 U	25 U	25 U	25 J	25 U	25 U
4-Chloroaniline	5	GA	UG/L		10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 J	10 U	10 U
Benzo[ghi]perylene			UG/L		10 UJ	10 U	10 U	10 U	1 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Dibenz[a,h]anthracene			UG/L		10 UJ	10 U	10 U	10 U	0.7 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Diethyl phthalate			UG/L		10 UJ	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Indeno[1,2,3-cd]pyrene			UG/L		10 UJ	10 U	10 U	10 U	0.6 J	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
OTHER ANALYSES																		
Nitrate/Nitrite Nitrogen	10	GA	MG/L		0.02	0.01 U	0.67	2	0.04	0.64	0.29	0.26	1.4	0.01 U	0.01 U	0.83	0.24	0.23
Percent Solids (Metals)					0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Petroleum Hydrocarbons			MG/L		0.44 U	0.4 U	0.4 U	0.36 U	0.41 U	1	0.41 U	0.42 U	0.91	0.89	0.73	0.41 U	0.46 U	1.3
NITROAROMATICS																		
1,3-Dinitrobenzene	5	GA	UG/L		0.26 U	0.26 U	1.8 J	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26	0.26 U	0.26 U
2,4-Dinitrotoluene	5	GA	UG/L		0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.68 J	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U
METALS																		
Aluminum			UG/L		1850	143 U	1010	490	336	36.1 U	24.9	36.1 U	148 U	208	170 U	12.4	67.4 U	52.9 U
Antimony	3	GA	UG/L		2 U	3 U	2 U	3 U	7.5	5.3 U	2 U	3 U	3 U	2 U	3 U	15.7 U	8.9 U	10 U
Arsenic	10	MCL	UG/L		2.7 U	4.4 U	2.7 U	4.4 U	2.7 U	4.4 U	2.7 U	4.4 U	4.4 U	2.7 U	4.4 U	4 U	4.4 U	4.4 U
Barium	1,000	GA	UG/L		74.2	48.2 U	48.1	31.4 U	64.4	57.4 U	97.4	55.2 U	67.6 U	86.4	80.2 U	89.2	59.1 U	60.2 U
Beryllium	4	MCL	UG/L		0.23	0.2 U	0.22	0.2 U	0.21	0.2 U	0.21	0.2 U	0.2 U	0.1 U	0.2 U	0.21	0.2 U	0.2 U
Cadmium	5	GA	UG/L		0.3 U	0.6 U	0.3 U	0.6 U	0.3 U	0.6 U	0.3 U	0.6 U	0.6 U	0.3 U	0.6 U	0.3 U	0.6 U	0.6 U
Calcium			UG/L		157,000	116,000	193,000	164,000	99,800	85,500	130,000	158,000	90,000	44600	84,900	109,000	114,000	117,000
Chromium	50	GA	UG/L		2.7	1 U	2.3	1.1 U	1 U	1 U	1 U	1 U	1 U	1.5	1 U	1	1 U	1 U
Cobalt			UG/L		2.1	1.3 U	1.5	1.3 U	1.2 U	1.3 U	1.2 U	1.3 U	1.3 U	1.2	1.3 U	1.2	1.3 U	1.3 U
Copper	200	GA	UG/L		4.9	1.9 U	7.9	2.9 U	19.2	11.4 U	3.6	1.1 U	1.1 U	4.4	1.1 U	5.1	1.4 U	2.1 U
Iron	300	GA	UG/L		2,400 J	296	1,720 J	923 J	432 J	77.8 U	38.2	126	211	273 J	290	23.4	174	160
Lead	15	MCL	UG/L		1.7 U	1.5 U	5.9	6.8	6.1	1.5 U	1.7 U	1.5 U	3 U	1.7 U	1.5 U	8.4	9.9	9.2
Magnesium			UG/L		23,300	17,600	23,700	20,900	11,600	10,000	17,700	22,900	11,800	6370	12,800	16,900	22,600	23,200
Manganese	300	GA	UG/L		210	64.2	129	65.2	130	5.9 U	132	66.9	51	545	1,380	85.7	43.2	44.3
Mercury	0.7	GA	UG/L		0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	100	GA	UG/L		4.7	2.5 U	11	3.1 U	3	2.5 U	2.2	2.5 U	2.5 U	4.1	2.5 U	2.2	2.5 U	2.5 U
Potassium			UG/L		1670	998 U	4760	3410 U	2740	1900 U	4040	1660 U	18800	3530	2230 U	3220	2090 U	2160 U
Selenium	10	GA	UG/L		2.4 U	4.7 UJ	2.4 U	4.7 UJ	2.4 U	4.7 UJ	2.4 U	4.7 UJ	4.7 UJ	2.4 U	4.7 UJ	2.4 U	4.7 UJ	4.7 UJ
Sodium	20,000	GA	UG/L		8,750	3,870 U	19,100	17,000	9,480	7,660	17,200	12,300	49,500	396000	409,000	12,000	9,940	10,200
Thallium	2	MCL	UG/L		4.2 U	5.9 U	9.2	9.6 U	4.2 U	4.1 U	4.2 U	4.1 U	6.9 U	6.2	4.1 U	4.2	11	4.1 U
Vanadium			UG/L		3.3	1.6 U	2.9	1.6 U	1.2 U	1.6 U	1.2 U	1.6 U	1.6 U	2.9	1.6 U	1.2	1.6 U	1.6 U
Zinc			UG/L		15.6 R	5.8 U	37.4 R	13.5 U	32.4 R	42	4.5 R	5.1 U	6.3 U	13.2 R	10.5 U	2.9 R	2.2 U	7.3 U

Notes:
1. The criteria values are NYSDEC 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 groundwater standard.
3. A blank in the action level column indicates no Class GA and/or MCL standand or standard is a secondary value.
4. Reported metals results are for total metals.

U = compound was not detected
J = the reported value is and estimated concentration
R = the compound was rejected
SA = Sample
DU = Duplicate

Appendix A
Pre-Remedial Action Groundwater Monitoring Results
Draft Annual Report - SEAD-16 and SEAD-17
Seneca Army Depot Activity

			LOC_ID:	MW17-1		MW17-1		MW17-1		MW17-2		MW17-3		MW17-4		MW17-5		MW17-5	
			SAMP ID:	16108		16109		16171		16163		16166		16169		16106		16170	
			QC CODE:	SA		DU		SA		SA		SA		SA		SA		SA	
			STUDY ID:	RI ROUND1		RI ROUND1		RI ROUND2		RI ROUND2		RI ROUND2		RI ROUND2		RI ROUND1		RI ROUND2	
			MATRIX:	GW		GW		GW		GW		GW		GW		GW		GW	
			SAMPLE DATE:	8/29/1996		8/29/1996		12/11/1996		12/9/1996		12/10/1996		12/11/1996		8/29/1996		12/11/1996	
PARAMETER	ACTION LEVEL	SOURCE [1]	UNIT	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q	VALUE	Q
SEMIVOLATILE ORGANICS																			
Benzo[a]pyrene			UG/L	0.7	J	10	U	10	U	10	U	10	U	10	U	10	U	10	U
Benzo[ghi]perylene			UG/L	2	J	1	J	10	U	10	U	10	U	10	U	10	U	10	U
Dibenz[a,h]anthracene			UG/L	1	J	0.9	J	10	U	10	U	10	U	10	U	10	U	10	U
Indeno[1,2,3-cd]pyrene			UG/L	2	J	1	J	10	U	10	U	10	U	10	U	10	U	10	U
OTHER ANALYSES																			
Nitrate/Nitrite Nitrogen	10	GA	MG/L	0.24		0.23		0.2		0.04		0.05		0.02		0.04		0.02	
Percent Solids (Metals)				0		0		0		0		0		0		0		0	
NITROAROMATICS																			
Tetryl			UG/L	0.26	U	0.26	U	0.26	U	0.26	U	0.26	U	0.26	U	0.26	U	0.26	U
METALS																			
Aluminum			UG/L	90.4		54.6		386		85.3	U	36.1	U	41.9	U	39.9		59	U
Antimony	3	GA	UG/L	2	U	2	U	3	U	3	U	3	U	3	U	2	U	3	U
Arsenic	10	MCL	UG/L	2.7	U	2.7	U	4.4	U	4.4	U	4.4	U	4.4	U	2.7	U	4.4	U
Barium	1,000	GA	UG/L	85		87		90.4	U	66.1	U	27.4	U	27.4	U	92.5		62.6	U
Beryllium	4	MCL	UG/L	0.26		0.21		0.2	U	0.2	U	0.2	U	0.2	U	0.23		0.2	U
Cadmium	5	GA	UG/L	0.3	U	0.31		0.6	U	0.6	U	0.6	U	0.6	U	0.3	U	0.6	U
Calcium			UG/L	108000		110000		104000		118000		108000		92000		108000		81100	
Chromium	50	GA	UG/L	1	U	1.5		1	U	1	U	1	U	1	U	1	U	1	U
Cobalt			UG/L	1.2	U	1.4		2	U	1.3	U	1.3	U	1.3	U	1.2	U	1.3	U
Copper	200	GA	UG/L	3.1		4.3		1.1	U	2.6	U	1.1	U	1.1	U	3.3		1.3	U
Iron	300	GA	UG/L	119		90.6		572	J	214		53.1	U	96.4	U	56.8		134	
Lead	15	MCL	UG/L	1.7	U	1.7	U	1.5	U	1.9	U	1.5	U	3	U	1.7	U	1.5	U
Magnesium			UG/L	22600		23000		22900		14600		15200		14200		17700		13600	
Manganese	300	GA	UG/L	21.3		20		9.7	U	73.8		0.7	U	22.5		73.2		62	
Mercury	0.7	GA	UG/L	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U	0.1	U
Nickel	100	GA	UG/L	1.8		2.2		2.5	U	2.5	U	2.5	U	2.5	U	2.4		2.5	U
Potassium			UG/L	472		574		843	U	5320		772	U	1330	U	853		1070	U
Selenium	10	GA	UG/L	2.4	U	2.4	U	4.7	UJ	4.7	UJ	4.7	UJ	4.7	UJ	2.4	U	4.7	UJ
Silver	50	GA	UG/L	1.3	U	2.3		1.5	U	1.5	U	1.5	U	1.5	U	1.3	U	1.5	U
Sodium	20,000	GA	UG/L	9,290		9,620		8,190		18,700		30,100		22,300		11,700		8,970	
Thallium	2	MCL	UG/L	4.40		7.1		4.1	U	4.7	U	4.4	U	6.2	U	4.7		8.6	U
Vanadium			UG/L	1.2	U	1.4		1.6	U	1.6	U	1.6	U	1.6	U	1.2	U	1.6	U
Zinc			UG/L	2.5	R	3.2	R	14.4	U	63.9		7.7	U	8.3	U	6.2	R	4.4	U

Notes:
1. The criteria values are NYSDEC 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 groundwater standard.
3. A blank in the action level column indicates no Class GA and/or MCL standand or standard is a secondary value.
4. Wells MW17-2, MW17-3, and MW17-4 were not sampled in August 1996 since they were dry.
5. Reported metals results are for total metals.

U = compound was not detected
J = the reported value is and estimated concentration
R = the compound was rejected
SA = Sample
DU = Duplicate

APPENDIX C

FIELD FORMS - YEAR 8 LTM GROUNDWATER SAMPLING ACTIVITIES

GROUNDWATER ELEVATION REPORT

PARSONS | CLIENT: | DATE: 12/16/15

PROJECT: S-16/17
LOCATION:
PROJECT NO:
INSPECTOR: BBC / DD

MONITORING EQUIPMENT:

INSTRUMENT	DECTECTOR	BGD	TIME	REMARKS

WATER LEVEL INDICATOR:

INSTRUMENT	CORRECTION FACTOR

COMMENTS: overcast, winds 5-10 SW → NE

WELL	TIME	DEPTH TO WATER	DEPTH TO 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.)
17-2	1450	3.80	6.10					locked,
17-3	1453	4.40	7.49					? unlocked
17-4	1456	3.40	8.20					locked, no well cap
17-5	1458	3.09	10.18					locked
17-1	1503	3.59	9.95					locked, mouse nest removed
16-5	1511	2.02	5.09					PVC lifted, well cap cracked at PVC top, locked
16-7	1513	3.60	6.78					locked
16-1	1516	3.93	7.95					locked, PVC recessed in metal well cap
16-6	1521	2.80	6.85					locked
16-4	1527	3.18	7.08					locked
16-2								unable to open lock

(ALL DEPTH MEASUREMENTS FROM MARKED LOCATION ON RISER)

GROUNDWATER ELEVATION REPORT

PARSONS | CLIENT: | DATE: 12/19/15

PROJECT: SEAD-16/17 LTM Round 10 | PROJECT NO:

LOCATION: | INSPECTOR: BTB / DD

MONITORING EQUIPMENT:

INSTRUMENT	DECTECTOR	BGD	TIME	REMARKS

WATER LEVEL INDICATOR:

INSTRUMENT	CORRECTION FACTOR

COMMENTS: overcast, lt shwr shwrs

WELL	TIME	DEPTH TO WATER	DEPTH TO 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.)
17-1	1139	3.53	9.95					[illegible]
17-5	1142	3.96	10.18					
17-4	1145	3.28	8.20					
17-3	1147	3.73	7.49					
17-2	1149	~~3.45~~ 3.50		6.10				
16-2	1155	3.33	5.65					
16-5	1157	2.20	5.09					
16-7	1158	3.52	6.78					
16-1	1200	3.69	7.95					
16-4	1202	3.03	7.08					
16-6	1203	2.68	6.85					
		* See 12/16/15 GW survey form for well condition comments.						

(ALL DEPTH MEASUREMENTS FROM MARKED LOCATION ON RISER)

[illegible]05-12 XLS GW ELEVATION

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW 16-2

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 8
LOCATION: ROMULUS, NY

DATE: 12/12/15
INSPECTORS: BBO
PUMP #: Parsons Peristaltic
SAMPLE ID #: 16LM20050

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
1212	30s	overcast		10-20	SW→NE			

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
	5.65					

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
		3.33'			

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)
1222	3.31	YSI	in well	YSI	YSI	Horiba	Horiba	Horiba	LaMotte
1222		Peristaltic pump Started							
1232	3.34	114		3.75	8.5	0.399	7.52	93	33.8
1237	3.34			1.56	8.4	0.444	7.40	103	20.1
1242	3.34			0.98	8.5	0.485	7.35	107	9.85
1247	3.34	~120	~0.5 gals	1.60	8.6	0.476	7.32	101	87.7
1252	"			0.76	8.6	0.526	7.29	91	25.1
1257	"		~1.0 gal	0.61	8.7	0.554	7.25	80	10.31
1302	"			0.50	8.7	0.565	7.22	70	4.79
1307	"		~1.25 gals	0.40	8.6	0.573	7.21	63	3.06
1312	"		~1.5 gals	0.34	8.7	0.578	7.21	58	2.40
1317	3.34		~1.6 gals	0.31	8.7	0.583	7.22	57	2.44
1320		Sample	Collected	1x Plastic	for	Metals	unfiltered		
1323	Restarted	Pump to Collect Post-Sample Collected for Pars							
1328	3.34		~1.9 gals	0.20	8.7	0.592	7.21	57	7.60

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW16-5

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 8
LOCATION: ROMULUS, NY

DATE: 12/19/15
INSPECTORS: DRD
PUMP #: Peristaltic
SAMPLE ID #: 16LM12005-2

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	20s	overcast, windy		10-20	55W	Gravel		

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
	5.09					

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
		3.17			

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)
1220	3.17	YSI	Installed	YSI	YSI	Horiba	Horiba	Horiba	LaMotte
1225		120		0.55	6.9	0.446	6.97	233	12.20
1230				0.38	7.2	0.443	6.63	134	
1235		120		0.33	7.3	0.440	6.81	77	
1240	3.45			0.30	7.4	0.440	6.81	22	3.90
1245				0.26	7.6	0.441	6.83	-5	
1250				0.24	7.7	0.443	6.77	-28	
1255				0.22	7.8	0.445	6.76	-40	
1300	3.85	120		0.18	7.9	0.447	6.77	-55	1.53
1305				0.16	8.0	0.449	6.72	-62	
1310	4.15	120	~2.0 gals	0.14	8.2	0.452	6.69	-74	1.94
1315	Collected	Sample:	16LM12005-2						
~~1320~~	Collecting	post sampling	round of	Geo	parameters				
1320		120		0.11	8.1	0.453	6.75	-81	0.94

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW16-7

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 8
LOCATION: ROMULUS, NY

DATE: 12/19/15
INSPECTORS: JPL
PUMP #: Peristaltic
SAMPLE ID #: 16LM20054 / MS/MSD Duplicate - 16LM20055

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
1345	20s	overcast, windy		10-20	WSW	Gravel		

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
	6.78					

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
		3.48			

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)
1345	3.48	YSI	Installed	YSI	YSI	Horiba	Horiba	Horiba	LaMotte
1350		140		3.23	9.1	0.485	7.14	-57	43.2
1355				3.01	9.3	0.473	7.05	-56	
1400	4.00			3.09	9.4	0.480	6.96	-35	
1405		160		2.77	9.3	0.485	6.98	-30	5.36
1410				2.07	9.4	0.492	6.94	-21	
1415		152		1.62	9.6	0.499	6.91	-15	
1420	4.02			1.44	9.7	0.512	6.94	-11	
1425		155		1.35	9.8	0.524	6.91	-5	2.97
1430				1.30	9.8	0.534	6.94	-3	
1435	4.03			1.27	9.8	0.544	6.92	1	1.52
1440	Collected	Sample #'s		16LM20054					
				16LM20054 MS					
				16LM20055 (Duplicate)			Time =	1500	
	Collected?	post sample		Geoparameter readings					
1445			~2.5 gals	1.17	9.8	0.595	6.90	14	1.92

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW16-6

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 8
LOCATION: ROMULUS, NY

DATE: 12/19/15
INSPECTORS: BDO
PUMP #: Parsons Peristaltic
SAMPLE ID #: 16LM20053

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
1400	30's	overcast		10-20	SW→NE			

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)]
1 x Well Vol = 0.68 gals 3 x Well = 2.0 gals

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
	6.85'					

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
		2.68'			

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)
1410 ~~1410~~	2.59	YSI	2 tubing volumes in the well	YSI	YSI	Horiba	Horiba	Horiba	LaMotte
1410		Peristaltic Pump Started							
1414	3.34	94		2.10	9.1	0.387	7.43	105	7.67
1419	3.72	102		2.14	9.1	0.385	7.40	108	6.21
1424	3.95			2.03	9.1	0.386	7.36	103	4.18
1429	4.1			2.10	9.2	0.386	7.34	98	3.86
1434	4.24			1.84	9.2	0.380	7.33	88	2.75
1439	4.35		0.5 gals	1.66	9.3	0.391	7.32	68	2.03
1444	4.45	118		1.65	9.3	0.391	7.33	51	1.39
1449	4.54			1.75	9.3	0.380	7.34	41	1.18
1454	4.63		1.0 gals	1.71	9.3	0.384	7.34	36	1.13
1459	4.73			1.71	9.3	0.381	7.35	33	0.87
1504	4.83	122	~1.25 gals	1.76	9.3	0.379	7.36	26	0.91
1509	4.95			1.68	9.3	0.384	7.35	11	1.09
1514	5.05		~1.5 gal	1.21	9.4	0.391	7.33	-13	1.34
1519	5.15	110		1.37	9.4	0.398	7.32	-27	1.39
1524	5.23		~2.0 gals	1.62	9.5	0.400	7.31	-33	1.86
1530		Sample Collected		1x Plastic for Metals			Unfiltered		
1531		Post-Sample Geo Pump Pump Started							
1536	5.43		2.25	1.49	9.6	0.405	7.29	-30	5.73

5.43

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW16-4

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 8
LOCATION: ROMULUS, NY

DATE: 12-20-15
INSPECTORS: DRD
PUMP #: Peristaltic
SAMPLE ID #: 16LM20051

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
0755	30s	P/cloudy		5-10	WNW	Grass		

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)]
Well Vol = 0.632 gals

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
		3.13			

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

MONITORING DATA COLLECTED DURING PURGING OPERATIONS

LaMotte

TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVED OXYGEN (mg/L) YSI	TEMP (C)	SPEC. COND (umhos) ← Horiba →	pH	ORP (mV)	TURBIDITY (NTU)
0800	3.08	YSI	Installed	0.81	8.6	1.32	6.89	239	
0805	3.25	150		0.69	8.6	1.35	6.91	237	3.55
0810				0.49	8.5	1.43	6.88	236	
0815	3.26	160		0.38	8.5	1.56	6.84	235	1.27
0820				0.35	8.4	1.63	6.82	234	
0825	3.25	160		0.27	8.4	1.69	6.81	233	
0830				0.26	8.4	1.74	6.80	232	
0835	3.26	165	~2.5 gals	0.27	8.4	1.75	6.79	231	1.19
0840		Collected Sample #		16LM20051					
0845		Collecting post sample		Geo parameter readings					
0845	3.26			0.22	8.4	1.82	6.82	233	0.87

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: 4616-1

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 8
LOCATION: ROMULUS, NY

DATE: 12/20/15
INSPECTORS: BTO
PUMP #: Parsa Peristaltic
SAMPLE ID #: 16LM20049

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
742	30's	partly cloudy		0-5	S-2N	grassy		

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)]
1x Well Vol = 0.66 gals 3x = 1.98 gals

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
	7.95'					

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
0.78' diff between TOR & TOC		3.91			

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

TOR TOC

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)
809	4.71	YSI	tubing & well	YSI	YSI	Horiba	Horiba	Horiba	LaMotte
814		Pump	Started						
819	4.79	106		1.40	9.5	0.808	7.42	213	7.98
824	4.79			1.65	9.6	0.816	7.37	218	15.5
829	"	~118		1.30	9.6	0.822	7.29	208	8.04
834	4.8			1.11	9.6	0.824	7.24	206	4.98
839	4.8	126	~0.5 gals	0.98	9.6	0.826	7.16	213	3.38
844	4.8			0.79	9.6	0.826	7.12	212	2.78
849	4.82		~0.75 gal	1.01	9.7	0.830	7.08	200	2.53
854	4.82	132	~1.0 gal	0.85	9.7	0.832	7.07	189	2.34
859	4.8			0.65	9.7	0.832	7.04	181	2.11
904	4.8		~1.5 gals	0.48	9.7	0.834	7.02	167	1.76
909	4.81	134		0.37	9.7	0.836	7.00	146	1.60
914	4.81		~1.75 gals	0.30	9.7	0.836	7.00	134	1.34
919	4.81			0.33	9.7	0.836	7.00	124	1.09
924	4.81		~2.0 gals	0.34	9.7	0.836	6.99	107	1.02
927		Sample	Collected	1x Plastic	for	Metals	unFiltered		
929	4.79	Pump	restarted to collect - Post-Sample		Collecta	Geo Para			
934	4.81		~2.5 gals	0.32	9.7	0.838	6.98	99	0.92

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW17-2

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 8
LOCATION: ROMULUS, NY

DATE: 12-20-15
INSPECTORS: DRD
PUMP #: Peristaltic
SAMPLE ID #: 17LM20036

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
0930	30s	Clear		0-5	WNW	Grass/Brush		

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)]
Well vol = 0.392

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
	6.10'					

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
		3.65			

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)
0930	3.58	YSI	Probe installed	YSI	YSI	Horiba	Horiba	Horiba	Lamotte
0935		180		1.27	8.4	0.817	7.62	192	
0940	4.65	160		0.95	8.7	0.789	7.24	181	11.25
0945	4.95	112		0.82	8.8	0.774	7.09	135	3.20
0950	5.45			0.75	8.8	0.764	6.96	73	
0955		120		0.49	8.9	0.761	6.90	41	
1000	5.80	112		0.36	8.9	0.758	6.88	26	1.38
1005	5.88	108		0.29	9.0	0.755	6.86	14	
1010			~ 1.5 gals	0.27	9.0	0.756	6.86	6	1.41
1015	Collected		Sample #	17LM20036	-	Well very close to going dry		> 3 vols	removed
	Collected		post sampling	Geo parameters					
1020	5.93			0.27	9.0	0.750	6.98	-3	0.79

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: 1617-5
PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 8		DATE: 12/20/15
LOCATION: ROMULUS, NY		INSPECTORS: TJB, O
		PUMP #: Parsons Peristaltic
		SAMPLE ID #: 17LM20039

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
949	30s	sunny		1-5	SO-2WE	grassy		

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)]

1xWell = 1.16 gals 3x = 3.49 gals

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
	10.18'					

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
		3.05'			

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)
959	3.05	YSI &	tubing on well	YSI	YSI	Horiba	Horiba	Horiba	LaMotte
1000		Pump	Started						
1004	3.15	126		0.53	9.7	0.543	7.40	165	5.28
1009	3.16			0.44	9.9	0.539	7.22	185	3.42
1014	3.18	158		0.34	9.9	0.536	7.20	193	1.31
1019	3.19			0.30	10.0	0.535	7.18	168	1.28
1024	3.18		~0.75 gals	0.30	9.7	0.529	7.19	141	0.90
1029	3.18			0.28	9.8	0.527	7.19	128	0.92
1034	3.17	142	~1.0 gals	0.24	9.7	0.525	7.20	109	1.38
1039	3.16			0.25	9.8	0.525	7.22	88	0.75
1044	3.15		~1.5 gals	0.25	9.8	0.525	7.23	84	1.06
1049	3.17	126		0.21	10.0	0.524	7.25	76	0.64
1054	3.16		~2.0 gals	0.19	10.1	0.525	7.26	68	0.81
1059	3.15			0.19	10.1	0.523	7.26	63	0.63
1104	3.16		~2.3 gals	0.18	10.1	0.521	7.27	57	0.67
1109	3.16			0.17	10.1	0.521	7.28	52	0.63
1114	3.16	148	~2.6 gals	0.19	10.1	0.520	7.28	45	0.98
1119	3.15			0.18	10.1	0.519	7.28	42	0.71
1124	3.16	122	~3.0 gals	0.12	10.1	0.519	7.28	40	0.70
1129	3.17		~3.2 gals	0.09	10.0	0.519	7.28	39	0.69
1134	3.16			0.08	10.1	0.519	7.28	36	1.37

1137 Sample Collected

1139 Restarted Pump for Post-Sample Collection Geo Parameters

1144 3.15 ~3.75 gals 0.08 10.1 0.519 7.27 36 0.59

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW17-3

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 8
LOCATION: ROMULUS, NY

DATE: 12-20-15
INSPECTORS: DRD
PUMP #: Peristaltic
SAMPLE ID #: 17LM20037

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
1045	30s	Clear		0-5	NNW	Grass/Dirt		

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)]
Well Vol. = 0.584

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
	7.49					

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
		3.84			

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)
1050	7.35	3.75	YSI Probe Installed	YSI	YSI	Horiba	Horiba	Horiba	LaMotte
1055				5.18	9.1	0.514	7.17	27	
1100	4.97	120		4.86	9.0	0.508	7.19	33	47.1
1105	5.18	108		4.89	8.9	0.504	7.00	54	
1110	5.35			4.56	9.0	0.501	6.94	65	5.25
1115	5.44	112		4.14	9.0	0.502	6.86	77	
1120				4.30	9.1	0.503	6.84	82	
1125	5.56	110		4.05	9.1	0.504	6.79	88	
1130				3.54	9.2	0.504	6.78	95	3.58
1135	5.70	116		3.50	9.2	0.504	6.81	95	
1140				3.22	9.2	0.505	6.78	98	
1145	5.82	112		2.95	9.3	0.506	6.82	98	0.89
1150				2.58	9.3	0.505	6.78	103	
1155	5.93			2.30	9.3	0.506	6.75	106	
1200		118		2.06	9.3	0.506	6.77	106	
1205	6.06		~3.0 gals	1.81	9.3	0.507	6.76	108	1.76
1210	Collected		Sample # 17LM20037		-	> 3 Well vols removed			
	Collected		post Sample	Geo parameters					
1215				1.83	9.4	0.536	6.82	107	1.87

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	PARSONS	WELL #: MW17-1

PROJECT: SEAD-16/17 LTM Groundwater Sampling - Round 8
LOCATION: ROMULUS, NY

DATE: 12/21/15
INSPECTORS: DRD
PUMP #: Peristaltic
SAMPLE ID #: 17LM20035

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
0745	40s	Overcast		5-10	SSW	Grass/Brush		

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)]
Well Vol. = 1.01 gals

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
	9.95'					

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
		3.62			

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)
0750	3.54		YSI Probe installed						
0755				0.17	10.4	0.438	7.72	207	
0800	4.10	150		0.13	10.5	0.430	7.46	181	9.47
0805	4.16			0.09	10.5	0.441	7.35	61	
0810		160		0.08	10.5	0.439	7.35	17	
0815	4.23			0.07	10.6	0.459	7.31	-16	4.99
0820		160		0.06	10.6	0.480	7.28	-30	
0825	4.25			0.06	10.6	0.489	7.25	-35	3.45
0830				0.06	10.6	0.500	7.23	-39	
0835	4.29			0.05	10.6	0.512	7.22	-42	
0840		164		0.05	10.6	0.523	7.22	-44	2.06
0845				0.05	10.7	0.514	7.22	-46	
0850		170	~2.5 gals	0.05	10.7	0.524	7.23	-47	1.36
0855	Collected		Sample # 17LM20035						
	Collected		Post Sample Geoparameters						
0900	4.30			0.04	10.7	0.534	7.26	-51	1.61

SAMPLING RECORD - GROUNDWATER

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

PROJECT:	SEAD-16/17 LTM Groundwater Sampling - Round 8	DATE: 12/21/15
LOCATION:	ROMULUS, NY	INSPECTORS: BBC
		PUMP #: Peristaltic
		SAMPLE ID #: 17LM20038

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
745	30s	overcast		5-10	SW 240	snowy		

WELL VOLUME CALCULATION FACTORS						
DIAMETER (INCHES):	0.25	1	2 (circled)	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)]

1x well vol = 0.79   3x = 2.38 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
	8.20'					

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
		3.33'			

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)
752	3.30	YSI & tubing in well							
752		Pump Started							
800	3.62	100		2.36	8.0	0.435	7.63	205	3.09
805	3.69	114		1.36	8.2	0.434	7.55	211	2.74
810	3.79			1.41	8.2	0.437	7.54	211	2.28
815	3.84	110		1.25	8.2	0.441	7.49	210	2.39
820	3.87		~0.5 gal	0.64	8.2	0.442	7.43	198	2.18
825	3.93			0.56	8.1	0.445	7.35	160	2.56
830	3.97	118		0.50	8.1	0.448	7.33	109	1.42
835	3.96		~1.0 gal	0.42	8.1	0.449	7.28	77	1.78
840	4.0		~1.25 gal	0.38	8.1	0.452	7.22	62	0.98
845	3.97	102		0.30	8.0	0.451	7.23	43	1.26
850	4.02		~1.6 gals	0.26	8.0	0.452	7.20	30	0.99
855	4.12		~1.75 gals	0.34	8.1	0.452	7.16	8	0.92
900	4.08	110	~2.0 gals	0.46	8.0	0.448	7.18	4	1.0[illegible]
905	4.01			0.43	8.0	0.447	7.16	-12	0.99
910	4.14		~2.25 gals	0.44	8.0	0.444	7.13	-19	1.34
915	4.17			0.42	8.0	0.441	7.13	-22	0.72
920	4.15		~2.5 gals	0.32	8.0	0.439	7.12	-27	1.20
922	Sample Collected								
926	[illegible]	Pump [illegible] + Sample Collected [illegible]							
9?1	4.17		~2.75 gals	0.07	8.0	0.438	7.12	-33	0.47

APPENDIX D

POST-REMEDIAL ACTION MONITORING RESULTS (YEARS 1 THROUGH 8)

Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 8)
Annual Report - 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		MW16-1	
Matrix							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	2,400				36	91	61.4	J	91.6	J	148	J	24	U	45	J	23	U	50	U
Antimony	UG/L	120	GA	3	42	53	91	1	U	1.02		0.95	J	1	U	1	U	2.3	U	2	U
Arsenic	UG/L	2.7	MCL	10	0	9	91	4.2	U	4.2	U	3.7	U	3.7	U	3.7	U	1.3	U	1.3	U
Barium	UG/L	600	GA	1,000	0	91	91	60.4		59		125		105		104		110		97	J
Beryllium	UG/L	0	MCL	4	0	0	91	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	6	91	0.36	U	0.36	U	0.33	U	0.3	U	0.3	U	0.095	U	0.13	U
Calcium	UG/L	510,000				91	91	107,000	J	105,000	J	176,000		111,000	J	110,000	J	140,000		130,000	
Chromium	UG/L	4.6	GA	50	0	7	91	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				37	91	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	69	91	1.3	U	1.3	U	1.3	U	1.6	J	1.6	J	1.1	U	1.1	U
Iron	UG/L	4,000	GA	300	24	65	91	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	3	42	91	2.9	U	2.9	U	2.9	U	2.9	U	2.9	U	0.2	U	0.5	U
Magnesium	UG/L	98,000				88	88	16,100	J	15,900	J	25,800		18,000		17,900		21,000		20,000	J
Manganese	UG/L	631	GA	300	1	85	91	3.3		5		11.8		1	J	2.4	J	54		52	
Mercury	UG/L	0.507	GA	0.7	0	3	91	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	54	91	1.2	U	1.2	U	1	U	1.8	J	1.2	J	2.8	J	2.7	J
Potassium	UG/L	15,000				85	85	886	R	907	R	1,340	J	1,110		1,100		1,200		1,100	
Selenium	UG/L	1.1	GA	10	0	1	91	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	91	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	56	89	89	**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	91	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	91	0.78	U	0.78	U	0.98	U	1	U	1	U	3.8	U	3.2	U
Zinc	UG/L	34.4				36	91	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
   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 D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 8)
Annual Report - 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		MW16-1	
Matrix							GW		GW		GW		GW		GW		GW	
Sample ID							16LM20028F		16LM20028U		16LM20035F		16LM20035U		16LM20042F		16LM20049	
Sample Date							12/15/2012		12/15/2012		12/17/2013		12/17/2013		12/21/2014		12/20/2015	
QC Type							SA		SA		SA		SA		SA		SA	
Study ID							LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round							5		5		6		6		7		8	
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	2,400				36	91	23	UJ	50	UJ	23	UJ	50	UJ	23	U	50	U	44	J
Antimony	UG/L	120	GA	3	42	53	91	2.3	UJ	2	UJ	2.3	UJ	2	UJ	2.3	U	2	U	0.5	U
Arsenic	UG/L	2.7	MCL	10	0	9	91	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ	1.3	U	1.3	U	1.5	U
Barium	UG/L	600	GA	1,000	0	91	91	78	J	78	J	63	J	69	J	99		94		81	
Beryllium	UG/L	0	MCL	4	0	0	91	0.25	UJ	0.15	UJ	0.25	UJ	0.15	UJ	0.25	U	0.15	U	0.17	U
Cadmium	UG/L	0.46	GA	5	0	6	91	0.095	UJ	0.13	UJ	0.095	UJ	0.13	UJ	0.095	U	0.13	U	0.15	U
Calcium	UG/L	510,000				91	91	120,000	J	120,000	J	140,000	J	130,000	J	160,000		150,000		120,000	
Chromium	UG/L	4.6	GA	50	0	7	91	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	2.5	U	2.5	U	3	J
Cobalt	UG/L	2				37	91	0.15	UJ	0.16	J	0.9	J	0.94	J	0.15	U	0.12	U	0.12	J
Copper	UG/L	34.7	GA	200	0	69	91	5.2	J	5	UJ	1.2	J	1.1	UJ	1.3	J	1.9	J	1.7	U
Iron	UG/L	4,000	GA	300	24	65	91	33	UJ	44	UJ	260	J	280	J	33	U	79	J	68	J
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	34	U	46	U	352	J	378	J	11		91		76.7	J
Lead	UG/L	88.6	MCL	15	3	42	91	0.2	UJ	0.5	UJ	0.2	UJ	0.5	UJ	0.2	U	0.5	U	0.98	U
Magnesium	UG/L	98,000				88	88	18,000	J	18,000	J	22,000	J+	22,000	J	25,000		24,000		19,000	
Manganese	UG/L	631	GA	300	1	85	91	1	UJ	2	UJ	92	J	98	J	11		12		8.7	
Mercury	UG/L	0.507	GA	0.7	0	3	91	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ	0.091	U	0.091	U	0.08	U
Nickel	UG/L	5.5	GA	100	0	54	91	2.3	J	2	UJ	3.6	J	2	UJ	2	J	2	U	3.8	J
Potassium	UG/L	15,000				85	85	900	J	870	J	810	J	790	J	950		890	J	1,000	
Selenium	UG/L	1.1	GA	10	0	1	91	1	UJ	1.1	UJ	1	UJ	1.1	UJ	1	U	1.1	U	1	U
Silver	UG/L	0	GA	50	0	0	91	0.25	UJ	0.18	UJ	0.25	UJ	0.18	UJ	0.25	U	0.18	U	0.1	U
Sodium	UG/L	550,000	GA	20,000	56	89	89	**63,000**	**J**	**62,000**	**J**	**57,000**	**J**	**60,000**	**J**	**63,000**		**63,000**		**62,000**	
Thallium	UG/L	0.03	MCL	2	0	1	91	0.5	UJ	0.25	UJ	0.5	UJ	0.25	UJ	0.5	U	0.25	U	0.49	U
Vanadium	UG/L	2.3				7	91	3.8	UJ	3.2	UJ	3.8	UJ	3.2	UJ	3.8	U	3.2	U	5.3	U
Zinc	UG/L	34.4				36	91	8.3	UJ	8.4	UJ	8.3	UJ	8.4	UJ	8.3	U	8.4	U	9.6	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.
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   J+ = result is an estimated quantity, biased high
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   UJ = detection limit is estimated.
3. Shading indicates a concentration above the identified criteria value.
   SA = Sample
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4. Rejected values are not included in the number of samples analyzed.

Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 8)
Annual Report - 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							16LM20002	16LM20007	16LM20015FIL	16LM20015UNFIL	16LM20022FIL	16LM20022UNF	16LM20023FIL
Sample Date							12/20/2007	12/9/2008	11/11/2009	11/11/2009	12/15/2010	12/15/2010	12/15/2010
QC Type							SA	SA	SA	SA	SA	SA	DU
Study ID							LTM	LTM	LTM	LTM	LTM	LTM	LTM
Sample Round							1	2	3	3	4	4	4
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	2,400				36	91	98.8 J	97.1 J	24 U	205	23 U	50 U	23 U
Antimony	UG/L	120	GA	3	42	53	91	3.36	5.53	3.6	3.6	6.1	6.6	6.1
Arsenic	UG/L	2.7	MCL	10	0	9	91	4.2 U	3.7 U	3.7 U	3.7 U	1.3 U	1.3 U	1.3 U
Barium	UG/L	600	GA	1,000	0	91	91	64.6	69.7	71.9	72.7	68	77 J	67
Beryllium	UG/L	0	MCL	4	0	0	91	0.27 U	0.33 U	0.3 U	0.3 U	0.25 U	0.15 U	0.25 U
Cadmium	UG/L	0.46	GA	5	0	6	91	0.36 U	0.33 U	0.3 U	0.3 U	0.095 U	0.13 U	0.095 U
Calcium	UG/L	510,000				91	91	143,000 J	138,000	118,000 J	117,000 J	100,000 J	110,000 J	96,000
Chromium	UG/L	4.6	GA	50	0	7	91	0.84 U	0.88 U	0.9 U	0.9 U	2.5 U	2.5 U	2.5 U
Cobalt	UG/L	2				37	91	0.89 U	1.1 U	1.1 U	1.1 U	0.15 U	0.12 U	0.15 U
Copper	UG/L	34.7	GA	200	0	69	91	4.5 J	4 J	3.4 J	5.1 J	4.4 J	5.9	4.5 J
Iron	UG/L	4,000	GA	300	24	65	91	49.5 J	26.1 J	19 UJ	197 J	33 U	89 J	33 U
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	53 J	27	39.5	260.7 J	12	105	12
Lead	UG/L	88.6	MCL	15	3	42	91	2.9 U	2.9 U	2.9 U	2.9 U	0.21 J	1.3 J	0.2 U
Magnesium	UG/L	98,000				88	88	15,600 J	15,700	12,600	12,300	12,000	14,000 J	11,000
Manganese	UG/L	631	GA	300	1	85	91	3.4	0.84 J	39.5	63.7	12	16	12
Mercury	UG/L	0.507	GA	0.7	0	3	91	0.12 U	0.148 J	0.1 U	0.1 U	0.091 U	0.091 U	0.091 U
Nickel	UG/L	5.5	GA	100	0	54	91	1.2 U	1.6 J	2.2 J	2.6 J	2 U	2 J	2.2 J
Potassium	UG/L	15,000				85	85	2,050 R	2,410 J	3,170	3,140	2,300 J	2,500 J	2,200 J
Selenium	UG/L	1.1	GA	10	0	1	91	6.1 U	6.1 U	6.1 U	6.1 U	1 U	1.1 U	1 U
Silver	UG/L	0	GA	50	0	0	91	1 U	1.3 U	1.3 U	1.3 U	0.25 U	0.18 U	0.25 U
Sodium	UG/L	550,000	GA	20,000	56	89	89	49,600 J	63,500	19,500 J	18,800 J	33,000 J	34,000 J	31,000 J
Thallium	UG/L	0.03	MCL	2	0	1	91	0.03 U	0.09 U	0.2 U	0.2 U	0.5 U	0.25 U	0.5 U
Vanadium	UG/L	2.3				7	91	0.78 U	0.98 U	1 U	1 U	3.8 U	3.2 U	3.8 U
Zinc	UG/L	34.4				36	91	8.2 J	10.2	11.1	11.3	11 J	14 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.
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3. Shading indicates a concentration above the identified criteria value.
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4. Rejected values are not included in the number of samples analyzed.

Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 8)
Annual Report - SEAD 16 and SEAD 17
Seneca Army Depot Activity

Area								SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16	
Loc ID								MW16-2		MW16-2		MW16-2		MW16-2		MW16-2		MW16-2	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								16LM20023UNF		16LM20029F		16LM20029U		16LM20036F		16LM20036U		16LM20043F		16LM20043U	
Sample Date								12/15/2010		12/15/2012		12/15/2012		12/16/2013		12/16/2013		12/21/2014		12/21/2014	
QC Type								DU		SA		SA		SA		SA		SA		SA	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								4		5		5		6		6		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	2,400				36	91	50	U	23	UJ	50	UJ	23	UJ	50	UJ	23	U	50	U
Antimony	UG/L	120	GA	3	42	53	91	**6**		**7.8**	J	**7.1**	J	**3.6**	J	**3.2**	J	**4.8**	J	**4.8**	J
Arsenic	UG/L	2.7	MCL	10	0	9	91	1.3	U	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ	1.3	U	1.3	U
Barium	UG/L	600	GA	1,000	0	91	91	69	J	65	J	62	J	70	J	66	J	72		68	
Beryllium	UG/L	0	MCL	4	0	0	91	0.15	U	0.25	UJ	0.15	UJ	0.25	UJ	0.15	UJ	0.25	U	0.15	U
Cadmium	UG/L	0.46	GA	5	0	6	91	0.13	U	0.095	UJ	0.13	UJ	0.095	UJ	0.13	UJ	0.095	U	0.13	U
Calcium	UG/L	510,000				91	91	100,000		110,000	J	100,000	J	120,000	J	100,000	J	110,000		100,000	
Chromium	UG/L	4.6	GA	50	0	7	91	2.5	U	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	2.5	U	2.5	U
Cobalt	UG/L	2				37	91	0.12	U	0.15	UJ	0.12	UJ	0.23	J	0.23	J	0.15	U	0.12	U
Copper	UG/L	34.7	GA	200	0	69	91	5.1		4.5	J	5	J	4	J	4.7	J	3.3	J	4.2	J
Iron	UG/L	4,000	GA	300	24	65	91	63	J	33	UJ	44	UJ	33	UJ	44	UJ	33	J	44	U
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	76		34	U	46	U	19	J	19	J	34	U	46	U
Lead	UG/L	88.6	MCL	15	3	42	91	0.97	J	0.24	J	0.66	J	0.38	J	1.1	J	0.2	U	0.87	J
Magnesium	UG/L	98,000				88	88	12,000	J	13,000	J	11,000	J	14,000	J+	13,000	J	12,000		11,000	
Manganese	UG/L	631	GA	300	1	85	91	13		1	UJ	2	UJ	19	J	19	J	1	U	2	U
Mercury	UG/L	0.507	GA	0.7	0	3	91	0.091	U	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ	0.091	U	0.091	U
Nickel	UG/L	5.5	GA	100	0	54	91	2.2	J	2.2	J	2	UJ	2	UJ	2	UJ	2.2	J	2.3	J
Potassium	UG/L	15,000				85	85	2,200	J	2,200	J	1,900	J	1,800	J	1,700	J	1,500		1,400	
Selenium	UG/L	1.1	GA	10	0	1	91	1.1	U	1	UJ	1.1	UJ	1	UJ	1.1	UJ	1	U	1.1	U
Silver	UG/L	0	GA	50	0	0	91	0.18	U	0.25	UJ	0.18	UJ	0.25	UJ	0.18	UJ	0.25	U	0.18	U
Sodium	UG/L	550,000	GA	20,000	56	89	89	**32,000**	J	20,000	J	17,000	J	**22,000**	J	**21,000**	J	11,000		9,900	
Thallium	UG/L	0.03	MCL	2	0	1	91	0.25	U	0.5	UJ	0.25	UJ	0.5	UJ	0.25	UJ	0.5	U	0.25	U
Vanadium	UG/L	2.3				7	91	3.2	U	3.8	UJ	3.2	UJ	3.8	UJ	3.2	UJ	3.8	U	3.2	U
Zinc	UG/L	34.4				36	91	12	J	9.5	J	8.8	J	24	J	12	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.
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Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 8)
Annual Report - SEAD 16 and SEAD 17
Seneca Army Depot Activity

Area								SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16	
Loc ID								MW16-2		MW16-4		MW16-4		MW16-4		MW16-4		MW16-4	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								16LM20050		16LM20003		16LM20008		16LM20009		16LM20016FIL		16LM20024FIL	
Sample Date								12/19/2015		12/20/2007		12/9/2008		12/9/2008		11/17/2009		12/16/2010	
QC Type								SA		SA		DU		SA		SA		SA	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								8		1		2		2		3		4	
Filtered								Total		Total		Total		Total		Dissolved		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
Inorganics																			
Aluminum	UG/L	2,400				36	91	58	J	167	J	104	J	101	J	24	U	68	J	23	U
Antimony	UG/L	120	GA	3	42	53	91	2.1	J	5.11		2.89		2.94		6		6.3		2.3	U
Arsenic	UG/L	2.7	MCL	10	0	9	91	1.5	U	4.2	U	3.7	U	3.7	U	3.7	U	3.7	U	1.3	U
Barium	UG/L	600	GA	1,000	0	91	91	94		44.5		290		279		129		123		220	
Beryllium	UG/L	0	MCL	4	0	0	91	0.17	U	0.27	U	0.33	U	0.33	U	0.3	U	0.3	U	0.25	U
Cadmium	UG/L	0.46	GA	5	0	6	91	0.15	U	0.36	U	0.33	U	0.33	U	0.3	U	0.3	U	0.095	U
Calcium	UG/L	510,000				91	91	130,000		87,100	J	275,000		267,000		130,000	J	125,000	J	210,000	
Chromium	UG/L	4.6	GA	50	0	7	91	1.6	U	1	J	0.88	U	0.88	U	0.9	U	0.9	U	2.5	U
Cobalt	UG/L	2				37	91	0.68		0.89	U	1.1	U	1.1	U	1.8	J	2	J	0.7	
Copper	UG/L	34.7	GA	200	0	69	91	3	J	5.4	J	4.4	J	4.2	J	2.4	J	6.2	J	1.4	J
Iron	UG/L	4,000	GA	300	24	65	91	130		95.4		57	J	38.4	J	329	J	419	J	130	J
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	193		127		65		46	J	417.7	J	513.5	J	260	
Lead	UG/L	88.6	MCL	15	3	42	91	2.9		2.9	U	2.9	U	2.9	U	2.9	U	2.9	U	0.7	J
Magnesium	UG/L	98,000				88	88	13,000		9,440	R	35,200		34,500		16,800		16,000		31,000	
Manganese	UG/L	631	GA	300	1	85	91	63		31.2		7.7		8		88.7		94.5		130	
Mercury	UG/L	0.507	GA	0.7	0	3	91	0.08	U	0.12	U	0.12	U	0.12	U	0.1	U	0.1	U	0.091	U
Nickel	UG/L	5.5	GA	100	0	54	91	2.6	J	1.2	U	2.2	J	1.9	J	1.7	J	1.4	J	2.2	J
Potassium	UG/L	15,000				85	85	1,900		1,300	R	3,830	J	3,690	J	3,270		3,270		2,600	J
Selenium	UG/L	1.1	GA	10	0	1	91	1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	1	U
Silver	UG/L	0	GA	50	0	0	91	0.1	U	1	U	1.3	U	1.3	U	1.3	U	1.3	U	0.25	U
Sodium	UG/L	550,000	GA	20,000	56	89	89	11,000		40,800	J	434,000		419,000		380,000	J	363,000	J	540,000	J
Thallium	UG/L	0.03	MCL	2	0	1	91	0.49	U	0.03	U	0.09	U	0.09	U	0.2	U	0.2	U	0.5	U
Vanadium	UG/L	2.3				7	91	5.3	U	0.78	U	0.98	U	0.98	U	1.1	J	1.1	J	3.8	U
Zinc	UG/L	34.4				36	91	17	J	5.3	J	14.6	J	9.8	J	3.6	U	3.6	U	9.2	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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Annual Report - 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		MW16-4	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								16LM20024UNF		16LM20030F		16LM20030U		16LM20037F		16LM20037U		16LM20044F		16LM20044U	
Sample Date								12/16/2010		12/15/2012		12/15/2012		12/17/2013		12/17/2013		12/21/2014		12/21/2014	
QC Type								SA		SA		SA		SA		SA		SA		SA	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								4		5		5		6		6		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	2,400				36	91	50	U	23	UJ	50	UJ	23	UJ	50	UJ	23	U	50	U
Antimony	UG/L	120	GA	3	42	53	91	2	U	4	J	3.9	J	2.3	UJ	2	UJ	3.3	J	3.2	J
Arsenic	UG/L	2.7	MCL	10	0	9	91	1.3	U	1.5	J	1.3	J	1.3	UJ	1.3	UJ	1.3	U	1.3	U
Barium	UG/L	600	GA	1,000	0	91	91	240	J	240	J	230	J	140	J	150	J	170		160	
Beryllium	UG/L	0	MCL	4	0	0	91	0.15	U	0.25	UJ	0.15	UJ	0.25	UJ	0.15	UJ	0.25	U	0.15	U
Cadmium	UG/L	0.46	GA	5	0	6	91	0.13	U	0.095	UJ	0.23	J	0.095	UJ	0.15	J	0.11	J	0.13	U
Calcium	UG/L	510,000				91	91	210,000		230,000	J	220,000	J	210,000	J	190,000	J	220,000		210,000	
Chromium	UG/L	4.6	GA	50	0	7	91	2.5	U	2.5	UJ	2.5	UJ	2.5	UJ	3.6	J	2.5	U	2.5	U
Cobalt	UG/L	2				37	91	0.71		1.9	J	1.9	J	1	J	0.94	J	1.1		1.1	
Copper	UG/L	34.7	GA	200	0	69	91	2.8	J	4.1	J	11	J	1.2	J	1.5	J	4.3	J	5.8	
Iron	UG/L	4,000	GA	300	24	65	91	150	J	130	J	140	J	350	J	380	J	170		290	
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	290		270	J	280	J	580	J	590	J	370		490	
Lead	UG/L	88.6	MCL	15	3	42	91	3		0.2	UJ	3.4	J	0.28	J	0.65	J	0.27	J	1.5	
Magnesium	UG/L	98,000				88	88	32,000	J	34,000	J	32,000	J	33,000	J+	31,000	J	33,000		32,000	
Manganese	UG/L	631	GA	300	1	85	91	140		140	J	140	J	230	J	210	J	200		200	
Mercury	UG/L	0.507	GA	0.7	0	3	91	0.091	U	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ	0.091	U	0.091	U
Nickel	UG/L	5.5	GA	100	0	54	91	2.3	J	2.6	J	3.2	J	3.3	J	2.9	J	4	J	3.5	J
Potassium	UG/L	15,000				85	85	2,600	J	3,200	J	3,100	J	2,500	J	2,400	J	2,000		1,900	
Selenium	UG/L	1.1	GA	10	0	1	91	1.1	U	1	UJ	1.1	UJ	1	UJ	1.1	UJ	1	U	1.1	U
Silver	UG/L	0	GA	50	0	0	91	0.18	U	0.25	UJ	0.18	UJ	0.25	UJ	0.18	UJ	0.25	U	0.18	U
Sodium	UG/L	550,000	GA	20,000	56	89	89	550,000	J	340,000	J	310,000	J	290,000	J	270,000	J	300,000		300,000	
Thallium	UG/L	0.03	MCL	2	0	1	91	0.25	U	0.5	UJ	0.25	UJ	0.5	UJ	0.25	UJ	0.5	U	0.25	U
Vanadium	UG/L	2.3				7	91	3.2	U	3.8	UJ	3.2	UJ	3.8	UJ	3.2	UJ	3.8	U	3.2	U
Zinc	UG/L	34.4				36	91	13	J	12	J	11	J	8.3	UJ	8.4	UJ	14	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.
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Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 8)
Annual Report - 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		MW16-5		MW16-5		MW16-5		MW16-5		MW16-5	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								16LM20051		16LM20004		16LM20010		16LM20017FIL		16LM20017UNFIL		16LM20025FIL		16LM20025UNF	
Sample Date								12/20/2015		12/20/2007		12/10/2008		11/16/2009		11/16/2009		12/15/2010		12/15/2010	
QC Type								SA		SA		SA		SA		SA		SA		SA	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								8		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	2,400				36	91	18	U	160	J	563		24	U	164	J	23	U	160	
Antimony	UG/L	120	GA	3	42	53	91	2	J	1.82		4.23		1	U	1	U	2.3	U	2	U
Arsenic	UG/L	2.7	MCL	10	0	9	91	1.5	U	4.2	U	3.7	U	3.7	U	3.7	U	1.3	U	1.3	U
Barium	UG/L	600	GA	1,000	0	91	91	140		38.9		22		42.6		42		34		33	J
Beryllium	UG/L	0	MCL	4	0	0	91	0.17	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	6	91	0.34	J	0.36	U	0.33	U	0.3	U	0.3	U	0.095	U	0.13	U
Calcium	UG/L	510,000				91	91	180,000		89,000	J	53,100		115,000	J	110,000	J	90,000		86,000	
Chromium	UG/L	4.6	GA	50	0	7	91	1.6	U	1.1	J	1.2	J	0.9	U	0.9	U	2.5	U	2.5	U
Cobalt	UG/L	2				37	91	0.28	J	0.89	U	1.1	U	1.1	U	1.1	U	0.15	U	0.12	U
Copper	UG/L	34.7	GA	200	0	69	91	6.8		3.1	J	10.6		1.3	U	1.3	U	1.1	U	1.1	U
Iron	UG/L	4,000	GA	300	24	85	91	33	J	1,200		699		800	J	1,150	J	480	J	660	J
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	85	J	1,238		731		970	J	1,323	J	680		820	
Lead	UG/L	88.6	MCL	15	3	42	91	1.1	J	2.9	U	10.1		2.9	U	2.9	U	0.2	U	0.77	J
Magnesium	UG/L	98,000				88	88	25,000		9,380	R	6,050		12,200		11,600		10,000		9,700	J
Manganese	UG/L	631	GA	300	1	85	91	52		37.6		32.4		170		173		200		160	
Mercury	UG/L	0.507	GA	0.7	0	3	91	0.08	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	54	91	3.7	J	1.2	U	2.6	J	1.8	J	2	J	2	U	2	U
Potassium	UG/L	15,000				85	85	1,900		4,420	R	2,610	J	2,370		2,380		2,200	J	2,100	J
Selenium	UG/L	1.1	GA	10	0	1	91	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	91	0.1	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	56	89	89	250,000		8,410	R	2,180		2,700	J	2,800	J	1,800	J	1,800	J
Thallium	UG/L	0.03	MCL	2	0	1	91	0.49	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	91	5.3	U	1.2	J	2.3	J	1	U	1.1	J	3.8	U	3.2	U
Zinc	UG/L	34.4				36	91	16	J	34.4		10.3		3.6	U	3.6	U	8.3	U	8.4	U

Notes:
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Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 8)
Annual Report - 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								16LM20031F		16LM20031U		16LM20038F		16LM20038U		16LM20039F		16LM20045F	
Sample Date								12/15/2012		12/15/2012		12/16/2013		12/16/2013		12/17/2013		12/20/2014	
QC Type								SA		SA		SA		SA		DU		SA	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								5		5		6		6		6		7	
Filtered								Dissolved		Total		Dissolved		Total		Dissolved		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
Inorganics																			
Aluminum	UG/L	2,400				36	91	23	UJ	50	UJ	23	UJ	50	UJ	23	UJ	50	UJ	23	U
Antimony	UG/L	120	GA	3	42	53	91	2.3	UJ	2	UJ	2.3	UJ	2	UJ	2.3	UJ	2	UJ	2.3	U
Arsenic	UG/L	2.7	MCL	10	0	9	91	2.6	J	2.7	J	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ	1.8	J
Barium	UG/L	600	GA	1,000	0	91	91	34	J	39	J	40	J	38	J	41	J	41	J	49	J
Beryllium	UG/L	0	MCL	4	0	0	91	0.25	UJ	0.15	UJ	0.25	UJ	0.15	UJ	0.25	UJ	0.15	UJ	0.25	U
Cadmium	UG/L	0.46	GA	5	0	6	91	0.095	UJ	0.13	UJ	0.095	UJ	0.13	UJ	0.095	UJ	0.13	UJ	0.095	U
Calcium	UG/L	510,000				91	91	97,000	J	96,000	J	100,000	J	88,000	J	110,000	J	95,000	J	110,000	
Chromium	UG/L	4.6	GA	50	0	7	91	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	2.5	U
Cobalt	UG/L	2				37	91	0.22	J	0.23	J	0.15	UJ	0.12	UJ	0.15	UJ	0.12	UJ	0.15	U
Copper	UG/L	34.7	GA	200	0	69	91	1.1	J	5	UJ	1.1	UJ	1.1	UJ	1.1	UJ	1.1	UJ	1.1	U
Iron	UG/L	4,000	GA	300	24	65	91	**1,100**	**J**	**1,300**	**J**	**440**	**J**	**510**	**J**	**490**	**J**	**530**	**J**	**360**	**J**
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	**1,230**	**J**	**1,430**	**J**	**670**	**J**	**680**	**J**	**710**	**J**	**720**	**J**	**520**	**J**
Lead	UG/L	88.6	MCL	15	3	42	91	0.2	UJ	0.5	UJ	0.2	UJ	0.5	UJ	0.22	J	0.5	UJ	0.2	U
Magnesium	UG/L	98,000				88	88	9,900	J	9,800	J	10,000	J+	9,500	J	11,000	J+	10,000	J	11,000	
Manganese	UG/L	631	GA	300	1	85	91	130	J	130	J	230	J	170	J	220	J	190	J	160	J
Mercury	UG/L	0.507	GA	0.7	0	3	91	0.1	J	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ	0.091	U
Nickel	UG/L	5.5	GA	100	0	54	91	2.1	J	2	UJ	2	UJ	2	UJ	2	UJ	2	UJ	2.1	J
Potassium	UG/L	15,000				85	85	2,100	J	2,100	J	2,300	J	1,900	J	2,300	J	2,100	J	3,500	J
Selenium	UG/L	1.1	GA	10	0	1	91	1	UJ	1.1	UJ	1	UJ	1.1	UJ	1	UJ	1.1	UJ	1	U
Silver	UG/L	0	GA	50	0	0	91	0.25	UJ	0.18	UJ	0.25	UJ	0.18	UJ	0.25	UJ	0.18	UJ	0.25	U
Sodium	UG/L	550,000	GA	20,000	56	89	89	1,600	J	1,500	J	1,400	J	1,300	J	1,400	J	1,300	J	1,900	
Thallium	UG/L	0.03	MCL	2	0	1	91	0.5	UJ	0.25	UJ	0.5	UJ	0.25	UJ	0.5	UJ	0.25	UJ	0.5	U
Vanadium	UG/L	2.3				7	91	3.8	UJ	3.2	UJ	3.8	UJ	3.2	UJ	3.8	UJ	3.2	UJ	3.8	U
Zinc	UG/L	34.4				36	91	8.3	UJ	8.4	UJ	8.3	UJ	8.4	UJ	8.3	UJ	8.4	UJ	8.3	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.
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Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 8)
Annual Report - 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		MW16-6		MW16-6		MW16-6		MW16-6	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								16LM20045U		16LM20052		16LM20005		16LM20011		16LM20018FIL		16LM20018UNFIL		16LM20026FIL	
Sample Date								12/20/2014		12/19/2015		12/20/2007		12/9/2008		11/17/2009		11/17/2009		12/15/2010	
QC Type								SA		SA		SA		SA		SA		SA		SA	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								7		8		1		2		3		3		4	
Filtered								Total		Total		Total		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	2,400				36	91	53	J	31	J	168	J	189	J	107	J	442		23	U
Antimony	UG/L	120	GA	3	42	53	91	2	U	0.75	J	1	U	0.92	J	0.9	J	1	U	2.3	U
Arsenic	UG/L	2.7	MCL	10	0	9	91	1.3	J	1.5	U	4.2	U	3.7	U	3.7	U	3.7	U	1.3	U
Barium	UG/L	600	GA	1,000	0	91	91	40	J	41		31.8		39.1		78.5		80.2		44	
Beryllium	UG/L	0	MCL	4	0	0	91	0.15	U	0.17	U	0.27	U	0.33	U	0.3	U	0.3	U	0.25	U
Cadmium	UG/L	0.46	GA	5	0	6	91	0.13	U	0.15	U	0.36	U	0.33	U	0.3	U	0.3	U	0.095	U
Calcium	UG/L	510,000				91	91	92,000		110,000		80,400	J	84,300		112,000	J	112,000	J	68,000	
Chromium	UG/L	4.6	GA	50	0	7	91	2.5	U	1.6	U	0.84	U	0.88	U	0.9	U	0.9	U	2.5	U
Cobalt	UG/L	2				37	91	0.12	U	0.12	U	0.89	U	1.1	U	1.1	U	1.1	U	0.15	U
Copper	UG/L	34.7	GA	200	0	69	91	3.1	J	1.7	U	3.4	J	2.1	J	1.9	J	2.5	J	1.5	J
Iron	UG/L	4,000	GA	300	24	65	91	280	J	**570**		**418**		153		55	J	**440**	**J**	33	U
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	410	J	710		441		158		153.4	J	**515**	**J**	2.1	J
Lead	UG/L	88.6	MCL	15	3	42	91	0.5	U	0.98	U	2.9	U	2.9	U	2.9	U	2.9	U	0.2	U
Magnesium	UG/L	98,000				88	88	9,000		10,000		7,100	R	7,380		9,970		9,950		6,600	
Manganese	UG/L	631	GA	300	1	85	91	130	J	140		23.3		4.8		98.4		75		2.1	J
Mercury	UG/L	0.507	GA	0.7	0	3	91	0.091	U	0.08	U	0.12	U	0.12	U	0.1	U	0.1	U	0.091	U
Nickel	UG/L	5.5	GA	100	0	54	91	2.3	J	2.3	J	1.2	U	1	U	1.2	J	2.6	J	2	U
Potassium	UG/L	15,000				85	85	2,800	J	2,500		2,690	R	2,310	J	2,380		2,580		1,500	
Selenium	UG/L	1.1	GA	10	0	1	91	1.1	U	1	U	6.1	U	6.1	U	6.1	U	6.1	U	1	U
Silver	UG/L	0	GA	50	0	0	91	0.18	U	0.1	U	1	U	1.3	U	1.3	U	1.3	U	0.25	U
Sodium	UG/L	550,000	GA	20,000	56	89	89	1,600		1,800		6,110	R	9,200		**22,000**	**J**	**20,600**	**J**	7,600	J
Thallium	UG/L	0.03	MCL	2	0	1	91	0.25	U	0.49	U	0.03	U	0.09	U	0.008	U	0.008	U	0.5	U
Vanadium	UG/L	2.3				7	91	3.2	U	5.3	U	0.86	J	0.98	U	1	U	1.3	J	3.8	U
Zinc	UG/L	34.4				36	91	8.4	U	9.6	U	5.5	J	3.7	J	3.6	U	3.6	U	8.3	U

Notes:
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Annual Report - 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		MW16-6		MW16-6		MW16-6	
Matrix							GW		GW		GW		GW		GW		GW	
Sample ID							16LM20026UNF		16LM20032F		16LM20032U		16LM20040F		16LM20040U		16LM20046F		16LM20046U	
Sample Date							12/15/2010		12/15/2012		12/15/2012		12/17/2013		12/17/2013		12/21/2014		12/21/2014	
QC Type							SA		SA		SA		SA		SA		SA		SA	
Study ID							LTM		LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round							4		5		5		6		6		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	2,400				36	91	61	J	23	UJ	300	J	23	UJ	50	UJ	23	U	140	
Antimony	UG/L	120	GA	3	42	53	91	2	U	2.3	UJ	2	UJ	2.3	UJ	2	UJ	2.3	U	2	U
Arsenic	UG/L	2.7	MCL	10	0	9	91	1.3	U	1.3	UJ	1.3	J	1.3	UJ	1.3	UJ	1.3	U	1.3	U
Barium	UG/L	600	GA	1,000	0	91	91	50	J	41	J	45	J	53	J	58	J	58		58	
Beryllium	UG/L	0	MCL	4	0	0	91	0.15	U	0.25	UJ	0.15	UJ	0.25	UJ	0.15	UJ	0.25	U	0.15	U
Cadmium	UG/L	0.46	GA	5	0	6	91	0.13	U	0.095	UJ	0.13	UJ	0.095	UJ	0.13	UJ	0.095	U	0.13	U
Calcium	UG/L	510,000				91	91	78,000		70,000	J	74,000	J	92,000	J	84,000	J	83,000		83,000	
Chromium	UG/L	4.6	GA	50	0	7	91	2.5	U	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	2.5	U	2.5	U
Cobalt	UG/L	2				37	91	0.12	U	0.18	J	0.43	J	0.35	J	0.34	J	0.15	U	0.12	U
Copper	UG/L	34.7	GA	200	0	69	91	2	J	4.5	J	5	UJ	1.1	UJ	1.1	UJ	2.3	J	2.8	J
Iron	UG/L	4,000	GA	300	24	65	91	110	J	33	J	**790**	**J**	180	J	210	J	57	J	140	
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	113.5	J	43	J	**816**	**J**	340	J	360	J	58.8	J	148.4	
Lead	UG/L	88.6	MCL	15	3	42	91	0.5	U	0.2	UJ	0.5	UJ	0.2	UJ	0.54	J	0.2	U	0.5	U
Magnesium	UG/L	98,000				88	88	7,600	J	7,200	J	7,600	J	9,500	J+	9,500	J	8,300		8,500	
Manganese	UG/L	631	GA	300	1	85	91	3.5	J	10	J	26	J	160	J	150	J	1.8	J	8.4	
Mercury	UG/L	0.507	GA	0.7	0	3	91	0.091	U	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ	0.091	U	0.091	U
Nickel	UG/L	5.5	GA	100	0	54	91	2	U	2	UJ	2	J	2	UJ	2	UJ	2.2	J	2	U
Potassium	UG/L	15,000				85	85	1,800		2,400	J	2,400	J	1,900	J	1,800	J	2,100		2,000	
Selenium	UG/L	1.1	GA	10	0	1	91	1.1	U	1	UJ	1.1	UJ	1	UJ	1.1	UJ	1	U	1.1	U
Silver	UG/L	0	GA	50	0	0	91	0.18	U	0.25	UJ	0.18	UJ	0.25	UJ	0.18	UJ	0.25	U	0.18	U
Sodium	UG/L	550,000	GA	20,000	56	89	89	8,400	J	8,700	J	8,000	J	14,000	J	13,000	J	8,500		8,300	
Thallium	UG/L	0.03	MCL	2	0	1	91	0.25	U	0.5	UJ	0.25	UJ	0.5	UJ	0.25	UJ	0.5	U	0.25	U
Vanadium	UG/L	2.3				7	91	3.2	U	3.8	UJ	3.2	UJ	3.8	UJ	3.2	UJ	3.8	U	3.2	U
Zinc	UG/L	34.4				36	91	8.4	U	8.3	UJ	8.4	UJ	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.
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3. Shading indicates a concentration above the identified criteria value.
   SA = Sample
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4. Rejected values are not included in the number of samples analyzed.

Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 8)
Annual Report - 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		MW16-7		MW16-7		MW16-7		MW16-7		MW16-7	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								16LM20053		16LM20006		16LM20012		16LM20019FIL		16LM20019UNFIL		16LM20020FIL		18LM20020UNFIL	
Sample Date								12/19/2015		12/20/2007		12/10/2008		11/12/2009		11/12/2009		11/12/2009		11/12/2009	
QC Type								SA		SA		SA		SA		SA		DU		DU	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								8		1		2		3		3		3		3	
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	2,400				36	91	2,400		45.9	J	577		32	J	182	J	25	J	116	J
Antimony	UG/L	120	GA	3	42	53	91	1	J	9.58		13.6		15.2		15.7		13.9		16.3	
Arsenic	UG/L	2.7	MCL	10	0	9	91	1.9	J	4.2	U	3.7	U	3.7	U	3.7	U	3.7	U	3.7	U
Barium	UG/L	600	GA	1,000	0	91	91	73		170		122		83.6		81.6		83.9		80.3	
Beryllium	UG/L	0	MCL	4	0	0	91	0.17	U	0.27	U	0.33	U	0.3	U	0.3	U	0.3	U	0.3	U
Cadmium	UG/L	0.46	GA	5	0	6	91	0.33	J	0.46	J	0.33	U	0.3	U	0.3	U	0.3	U	0.3	U
Calcium	UG/L	510,000				91	91	60,000		194,000		133,000		85,000	J	84,600	J	81,900	J	82,800	J
Chromium	UG/L	4.6	GA	50	0	7	91	4.6	J	0.84	U	1.6	J	0.9	U	0.9	U	0.9	U	0.9	U
Cobalt	UG/L	2				37	91	1.6		1.6	J	1.1	J	1.1	U	1.1	U	1.1	U	1.1	U
Copper	UG/L	34.7	GA	200	0	69	91	6.3		34.7		20.2		3.1	J	5	J	3.5	J	4.1	J
Iron	UG/L	4,000	GA	300	24	65	91	4,000		29.2	J	770		19	UJ	135	J	19	UJ	61	J
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	4,120		660	J	990		136		244	J	152		168	J
Lead	UG/L	88.6	MCL	15	3	42	91	2.2	J	26.5		88.6		4.4	J	12.1		4.9	J	9.4	
Magnesium	UG/L	98,000				88	88	8,300		32,000	J	25,100		15,900		16,500		14,800		16,200	
Manganese	UG/L	631	GA	300	1	85	91	120		631		220		136		109		152		107	
Mercury	UG/L	0.507	GA	0.7	0	3	91	0.08	U	0.507		0.12	U	0.1	U	0.1	U	0.1	U	0.1	U
Nickel	UG/L	5.5	GA	100	0	54	91	5.1		5.5	J	2.6	J	1.9	J	1.7	J	2	J	1.1	J
Potassium	UG/L	15,000				85	85	2,600		5,480	J	5,670	J	6,520		5,780		7,010		5,630	
Selenium	UG/L	1.1	GA	10	0	1	91	1.1	J	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U	6.1	U
Silver	UG/L	0	GA	50	0	0	91	0.1	U	1	U	1.3	U	1.3	U	1.3	U	1.3	U	1.3	U
Sodium	UG/L	550,000	GA	20,000	56	89	89	10,000		68,400	J	74,900		52,100	J	47,100	J	55,900	J	46,100	J
Thallium	UG/L	0.03	MCL	2	0	1	91	0.49	U	0.03	J	0.09	U	0.2	U	0.2	U	0.2	U	0.2	U
Vanadium	UG/L	2.3				7	91	5.3	U	0.78	U	0.98	U	1	U	1	U	1	U	1	U
Zinc	UG/L	34.4				36	91	18	J	3.6	U	8.6	J	3.6	U	3.6	U	3.6	U	3.6	U

Notes:

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Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 8)
Annual Report - SEAD 16 and SEAD 17
Seneca Army Depot Activity

Area								SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16	
Loc ID								MW16-7		MW16-7		MW16-7		MW16-7		MW16-7		MW16-7	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								16LM20027FIL		16LM20027UNF		16LM20033F		16LM20033U		16LM20034F		16LM20041F	
Sample Date								12/15/2010		12/15/2010		12/15/2012		12/15/2012		12/15/2012		12/17/2013	
QC Type								SA		SA		SA		SA		DU		SA	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								4		4		5		5		5		6	
Filtered								Dissolved		Total		Dissolved		Total		Dissolved		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
Inorganics																			
Aluminum	UG/L	2,400				36	91	23	U	50	U	23	UJ	50	UJ	23	UJ	50	UJ	23	UJ
Antimony	UG/L	120	GA	3	42	53	91	**15**		**16**		**13**	**J**	**13**	**J**	**13**	**J**	**14**	**J**	**16**	**J**
Arsenic	UG/L	2.7	MCL	10	0	9	91	1.3	U	1.3	U	1.3	J	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ
Barium	UG/L	600	GA	1,000	0	91	91	69		71	J	100	J	100	J	99	J	100	J	100	J
Beryllium	UG/L	0	MCL	4	0	0	91	0.25	U	0.15	U	0.25	UJ	0.15	UJ	0.25	UJ	0.15	UJ	0.25	UJ
Cadmium	UG/L	0.46	GA	5	0	6	91	0.095	U	0.13	U	0.095	UJ	0.13	UJ	0.095	UJ	0.13	UJ	0.095	UJ
Calcium	UG/L	510,000				91	91	82,000		86,000		110,000	J	100,000	J	100,000	J	110,000	J	120,000	J
Chromium	UG/L	4.6	GA	50	0	7	91	2.5	U	2.5	U	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ
Cobalt	UG/L	2				37	91	0.15	U	0.12	U	0.23	J	0.22	J	0.24	J	0.24	J	0.19	J
Copper	UG/L	34.7	GA	200	0	69	91	1.8	J	2.7	J	4.1	J	8.3	J	1.7	J	5.6	J	3.4	J
Iron	UG/L	4,000	GA	300	24	65	91	33	U	45	J	33	UJ	44	UJ	33	UJ	44	UJ	33	UJ
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	35		79		92	J	90	J	98	J	91	J	16	J
Lead	UG/L	88.6	MCL	15	3	42	91	1	J	6.3		1.3	J	2.5	J	2.3	J	2.6	J	1.9	J
Magnesium	UG/L	98,000				88	88	18,000		19,000	J	21,000	J	21,000	J	20,000	J	22,000	J	26,000	J+
Manganese	UG/L	631	GA	300	1	85	91	35		34		92	J	90	J	98	J	91	J	16	J
Mercury	UG/L	0.507	GA	0.7	0	3	91	0.091	U	0.091	U	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ
Nickel	UG/L	5.5	GA	100	0	54	91	2	U	2	U	2	UJ	2.2	J	2	UJ	2.4	J	2	UJ
Potassium	UG/L	15,000				85	85	2,800	J	2,700	J	5,300	J	5,200	J	5,100	J	5,400	J	3,100	J
Selenium	UG/L	1.1	GA	10	0	1	91	1	U	1.1	U	1	UJ	1.1	UJ	1	UJ	1.1	UJ	1	UJ
Silver	UG/L	0	GA	50	0	0	91	0.25	U	0.18	U	0.25	UJ	0.18	UJ	0.25	UJ	0.18	UJ	0.25	UJ
Sodium	UG/L	550,000	GA	20,000	56	89	89	**29,000**	**J**	**28,000**	**J**	**35,000**	**J**	**32,000**	**J**	**33,000**	**J**	**32,000**	**J**	**28,000**	**J**
Thallium	UG/L	0.03	MCL	2	0	1	91	0.5	U	0.25	U	0.5	UJ	0.25	UJ	0.5	UJ	0.25	UJ	0.5	UJ
Vanadium	UG/L	2.3				7	91	3.8	U	3.2	U	3.8	UJ	3.2	UJ	3.8	UJ	3.2	UJ	3.8	UJ
Zinc	UG/L	34.4				36	91	8.3	U	8.4	U	8.3	UJ	8.4	UJ	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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Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 8)
Annual Report - SEAD 16 and SEAD 17
Seneca Army Depot Activity

Area								SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16		SEAD-16	
Loc ID								MW16-7		MW16-7		MW16-7		MW16-7		MW16-7		MW16-7	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								16LM20041U		16LM20047F		16LM20047U		16LM20048F		16LM20048U		16LM20054		16LM20055	
Sample Date								12/17/2013		12/20/2014		12/20/2014		12/20/2014		12/20/2014		12/19/2015		12/19/2015	
QC Type								SA		SA		SA		DU		DU		SA		DU	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								6		7		7		7		7		8		8	
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	2,400				36	91	50	UJ	29	J	50	U	23	U	50	U	140	J	36	J
Antimony	UG/L	120	GA	3	42	53	91	15	J	16		15		15		14		120	J	19	J
Arsenic	UG/L	2.7	MCL	10	0	9	91	1.3	UJ	1.3	U	1.3	U	1.3	U	1.3	U	7.5	U	1.5	U
Barium	UG/L	600	GA	1,000	0	91	91	100	J	110		95		110		100		600	J	130	J
Beryllium	UG/L	0	MCL	4	0	0	91	0.15	UJ	0.25	U	0.15	U	0.25	U	0.15	U	0.85	U	0.17	U
Cadmium	UG/L	0.46	GA	5	0	6	91	0.13	UJ	0.095	U	0.13	U	0.095	U	0.13	U	0.15	U	0.15	U
Calcium	UG/L	510,000				91	91	110,000	J	110,000		100,000		110,000		110,000		510,000	J	110,000	J
Chromium	UG/L	4.6	GA	50	0	7	91	2.5	UJ	2.5	U	2.5	U	2.5	U	2.5	U	8	U	1.6	U
Cobalt	UG/L	2				37	91	0.2	J	0.25	J	0.12	U	0.15	U	0.12	U	0.6	U	0.12	J
Copper	UG/L	34.7	GA	200	0	69	91	2.5	J	3.2	J	3.6	J	3.3	J	3.8	J	21	J	4.2	J
Iron	UG/L	4,000	GA	300	24	65	91	44	UJ	52	J	44	U	33	U	44	U	370	J	62	J
Iron+Manganese	UG/L	1,430	GA	500	20	78	84	15	J	80	J	23	J	38	J	33	J	396	J	69.4	J
Lead	UG/L	88.6	MCL	15	3	42	91	6	J	1.8		1.8		4.2		4.1		48	J	10	J
Magnesium	UG/L	98,000				88	88	27,000	J	23,000		22,000		23,000		21,000		98,000	J	20,000	J
Manganese	UG/L	631	GA	300	1	85	91	15	J	28	J	23	J	38	J	33	J	26	J	7.4	J
Mercury	UG/L	0.507	GA	0.7	0	3	91	0.091	UJ	0.091	U	0.091	U	0.091	U	0.091	U	0.08	U	0.08	U
Nickel	UG/L	5.5	GA	100	0	54	91	2	UJ	3.2	J	2.4	J	2	J	2	U	9.5	U	1.9	U
Potassium	UG/L	15,000				85	85	2,900	J	3,700		3,500		4,600		3,900		15,000	J	3,600	J
Selenium	UG/L	1.1	GA	10	0	1	91	1.1	UJ	1	U	1.1	U	1	U	1.1	U	5	U	1	U
Silver	UG/L	0	GA	50	0	0	91	0.18	UJ	0.25	U	0.18	U	0.25	U	0.18	U	0.5	U	0.1	U
Sodium	UG/L	550,000	GA	20,000	56	89	89	27,000	J	30,000		29,000		38,000		33,000		89,000	J	23,000	J
Thallium	UG/L	0.03	MCL	2	0	1	91	0.25	UJ	0.5	U	0.25	U	0.5	U	0.25	U	2.5	U	0.49	U
Vanadium	UG/L	2.3				7	91	3.2	UJ	3.8	U	3.2	U	3.8	U	3.2	U	27	U	5.3	U
Zinc	UG/L	34.4				36	91	8.4	UJ	8.3	U	8.4	U	8.7	J	8.4	U	48	U	9.6	U

Notes:
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   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 D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 8)
Annual Report - SEAD 16 and SEAD 17
Seneca Army Depot Activity

Area								SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Loc ID								MW17-1		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				25	65	204		219		37	J	59	J	23	U	50	U	23	UJ
Antimony	UG/L	4.4	GA	3	6	16	65	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	65	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	65	65	70		79		99.1		99		61		63	J	28	J
Beryllium	UG/L	1.2	MCL	4	0	1	65	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	65	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				65	65	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	65	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				43	65	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	33	65	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	15	51	65	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	11	65	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				62	62	21,800	J	20,600		24,300		24,000		19,000		20,000	J	7,200	J
Manganese	UG/L	911	GA	300	2	60	65	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	65	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	22	65	1.2	U	1.3	J	1	U	1	U	2	U	2	U	2	UJ
Potassium	UG/L	7,810				59	60	614	R	462	J	260	J	254	J	690		690	J	380	J
Selenium	UG/L	0	GA	10	0	0	65	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	65	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	61	61	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	65	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	65	0.78	U	0.98	U	1	U	1	U	3.8	U	3.2	U	3.8	UJ
Zinc	UG/L	935				35	65	4.7	J	4	J	3.6	U	3.6	U	8.3	U	8.4	U	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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Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 8)
Annual Report - 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	MW17-1	MW17-2
Matrix								GW	GW	GW	GW	GW	GW	GW
Sample ID								17LM20020U	17LM20025F	17LM20025U	17LM20030F	17LM20030U	17LM20035	17LM20001
Sample Date								12/11/2012	12/15/2013	12/15/2013	12/20/2014	12/20/2014	12/21/2015	12/20/2007
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	8	1
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				25	65	50 UJ	23 UJ	50 UJ	23 U	50 U	18 J	110 J
Antimony	UG/L	4.4	GA	3	6	16	65	2.7 J	2.3 UJ	2 UJ	2.3 U	2 U	0.5 U	**3.44**
Arsenic	UG/L	7.8	MCL	10	0	2	65	1.3 UJ	1.3 J	1.3 UJ	1.3 U	1.3 U	1.5 U	4.2 U
Barium	UG/L	251	GA	1,000	0	65	65	28 J	60 J	56 J	44	41	70	58.8
Beryllium	UG/L	1.2	MCL	4	0	1	65	0.15 UJ	0.25 UJ	0.15 UJ	0.25 U	0.15 U	0.17 U	0.27 U
Cadmium	UG/L	1.7	GA	5	0	4	65	0.44 J	0.095 UJ	0.13 UJ	0.095 U	0.13 U	0.15 U	0.36 U
Calcium	UG/L	195,000				65	65	55,000 J	120,000 J	91,000 J	81,000	77,000	98,000	110,000 J
Chromium	UG/L	37.2	GA	50	0	4	65	2.5 UJ	2.5 UJ	2.5 UJ	2.5 U	2.5 U	1.6 U	0.84 U
Cobalt	UG/L	10.5				43	65	0.37 J	0.34 J	0.29 J	0.19 J	0.16 J	0.3 J	0.89 U
Copper	UG/L	46.7	GA	200	0	33	65	5.4 J	1.1 UJ	1.1 UJ	3.5 J	3.6 J	1.7 U	6.2 J
Iron	UG/L	25,500	GA	300	15	51	65	90 J	**800 J**	**680 J**	190	79 J	**360**	140
Iron+Manganese	UG/L	25,929	GA	500	13	56	60	98.1 J	**897 J**	**765 J**	199.6	87.7	449	160
Lead	UG/L	103	MCL	15	1	11	65	1.1 J	0.2 UJ	0.5 UJ	0.23 J	0.5 U	0.98 U	2.9 U
Magnesium	UG/L	27,300				62	62	7,700 J	24,000 J+	19,000 J	14,000	13,000	19,000	11,000 R
Manganese	UG/L	911	GA	300	2	60	65	8.1 J	97 J	85 J	9.6	8.7	89	20.5
Mercury	UG/L	0.14	GA	0.7	0	2	65	0.091 UJ	0.091 UJ	0.091 UJ	0.091 U	0.091 U	0.08 U	0.12 U
Nickel	UG/L	34	GA	100	0	22	65	2 UJ	2 UJ	2 UJ	2.5 J	2 U	1.9 U	1.2 U
Potassium	UG/L	7,810				59	60	410 J	500 J	400 J	280 J	330 U	520 J	1,690 R
Selenium	UG/L	0	GA	10	0	0	65	1.1 UJ	1 UJ	1.1 UJ	1 U	1.1 U	1 U	6.1 U
Silver	UG/L	0	GA	50	0	0	65	0.18 UJ	0.25 UJ	0.18 UJ	0.25 U	0.18 U	0.1 U	1 U
Sodium	UG/L	366,000	GA	20,000	4	61	61	2,500 J	6,000 J	4,800 J	3,700	3,500	6,400	6,620 R
Thallium	UG/L	0.08	MCL	2	0	2	65	0.25 UJ	0.5 UJ	0.25 UJ	0.5 U	0.25 U	0.49 U	0.03 U
Vanadium	UG/L	32.8				2	65	3.2 UJ	3.8 UJ	3.2 UJ	3.8 U	3.2 U	5.3 U	0.78 U
Zinc	UG/L	935				35	65	8.4 UJ	8.3 UJ	8.4 UJ	12 J	9 J	9.6 U	72 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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Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 8)
Annual Report - SEAD 16 and SEAD 17
Seneca Army Depot Activity

Area								SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Loc ID								MW17-2		MW17-2		MW17-2		MW17-2		MW17-2		MW17-2	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								17LM20006		17LM20011FIL		17LM20011UNFIL		17LM20015FIL		17LM20015UNF		17LM20021F	17LM20021U
Sample Date								12/10/2008		11/17/2009		11/17/2009		12/16/2010		12/16/2010		12/11/2012	12/11/2012
QC Type								SA		SA		SA		SA		SA		SA	SA
Study ID								LTM		LTM		LTM		LTM		LTM		LTM	LTM
Sample Round								2		3		3		4		4		5	5
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	19,600				25	65	142	J	88	J	19,600		23	U	51	J	23	UJ	50	UJ
Antimony	UG/L	4.4	GA	3	6	16	65	2.76		2.2		**3.7**		2.3	U	2	U	4	J	4.4	J
Arsenic	UG/L	7.8	MCL	10	0	2	65	3.7	U	3.7	U	7.8	J	1.3	U	1.3	U	1.3	UJ	1.3	UJ
Barium	UG/L	251	GA	1,000	0	65	65	51.8		82.3		251		54		58	J	69	J	68	J
Beryllium	UG/L	1.2	MCL	4	0	1	65	0.33	U	0.3	U	1.2	J	0.25	U	0.15	U	0.25	UJ	0.15	UJ
Cadmium	UG/L	1.7	GA	5	0	4	65	0.33	U	0.3	U	1.7		0.095	U	0.13	U	0.095	UJ	0.13	UJ
Calcium	UG/L	195,000				65	65	112,000		154,000	J	195,000	J	140,000		150,000		120,000	J	120,000	J
Chromium	UG/L	37.2	GA	50	0	4	65	2.9	J	0.9	U	37.2		2.5	U	2.5	U	2.5	UJ	2.5	UJ
Cobalt	UG/L	10.5				43	65	1.1	U	1.1	U	10.5		0.32	J	0.46	J	0.39	J	0.42	J
Copper	UG/L	46.7	GA	200	0	33	65	4.4	J	2.9	J	46.7		1.5	J	1.9	J	7.7	J	7.8	J
Iron	UG/L	25,500	GA	300	15	51	65	115		19	UJ	**25,500**	**J**	33	U	130	J	33	UJ	44	UJ
Iron+Manganese	UG/L	25,929	GA	500	13	56	60	121		1.5	J	**25,929**	**J**	23		173		12	J	14	J
Lead	UG/L	103	MCL	15	1	11	65	2.9	U	2.9	U	**103**		0.2	U	0.6	J	0.2	UJ	0.99	J
Magnesium	UG/L	27,300				62	62	11,200		18,200		23,300		18,000		19,000	J	12,000	J	12,000	J
Manganese	UG/L	911	GA	300	2	60	65	6.1		1.5	J	**429**		23		43		12	J	14	J
Mercury	UG/L	0.14	GA	0.7	0	2	65	0.12	U	0.1	U	0.1	U	0.091	U	0.091	U	0.091	UJ	0.091	UJ
Nickel	UG/L	34	GA	100	0	22	65	2.8	J	1.2	J	34		2	U	2	U	2	UJ	2	UJ
Potassium	UG/L	7,810				59	60	1,260	J	2,390		7,810		1,300	J	1,300		2,500	J	2,500	J
Selenium	UG/L	0	GA	10	0	0	65	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	65	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	61	61	7,860		19,800	J	**20,300**	**J**	14,000	J	14,000	J	8,400	J	8,400	J
Thallium	UG/L	0.08	MCL	2	0	2	65	0.09	U	0.008	U	0.2	U	0.5	U	0.25	U	0.5	UJ	0.25	UJ
Vanadium	UG/L	32.8				2	65	0.98	U	1	U	32.8		3.8	U	3.2	U	3.8	UJ	3.2	UJ
Zinc	UG/L	935				35	65	27.6		28.6		935		17	J	21		24	J	26	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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Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 8)
Annual Report - SEAD 16 and SEAD 17
Seneca Army Depot Activity

Area								SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Loc ID								MW17-2		MW17-2		MW17-2		MW17-2		MW17-2		MW17-3	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								17LM20026F		17LM20026U		17LM20031F		17LM20031U		17LM20036		17LM20002		17LM20007	
Sample Date								12/15/2013		12/15/2013		12/20/2014		12/20/2014		12/20/2015		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								6		6		7		7		8		1		2	
Filtered								Dissolved		Total		Dissolved		Total		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				25	65	23	UJ	50	UJ	23	U	50	U	19	J	108	J	386	
Antimony	UG/L	4.4	GA	3	6	16	65	2.3	UJ	2	UJ	3.2	J	3.3	J	0.63	J	1	U	1	U
Arsenic	UG/L	7.8	MCL	10	0	2	65	1.3	UJ	1.3	UJ	1.3	U	1.3	U	1.5	U	4.2	U	3.7	U
Barium	UG/L	251	GA	1,000	0	65	65	46	J	47	J	63		57		66		39		29.3	
Beryllium	UG/L	1.2	MCL	4	0	1	65	0.25	UJ	0.15	UJ	0.25	U	0.15	U	0.17	U	0.27	U	0.33	U
Cadmium	UG/L	1.7	GA	5	0	4	65	0.095	UJ	0.13	UJ	0.12	J	0.14	J	0.15	U	0.36	U	0.33	U
Calcium	UG/L	195,000				65	65	180,000	J	150,000	J	130,000		120,000		160,000		69,000	J	67,200	
Chromium	UG/L	37.2	GA	50	0	4	65	2.5	UJ	2.5	UJ	2.5	U	2.5	U	1.6	U	0.84	U	0.88	U
Cobalt	UG/L	10.5				43	65	0.44	J	0.38	J	0.15	U	0.13	J	0.42	J	0.89	U	1.1	U
Copper	UG/L	46.7	GA	200	0	33	65	1.1	UJ	1.1	UJ	6.4		6.3		2.4	J	2.6	J	2.8	J
Iron	UG/L	25,500	GA	300	15	51	65	520	J	470	J	33	U	46	J	140		133		1,300	
Iron+Manganese	UG/L	25,929	GA	500	13	56	60	594	J	534	J	2	J	50.1	J	175		170		1,573	
Lead	UG/L	103	MCL	15	1	11	65	0.2	UJ	0.5	UJ	0.2	U	0.5	U	0.98	U	2.9	U	2.9	U
Magnesium	UG/L	27,300				62	62	24,000	J+	22,000	J	13,000		11,000		16,000		7,560	R	7,400	
Manganese	UG/L	911	GA	300	2	60	65	74	J	64	J	2	J	4.1	J	35		36.7		273	
Mercury	UG/L	0.14	GA	0.7	0	2	65	0.091	UJ	0.091	UJ	0.091	U	0.091	U	0.08	U	0.12	U	0.12	U
Nickel	UG/L	34	GA	100	0	22	65	2	UJ	2	UJ	2	U	2.2	J	1.9	U	1.2	U	1.8	J
Potassium	UG/L	7,610				59	60	1,100	J	1,000	J	1,600		1,600		1,600		2,620	R	1,840	J
Selenium	UG/L	0	GA	10	0	0	65	1	UJ	1.1	UJ	1	U	1.1	U	1	U	6.1	U	6.1	U
Silver	UG/L	0	GA	50	0	0	65	0.25	UJ	0.18	UJ	0.25	U	0.18	U	0.1	U	1	U	1.3	U
Sodium	UG/L	366,000	GA	20,000	4	61	61	16,000	J	14,000	J	8,800		7,800		12,000		4,550	R	5,500	
Thallium	UG/L	0.08	MCL	2	0	2	65	0.5	UJ	0.25	UJ	0.5	U	0.25	U	0.49	U	0.03	U	0.09	U
Vanadium	UG/L	32.8				2	65	3.8	UJ	3.2	UJ	3.8	U	3.2	U	5.3	U	0.78	U	0.98	U
Zinc	UG/L	935				35	65	11	J	9.3	J	28	J	40	J	26		27	J	14.2	

Notes:

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Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 8)
Annual Report - SEAD 16 and SEAD 17
Seneca Army Depot Activity

Area								SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Loc ID								MW17-3		MW17-3		MW17-3		MW17-3		MW17-3		MW17-3	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								17LM20012FIL		17LM20012UNFIL		17LM20017FIL		17LM20017UNF		17LM20022F		17LM20022U		17LM20027F	
Sample Date								11/18/2009		11/18/2009		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				25	65	141	J	1,550	J	23	U	50	U	23	UJ	50	UJ	23	UJ
Antimony	UG/L	4.4	GA	3	6	16	65	1	U	1.5		2.3	U	2	U	2.3	UJ	2	UJ	2.3	UJ
Arsenic	UG/L	7.8	MCL	10	0	2	65	3.7	U	3.7	U	1.3	U	1.3	U	1.3	UJ	1.3	UJ	1.3	UJ
Barium	UG/L	251	GA	1,000	0	65	65	49.4		54.5		37		38	J	37	J	36	J	52	J
Beryllium	UG/L	1.2	MCL	4	0	1	65	0.3	U	0.3	U	0.25	U	0.15	U	0.25	UJ	0.15	UJ	0.25	UJ
Cadmium	UG/L	1.7	GA	5	0	4	65	0.3	U	0.3	U	0.095	U	0.13	U	0.095	UJ	0.13	UJ	0.095	UJ
Calcium	UG/L	195,000				65	65	99,400	J	95,900	J	90,000		93,000		74,000	J	67,000	J	130,000	J
Chromium	UG/L	37.2	GA	50	0	4	65	0.9	U	5.2		2.5	U	2.5	U	2.5	UJ	2.5	UJ	2.5	UJ
Cobalt	UG/L	10.5				43	65	1.5	J	1.7	J	0.63		0.7		0.15	UJ	0.12	UJ	0.31	J
Copper	UG/L	46.7	GA	200	0	33	65	2.5	J	7.9	J	1.1	U	1.1	U	3.3	J	5	UJ	1.3	J
Iron	UG/L	25,500	GA	300	15	51	65	**827**	**J**	**2,690**	**J**	**730**	**J**	**770**	**J**	33	UJ	44	UJ	33	UJ
Iron+Manganese	UG/L	25,929	GA	500	13	56	60	**968**	**J**	**2,858**	**J**	**890**		**940**		34	U	46	U	2.3	J
Lead	UG/L	103	MCL	15	1	11	65	2.9	U	8.6		0.2	U	0.5	U	0.24	J	0.78	J	0.35	J
Magnesium	UG/L	27,300				62	62	9,850		9,170		9,900		10,000	J	6,100	J	5,800	J	15,000	J+
Manganese	UG/L	911	GA	300	2	60	65	141		168		160		170		1	UJ	2	UJ	2.3	J
Mercury	UG/L	0.14	GA	0.7	0	2	65	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	22	65	3.1	J	4.5	J	2	U	2	U	2	UJ	2	UJ	2	UJ
Potassium	UG/L	7,810				59	60	1,290		1,590		1,200	J	1,200		1,800	J	1,700	J	870	J
Selenium	UG/L	0	GA	10	0	0	65	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	65	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	61	61	7,500	J	6,200	J	6,000	J	6,100	J	3,300	J	3,100	J	11,000	J
Thallium	UG/L	0.08	MCL	2	0	2	65	0.008	U	0.008	U	0.5	U	0.25	U	0.5	UJ	0.25	UJ	0.5	UJ
Vanadium	UG/L	32.8				2	65	1	U	1.7	J	3.8	U	3.2	U	3.8	UJ	3.2	UJ	3.8	UJ
Zinc	UG/L	935				35	65	21.1		45.7		8.3	U	12	J	29	J	26	J	35	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
   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 D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 8)
Annual Report - SEAD 16 and SEAD 17
Seneca Army Depot Activity

Area								SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Loc ID								MW17-3		MW17-3		MW17-3		MW17-3		MW17-4		MW17-4	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								17LM20027U		17LM20032F		17LM20032U		17LM20037		17LM20003		17LM20013FIL	
Sample Date								12/15/2013		12/20/2014		12/20/2014		12/20/2015		12/20/2007		11/17/2009	
QC Type								SA		SA		SA		SA		SA		SA	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								6		7		7		8		1		3	
Filtered								Total		Dissolved		Total		Total		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
Inorganics																			
Aluminum	UG/L	19,600				25	65	50	UJ	23	U	180		31	J	50.2	J	125	J	28	J
Antimony	UG/L	4.4	GA	3	6	16	65	2	UJ	2.3	U	2	U	0.5	U	1	U	0.62	J	1	U
Arsenic	UG/L	7.8	MCL	10	0	2	65	1.3	UJ	1.3	U	1.3	U	1.5	U	4.2	U	3.7	U	3.7	U
Barium	UG/L	251	GA	1,000	0	65	65	53	J	41		38		51		32.5		35.9		36.3	
Beryllium	UG/L	1.2	MCL	4	0	1	65	0.15	UJ	0.25	U	0.15	U	0.17	U	0.27	U	0.33	U	0.3	U
Cadmium	UG/L	1.7	GA	5	0	4	65	0.13	UJ	0.095	U	0.13	U	0.15	U	0.36	U	0.33	U	0.3	U
Calcium	UG/L	195,000				65	65	110,000	J	73,000		69,000		100,000		74,900	J	74,700		96,600	J
Chromium	UG/L	37.2	GA	50	0	4	65	2.5	UJ	2.5	U	2.5	U	1.6	U	1	J	0.88	U	0.9	U
Cobalt	UG/L	10.5				43	65	0.3	J	0.15	U	0.12	J	0.12	U	0.89	U	2.4	J	1.5	J
Copper	UG/L	46.7	GA	200	0	33	65	1.1	J	13		15		1.7	U	1.8	J	1.8	J	1.3	U
Iron	UG/L	25,500	GA	300	15	51	65	110	J	33	U	160		43	J	45.4	J	**1,760**		60	J
Iron+Manganese	UG/L	25,929	GA	500	13	56	60	112	J	5.1		166.1		44.8	J	59	J	**2,671**		258	J
Lead	UG/L	103	MCL	15	1	11	65	0.5	UJ	0.2	U	1.1	J	0.98	U	2.9	U	2.9	U	2.9	U
Magnesium	UG/L	27,300				62	62	15,000	J	5,800		5,600		11,000		10,400	R	10,200		12,900	
Manganese	UG/L	911	GA	300	2	60	65	2	J	5.1		6.1		1.8	U	13.7		**911**		198	
Mercury	UG/L	0.14	GA	0.7	0	2	65	0.091	UJ	0.091	U	0.091	U	0.08	U	0.12	U	0.12	U	0.1	U
Nickel	UG/L	34	GA	100	0	22	65	2	UJ	2.6	J	2	J	1.9	U	1.2	U	2.6	J	2.2	J
Potassium	UG/L	7,810				59	60	840	J	1,400		1,500		810	J	838	R	1,190	J	844	
Selenium	UG/L	0	GA	10	0	0	65	1.1	UJ	1	U	1.1	U	1	U	6.1	U	6.1	U	6.1	U
Silver	UG/L	0	GA	50	0	0	65	0.18	UJ	0.25	U	0.18	U	0.1	U	1	U	1.3	U	1.3	U
Sodium	UG/L	366,000	GA	20,000	4	61	61	10,000	J	1,900		1,900		8,400		**28,500**	J	15,500		10,400	J
Thallium	UG/L	0.08	MCL	2	0	2	65	0.25	UJ	0.5	U	0.25	U	0.49	U	0.03	U	0.09	U	0.008	U
Vanadium	UG/L	32.8				2	65	3.2	UJ	3.8	U	3.2	U	5.3	U	0.78	U	0.98	U	1	U
Zinc	UG/L	935				35	65	33	J	42	J	44	J	27		5.1	J	6.7	J	3.6	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.
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Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 8)
Annual Report - 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		MW17-4	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								17LM20013UNFIL		17LM20018FIL		17LM20018UNF		17LM20023F		17LM20023U		17LM20028F		17LM20028U	
Sample Date								11/17/2009		12/16/2010		12/16/2010		12/11/2012		12/11/2012		12/15/2013		12/15/2013	
QC Type								SA		SA		SA		SA		SA		SA		SA	
Study ID								LTM		LTM		LTM		LTM		LTM		LTM		LTM	
Sample Round								3		4		4		5		5		6		6	
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	19,600				25	65	70	J	23	U	50	U	23	UJ	50	UJ	23	UJ	50	UJ
Antimony	UG/L	4.4	GA	3	6	16	65	1	U	2.3	U	2	U	2.3	UJ	2	UJ	2.3	UJ	2	UJ
Arsenic	UG/L	7.8	MCL	10	0	2	65	3.7	U	1.3	U	1.3	U	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ
Barium	UG/L	251	GA	1,000	0	65	65	36.6		27		28	J	65	J	67	J	20	J	23	J
Beryllium	UG/L	1.2	MCL	4	0	1	65	0.3	U	0.25	U	0.15	U	0.25	UJ	0.15	UJ	0.25	UJ	0.15	UJ
Cadmium	UG/L	1.7	GA	5	0	4	65	0.3	U	0.095	U	0.13	U	0.095	UJ	0.13	UJ	0.095	UJ	0.13	UJ
Calcium	UG/L	195,000				65	65	97,600	J	90,000		88,000		83,000	J	87,000	J	96,000	J	93,000	J
Chromium	UG/L	37.2	GA	50	0	4	65	0.9	U	2.5	U	2.5	U	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ
Cobalt	UG/L	10.5				43	65	1.3	J	0.96		1.1		0.21	J	0.25	J	1	J	1.1	J
Copper	UG/L	46.7	GA	200	0	33	65	1.3	U	1.1	U	1.1	U	1.1	J	5	UJ	1.1	UJ	1.1	UJ
Iron	UG/L	25,500	GA	300	15	51	65	142	J	240	J	260	J	33	UJ	72	J	**810**	**J**	**810**	**J**
Iron+Manganese	UG/L	25,929	GA	500	13	56	60	355	J	370		400		9.5	J	83	J	**1,090**	**J**	**1,090**	**J**
Lead	UG/L	103	MCL	15	1	11	65	2.9	U	0.2	U	0.5	U	0.2	UJ	0.5	UJ	0.2	UJ	0.5	UJ
Magnesium	UG/L	27,300				62	62	13,000		13,000		13,000	J	15,000	J	15,000	J	15,000	J+	15,000	J
Manganese	UG/L	911	GA	300	2	60	65	213		130		140		9.5	J	11	J	280	J	280	J
Mercury	UG/L	0.14	GA	0.7	0	2	65	0.1	U	0.091	U	0.091	U	0.091	UJ	0.091	UJ	0.091	UJ	0.091	UJ
Nickel	UG/L	34	GA	100	0	22	65	2.4	J	2	U	2	U	2	UJ	2.1	J	2	UJ	2	UJ
Potassium	UG/L	7,810				59	60	866		540		530	J	750	J	780	J	450	J	430	J
Selenium	UG/L	0	GA	10	0	0	65	6.1	U	1	U	1.1	U	1	UJ	1.1	UJ	1	UJ	1.1	UJ
Silver	UG/L	0	GA	50	0	0	65	1.3	U	0.25	U	0.18	U	0.25	UJ	0.18	UJ	0.25	UJ	0.18	UJ
Sodium	UG/L	366,000	GA	20,000	4	61	61	10,500	J	12,000	J	12,000	J	8,900	J	8,600	J	7,800	J	7,800	J
Thallium	UG/L	0.08	MCL	2	0	2	65	0.008	U	0.5	U	0.25	U	0.5	UJ	0.25	UJ	0.5	UJ	0.25	UJ
Vanadium	UG/L	32.8				2	65	1	U	3.8	U	3.2	U	3.8	UJ	3.2	UJ	3.8	UJ	3.2	UJ
Zinc	UG/L	935				35	65	3.6	U	8.7	J	8.4	U	8.3	UJ	8.4	UJ	8.3	UJ	8.4	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.
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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4. Rejected values are not included in the number of samples analyzed.

Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 8)
Annual Report - 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		MW17-5		MW17-5		MW17-5	
Matrix								GW		GW		GW		GW		GW		GW	
Sample ID								17LM20033F		17LM20033U		17LM20038		17LM20004		17LM20009		17LM20014FIL	17LM20014UNFIL
Sample Date								12/20/2014		12/20/2014		12/21/2015		12/20/2007		12/11/2008		11/17/2009	11/17/2009
QC Type								SA		SA		SA		SA		SA		SA	SA
Study ID								LTM		LTM		LTM		LTM		LTM		LTM	LTM
Sample Round								7		7		8		1		2		3	3
Filtered								Dissolved		Total		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				25	65	23	U	50	U	18	U	98.5	J	125	J	29	J	98	J
Antimony	UG/L	4.4	GA	3	6	16	65	2.3	U	2	U	0.56	J	1	U	0.56	J	1		1	
Arsenic	UG/L	7.8	MCL	10	0	2	65	1.3	U	1.3	U	1.5	U	4.2	U	3.7	U	3.7	U	3.7	U
Barium	UG/L	251	GA	1,000	0	65	65	27		27		29		86.7		82.9		166		168	
Beryllium	UG/L	1.2	MCL	4	0	1	65	0.25	U	0.15	U	0.17	U	0.27	U	0.33	U	2	U	2	U
Cadmium	UG/L	1.7	GA	5	0	4	65	0.095	U	0.13	U	0.15	U	0.38	U	0.33	U	0.3	U	0.3	U
Calcium	UG/L	195,000				65	65	80,000		75,000		80,000		97,100	J	97,300		184,000	J	185,000	J
Chromium	UG/L	37.2	GA	50	0	4	65	2.5	U	2.5	U	1.6	U	0.84	U	0.88	U	0.9	U	0.9	U
Cobalt	UG/L	10.5				43	65	0.31	J	0.24	J	1.1		0.89	U	1.1	U	1.1	U	1.1	U
Copper	UG/L	46.7	GA	200	0	33	65	2.3	J	2.8	J	1.7	U	1.3	U	1.5	J	1.3	U	1.3	U
Iron	UG/L	25,500	GA	300	15	51	65	120		130		59	J	91.7		76		19	UJ	34	J
Iron+Manganese	UG/L	25,929	GA	500	13	56	60	260		250		158	J	128		85		24.3		61.4	J
Lead	UG/L	103	MCL	15	1	11	65	0.2	U	0.5	U	1.5	J	2.9	U	2.9	U	2.9	U	2.9	U
Magnesium	UG/L	27,300				62	62	12,000		11,000		11,000		15,800	J	15,600		27,100		27,300	
Manganese	UG/L	911	GA	300	2	60	65	140		120		99		36.5		8.9		24.3		27.4	
Mercury	UG/L	0.14	GA	0.7	0	2	65	0.091	U	0.091	U	0.08	U	0.12	U	0.12	U	0.1	U	0.1	U
Nickel	UG/L	34	GA	100	0	22	65	3	J	2	J	2.1	J	1.2	U	1.2	J	1.7	J	1.8	J
Potassium	UG/L	7,810				59	60	480	J	420	J	500	J	972	R	824	J	1,920		1,960	
Selenium	UG/L	0	GA	10	0	0	65	1	U	1.1	U	1	U	6.1	U	6.1	U	6.1	U	6.1	U
Silver	UG/L	0	GA	50	0	0	65	0.25	U	0.18	U	0.1	U	1	U	1.3	U	1.3	U	1.3	U
Sodium	UG/L	366,000	GA	20,000	4	61	61	7,700		7,300		6,000		7,950	R	7,360		364,000	J	366,000	J
Thallium	UG/L	0.08	MCL	2	0	2	65	0.5	U	0.25	U	0.49	U	0.03	U	0.09	U	0.08	J	0.08	J
Vanadium	UG/L	32.8				2	65	3.8	U	3.2	U	5.3	U	0.78	U	0.98	U	1	U	1	U
Zinc	UG/L	935				35	65	8.3	U	8.4	U	9.6	U	4.7	J	41.6		3.6	U	3.6	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 D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 8)
Annual Report - SEAD 16 and SEAD 17
Seneca Army Depot Activity

Area								SEAD-17		SEAD-17		SEAD-17		SEAD-17		SEAD-17	
Loc ID								MW17-5		MW17-5		MW17-5		MW17-5		MW17-5	
Matrix								GW		GW		GW		GW		GW	
Sample ID								17LM20019FIL		17LM20019UNF		17LM20024F		17LM20024U		17LM20029F		17LM20029U
Sample Date								12/16/2010		12/16/2010		12/11/2012		12/11/2012		12/15/2013		12/15/2013
QC Type								SA		SA		SA		SA		SA		SA
Study ID								LTM		LTM		LTM		LTM		LTM		LTM
Sample Round								4		4		5		5		6		6
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	19,600				25	65	23	U	50	U	23	UJ	50	UJ	23	UJ	50	UJ
Antimony	UG/L	4.4	GA	3	6	16	65	2.3	U	2	U	2.3	UJ	2	UJ	2.3	UJ	2	UJ
Arsenic	UG/L	7.8	MCL	10	0	2	65	1.3	U	1.3	U	1.3	UJ	1.3	UJ	1.3	UJ	1.3	UJ
Barium	UG/L	251	GA	1,000	0	65	65	81		82	J	24	J	26	J	75	J	86	J
Beryllium	UG/L	1.2	MCL	4	0	1	65	0.25	U	0.15	U	0.25	UJ	0.15	UJ	0.25	UJ	0.15	UJ
Cadmium	UG/L	1.7	GA	5	0	4	65	0.095	U	0.13	U	0.095	UJ	0.13	UJ	0.095	UJ	0.13	UJ
Calcium	UG/L	195,000				65	65	100,000		110,000		68,000	J	75,000	J	110,000	J	100,000	J
Chromium	UG/L	37.2	GA	50	0	4	65	2.5	U	2.5	U	2.5	UJ	2.5	UJ	2.5	UJ	2.5	UJ
Cobalt	UG/L	10.5				43	65	0.17	J	0.19	J	0.31	J	0.31	J	0.2	J	0.22	J
Copper	UG/L	46.7	GA	200	0	33	65	1.1	U	1.1	U	3.7	J	5	UJ	1.1	UJ	1.1	UJ
Iron	UG/L	25,500	GA	300	15	51	65	83	J	110	J	44	J	160	J	350	J	140	J
Iron+Manganese	UG/L	25,929	GA	500	13	56	60	118		145		82	J	219	J	374	J	167	J
Lead	UG/L	103	MCL	15	1	11	65	0.2	U	0.5	U	0.2	UJ	0.5	UJ	0.2	UJ	0.5	UJ
Magnesium	UG/L	27,300				62	62	17,000		18,000	J	9,900	J	11,000	J	18,000	J+	17,000	J
Manganese	UG/L	911	GA	300	2	60	65	35		35		38	J	59	J	24	J	27	J
Mercury	UG/L	0.14	GA	0.7	0	2	65	0.091	U	0.091	U	0.12	J	0.091	UJ	0.091	UJ	0.091	UJ
Nickel	UG/L	34	GA	100	0	22	65	2	U	2	U	2	UJ	2	UJ	2	UJ	2	UJ
Potassium	UG/L	7,810				59	60	1,600	J	1,600		460	J	460	J	1,200	J	1,100	J
Selenium	UG/L	0	GA	10	0	0	65	1	U	1.1	U	1	UJ	1.1	UJ	1	UJ	1.1	UJ
Silver	UG/L	0	GA	50	0	0	65	0.25	U	0.18	U	0.25	UJ	0.18	UJ	0.25	UJ	0.18	UJ
Sodium	UG/L	366,000	GA	20,000	4	61	61	8,200	J	8,300	J	9,400	J	9,100	J	5,400	J	5,300	J
Thallium	UG/L	0.08	MCL	2	0	2	65	0.5	U	0.25	U	0.5	UJ	0.25	UJ	0.5	UJ	0.25	UJ
Vanadium	UG/L	32.8				2	65	3.8	U	3.2	U	3.8	UJ	3.2	UJ	3.8	UJ	3.2	UJ
Zinc	UG/L	935				35	65	20		8.4	U	8.3	UJ	8.4	UJ	8.3	UJ	8.4	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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3. Shading indicates a concentration above the identified criteria value.
   SA = Sample
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4. Rejected values are not included in the number of samples analyzed.

Appendix D
Post-Remedial Action Groundwater Monitoring Results (Years 1 through 8)
Annual Report - SEAD 16 and SEAD 17
Seneca Army Depot Activity

	Area							SEAD-17		SEAD-17		SEAD-17		
	Loc ID							MW17-5		MW17-5		MW17-5		
	Matrix							GW		GW		GW		
	Sample ID							17LM20034F		17LM20034U		17LM20039		
	Sample Date							12/20/2014		12/20/2014		12/20/2015		
	QC Type							SA		SA		SA		
	Study ID							LTM		LTM		LTM		
	Sample Round							7		7		8		
	Filtered							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
Inorganics														
Aluminum	UG/L	19,600				25	65	23	U	50	U	18	U
Antimony	UG/L	4.4	GA	3	6	16	65	2.3	U	2	U	0.5	U
Arsenic	UG/L	7.8	MCL	10	0	2	65	1.3	U	1.3	U	1.5	U
Barium	UG/L	251	GA	1,000	0	65	65	83		92		86		
Beryllium	UG/L	1.2	MCL	4	0	1	65	0.25	U	0.15	U	0.17	U
Cadmium	UG/L	1.7	GA	5	0	4	65	0.095	U	0.13	U	0.15	U
Calcium	UG/L	195,000				65	65	91,000		100,000		100,000		
Chromium	UG/L	37.2	GA	50	0	4	65	2.5	U	2.5	U	1.6	U
Cobalt	UG/L	10.5				43	65	0.15	U	0.12	U	0.14	J
Copper	UG/L	46.7	GA	200	0	33	65	1.1	U	2.6	J	1.7	U
Iron	UG/L	25,500	GA	300	15	51	65	33	U	55	J	43	J
Iron+Manganese	UG/L	25,929	GA	500	13	56	60	34	U	46	U	48.8	J
Lead	UG/L	103	MCL	15	1	11	65	0.2	U	0.5	U	0.98	U
Magnesium	UG/L	27,300				62	62	14,000		15,000		17,000		
Manganese	UG/L	911	GA	300	2	60	65	1	U	2	U	5.8		
Mercury	UG/L	0.14	GA	0.7	0	2	65	0.091	U	0.091	U	0.08	U
Nickel	UG/L	34	GA	100	0	22	65	2.8	J	2	U	1.9	U
Potassium	UG/L	7,810				59	60	810		860	J	1,300		
Selenium	UG/L	0	GA	10	0	0	65	1	U	1.1	U	1	U
Silver	UG/L	0	GA	50	0	0	65	0.25	U	0.18	U	0.1	U
Sodium	UG/L	366,000	GA	20,000	4	61	61	4,900		4,900		5,800		
Thallium	UG/L	0.08	MCL	2	0	2	65	0.5	U	0.25	U	0.49	U
Vanadium	UG/L	32.8				2	65	3.8	U	3.2	U	5.3	U
Zinc	UG/L	935				35	65	8.3	U	8.4	U	9.6	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
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   SA = Sample
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4. Rejected values are not included in the number of samples analyzed.

APPENDIX E

LABORATORY ANALYTICAL REPORT

Laboratory Reports are provided on the CD version of this report.

APPENDIX F

DATA VALIDATION

PROJECT NAME/NO. USACE - Seneca Army Depot SEAD-16/17 LTM Round 8
LAB: TestAmerica
SDG: 680-120341-1
FRACTION: Metals (SW846 6020A)
MEDIA: Groundwater
NUMBER OF SAMPLES: 12

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%	Sample 16LM20054 was designated for MS/MSD analysis. All precision and accuracy results were acceptable with the exception of potassium (-146%R/-140%R) and antimony (-87%R/-96%R). The post digestion spike also experienced low recoveries for potassium (-18%R) and antimony (13%R). Therefore, the positive potassium and antimony results for the parent sample were considered estimated, possibly biased low, and qualified "J-".	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%	All isotopes of each analyte had a RSD < 5%.	No
Internal Standard	Yes	Intensity within 60-125%	IS had %RI within acceptance limits.	No
Serial Dilution	No	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.	Serial dilution was conducted on sample 16LM20054 with all results considered compliant with the exception of the serial dilution results for barium (80%D), caclcium (79%D), potassium (78%D), magnesium (80%D), sodium (79%D), and antimony (80%D). Therefore, positive results for these analytes were considered estimated and qualified "J" for the parent sample..	Yes
Total/Dissolved Comparison	Yes	%RPD less than 20%	Samples were collected for total analysis.	No
Field Duplicate Precision	No	%RPD less than 30%	Sample 16LM20055 was collected as the field duplicate sample of 16LM20054. Precision results were considered acceptable with the exception of barium (129%RPD), calcium (129%RPD), potassium (123%RPD), magnesium (132%RPD), manganese (111%RPD), sodium (118%RPD), lead (131%RPD), and antimony (145%RPD). Results for these analytes for samples 16LM20054 and its duplicate16LM20055 were considered estimated and qualified "J" based upon field duplicate precision outliers.	Yes

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 Round 8
LAB: TestAmerica
SDG: 680-120341-1
FRACTION: Metals (SW846 7470A)
MEDIA: Groundwater
NUMBER OF SAMPLES: 12

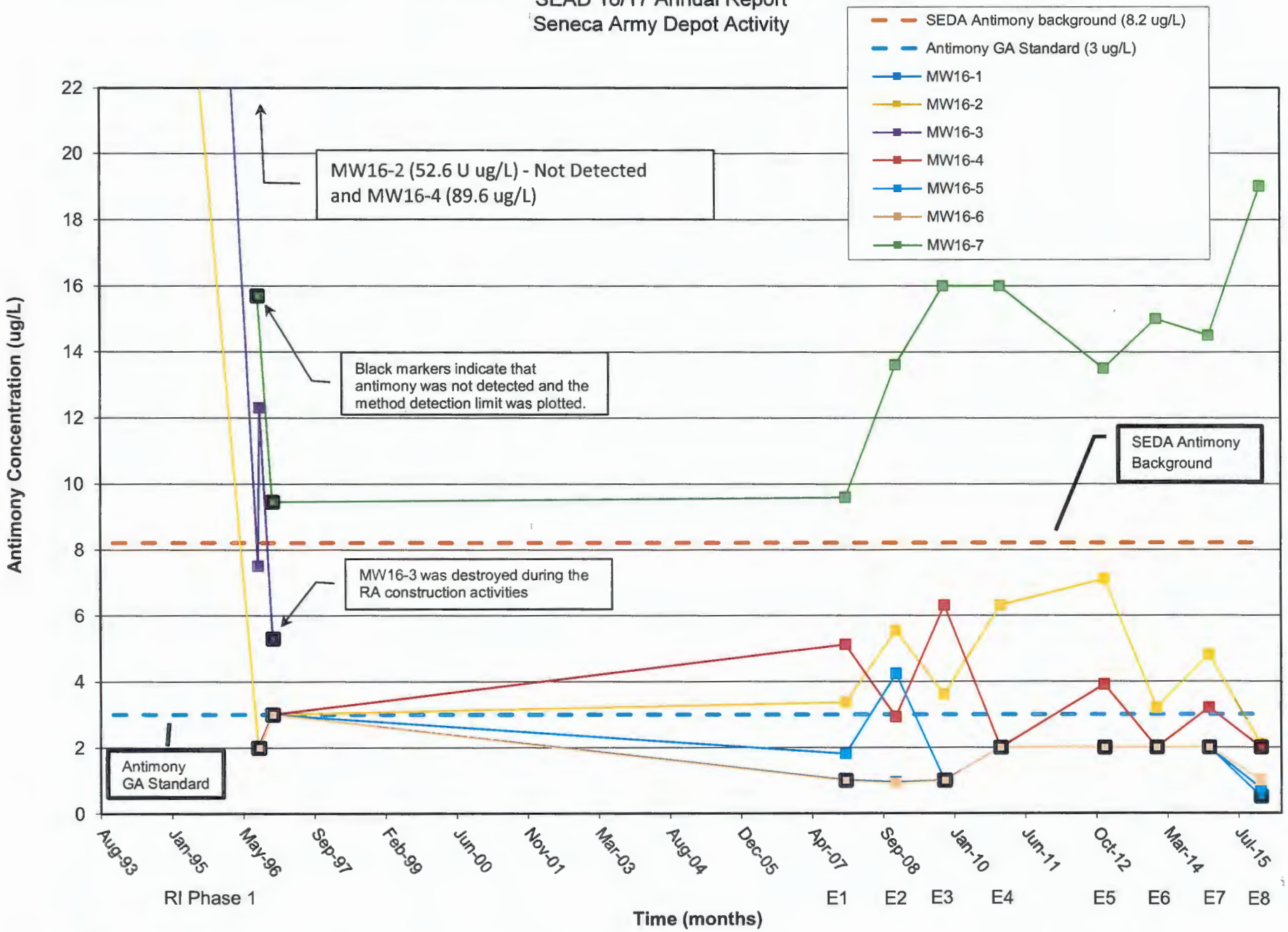
CRITERIA	Did Analyses Meet all criteria as specified in the SOPS?	Region 2 Acceptable limits / criteria	Comments/Qualifying Actions	Qualifiers Added?
Data Completeness, Holding Times & Preservation	Yes	Cooler temp < 10 C. Holding Time Hg < 28 days, all other metals < 180 days from collection.	Coolers were received at 1.2-1.6°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.	No
Calibration	Yes	r^2 ≥ 0.995 CCV every 10 samples or 2 hours ICV/CCV %R btw 80-120% (specific to Hg)	Calibrations available, taken every ten samples, and within recovery limits (80-120%).	No
Blanks (prep blank, ICB, CCB)	Yes	Method blanks: 1 per 20 project samples.	ICB, CCB, and preparation blanks did not contain mercury.	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%.	All LCSs within QC limits.	No
Duplicates	Yes	RPD < 20% or Absolute Diff < RL when samp/dup value < 5x RL	All laboratory duplicate results were within criteria for mercury.	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%	Sample 16LM20054 was designated for MS/MSD analysis. Precision and accuracy results for mercury were compliant.	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 were collected for total analysis.	No
Field Duplicate Precision	Yes	%RPD less than 30%	Sample 16LM20055 was collected as the field duplicate of 16LM20054. Mercury was not detected in either sample.	No

APPENDIX G

HISTORICAL GROUNDWATER TRENDS

SEAD 16 Concentration of Antimony Over Time

SEAD 16/17 Annual Report
Seneca Army Depot Activity

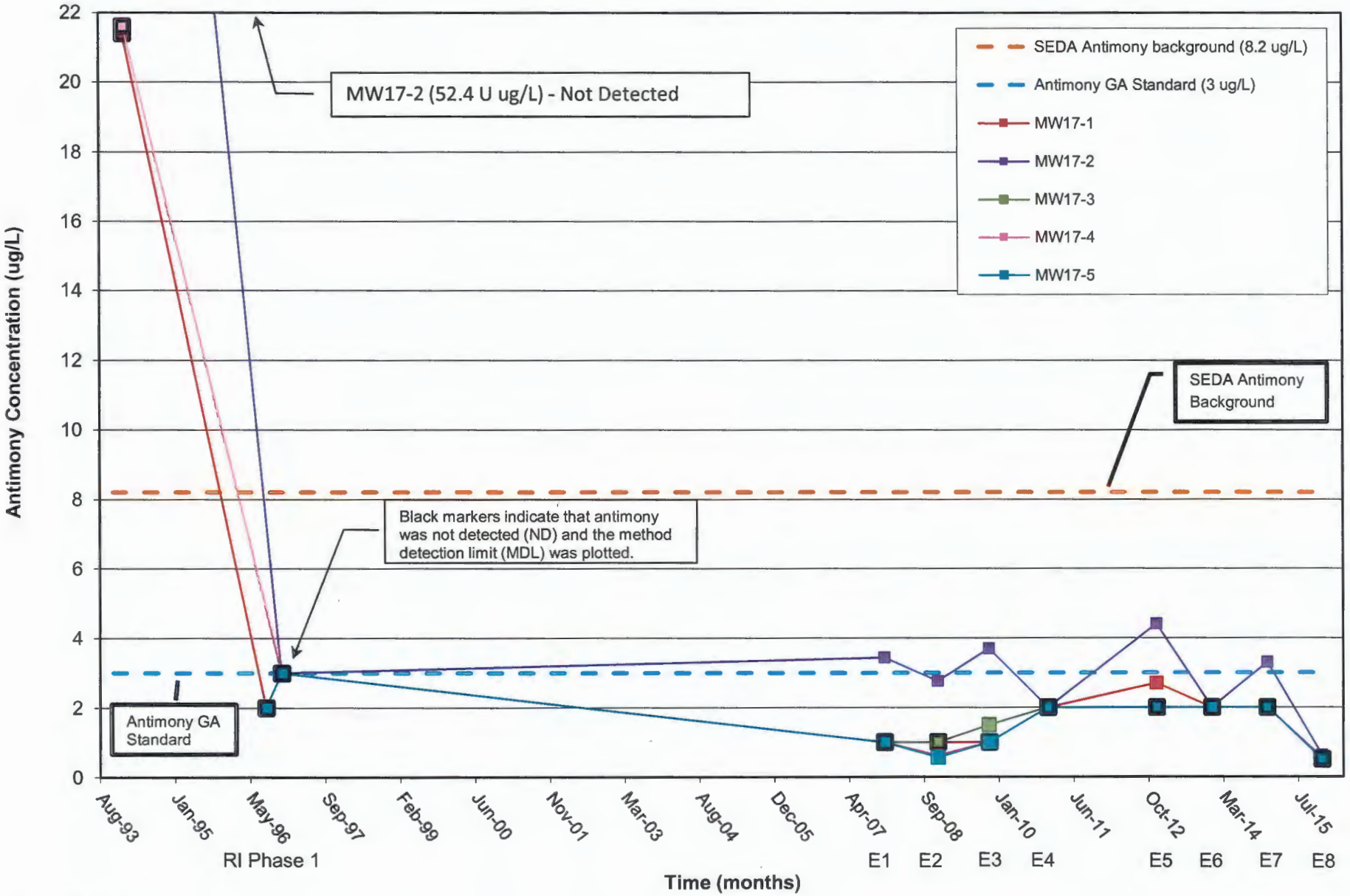


Note:
Black markers - Antimony was not detected (MDL plotted).

SEAD 17 Concentration Antimony Over Time

SEAD 16/17 Annual Report

Seneca Army Depot Activity



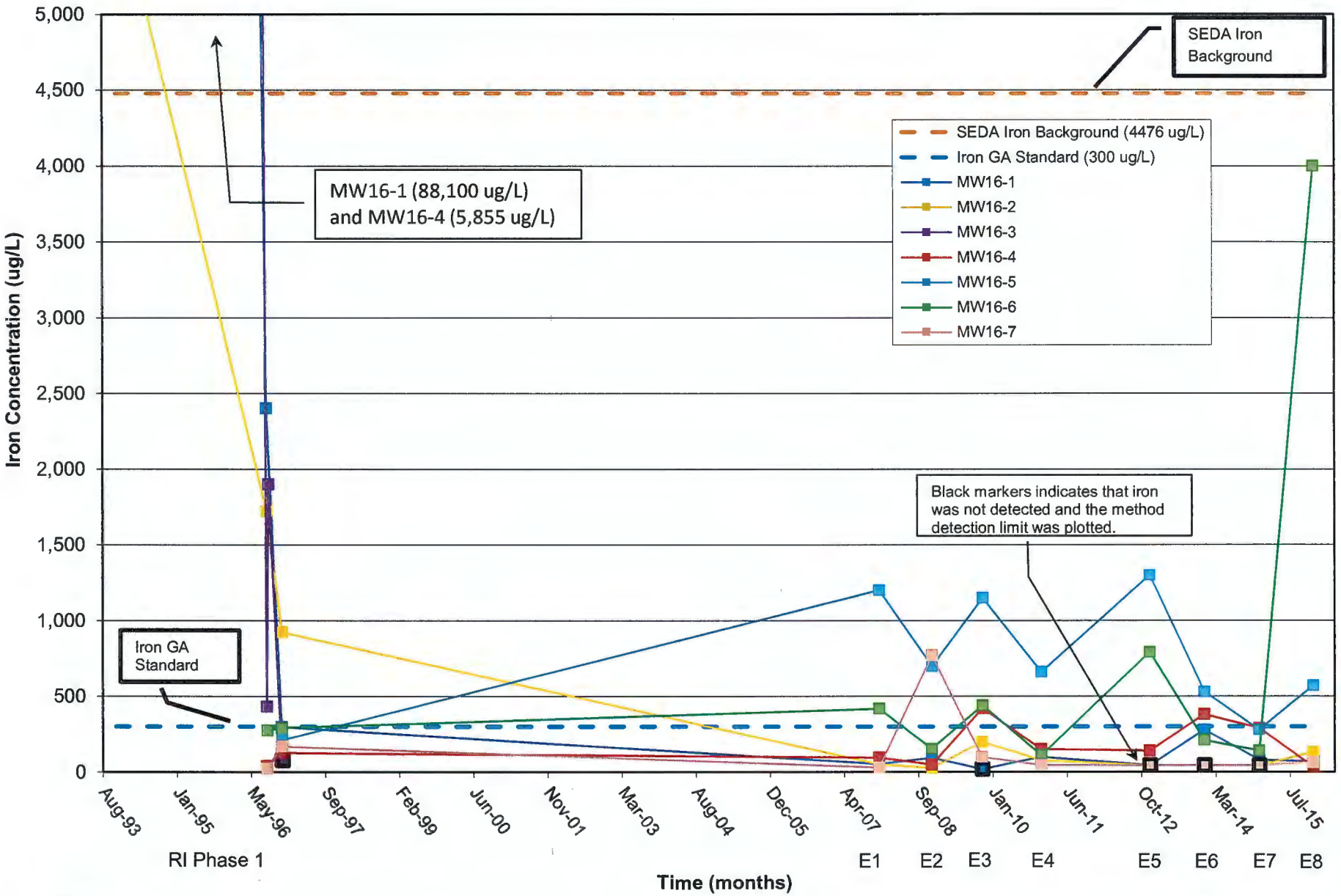
Note:

Black markers - Antimony was not detected (MDL plotted).

SEAD 16 Concentration of Iron Over Time

SEAD 16/17 Annual Report

Seneca Army Depot Activity



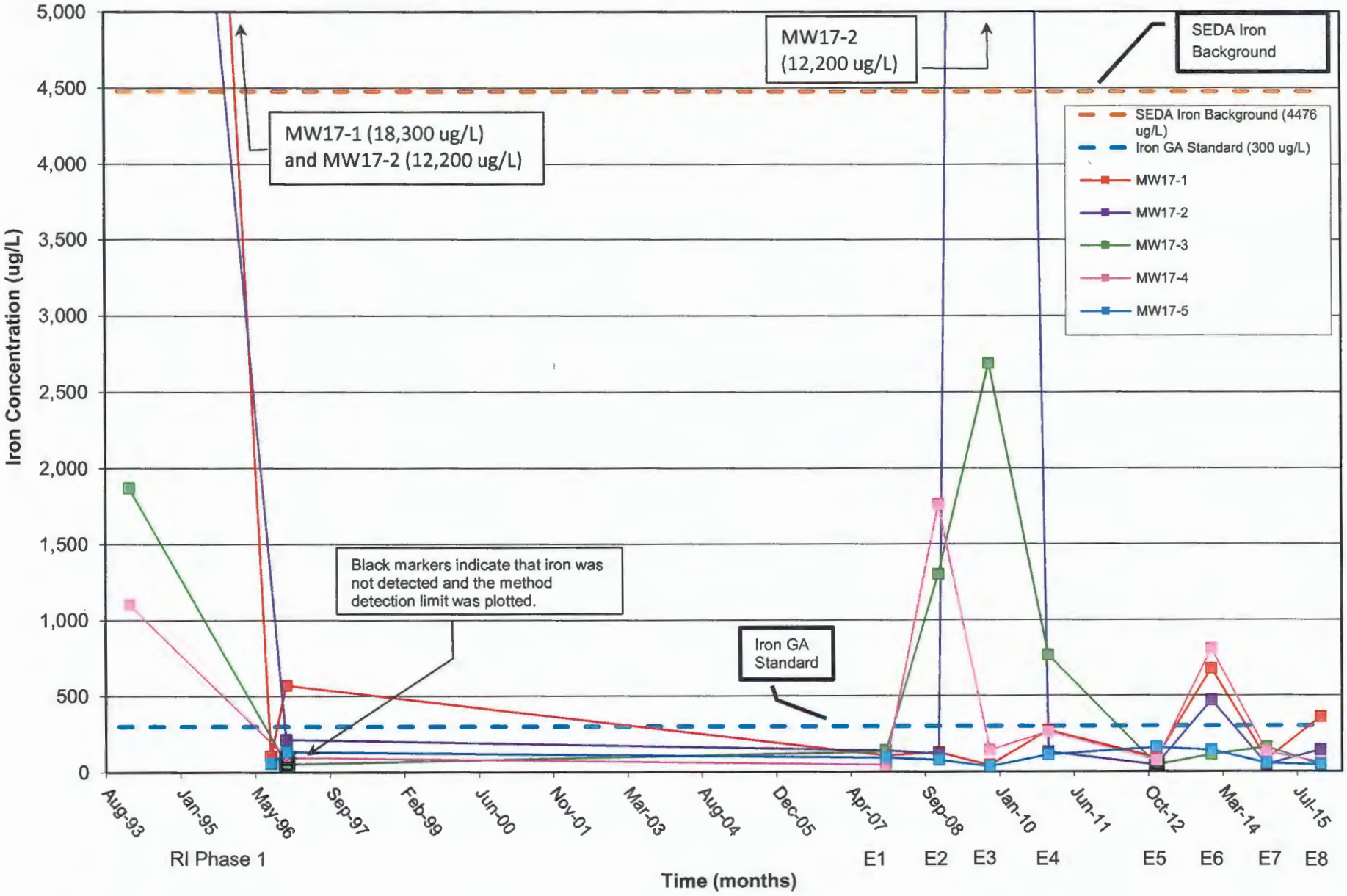
Note:

Black markers - Iron was not detected (MDL plotted).

SEAD 17 Concentrat. . of Iron Over Time

SEAD 16/17 Annual Report

Seneca Army Depot Activity



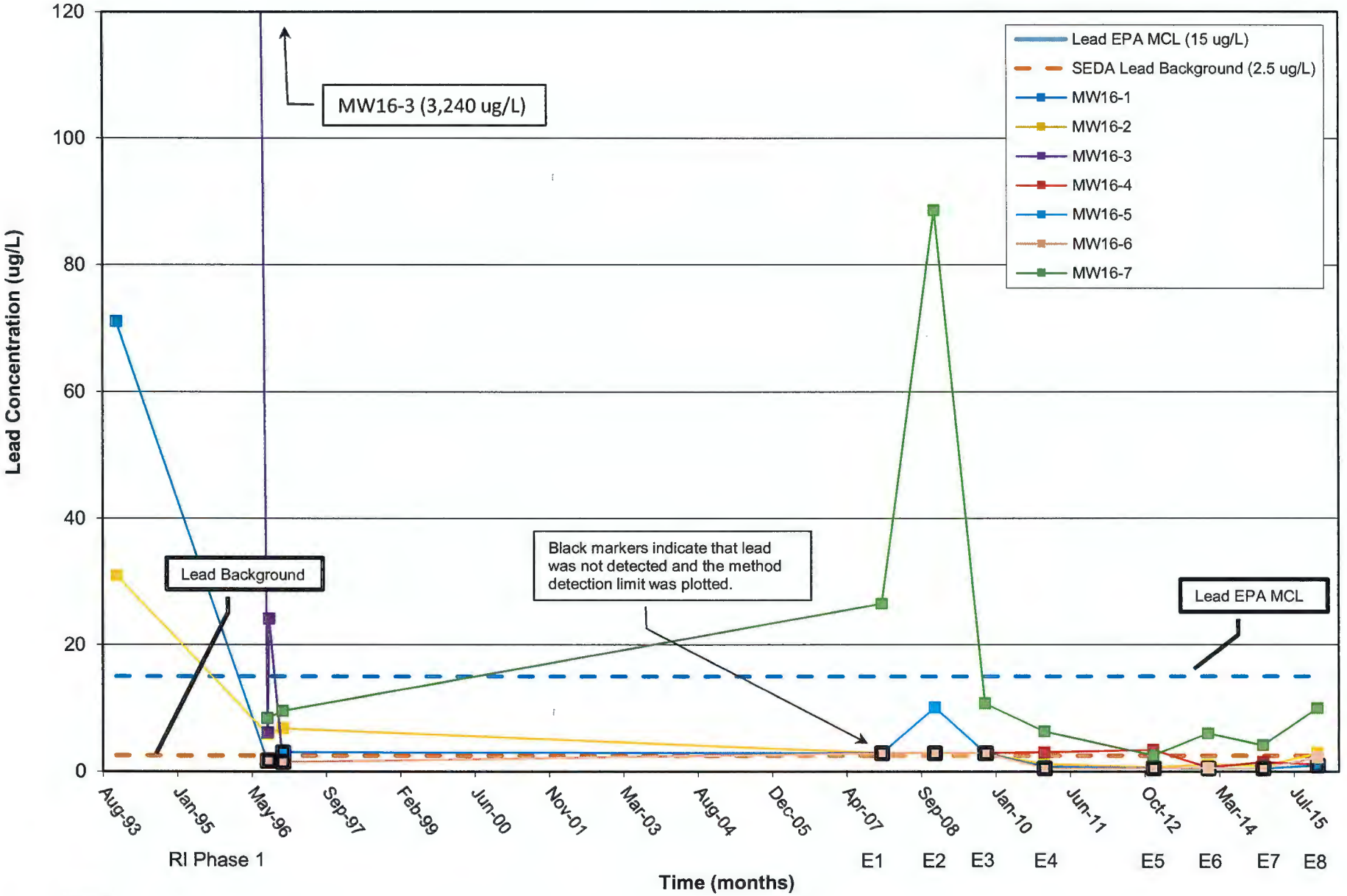
Note:

Black markers - Iron was not detected (MDL plotted).

SEAD 16 Concentration of Lead Over Time

SEAD 16/17 Annual Report

Seneca Army Depot Activity



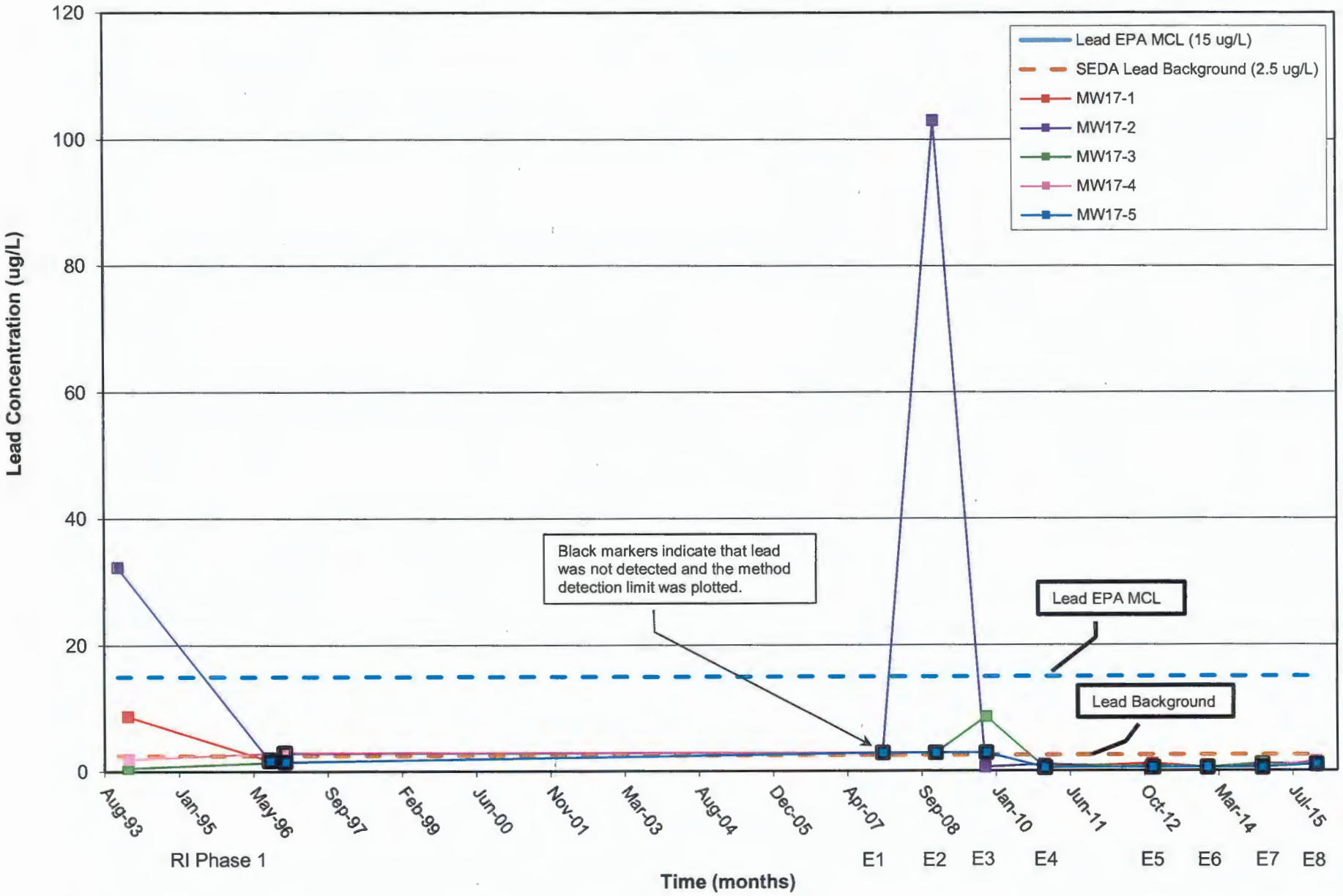
Note:

Black markers - Lead was not detected (MDL plotted).

SEAD 17 Concentrati of Lead Over Time

SEAD 16/17 Annual Report

Seneca Army Depot Activity



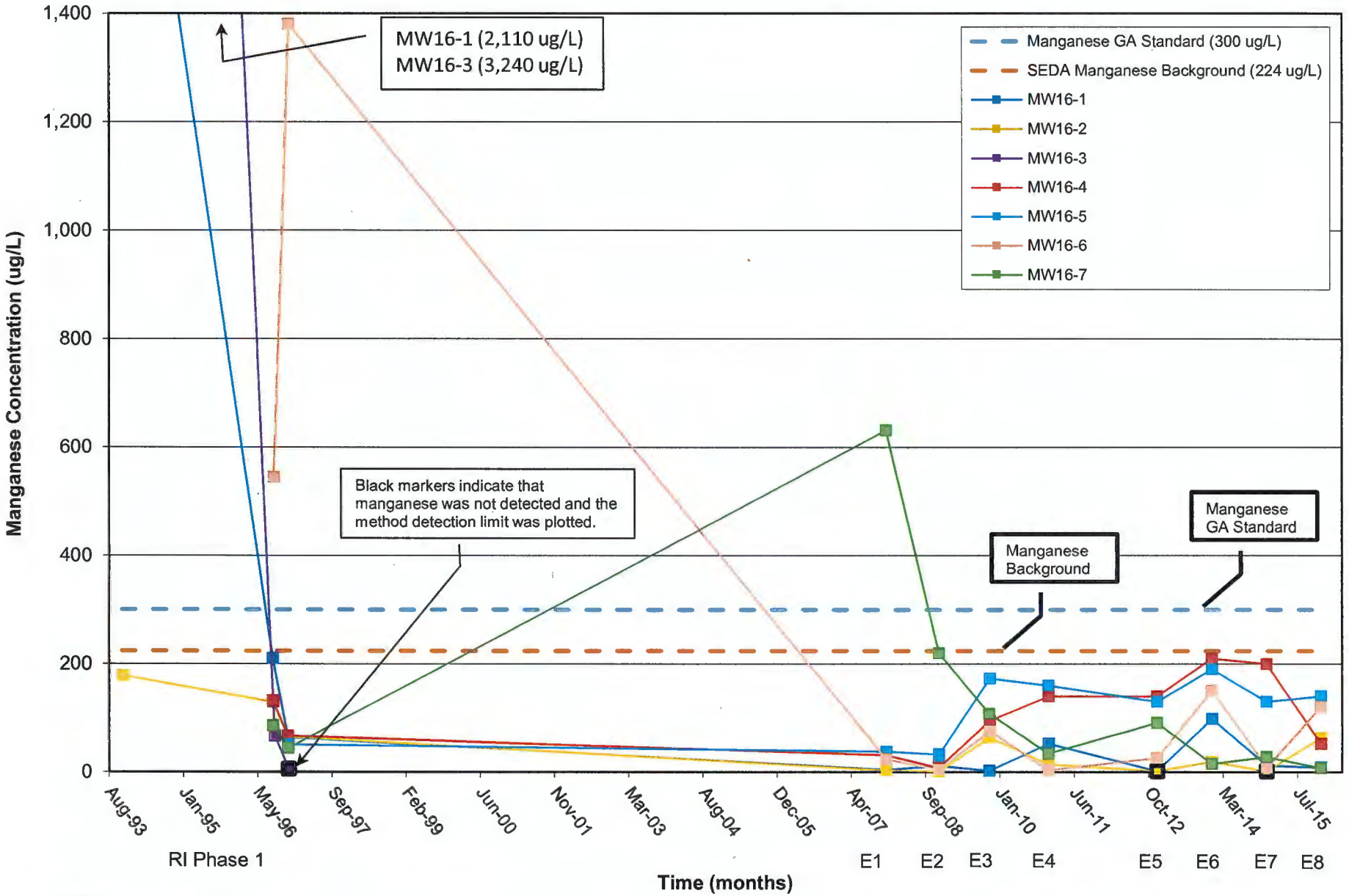
Note:

Black markers - Lead was not detected (MDL plotted).

SEAD 16 Concentration of Manganese Over Time

SEAD 16/17 Annual Report

Seneca Army Depot Activity



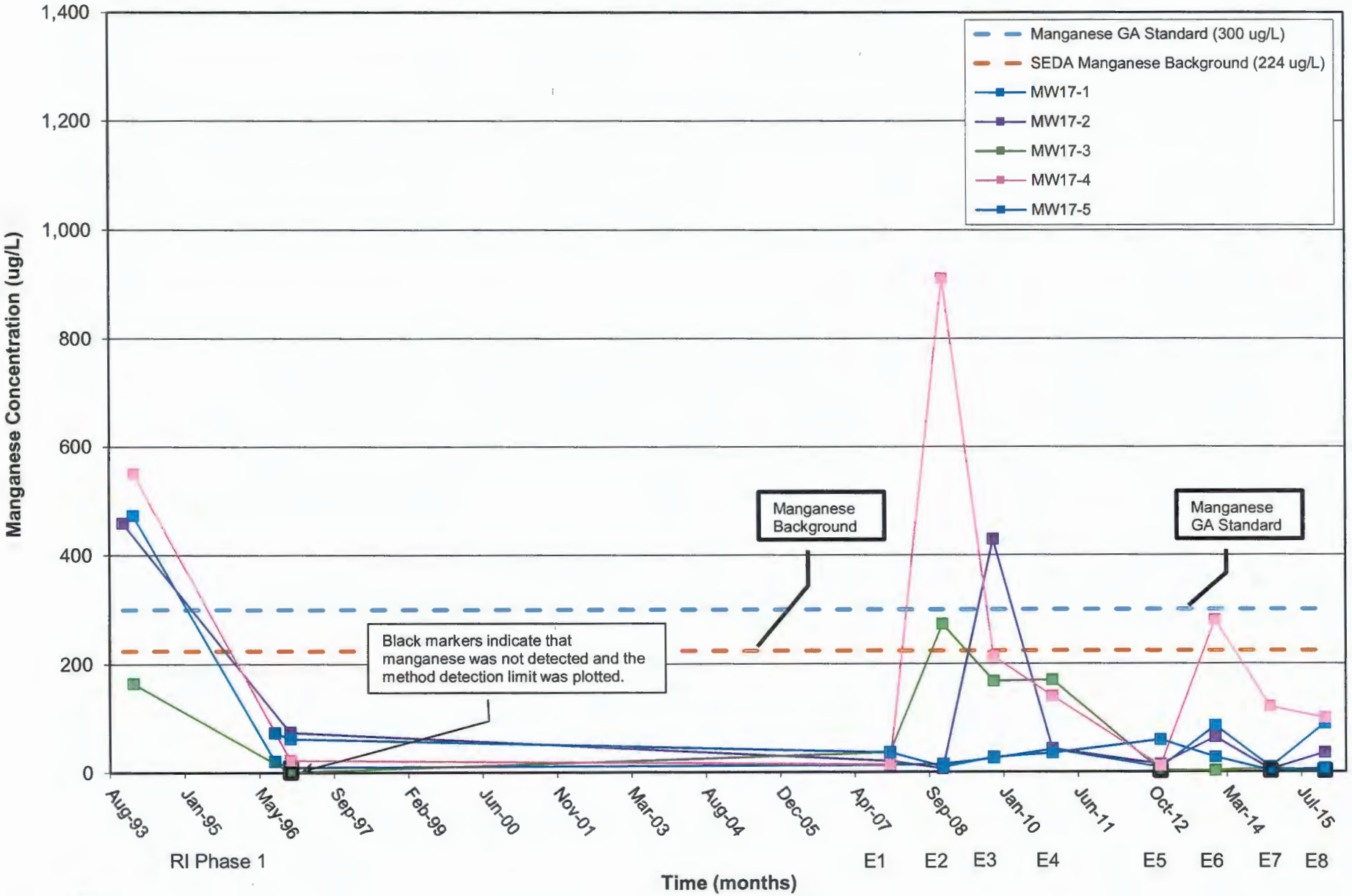
Note:

Black markers - Manganese was not detected (MDL plotted).

SEAD 17 Concentration of Manganese Over Time

SEAD 16/17 Annual Report

Seneca Army Depot Activity



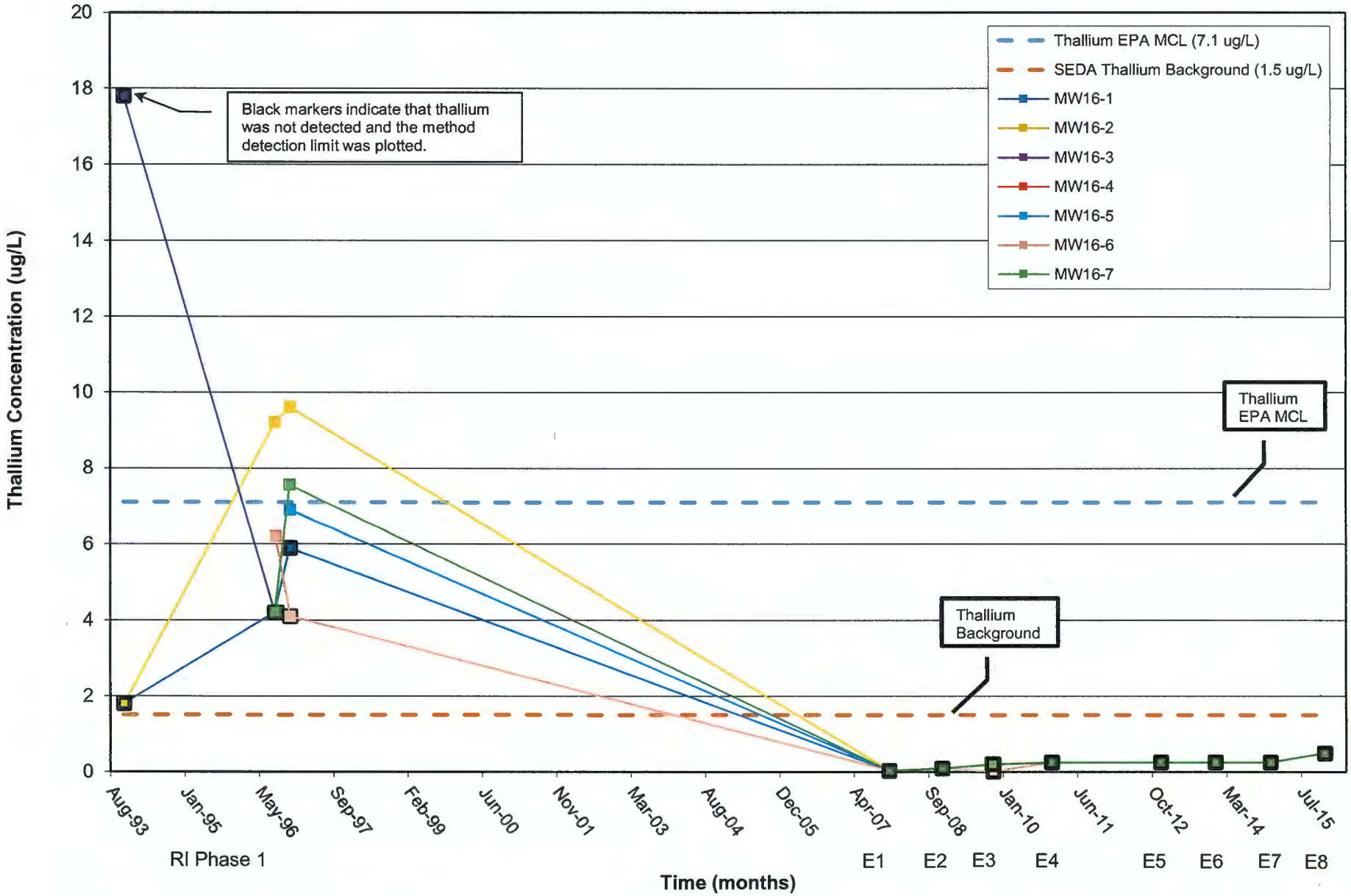
Note:

Black markers - Manganese was not detected (MDL plotted).

SEAD 16 Concentration of Thallium Over Time

SEAD 16/17 Annual Report

Seneca Army Depot Activity



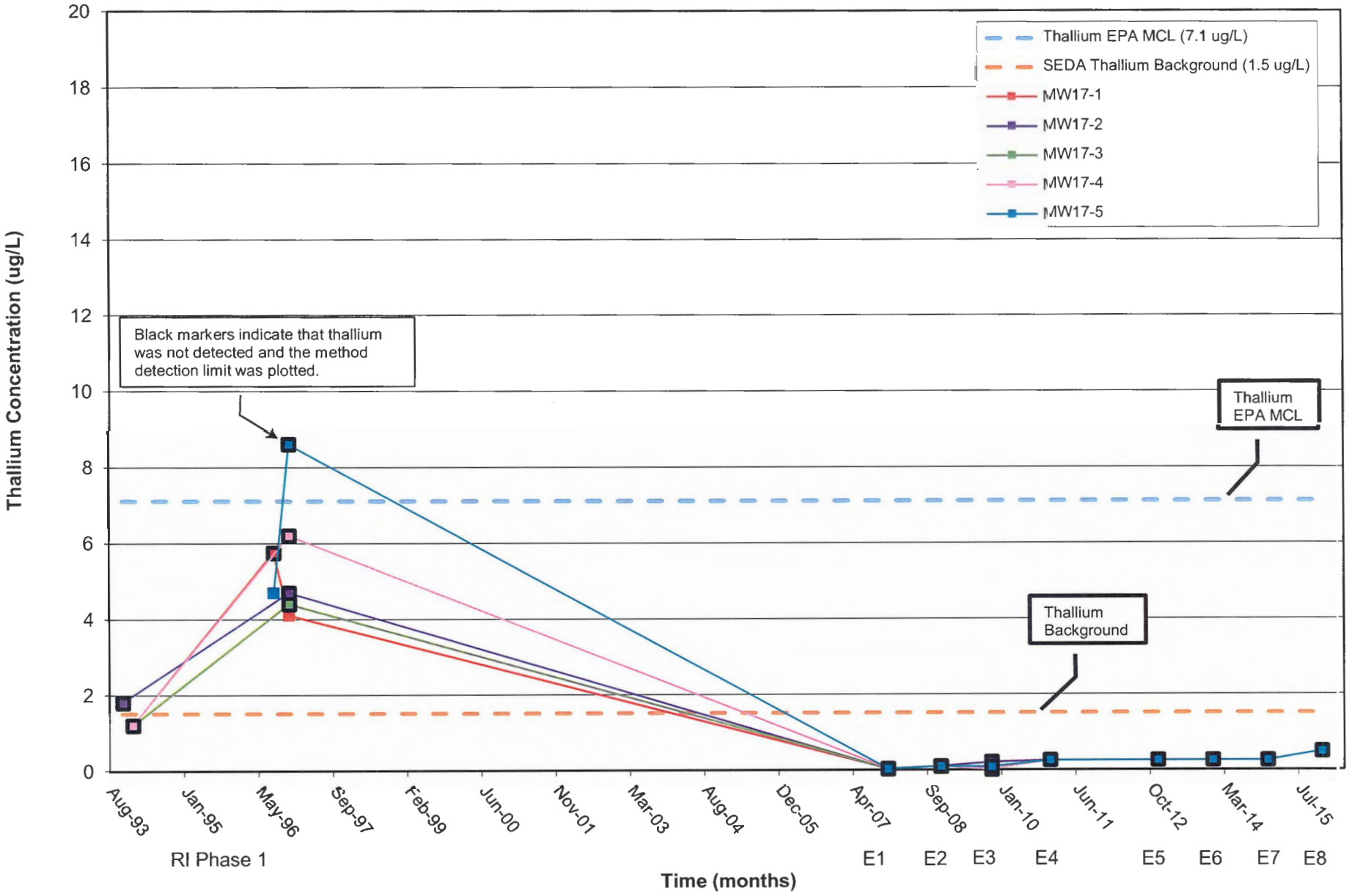
Note:

Black markers - Thallium was not detected (MDL plotted).

SEAD 17 Concentration of Thallium Over Time

SEAD 16/17 Annual Report

Seneca Army Depot Activity



Note:

Black marker - Thallium was not detected (MDL plotted).

Army's Response to Comments from the United States Environmental Protection Agency

Subject: Draft 2016 Year 8 Annual Report, SEAD-16/17
Seneca Army Depot Activity
Romulus, New York

Comments Dated: October 18, 2016

Date of Comment Response: February 21, 2017

Army's Response to Comments

General Comment: Presented below are review comments for the subject document dated August 2016 (Annual Report). EPA recommends a modification to the sampling frequency as response to your sampling discontinuing recommendation. We recommend two additional rounds of sampling within the next five years, but prior to the next five-year review. One round should be done during Spring and the other one during Autumn.

Response: Agreement was reached between the EPA and Army via email dated 28 October 2016 to conduct the next round of groundwater sampling at SEAD-16/17 in 2019 (year 3 of the FYR cycle). This will allow for an additional round of sampling, if necessary, before the next 2021 five-year review. This decision was documented in the Recommendations section of the Annual Report.

Comment 1: All monitoring wells were sampled during 1996 before the RA. The results of the sampling should be included on "time lines" for each well so that a comparison can be readily made with the results from post RA monitoring. It is noted that additional constituents were analyzed for as part of the RI.

Response 1: Plots for each well at SEAD-16 and SEAD-17 are presented in Appendix G. The plots present the pre-LTM and LTM groundwater data for analytes (antimony, iron, lead, manganese, and thallium) that had more than 2 exceedances in the RA. Sodium was not included as it is not a site-related COC. In general, concentrations of all analytes have decreased after the RA.

Comment 2: Tables 1 and 2 provide information regarding the monitoring well measuring point elevations and the measurements used to establish groundwater table elevations. A review of the survey data reveals issues with the accuracy and precision of the elevation survey data. As an example, Monitoring Well MW16-7 was assigned a top of PVC elevation of 734.42 feet (NAVD 88) – the survey date is not provided, and a re-survey using GPS RTK equipment in Nov 2012 identified the top of PVC casing elevation as 732.96 feet. This is a difference of over half a foot. Similarly, the revised measuring point elevation for MW16-4 from the two surveys also exceeds half a foot. Note that the revisions are not consistent for each well. The tables indicate previous instances where a specific monitoring well elevation was re-surveyed due to damage. These factors are mentioned as there appears to be an uncertainty regarding the actual groundwater table and flow directions, (Figure 5 and text). The water table groundwater gradient appears very "flat" in this area and a need for better accuracy, precision and number of measuring points is apparent. I suggest the installation of piezometers be considered so that more representative water level measurements can be obtained for use on the LTM program. Further, it appears the specific well water levels were measured as part of each well purging and

sampling event. For better accuracy, it would be appropriate to take a synoptic round of water level measurements at all wells and then initiate and conduct the purging and sampling event.

Response 2: Prior to sampling, a synoptic round of water level measurements are collected from all of the SEAD-16 and SEAD-17 monitoring wells (e.g., Table 1, Appendix C). The differences in the change in elevation between wells are a result of the different amounts of frost heave each well experiences during the winter. The elevations of the wells were remeasured using GPS. The groundwater flow direction has been consistent over the length of LTM and the most current elevations agree with historical groundwater flow directions. With the limited amount of events remaining (i.e., one to two) no additional information is expected to be gained by resurveying the wells.

Comment 3: It is noted that the monitoring well network age exceeds 20 years. I suggest it is time to redevelop the wells to remove potential silt and materials to ensure good connection between the screen and aquifer.

Response 3: Agreed. The wells associated with LTM at SEAD-16/17 will be redeveloped prior to the next sampling event in 2019.

Comment 4: There have been a number of exceedances reported for more than one constituent of concern at both SEAD 16 and SEAD 17, with only a limited database available to enable long term trends and monitoring of the groundwater quality to conclude LTM. The discussion on increasing sodium concentrations is noted, but the impacted area should be provided on a map with the suspected source located. An additional monitoring point may be appropriate between the SEAD areas and the source to provide a more technical foundation for the allegation of the DOT as the source.

Response 4: As discussed in the report, Section 3.1.6.1, the source of the elevated sodium concentrations is most likely the nearby highway department salt storage pile (noted in Figure 5). Sampling has not been conducted at the salt pile, or immediately downgradient of it, as it is not a CERCLA release; the Army does not plan on conducting any sampling in this location.

SPECIFIC COMMENTS

Comment 1: Figure 6C, Concentration of Iron Over Time at SEAD 16, and Figure 6D, Concentration of Iron Over Time at SEAD 17: The Y-axis on the graphs presented in these figures is labeled "Lead Concentration (ug/L)." However, these figures should present iron results. Revise these figures to include "Iron Concentration (ug/L)" as the label on the Y-axis.

Response 1: The Y-axis of Figure 6C was corrected to reflect that it represents the concentration of iron.

Comment 2: Annual Report Appendix F, Data Validation: The data validation report for metals analysis by SW846 Method 6020A indicates that only the parent sample was impacted due to exceedances of matrix spike/matrix spike duplicate (MS/MSD) recovery limits for potassium and antimony. The data validation report for metals analysis by SW846 Method 6020A also indicates that only the parent sample was impacted due to exceedances of serial dilution recovery limits for barium, calcium,

potassium, magnesium, sodium, and antimony. However, the MS/MSD and serial dilution are batch quality control (QC) samples, and all associated samples within the analytical batch should be qualified when recoveries of metals MS/MSDs and serial dilutions exceed the acceptance criteria, since the accuracy of each sample is not checked for metals analyses. Revise the Annual Report to qualify all samples within the analytical batch due to these metals QC exceedances, or provide sufficient justification to clarify how it was determined that only the parent sample was impacted.

Response 2: According to the USEPA Region 2 SOP for reviewing metals data, it is stated that

"For a Matrix Spike that does not meet the technical criteria, apply the action to only the field sample used to prepare the Matrix Spike sample."

and

"For a serial dilution that does not meet the technical criteria, apply the action to only the field sample used to prepare the serial dilution sample."

Comment 3: Annual Report Appendix F, Data Validation: The data validation report for metals analysis by SW846 Method 6020A indicates that precision results for sample 16LM20055 (the field duplicate sample of 16LM20054) were considered acceptable with the exception of barium, calcium, potassium, magnesium, manganese, sodium, lead, and antimony, and that the results for these analytes were considered estimated and qualified "J". However, the data validation report does not indicate which samples were qualified. Revise the data validation report to clarify that only the sample (16LM20054) and the associated field duplicate (16LM20055) were qualified as estimated.

Response 3: The data validation report will be revised to clarify that only the sample 16LM20054 and its field duplicate sample 16LM20055 were qualified as estimated based upon field duplicate precision outliers.