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December 15, 2010

AFCEE/EXA
ATTN: John Q. Hill, Jr.
3515 S General McMullen, Bldg 171
San Antonio TX 78226-2018

SUBJECT: Draft Final Annual Report – Year 3 for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17) Sites at Seneca Army Depot Activity; Contract FA8903-04-D-8675, Delivery Order 0031, CDRL A001G

Dear Mr. Hill:

Parsons Infrastructure & Technology Group Inc. (Parsons) is pleased to submit Response to USEPA Comments on the Draft Annual Report and Year 3 Review for SEAD-16 and SEAD-17, and the Draft Final Annual Report – Year 3 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 work was performed in accordance with the Scope of Work (SOW) for Contract No. FA8903-04-D-8674, Task Order No. 0031.

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,

Todd Heino, P.E., VP
Project Manager

Enclosure
cc: J. Chavez, AFCEE
S. Absolom, SEDA
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R. Battaglia, USACE - NY District
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December 15, 2010

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Mr. Mark Sergott
Bureau of Environmental Exposure Investigation
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Troy, NY 12180

SUBJECT: Draft Final Annual Report – Year 3 for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17) Sites at Seneca Army Depot Activity; EPA Site ID# NY0213820830 and NY Site ID# 8-50-006

Dear Mr. Vazquez/Mr. Gupta/Mr. Sergott:

Parsons Infrastructure & Technology Group Inc. (Parsons) is pleased to submit Response to USEPA Comments on the Draft Annual Report and Year 3 Review for SEAD-16 and SEAD-17, and the Draft Final Annual Report – Year 3 for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17) sites at the Seneca Army Depot Activity (SEDA) in Romulus, New York (USEPA Site ID# NY0213820830 and NY Site ID# 8-50-006).

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

Sincerely,

Todd Heino, P.E., VP
Project Manager

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US Army Corps of Engineers

Air Force Center for Engineering and the Environment

Seneca Army Depot Activity
Romulus, New York

01215

DRAFT FINAL
ANNUAL REPORT - YEAR 3

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

AFCEE CONTRACT NO. FA8903-04-D-8675
TASK ORDER NO. 0031
CDRL A001G

EPA SITE ID# NY0213820830
NY SITE ID# 8-50-006

PARSONS
DECEMBER 2010

DRAFT FINAL ANNUAL REPORT – YEAR 3

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

Prepared for:

AIR FORCE CENTER FOR ENGINEERING AND THE ENVIRONMENT

BROOKS CITY-BASE, TEXAS

and

SENECA ARMY DEPOT ACTIVITY

ROMULUS, NY

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Contract Number FA8903-04-D-8675
Task Order 0031, CDRL A001G
EPA Site ID# NY0213820830
NY Site ID# 8-50-006

December 2010

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1.0 INTRODUCTION

This third Annual Report for the Abandoned Deactivation Furnace (SEAD-16) and Active Deactivation Furnace (SEAD-17) sites at the Seneca Army Depot Activity (SEDA or the Depot) in Romulus, New York provides a review of annual groundwater monitoring data collected in 2009, recommendations for future long-term monitoring at SEAD-16 and SEAD-17, and the annual review of the effectiveness of the remedy implemented 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 remedial action was completed in August 2007 for both areas of concern (AOCs). The remedial action consisted of the excavation, stabilization, if warranted, and disposal of soil from both areas of concern that was contaminated with selected metals (i.e., antimony, arsenic, cadmium, copper, lead, mercury, thallium, and zinc) at levels above identified risk-based action levels. In addition, soil at SEAD-16 that was also contaminated with polyaromatic hydrocarbons (PAHs) at concentrations in excess of risk-based action levels was also excavated, stabilized, if warranted, and disposed at a licensed landfill. The work is documented in the "Final Construction Completion Report for the Abandoned Deactivation Furnace (SEAD-16) and Active Deactivation Furnace (SEAD-17)" (Parsons, 2008) (CCR). The remedial action at SEAD-16 involved the removal of 1,862 cubic yards (cy) of soil that was impacted with metals and polycyclic aromatic hydrocarbons (PAHs). The remedial action at SEAD-17 involved the removal of 2,565 cy of metal-impacted soil.

The ROD for SEAD-16 and SEAD-17 also requires the implementation of land use controls (LUCs) that prohibit use of the land at the AOCs for residential purposes, and prohibits access to and use of groundwater until applicable cleanup standards are met [i.e., New York State Class GA Ambient Water Quality Standards (AWQS) and/or United States Environmental Protection Agency (EPA) maximum contaminant levels (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, which 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 implementing the land use controls required by the SEAD-16 and SEAD-17 ROD at the identified AOCs, as well as others, was submitted on April 20, 2010. Regulatory agency acceptance and approval of this document is pending. 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 land use controls 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. Additionally, a five-year review will be conducted to evaluate the effectiveness of the selected remedy for SEAD-16 and SEAD-17.

Long-term groundwater monitoring (LTM) 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 outlined in the Final Work Plan. The first year (Year 1) groundwater sampling event that was conducted as part of the LTM for SEAD-16 and SEAD-17 was performed in December 2007, and results are documented in the CCR. The second year (Year 2) groundwater sampling event was conducted in December 2008 for SEAD-16 and SEAD-17, and the results of the Year 2 sampling event are documented in the "Final Annual Report – Year 2" (Parsons, 2009). The third year (Year 3) groundwater sampling event was conducted in November 2009 for both AOCs, and the results are presented and discussed in this report.

2.0 SITE BACKGROUND

2.1 Site Description

SEDA is a 10,587-acre former military facility located in Seneca County near Romulus, New York that was wholly owned by the United States Government and 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. SEDA's primary mission was the receipt, storage, maintenance, and supply of military items. A location map for SEDA is shown in **Figure 1**. SEDA 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.

SEAD-16 and SEAD-17 are located in the east-central portion of the former Depot, within the Depot's former ammunition storage area, where vehicular and pedestrian access is restricted. SEAD-16 and SEAD-17 are now located in the portion of the former Depot where land is designated for future planned industrial/office development and warehousing (PID) uses. The location of SEAD-16 and SEAD-17 is 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 has been inactive and abandoned since the 1960s and consists of 2.6 acres of fenced land with grasslands in the north, east, and west; a storage area for empty boxes and wooden debris; and an unpaved roadway in the south. Building S-311, which previously housed the deactivation furnace, was demolished as part of the remedial action at SEAD-16 and the results are documented in the "Building Cleaning and Building Demolition Completion Report" (Parsons, 2008). Building S-366, known as the Process Support Building, is present on site along with two sets of SEDA railroad tracks and utilities.

SEAD-17, the Active Deactivation Furnace, was constructed to replace the deactivation furnace at SEAD-16. However, SEAD-17 has been inactive since 1989 as a result of Resource Conservation and Recovery Act (RCRA) permitting issues. SEAD-17 formerly consisted of the deactivation furnace building (Building S-367), which was demolished during the remedial action. Details and results of the demolition are documented in the "Building Cleaning and Building Demolition Completion Report" (Parsons, 2008). SEAD-17 is surrounded by a crushed shale road, beyond which are grasslands. Two small sheds are located in the eastern portion of SEAD-17. An unpaved 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 "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 hydrogeologic conditions and chemical impacts found 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. The locations of the seven groundwater monitoring wells installed at SEAD-16 are shown on **Figure 3**.

Prior to the completion of the remedial action, depth to groundwater was measured at SEAD-16 on three different occasions: April 1994, August 1996, and December 1996. Groundwater flow at SEDA generally trends to the west based on previous subsurface investigations conducted at the Depot. Previous investigation data suggest that a groundwater divide exists near, and approximately parallel to, Route 96 near Romulus, New York, indicating that the groundwater in the area encompassing SEAD-16 flows west. However, the groundwater elevation data are difficult to interpret since the varied ground surface cover type at SEAD-16 (i.e., vegetation, gravel, drainage swales, etc.) influences surface water infiltration. Available elevation data indicate that there may be a regional groundwater high southwest of the former Building S-311, which could contribute to local fluctuations in groundwater flow.

Horizontal hydraulic conductivities were determined for five wells that are 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 range from 2.8×10^{-3} cm/sec to 2.5×10^{-2} cm/sec and 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**.

The depth to groundwater was measured at SEAD-17 during the same times as SEAD-16. Elevation data indicate that groundwater flows southwesterly.

The horizontal hydraulic gradient was calculated to be 0.01ft/ft 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 include 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 and

the Process Support Building. 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 remedial action, three rounds of groundwater sampling were conducted at SEAD-16. Compounds detected in the groundwater samples collected during the low-flow sampling events in 1996 are presented in **Appendix A**. For complete groundwater data results refer to the RI report.

Metals were detected above the applicable Class GA standards or EPA MCLs. All of these exceedances 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 (e.g., maximum and average concentrations, the standard deviation for the collected data, and the frequency of detection) is provided in **Appendix B**. The Final Work Plan summarized that, although metals had been detected in the groundwater above their respective standards during previous sampling events, the groundwater was not impacted by site activities. This conclusion is based on a comparison of results to groundwater data collected from unaffected parts of the Depot.

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

Pre-Remedial Action Soil Conditions

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

Pre-Remedial Action Groundwater Conditions

Prior to the completion of the remedial action, three rounds of groundwater sampling were conducted at SEAD-17, similar to the sampling that was conducted at SEAD-16 (April 1993 for the ESI and August and December 1996 for the RI). Compounds detected in the groundwater samples collected during the low-flow sampling events in 1996 are presented in **Appendix A**. Metals were detected at concentrations above the applicable Class GA standards or MCLs; however, these concentrations were lower than SEDA background concentrations, except for sodium. (See SEDA background groundwater data summary in **Appendix B**). The Final Work Plan summarized that, although metals had been detected in the groundwater above their respective standards during previous sampling events, the groundwater was not impacted by site activities. This conclusion is based on a comparison of results to groundwater data collected from unaffected parts of the Depot.

2.5 Remedial Action Summary

The selected remedy for SEAD-16 and SEAD-17 consisted of the following elements:

- Excavation of soil impacted with metals and PAHs at concentrations greater than the site-specific cleanup standards;
- Stabilization of excavated soil exceeding the toxicity characteristic leaching procedure;
- Disposal of the material in an off-site landfill;
- Backfilling the excavated areas with clean backfill;
- Groundwater monitoring until concentrations are below applicable New York State Class GA or MCL standard levels;
- Establishment and maintenance of LUCs to prevent access to or use of groundwater and to prevent residential use of the land until cleanup standards are met; and
- Performance of a review of the selected remedy every 5 years to evaluate if the remedy remains protective of the public health and the environment in accordance with Section 121(c) of the CERCLA.

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

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

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

3.0 LONG TERM MONITORING RESULTS

3.1 Summary of Year 1 Groundwater Event

The first post-remedial action long-term groundwater monitoring event (Year 1) was performed at SEAD-16 and SEAD-17 between December 19, 2007 and December 21, 2007. The results of the Year 1 event are reported in the CCR.

In summary, at SEAD-16 five metals of concern (antimony, iron, lead, manganese, and sodium) were detected at concentrations above their respective Class GA or MCL standards; at SEAD-17 two metals, antimony and sodium, were each detected once at concentrations above their respective Class GA groundwater standards. Concentrations of other metals detected at SEAD-16 and SEAD-17 were below their respective Class GA groundwater and MCL standards. With the noted exception of sodium concentrations detected at SEAD-16, concentrations detected at both SEAD-16 and SEAD-17 were below SEDA background concentrations. The CCR concluded that the groundwater does not appear to be impacted by historic site activities.

3.2 Summary of Year 2 Groundwater Event

The second post-remedial action long-term groundwater monitoring event (Year 2) was performed at SEAD-16 and SEAD-17 between December 9, 2008 and December 11, 2008. The results of the Year 2 event were reported in "Final Annual Report – Year 2" (Parsons, 2009).

In summary, at SEAD-16 four metals (antimony, iron, lead, and sodium) were detected at concentrations above their respective Class GA or MCL standards; at SEAD-17 two COCs (iron and manganese) were detected at concentrations above their respective Class GA standards. Concentrations of all other metals detected at SEAD-16 and SEAD-17 were below their respective Class GA or MCL standards. The "Final Annual Report – Year 2" (Parsons, 2009) concluded that the groundwater does not appear to be impacted by historic site activities and there does not appear to be an indication that conditions are deteriorating at SEAD-16 and SEAD-17.

3.3 Year 3 Groundwater Sampling

The Year 3 post-remedial action groundwater sampling event was conducted at SEAD-16 and SEAD-17 between November 12, 2009 and November 18, 2009. Groundwater samples were collected from the six monitoring wells (MW16-1, MW16-2, MW16-4, MW16-5, MW16-6, and MW16-7) located at SEAD-16. Well MW16-3 was removed during the remedial action and was not sampled. Groundwater samples were collected from the five original monitoring wells (MW17-1, MW17-2, MW17-3, MW17-4, and MW17-5) located at SEAD-17. Field forms for Year 3 sampling activities are included in **Appendix C**. Prior to the collection of groundwater samples from each of the monitoring wells, groundwater elevations measurements were collected at each of the wells to be sampled. The results of the groundwater elevation monitoring are presented in **Table 1** for SEAD-16 and **Table 2** for SEAD-17, along with historic data fro these locations.

3.3.1 Sample Collection

The samples were collected using low flow sampling techniques. A bladder pump was used to collect the samples from all wells except MW17-2 and MW17-3. A peristaltic pump was used to collect the groundwater samples at MW17-2 and MW17-3 since limited water was available. Sampling procedures, sample handling and custody, holding times, and collection of field parameters were conducted in accordance with the "Revised Final Sampling and Analysis Plan for Seneca Army Depot Activity (SAP)" (Parsons, 2006c). Samples were collected from the 11 wells and submitted to TestAmerica for analysis of the following analytes:

- Antimony and Thallium by USEPA SW846 Method 6020;
- Mercury by USEPA SW846 7470A; and
- TAL metals by USEPA SW846 Method 6010B.

Quality control (QC) samples, including one duplicate and one matrix spike/matrix spike duplicate (MS/MSD) pair, were also collected at MW16-7. In the field, pH, oxidation-reduction potential (ORP), dissolved oxygen (DO), conductivity, temperature, and turbidity data were also collected from each well during the purging of the well prior to sampling, with the exception of MW17-2 and MW17-3.

3.3.2 Sample Filtering

As documented in "Final Annual Report – Year 2" (Parsons, 2009), some of the metal concentrations that exceed Class GA or MCL standards in specific SEAD-16 and SEAD-17 wells may be associated with the fluctuation of groundwater turbidity encountered in the wells during sampling. Turbidity measurements indicate that there are particles present in the sampled water, and if these particles are included in the sample analyzed, they can possibly impact (i.e., elevate) metal concentrations reported. With this in mind, samples from the Year 3 sampling event were collected in two ways: as extracted from the well (i.e., unfiltered) and filtered in the field through a 0.45-micron membrane filter. The purpose of filtering is to remove the particulates from suspension, resulting in a sample that is representative of the concentration of dissolved metals only, not the sum of the dissolved and suspended metals.

Both the filtered and unfiltered samples from all SEAD-16 and SEAD-17 wells were analyzed for the analytes listed in **Section 3.3.1**. A comparison of the unfiltered and filtered concentrations of all metals at SEAD-16 and SEAD-17 is shown in **Table 3A** and **Table 3B**. The data show that in cases where groundwater turbidity level was low, the difference between the filtered and unfiltered samples concentrations are minute. Several of the samples (e.g., MW16-1, MW16-4, MW16-7, MW17-1, and MW17-4) collected during the Year 3 monitoring event had very low levels of turbidity (i.e., less than 1 NTU) which results in similar metal concentrations being reported for both ~~in~~ the filtered and unfiltered sample pairs. Conversely, certain metals, most notably including aluminum, iron, and manganese in most wells, and specific metals in other wells (e.g., lead in MW16-7, MW17-2 and MW17-3) do appear to be affected by filtering , which suggests that some of the reported metal

results from the presence of soil particles in the analyzed samples. Concentrations measured for several metals (i.e., antimony, calcium, magnesium, potassium and sodium) are unaffected either by variation in turbidity levels of by sample filtering, suggesting that these metals are dissolved in the groundwater.

3.4 Year 3 Groundwater Elevations for SEAD-16 and SEAD-17

SEAD-16 groundwater elevation data were recorded on November 13, 2009 for Year 3 and are presented on **Table 1**. Groundwater elevation data collected during the pre-remedial action (April 4, 1994, August 1996, December 1996) and Year 1 post-remedial action are also shown on **Table 1**. Groundwater elevation data collected during previous investigations indicate that groundwater generally flows southwestward at SEAD-16; however, groundwater elevation data also indicate that there may be a regional high southwest of former Building 311 that could create local fluctuation in groundwater flow direction. During the most recent event, elevation data demonstrate that the regional high southwest of former Building 311 was influencing groundwater flow direction at SEAD-16 as shown on **Figure 5**.

SEAD-17 groundwater elevation data were recorded on November 13, 2009 for Year 3 and are presented on **Table 2**. Groundwater elevation data collected during the pre-remedial action (April 4, 1994, August 1996, December 1996) and Year 1 post remedial action events are shown on **Table 2**. Based on the most recent elevation data (November 2009), groundwater at SEAD-17 appears to flow westward as shown on **Figure 5**.

3.5 Year 3 Groundwater Data Analysis for SEAD-16

A summary of metals detected in the groundwater during the Year 3 annual sampling event for SEAD-16 is presented in **Table 4A**. Complete groundwater data results are presented in **Appendix D**. Concentrations of metals above the comparative criteria levels were detected in filtered and unfiltered samples collected from each monitoring well in SEAD-16, exclusive of MW16-1.

Antimony exceeded its Class GA standard (3 μg/L) in both the filtered and unfiltered samples collected from three wells (MW16-2, MW16-4, and MW16-7). The highest concentrations of antimony detected were found at well MW16-7, where concentrations of 16 μg/L and 14.6 μg/L, respectively were found in the unfiltered and filtered, sample/duplicate samples collected at this location. Antimony concentrations measured in the unfiltered and filtered sample collected from MW16-2 were equivalent (i.e., 3.6 μg/L), and comparable (i.e., 6.3 μg/L, unfiltered; 6 μg/L filtered) at MW16-4.

Iron exceeded its Class GA standard (300 μg/L) in the unfiltered and filtered samples characterized from two wells (MW16-4 and MW16-5), and in the unfiltered sample only at MW16-6. The highest unfiltered and filtered sample concentration of iron was detected at MW16-5 (1150 J μg/L and 800 J μg/L, respectively).

The unfiltered and filtered sample concentrations of "iron+manganese" detected in well MW16-5 also exceeded combined GA standard (500 μg/L) with the primary contributing metal being iron.

Unfiltered "iron+manganese" concentrations found in wells MW16-4 and MW16-6 also exceeded the 500 µg/L combined standard level with the primary contributing metal being iron. Although, manganese was detected in the unfiltered and filtered groundwater samples collected from all SEAD-16 wells, it was never detected at concentrations above its GA standard level (300 µg/L).

Sodium was detected at concentrations above its Class GA standard (20,000 µg/L) in unfiltered and filtered sample pairs collected from three of the SEAD-16 wells (MW16-4, MW16-6, and MW16-7). The highest concentration was found in the filtered sample collected from well MW16-4 (380,000 J µg/L). The highest sodium concentrations reported at the other two wells were also found in the filtered samples collected from MW16-6 and MW16-7, where levels of 22,000 J µg/L at MW16-6 and 54,000 J µg/L (average of sample and duplicate pair), respectively were reported. .

In summary, select metals continue to be detected in the groundwater at SEAD-16 at levels that exceed Class GA or MCL standard levels. In general, there does not appear to be evidence of an area-wide or expanding plume at SEAD-16, as identified by the contaminant concentrations detected in the groundwater monitoring wells. Access to and use of the groundwater is restricted at the AOC under the terms of the ROD and the groundwater is not being used as a potable water source. A municipal water supply derived from a non-groundwater source is available for the Depot and its current distribution includes the PID area. The groundwater access/use restriction will remain in effect at SEAD-16 until the groundwater concentrations have been reduced to levels below applicable Class GA and MCL standards, and until data that documents acceptable groundwater quality is present in the AOC is provided to and approved by the oversight agencies.

3.6 Year 3 Groundwater Data Analysis for SEAD-17

A summary of metals detected from the Year 3 groundwater sampling event for SEAD-17 is presented in **Table 4B**. Complete groundwater analytical results are presented in **Appendix D**. All metals in monitoring wells MW17-1and MW17-4 were detected at concentrations below their respective Class GA or MCL standards in the filtered and unfiltered samples. At MW17-2, antimony, iron, lead, manganese, and the summation of "iron+manganese" were found at concentrations in excess of their respective criteria levels in the unfiltered sample, but each of these metals were found at concentrations below their comparative criteria in the filtered sample characterized. At MW17-3, iron was the only metal detected above its groundwater standard (i.e., 300 µg/L) in both the filtered (2690 J µg/L) and unfiltered (827 J µg/L) sample, The "iron+manganese" concentration determined in this well also exceeded NYSDEC's GA standard level in both the filtered and unfiltered sample collected from MW17-4, but both of these exceedances resulted from the elevated iron concentration and not due to elevated manganese concentrations in the well. At MW17-5, only the concentrations reported for sodium in the filtered (366,000 J µg/L) and unfiltered (364,000 J µg/L) sample were found to be above criteria values.

The Year 3 data demonstrate that the groundwater at SEAD-17 has not been impacted by metals. Access to and use of the groundwater is restricted at the AOC under the terms of the ROD and it is not being used as a potable water source. A municipal water supply derived from a non-groundwater

source is available for the Depot and its current distribution includes the PID area. The groundwater access/use restriction will remain in effect at SEAD-17 until the groundwater concentrations have been reduced to levels below applicable Class GA and MCL standards, and until data that documents acceptable groundwater quality is present in the AOC is provided to and approved by the oversight agencies.

3.7 Groundwater Data Trends

A comparison of data from the Year 1, Year 2, and Year 3 (filtered only) events, as well as an assessment of any trends, are discussed below. A comparison of Year 1, Year 2, and Year 3, groundwater monitoring events for SEAD-16 and SEAD-17 is provided in **Table 4A** and **Table 4B**, respectively. The complete data set for the Year 1, Year 2, and Year 3 events is included in **Appendix D**.

3.7.1 Review of Groundwater Trends at SEAD-16

Over the last three years, lead has been detected once in MW16-5 and three times in MW16-7. Lead was detected below its MCL at MW16-5 during Year 2 and was not detected at that well during Year 1 or Year 3. The Year 2 detection of lead at MW16-5 is likely associated with the high turbidity (29 NTU) observed in that well; therefore, the single detection of lead at MW16-5 appears to be an anomaly associated with a measure of soil particles in the groundwater and high turbidity, and not an indication of lead-impacted groundwater. At MW16-7, lead was detected above its MCL in Years 1 and 2 (increasing from 26.5 µg/ in Year 1 to 88.6 µg/L in Year 2). Lead was detected in the filtered sample collected at MW16-7 during Year 3 at a significantly lower concentration, 4.7 J µg/L (average of sample and duplicate pair), which is below the MCL. The detections of lead at MW16-7 appear to be an anomaly; the decrease in concentrations of lead at MW16-7 and MW16-5 indicates that lead is not impacting the groundwater quality and is not spreading across the site.

The concentrations of antimony, iron, manganese, and sodium were generally similar over the three post-remediation groundwater events, with fluctuations and maximum concentrations observed during Year 2. The data from Year 3 was either consistent with or lower than the concentrations previously observed.

A statistical analysis could not be performed on the available SEAD-16 pre (1 to 3 samples per well) and post remedial action (3 samples per well) datasets due to limited available data points and the high percentage of non-detects in the metal constituents results. A review of the EPA's "Groundwater – *Unified Guidance*" (EPA 2009) document provides numerous statistical methodologies, however all of them require more data points than are presently available. Once a sufficient number of data points has been obtained a statistical analysis of the post remedial action sampling events can be conducted.

3.7.2 Review of Groundwater Trends at SEAD-17

In general, iron and manganese were detected in groundwater samples at concentrations that were similar to or followed a decreasing trend over the past three LTM events. The concentrations of antimony have decreased over time, and the concentrations of sodium have varied during the three

sampling events. The metals were detected below their GA standards at most wells. A summary of the notable changes in concentrations between the three rounds, including exceedances of the GA standards, is presented below.

Over the past three years, antimony was detected six times and exceeded its Class GA standard once. Three of the detections were at MW17-2 (once each year); the Year 1 concentration of antimony at MW17-2 (3.44 µg/L) exceeded the Class GA groundwater standard of 3 µg/L, and the concentration of antimony decreased to levels below the Class GA standard each subsequent year to 2.76 µg/L in Year 2 and 2.2 µg/L in Year 3.

Iron was detected in all five wells during Year 1 and Year 2; but only the concentrations of iron detected at MW17-3 and MW17-4 during Year 2 were above the Class GA groundwater standard of300 µg/L. In Year 3, iron was not detected in MW17-1, MW17-2, or MW17-5; in MW17-3 the concentration of iron dropped from the Year 2 value to 827 J µg/L; and in MW17-4 the concentration of iron dropped below the standard to 60 µg/L.

Manganese was detected in all five wells during Year 1, Year 2, and Year 3; but only exceeded its Class GA standard of 300 µg/L once in Year 2 at a concentration of 911 µg/L at MW17-4.

Sodium was detected once during Year 1 at MW17-4, and in all samples collected from all wells during the Year 2 and Year 3 events. Two exceedances of the Class GA standard of 20,000 µg/L were observed: one during Year 1 at MW17-4 (28,500 µg/L), and one during Year 3 at MW17-5 (364,000 J µg/L). From Year 1 to Year 2, the concentration of sodium at MW17-4 decreased below the Class GA standard to 15,500 µg/L; in Year 3 the sodium concentration dropped further below the standard to 10,400 µg/L. Sodium concentrations in all other wells were consistent between Year 1, Year 2, and Year 3.

The variation in the concentrations of antimony, iron, manganese, and sodium do not relate to historic site activities. A comparison of the Year 1, Year 2, and Year 3 post remedial action groundwater data for SEAD-17 indicate that the overall concentrations of metals remained similar throughout the years and that no clear trends have emerged.

Similar to SEAD-16 a statistical analysis could not be performed on the available SEAD-17 pre (1 to 3 samples per well) and post remedial action (3 samples per well) datasets due to limited available data points and the high percentage of non-detects in the metal constituents results. A review of the EPA's "*Groundwater – Unified Guidance*" document provides numerous statistical methodologies, however all of them require more data points than are presently available. Once a sufficient number of data points has been obtained a statistical analysis of the post remedial action sampling events can be conducted.

3.8 Routine Inspections of Monitoring Wells for SEAD-16 and SEAD-17

There is evidence that the wells at SEAD-16 are generally in good condition. It appears that perhaps some of the wells at SEAD-17 may be compromised. Observations from Year 3 indicate that roots may have breached MW17-2 and MW17-3, and MW17-5 may have a broken casing or root intrusion.

These potential obstructions are not hindering sample collection efforts and corrective action is not necessary at this time.

4.0 REMEDY EVALUATION

As discussed in **Section 2.5**, a total of 4,427 cy of metal- and PAH-impacted soil were removed from SEAD-16 and SEAD-17. The impacted soil was removed to eliminate and minimize the migration of hazardous contaminates 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 for all three years shows that the soil removal remedy has been effective in minimizing the migration of the identified COCs from soil to groundwater.

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 New York State Class GA Groundwater or EPA MCL standard levels.

As part of the LTM program, SEAD-16 and SEAD-17 were inspected to determine that the LUCs are being maintained. During the Year 3 event, it was confirmed that no residential housing, elementary and 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 exiting monitoring well network, was evident at either SEAD-16 or SEAD-17.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

- The soil excavation remedy at SEAD-16 and SEAD-17 has been effective in minimizing the migration of COCs from soil to the groundwater based on the three LTM sampling rounds.
- The results of the Year 3 LTM event demonstrate that field filtering is effective at minimizing the impact of turbidity on the groundwater data.
- Post-remediation groundwater monitoring results indicate that the groundwater has not been impacted by site activities, though concentrations were observed above the Class GA or MCL standards.
- The land and groundwater use restrictions imposed at SEAD-16 and SEAD-17 are maintained and there are no signs of unauthorized use or access to the AOCs.

5.2 Recommendations

Based on the pre-remedial groundwater data and the data collected during Years 1, 2, and 3 of the LTM program at SEAD-16 and SEAD-17, the Army recommends that the groundwater monitoring continue on an annual basis at SEAD-16 and SEAD-17 for 2010. At that time, the LTM program will be re-evaluated.

6.0 REFERENCES

Army, 2006. Final Land Use Control Remedial Design for SEAD-27, 66, and 64A, Seneca Army Depot, Romulus, New York. December 2006.

Army, 2010. Addendum 4 Addressing SEAD 1, 2, 5, 16, 17, 59, 71, 121C, and 121I, Land Use Control Remedial Design for SEAD 27, 66, and 64A, Seneca Army Depot Activity, Romulus, New York. April, 2010.

EPA, 2009, Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, Unified Guidance, EPA 530/R-09-007, March 2009

NYSDEC, 1998 with 2000 and 2004 Addendum. Ambient Water Quality Standard and Guidance Values and Groundwater Effluent Limitations

Parsons 1995. Final Expanded Site Inspection, Seven High Priority SWMUs, SEAD 4, 16, 24, 25, 26, and 45. December, 1995.

Parsons 1999. Final Remedial Investigation (RI) Report at the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17). March, 1999.

Parsons 2006. Record of Decision for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17), Final. March, 2006.

Parsons 2006c. Revised Final Sampling and Analysis Plan for Seneca Army Depot Activity (SAP). 2006c.

Parsons 2007. Remedial Design Work Plan and Design Report for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17), Final. July, 2007.

Parsons 2008. Building Cleaning and Building Demolition Completion Report, SENECA Army Depot Activity, Romulus, New York, Draft Final. November, 2008.

Parsons 2008. Construction Completion Report for the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17), Final. September, 2008.

Parsons 2009. For the Abandoned Deactivation Furnace (SEAD-16) and the Active Deactivation Furnace (SEAD-17), Final. September, 2009.

TABLES

Table 1
SEAD-16 - Groundwater Table Elevations Summary
SEAD-16 & SEAD-17 Third Annual Groundwater Monitoring Report
Seneca Army Depot Activity

Monitoring Well	Top of PVC Elevation [(1)] (feet)	April 4, 1994		August 27, 1996		December 6, 1996		December 20, 2007		December 9, 2008		November 13, 2009	
		Depth to Water (feet)	Water Table Elevation (feet)	Depth to Water (feet)	Water Table Elevation (feet)	Depth to Water (feet)	Water Table Elevation (feet)	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	4.25	731.29	4.28	731.23	5.76	729.78
MW 16-2*	734.56	3.65	730.91	4.50	730.06	3.71	730.85	4.20	730.36	4.20	730.26	4.35	730.21
MW 16-3	735.48	4.60	730.88	5.43	730.05	4.64	730.84	NA	NA	NA	NA	NA	NA
MW 16-4	733.93	NA	NA	4.83	729.10	2.93	731.00	3.00	730.93	3.42	730.48	3.91	730.02
MW 16-5*	733.40	NA	NA	4.76	728.64	2.20	731.20	1.90	731.50	3.32	730.08	3.10	730.30
MW 16-6	733.56	NA	NA	4.54	729.02	2.90	730.66	2.66	730.90	3.47	730.09	3.68	729.88
MW 16-7	734.42	NA	NA	5.06	729.36	4.23	730.19	4.45	729.97	4.63	729.77	4.75	729.67

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 Report.
(3) Monitoring well MW16-3 was destroyed during the remedial action conducted at SEAD-16.
(4) December 2007 and 2008 data collected after the completion of the remedial action.
NA = Not Available.
* indicates that PVC riser pipe was cut during December 2008 sampling event.

Table 2
SEAD-17 - Groundwater Table Elevations Summary
SEAD-16 & SEAD-17 Third Annual Groundwater Monitoring Report
Seneca Army Depot Activity

Monitoring Well	Top of PVC Elevation (1) (feet)	April 4, 1994		August 29, 1996		December 6, 1996		December 19, 2007		December 9, 2008		November 11, 2009	
		Depth to Water (feet)	Water Table Elevation (feet)	Depth to Water (feet)	Water Table Elevation (feet)	Depth to Water (feet)	Water Table Elevation (feet)	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	733.53	7.64	728.69	3.01	733.32	3.33	732.97	4.25	731.97	5.60	730.70
MW 17-2	733.75	3.19	730.56	7.24	726.51	3.45	730.30	3.31	730.44	4.07	733.70	5.27	728.48
MW 17-3*	732.15	2.38	729.77	7.14	725.01	2.47	729.68	2.67	729.48	3.96	732.20	6.15	726.00
MW 17-4	734.59	3.00	731.59	7.23	727.36	3.13	731.46	3.40	731.19	4.05	730.57	5.75	728.84
MW 17-5	733.58	NA	NA	6.92	726.66	2.65	730.93	2.90	730.68	3.46	730.16	4.65	728.93

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 Report.
(3) December 2007 and 2008 data collected after the completion of the remedial action.
NA = Not Available.
* indicates that PVC riser pipe was cut during December 2008 sampling event.

Table 3A
Comparison of Filtered and Unfiltered Groundwater at SEAD-16
Round 3 - SEAD-16 & SEAD-17 Long-Term Monitoring
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Collected	SEAD-16 MW16-1 GW 16LM20014UNFIL 11/13/2009 SA LTM 3 Value (Q)	SEAD-16 MW16-1 GW 16LM20014FIL 11/13/2009 SA LTM 3 Value (Q)	SEAD-16 MW16-2 GW 16LM20015UNFIL 11/11/2009 SA LTM 3 Value (Q)	SEAD-16 MW16-2 GW 16LM20015FIL 11/11/2009 SA LTM 3 Value (Q)	SEAD-16 MW16-4 GW 16LM20016UNFIL 11/17/2009 SA LTM 3 Value (Q)	SEAD-16 MW16-4 GW 16LM20016FIL 11/17/2009 SA LTM 3 Value (Q)
Aluminum	UG/L	442	71%		0	10	14	45 J	24 U	205	24 U	68 J	24 U
Antimony	UG/L	16.3	64%	3	8	9	14	1 U	1 U	**3.6**	**3.6**	**6.3**	**6**
Arsenic	UG/L	0	0%	10	0	0	14	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	3.7 U
Barium	UG/L	129	100%	1000	0	14	14	104	105	72.7	71.9	123	129
Beryllium	UG/L	0	0%	4	0	0	14	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Cadmium	UG/L	0	0%	5	0	0	14	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Calcium	UG/L	130000	100%		0	14	14	110000 J	111000 J	117000 J	118000 J	125000 J	130000 J
Chromium	UG/L	0	0%	50	0	0	14	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U	0.9 U
Cobalt	UG/L	2	14%		0	2	14	1.1 U	1.1 U	1.1 U	1.1 U	2 J	1.8 J
Copper	UG/L	6.2	86%	200	0	12	14	1.6 J	1.6 J	5.1 J	3.4 J	6.2 J	2.4 J
Iron	UG/L	1150	64%	300	5	9	14	19 UJ	19 UJ	197 J	19 UJ	**419** J	**329** J
Iron+Manganese	UG/L	1323	100%	500	4	14	14	21.4 J	20 J	260.7 J	58.5	**513.5** J	417.7 J
Lead	UG/L	12.1	29%	15	0	4	14	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U
Magnesium	UG/L	18000	100%		0	14	14	17900	18000	12300	12600	16000	16800
Manganese	UG/L	173	100%	300	0	14	14	2.4 J	1 J	63.7	39.5	94.5	88.7
Mercury	UG/L	0	0%	0.7	0	0	14	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	UG/L	2.6	100%	100	0	14	14	1.2 J	1.8 J	2.6 J	2.2 J	1.4 J	1.7 J
Potassium	UG/L	7010	100%		0	14	14	1100	1110	3140	3170	3270	3270
Selenium	UG/L	0	0%	10	0	0	14	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U
Silver	UG/L	0	0%	50	0	0	14	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Sodium	UG/L	380000	100%	20000	8	14	14	8000 J	8000 J	18800 J	19500 J	**363000** J	**380000** J
Thallium	UG/L	0	0%	2	0	0	14	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Vanadium	UG/L	1.3	29%		0	4	14	1 U	1 U	1 U	1 U	1.1 J	1.1 J
Zinc	UG/L	11.3	14%		0	2	14	3.6 U	3.6 U	11.3	11.1	3.6 U	3.6 U
Turbidity	NTU	17.9	100%		0	7	7	0.4		17.9		0.03	

Notes:
1. Only exceeding metals are included in this sumamry table.
2. 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
3. Shading indicates a concentration above the GA or MCL groundwater standard.

U = compound was not detected
J = the reported value is an estimated cocentration

Table 3A
Comparison of Filtered and Unfiltered Groundwater at SEAD-16
Round 3 - SEAD-16 & SEAD-17 Long-Term Monitoring
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Collected	SEAD-16 MW16-5 GW 16LM20017UNFIL 11/16/2009 SA LTM 3 Value (Q)	SEAD-16 MW16-5 GW 16LM20017FIL 11/16/2009 SA LTM 3 Value (Q)	SEAD-16 MW16-6 GW 16LM20018UNFIL 11/17/2009 SA LTM 3 Value (Q)	SEAD-16 MW16-6 GW 16LM20018FIL 11/17/2009 SA LTM 3 Value (Q)
Aluminum	UG/L	442	71%		0	10	14	164 J	24 U	442	107 J
Antimony	UG/L	16.3	64%	3	8	9	14	1 U	1 U	1 U	0.9 J
Arsenic	UG/L	0	0%	10	0	0	14	3.7 U	3.7 U	3.7 U	3.7 U
Barium	UG/L	129	100%	1000	0	14	14	42	42.8	80.2	78.5
Beryllium	UG/L	0	0%	4	0	0	14	0.3 U	0.3 U	0.3 U	0.3 U
Cadmium	UG/L	0	0%	5	0	0	14	0.3 U	0.3 U	0.3 U	0.3 U
Calcium	UG/L	130000	100%		0	14	14	110000 J	115000 J	112000 J	112000 J
Chromium	UG/L	0	0%	50	0	0	14	0.9 U	0.9 U	0.9 U	0.9 U
Cobalt	UG/L	2	14%		0	2	14	1.1 U	1.1 U	1.1 U	1.1 U
Copper	UG/L	6.2	86%	200	0	12	14	1.3 U	1.3 U	2.5 J	1.9 J
Iron	UG/L	1150	64%	300	5	9	14	**1150** J	**800** J	**440** J	55 J
Iron+Manganese	UG/L	1323	100%	500	4	14	14	**1323** J	**970** J	**515** J	153.4 J
Lead	UG/L	12.1	29%	15	0	4	14	2.9 U	2.9 U	2.9 U	2.9 U
Magnesium	UG/L	18000	100%		0	14	14	11800	12200	9950	9970
Manganese	UG/L	173	100%	300	0	14	14	173	170	75	98.4
Mercury	UG/L	0	0%	0.7	0	0	14	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	UG/L	2.6	100%	100	0	14	14	2 J	1.8 J	2.6 J	1.2 J
Potassium	UG/L	7010	100%		0	14	14	2380	2370	2580	2380
Selenium	UG/L	0	0%	10	0	0	14	6.1 U	6.1 U	6.1 U	6.1 U
Silver	UG/L	0	0%	50	0	0	14	1.3 U	1.3 U	1.3 U	1.3 U
Sodium	UG/L	380000	100%	20000	8	14	14	2800 J	2700 J	**20600** J	**22000** J
Thallium	UG/L	0	0%	2	0	0	14	0.2 U	0.2 U	0.008 U	0.008 U
Vanadium	UG/L	1.3	29%		0	4	14	1.1 J	1 U	1.3 J	1 U
Zinc	UG/L	11.3	14%		0	2	14	3.6 U	3.6 U	3.6 U	3.6 U
Turbidity	NTU	17.9	100%		0	7	7	10		7.3	

Notes:
1. Only exceeding metals are included in this sumamry table.
2. 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
3. Shading indicates a concentration above the GA or MCL groundwater standard.

U = compound was not detected
J = the reported value is an estimated cocentration

Table 3A
Comparison of Filtered and Unfiltered Groundwater at SEAD-16
Round 3 - SEAD-16 & SEAD-17 Long-Term Monitoring
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Collected	SEAD-16 MW16-7 GW 16LM20020UNFIL 11/12/2009 DU LTM 3 Value (Q)	SEAD-16 MW16-7 GW 16LM20020FIL 11/12/2009 DU LTM 3 Value (Q)	SEAD-16 MW16-7 GW 16LM20019UNFIL 11/12/2009 SA LTM 3 Value (Q)	SEAD-16 MW16-7 GW 16LM20019FIL 11/12/2009 SA LTM 3 Value (Q)
Aluminum	UG/L	442	71%		0	10	14	116 J	25 J	182 J	32 J
Antimony	UG/L	16.3	64%	3	8	9	14	**16.3**	**13.9**	**15.7**	**15.2**
Arsenic	UG/L	0	0%	10	0	0	14	3.7 U	3.7 U	3.7 U	3.7 U
Barium	UG/L	129	100%	1000	0	14	14	80.3	83.9	81.6	83.6
Beryllium	UG/L	0	0%	4	0	0	14	0.3 U	0.3 U	0.3 U	0.3 U
Cadmium	UG/L	0	0%	5	0	0	14	0.3 U	0.3 U	0.3 U	0.3 U
Calcium	UG/L	130000	100%		0	14	14	82800 J	81900 J	84600 J	85000 J
Chromium	UG/L	0	0%	50	0	0	14	0.9 U	0.9 U	0.9 U	0.9 U
Cobalt	UG/L	2	14%		0	2	14	1.1 U	1.1 U	1.1 U	1.1 U
Copper	UG/L	6.2	86%	200	0	12	14	4.1 J	3.5 J	5 J	3.1 J
Iron	UG/L	1150	64%	300	5	9	14	61 J	19 UJ	135 J	19 UJ
Iron+Manganese	UG/L	1323	100%	500	4	14	14	168 J	171	244 J	155
Lead	UG/L	12.1	29%	15	0	4	14	9.4	4.9 J	12.1	4.4 J
Magnesium	UG/L	18000	100%		0	14	14	16200	14800	16500	15900
Manganese	UG/L	173	100%	300	0	14	14	107	152	109	136
Mercury	UG/L	0	0%	0.7	0	0	14	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	UG/L	2.6	100%	100	0	14	14	1.1 J	2 J	1.7 J	1.9 J
Potassium	UG/L	7010	100%		0	14	14	5630	7010	5780	6520
Selenium	UG/L	0	0%	10	0	0	14	6.1 U	6.1 U	6.1 U	6.1 U
Silver	UG/L	0	0%	50	0	0	14	1.3 U	1.3 U	1.3 U	1.3 U
Sodium	UG/L	380000	100%	20000	8	14	14	**46100** J	**55900** J	**47100** J	**52100** J
Thallium	UG/L	0	0%	2	0	0	14	0.2 U	0.2 U	0.2 U	0.2 U
Vanadium	UG/L	1.3	29%		0	4	14	1 U	1 U	1 U	1 U
Zinc	UG/L	11.3	14%		0	2	14	3.6 U	3.6 U	3.6 U	3.6 U
Turbidity	NTU	17.9	100%		0	7	7	0.8		0.8	

Notes:
1. Only exceeding metals are included in this sumamry table.
2. 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
3. Shading indicates a concentration above the GA or MCL groundwater standard.

U = compound was not detected
J = the reported value is an estimated cocentration

Table 3B
Summary of Metals Detected in Groundwater at SEAD-17
Rounds 1-3 - SEAD-16 and SEAD-17 Long-Term Monitoring
Seneca Army Depot Activity

Facility								SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17
Location ID								MW17-1	MW17-1	MW17-2	MW17-2	MW17-3	MW17-3
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								17LM20010UNFIL	17LM20010FIL	17LM20011UNFIL	17LM20011FIL	17LM20012UNFIL	17LM20012FIL
Sample Date								11/18/2009	11/18/2009	11/17/2009	11/17/2009	11/18/2009	11/18/2009
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								3	3	3	3	3	3
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Criteria Level**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Collected**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Aluminum	UG/L	19600	100%		0	10	10	59 J	37 J	19600	88 J	1550 J	141 J
Antimony	UG/L	3.7	50%	3	1	5	10	1 U	1 U	**3.7**	2.2	1.5	1 U
Arsenic	UG/L	7.8	10%	10	0	1	10	3.7 U	3.7 U	7.8 J	3.7 U	3.7 U	3.7 U
Barium	UG/L	251	100%	1000	0	10	10	99	99.1	251	82.3	54.5	49.4
Beryllium	UG/L	1.2	10%	4	0	1	10	0.3 U	0.3 U	1.2 J	0.3 U	0.3 U	0.3 U
Cadmium	UG/L	1.7	10%	5	0	1	10	0.3 U	0.3 U	1.7	0.3 U	0.3 U	0.3 U
Calcium	UG/L	195000	100%		0	10	10	108000 J	109000 J	195000 J	154000 J	95900 J	99400 J
Chromium	UG/L	37.2	20%	50	0	2	10	0.9 U	0.9 U	37.2	0.9 U	5.2	0.9 U
Cobalt	UG/L	10.5	50%		0	5	10	1.1 U	1.1 U	10.5	1.1 U	1.7 J	1.5 J
Copper	UG/L	46.7	40%	200	0	4	10	1.3 U	1.3 U	46.7	2.9 J	7.9 J	2.5 J
Iron	UG/L	25500	70%	300	3	7	10	42 J	19 UJ	**25500** J	19 UJ	**2690** J	**827** J
Iron+Manganese	UG/L	25929	100%	500	3	10	10	67.6 J	57.9	**25929** J	20.5 J	**2858** J	**968** J
Lead	UG/L	103	20%	15	1	2	10	2.9 U	2.9 U	**103**	2.9 U	8.6	2.9 U
Magnesium	UG/L	27300	100%		0	10	10	24000	24300	23300	18200	9170	9850
Manganese	UG/L	429	100%	300	1	10	10	25.6	38.9	**429**	1.5 J	168	141
Mercury	UG/L	0	0%	0.7	0	0	10	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	UG/L	34	80%	100	0	8	10	1 U	1 U	34	1.2 J	4.5 J	3.1 J
Potassium	UG/L	7810	100%		0	10	10	254 J	260 J	7810	2390	1590	1290
Selenium	UG/L	0	0%	10	0	0	10	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U
Silver	UG/L	0	0%	50	0	0	10	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Sodium	UG/L	366000	100%	20000	3	10	10	7400 J	7300 J	**20300** J	19800 J	6200 J	7500 J
Thallium	UG/L	0.08	20%	2	0	2	10	0.008 U	0.008 U	0.2 U	0.008 U	0.008 U	0.008 U
Vanadium	UG/L	32.8	20%		0	2	10	1 U	1 U	32.8	1 U	1.7 J	1 U
Zinc	UG/L	935	40%		0	4	10	3.6 U	3.6 U	935	28.6	45.7	21.1
Turbidity	NTU	6.2	100%		0	6	6	0.4	0.4	24.4	24.4		

Notes:
1. Only exceeding metals are included in this sumamry table.
2. 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
3. Shading indicates a concentration above the GA or MCL groundwater standard.

U = compound was not detected
J = the reported value is an estimated cocentration

Table 3B
Summary of Metals Detected in Groundwater at SEAD-17
Rounds 1-3 - SEAD-16 and SEAD-17 Long-Term Monitoring
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Collected	SEAD-17 MW17-4 GW 17LM20013UNFIL 11/17/2009 SA LTM 3 Value (Q)	SEAD-17 MW17-4 GW 17LM20013FIL 11/17/2009 SA LTM 3 Value (Q)	SEAD-17 MW17-5 GW 17LM20014UNFIL 11/17/2009 SA LTM 3 Value (Q)	SEAD-17 MW17-5 GW 17LM20014FIL 11/17/2009 SA LTM 3 Value (Q)
Aluminum	UG/L	19600	100%		0	10	10	70 J	28 J	98 J	29 J
Antimony	UG/L	3.7	50%	3	1	5	10	1 U	1 U	1	1
Arsenic	UG/L	7.8	10%	10	0	1	10	3.7 U	3.7 U	3.7 U	3.7 U
Barium	UG/L	251	100%	1000	0	10	10	36.6	36.3	168	166
Beryllium	UG/L	1.2	10%	4	0	1	10	0.3 U	0.3 U	2 U	2 U
Cadmium	UG/L	1.7	10%	5	0	1	10	0.3 U	0.3 U	0.3 U	0.3 U
Calcium	UG/L	195000	100%		0	10	10	97600 J	96600 J	185000 J	184000 J
Chromium	UG/L	37.2	20%	50	0	2	10	0.9 U	0.9 U	0.9 U	0.9 U
Cobalt	UG/L	10.5	50%		0	5	10	1.3 J	1.5 J	1.1 U	1.1 U
Copper	UG/L	46.7	40%	200	0	4	10	1.3 U	1.3 U	1.3 U	1.3 U
Iron	UG/L	25500	70%	300	3	7	10	142 J	60 J	34 J	19 UJ
Iron+Manganese	UG/L	25929	100%	500	3	10	10	355 J	258 J	61.4 J	43.3
Lead	UG/L	103	20%	15	1	2	10	2.9 U	2.9 U	2.9 U	2.9 U
Magnesium	UG/L	27300	100%		0	10	10	13000	12900	27300	27100
Manganese	UG/L	429	100%	300	1	10	10	213	198	27.4	24.3
Mercury	UG/L	0	0%	0.7	0	0	10	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	UG/L	34	80%	100	0	8	10	2.4 J	2.2 J	1.8 J	1.7 J
Potassium	UG/L	7810	100%		0	10	10	866	844	1960	1920
Selenium	UG/L	0	0%	10	0	0	10	6.1 U	6.1 U	6.1 U	6.1 U
Silver	UG/L	0	0%	50	0	0	10	1.3 U	1.3 U	1.3 U	1.3 U
Sodium	UG/L	366000	100%	20000	3	10	10	10500 J	10400 J	**366000** J	**364000** J
Thallium	UG/L	0.08	20%	2	0	2	10	0.008 U	0.008 U	0.08 J	0.08 J
Vanadium	UG/L	32.8	20%		0	2	10	1 U	1 U	1 U	1 U
Zinc	UG/L	935	40%		0	4	10	3.6 U	3.6 U	3.6 U	3.6 U
Turbidity	NTU	6.2	100%		0	6	6	6.2	6.2	0.04	0.04

Notes:
1. Only exceeding metals are included in this sumamry table.
2. 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
3. Shading indicates a concentration above the GA or MCL groundwater standard.

U = compound was not detected
J = the reported value is an estimated cocentration

Table 4A
Metal Exceedances in Groundwater at SEAD-16
Rounds 1-3 - SEAD-16 and SEAD-17 Long-Term Monitoring
Seneca Army Depot Activity

Facility								SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16
Location ID								MW16-1	MW16-1	MW16-2	MW16-2	MW16-4	MW16-4
Matrix								GW	GW	GW	GW	GW	GW
Sample ID								16LM20014UNFIL	16LM20014FIL	16LM20015UNFIL	16LM20015FIL	16LM20016UNFIL	16LM20016FIL
Sample Date								11/13/2009	11/13/2009	11/11/2009	11/11/2009	11/17/2009	11/17/2009
QC Code								SA	SA	SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Round								3	3	3	3	3	3
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Criteria Level**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Collected**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Antimony	UG/L	16.3	64%	3	8	9	14	1 U	1 U	**3.6**	**3.6**	**6.3**	**6**
Iron	UG/L	1150	64%	300	5	9	14	19 UJ	19 UJ	197 J	19 UJ	**419** J	**329** J
Iron+Manganese	UG/L	1323	100%	500	4	14	14	21.4 J	20 J	260.7 J	58.5	**513.5** J	417.7 J
Sodium	UG/L	380000	100%	20000	8	14	14	8000 J	8000 J	18800 J	19500 J	**363000** J	**380000** J
Turbidity	NTU	17.9	100%		0	14	14	0.4	0.4	17.9	17.9	0.03	0.03

Notes:
1. Only exceeding metals are included in this sumamry tabl
2. 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.htm
3. Shading indicates a concentration above the GA or MCL groundwater standard.

U = compound was not detected
J = the reported value is an estimated cocentration

Table 4A
Metal Exceedances in Groundwater at SEAD-16
Rounds 1-3 - SEAD-16 and SEAD-17 Long-Term Monitoring
Seneca Army Depot Activity

Facility								SEAD-16	SEAD-16	SEAD-16	SEAD-16
Location ID								MW16-5	MW16-5	MW16-6	MW16-6
Matrix								GW	GW	GW	GW
Sample ID								16LM20017UNFIL	16LM20017FIL	16LM20018UNFIL	16LM20018FIL
Sample Date								11/16/2009	11/16/2009	11/17/2009	11/17/2009
QC Code								SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM
Sampling Round								3	3	3	3
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Criteria Level**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Collected**	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Antimony	UG/L	16.3	64%	3	8	9	14	1 U	1 U	1 U	0.9 J
Iron	UG/L	1150	64%	300	5	9	14	**1150** J	**800** J	**440** J	55 J
Iron+Manganese	UG/L	1323	100%	500	4	14	14	**1323** J	**970** J	**515** J	153.4 J
Sodium	UG/L	380000	100%	20000	8	14	14	2800 J	2700 J	**20600** J	**22000** J
Turbidity	NTU	17.9	100%		0	14	14	10	10	7.3	7.3

Notes:
1. Only exceeding metals are included in this sumamry tabl
2. 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.htm
3. Shading indicates a concentration above the GA or MCL groundwater standard.

U = compound was not detected
J = the reported value is an estimated cocentration

Table 4A
Metal Exceedances in Groundwater at SEAD-16
Rounds 1-3 - SEAD-16 and SEAD-17 Long-Term Monitoring
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Collected	Facility	Location ID	Matrix	Sample ID	Sample Date	QC Code	Study ID	Sampling Round
								SEAD-16	MW16-7	GW	16LM20020UNFIL	11/12/2009	DU	LTM	3
								Value (Q)							
Antimony	UG/L	16.3	64%	3	8	9	14	**16.3**							
Iron	UG/L	1150	64%	300	5	9	14	61 J							
Iron+Manganese	UG/L	1323	100%	500	4	14	14	168 J							
Sodium	UG/L	380000	100%	20000	8	14	14	**46100** J							
Turbidity	NTU	17.9	100%		0	14	14	0.8							

Facility	Location ID	Matrix	Sample ID	Sample Date	QC Code	Study ID	Sampling Round
SEAD-16	MW16-7	GW	16LM20020FIL	11/12/2009	DU	LTM	3
Value (Q)							
13.9							
19 UJ							
171							
55900 J							
0.8							

Facility	Location ID	Matrix	Sample ID	Sample Date	QC Code	Study ID	Sampling Round
SEAD-16	MW16-7	GW	16LM20019UNFIL	11/12/2009	SA	LTM	3
Value (Q)							
15.7							
135 J							
244 J							
47100 J							
0.8							

Facility	Location ID	Matrix	Sample ID	Sample Date	QC Code	Study ID	Sampling Round
SEAD-16	MW16-7	GW	16LM20019FIL	11/12/2009	SA	LTM	3
Value (Q)							
15.2							
19 UJ							
155							
52100 J							
0.8							

Notes:
1. Only exceeding metals are included in this sumamry tabl
2. 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.htm
3. Shading indicates a concentration above the GA or MCL groundwater standard.

U = compound was not detected
J = the reported value is an estimated cocentration

Table 4B
Metal Exceedances in Groundwater at SEAD-17
Rounds 1-3 - SEAD-16 and SEAD-17 Long-Term Monitoring
Seneca Army Depot Activity

Parameter	Units	Maximum Value	Frequency of Detection	Criteria Level	Number of Exceedances	Number of Times Detected	Number of Samples Collected	SEAD-17 MW17-1 GW 17LM20010UNFIL 11/18/2009 SA LTM 3 Value (Q)	SEAD-17 MW17-1 GW 17LM20010FIL 11/18/2009 SA LTM 3 Value (Q)	SEAD-17 MW17-2 GQ 17LM20011UNFIL 11/17/2009 SA LTM 3 Value (Q)	SEAD-17 MW17-2 GW 17LM20011FIL 11/17/2009 SA LTM 3 Value (Q)	SEAD-17 MW17-3 GW 17LM20012UNFIL 11/18/2009 SA LTM 3 Value (Q)	SEAD-17 MW17-3 GW 17LM20012FIL 11/18/2009 SA LTM 3 Value (Q)
Antimony	UG/L	3.7	50%	3	1	5	10	1 U	1 U	**3.7**	2.2	1.5	1 U
Iron	UG/L	25500	70%	300	3	7	10	42 J	19 UJ	**25500** J	19 UJ	**2690** J	**827** J
Iron+Manganese	UG/L	25929	100%	500	3	10	10	67.6 J	57.9	**25929** J	20.5 J	**2858** J	**968** J
Lead	UG/L	103	20%	15	1	2	10	2.9 U	2.9 U	**103**	2.9 U	8.6	2.9 U
Manganese	UG/L	429	100%	300	1	10	10	25.6	38.9	**429**	1.5 J	168	141
Sodium	UG/L	366000	100%	20000	3	10	10	7400 J	7300 J	**20300** J	19800 J	6200 J	7500 J
Turbidity	NTU	6.2	100%		0	6	6	0.4	0.4	24.4	24.4		

Notes:
1. Only exceeding metals are included in this sumamry table.
2. 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
3. Shading indicates a concentration above the GA or MCL groundwater standard.

U = compound was not detected
J = the reported value is an estimated cocentration

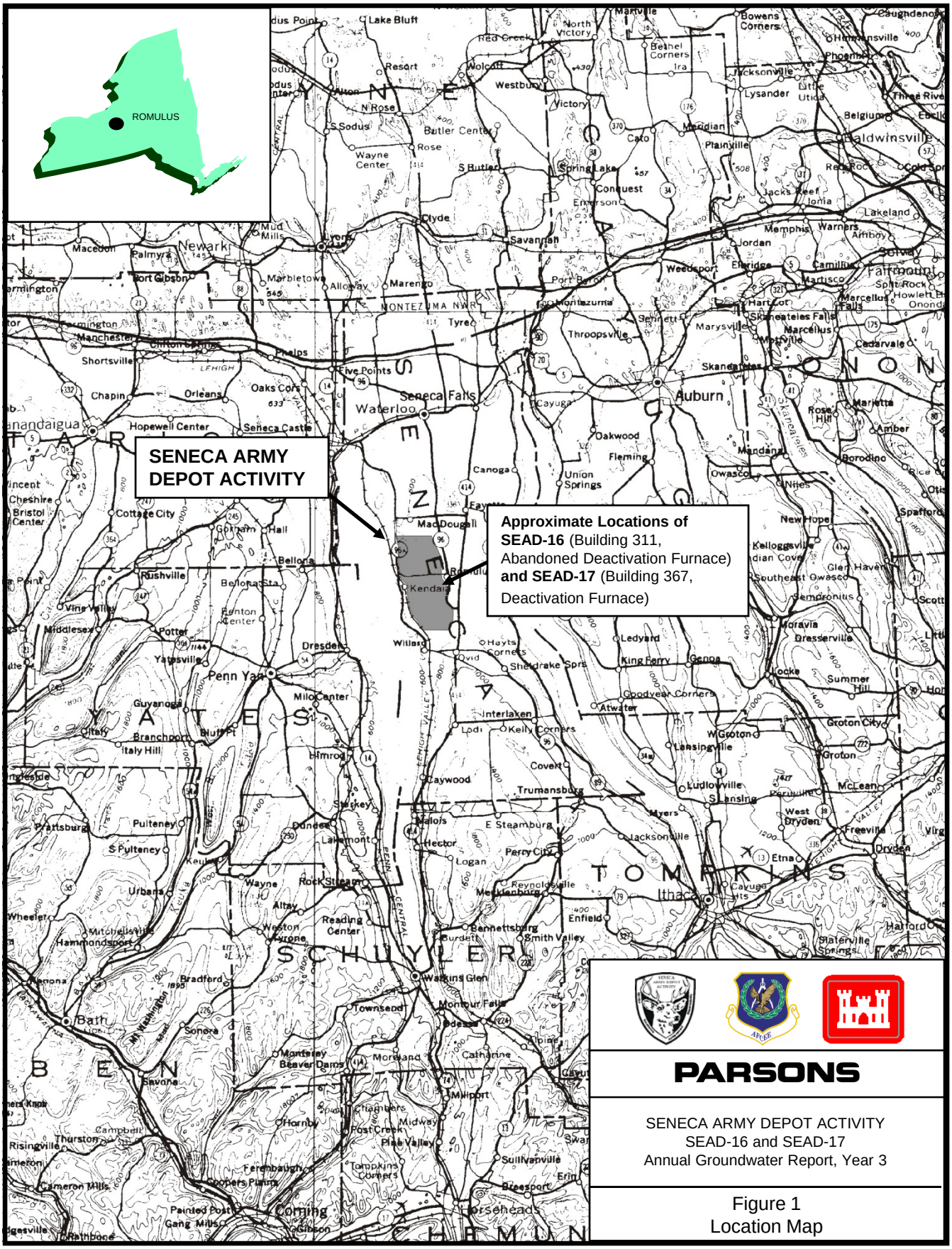
Table 4B
Metal Exceedances in Groundwater at SEAD-17
Rounds 1-3 - SEAD-16 and SEAD-17 Long-Term Monitoring
Seneca Army Depot Activity

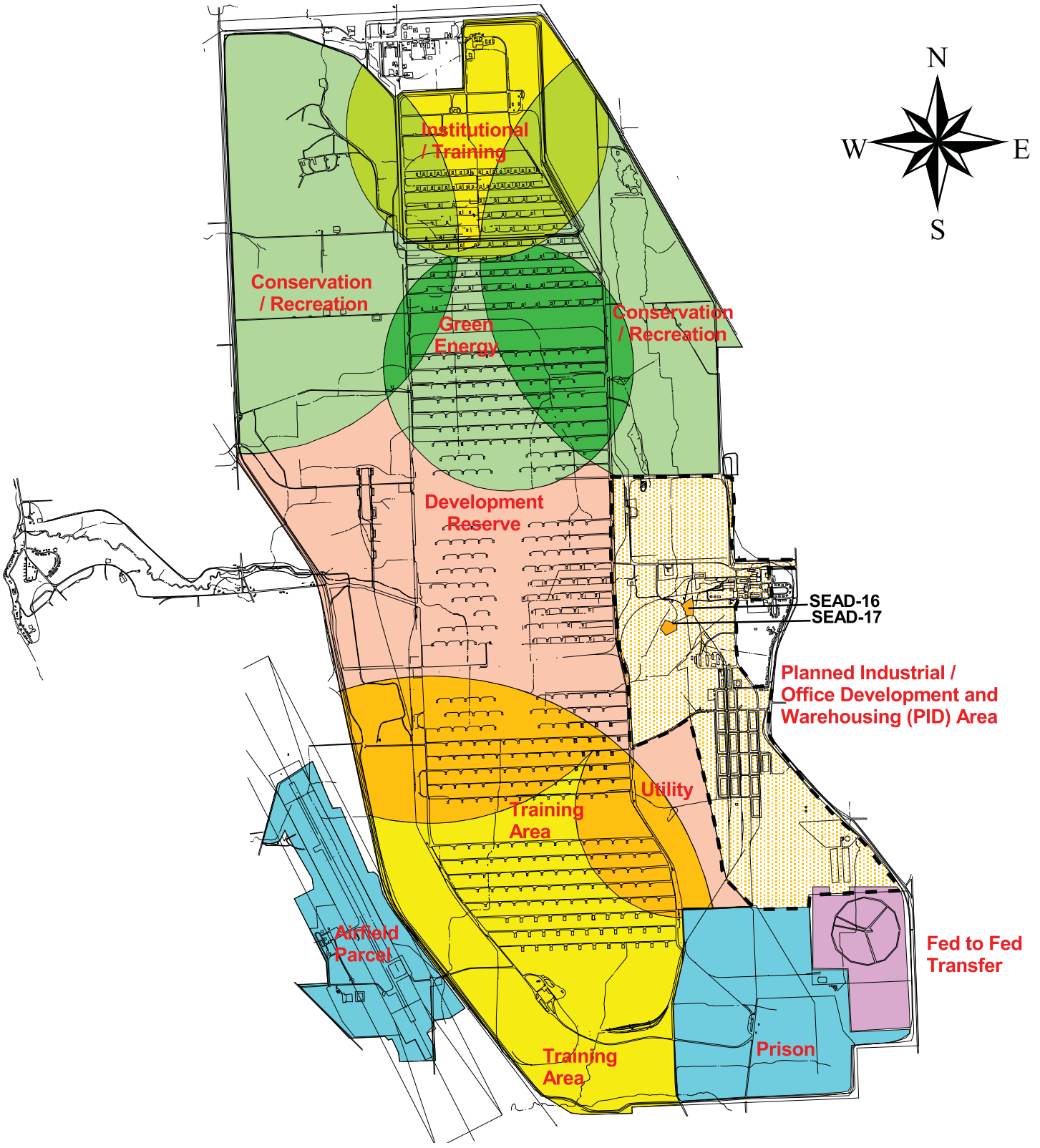
Facility								SEAD-17	SEAD-17	SEAD-17	SEAD-17
Location ID								MW17-4	MW17-4	MW17-5	MW17-5
Matrix								GW	GW	GW	GW
Sample ID								17LM20013UNFIL	17LM20013FIL	17LM20014UNFIL	17LM20014FIL
Sample Date								11/17/2009	11/17/2009	11/17/2009	11/17/2009
QC Code								SA	SA	SA	SA
Study ID								LTM	LTM	LTM	LTM
Sampling Round								3	3	3	3
Parameter	**Units**	**Maximum Value**	**Frequency of Detection**	**Criteria Level**	**Number of Exceedances**	**Number of Times Detected**	**Number of Samples Collected**	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Antimony	UG/L	3.7	50%	3	1	5	10	1 U	1 U	1	1
Iron	UG/L	25500	70%	300	3	7	10	142 J	60 J	34 J	19 UJ
Iron+Manganese	UG/L	25929	100%	500	3	10	10	355 J	258 J	61.4 J	43.3
Lead	UG/L	103	20%	15	1	2	10	2.9 U	2.9 U	2.9 U	2.9 U
Manganese	UG/L	429	100%	300	1	10	10	213	198	27.4	24.3
Sodium	UG/L	366000	100%	20000	3	10	10	10500 J	10400 J	**366000** J	**364000** J
Turbidity	NTU	6.2	100%		0	6	6	6.2	6.2	0.04	0.04

Notes:
1. Only exceeding metals are included in this sumamry table.
2. 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.htr
3. Shading indicates a concentration above the GA or MCL groundwater standard.

U = compound was not detected
J = the reported value is an estimated cocentration

FIGURES


ROMULUS
SENECA ARMY DEPOT ACTIVITY
Approximate Locations of SEAD-16 (Building 311, Abandoned Deactivation Furnace) and SEAD-17 (Building 367, Deactivation Furnace)
PARSONS
SENECA ARMY DEPOT ACTIVITY
SEAD-16 and SEAD-17
Annual Groundwater Report, Year 3
Figure 1
Location Map



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

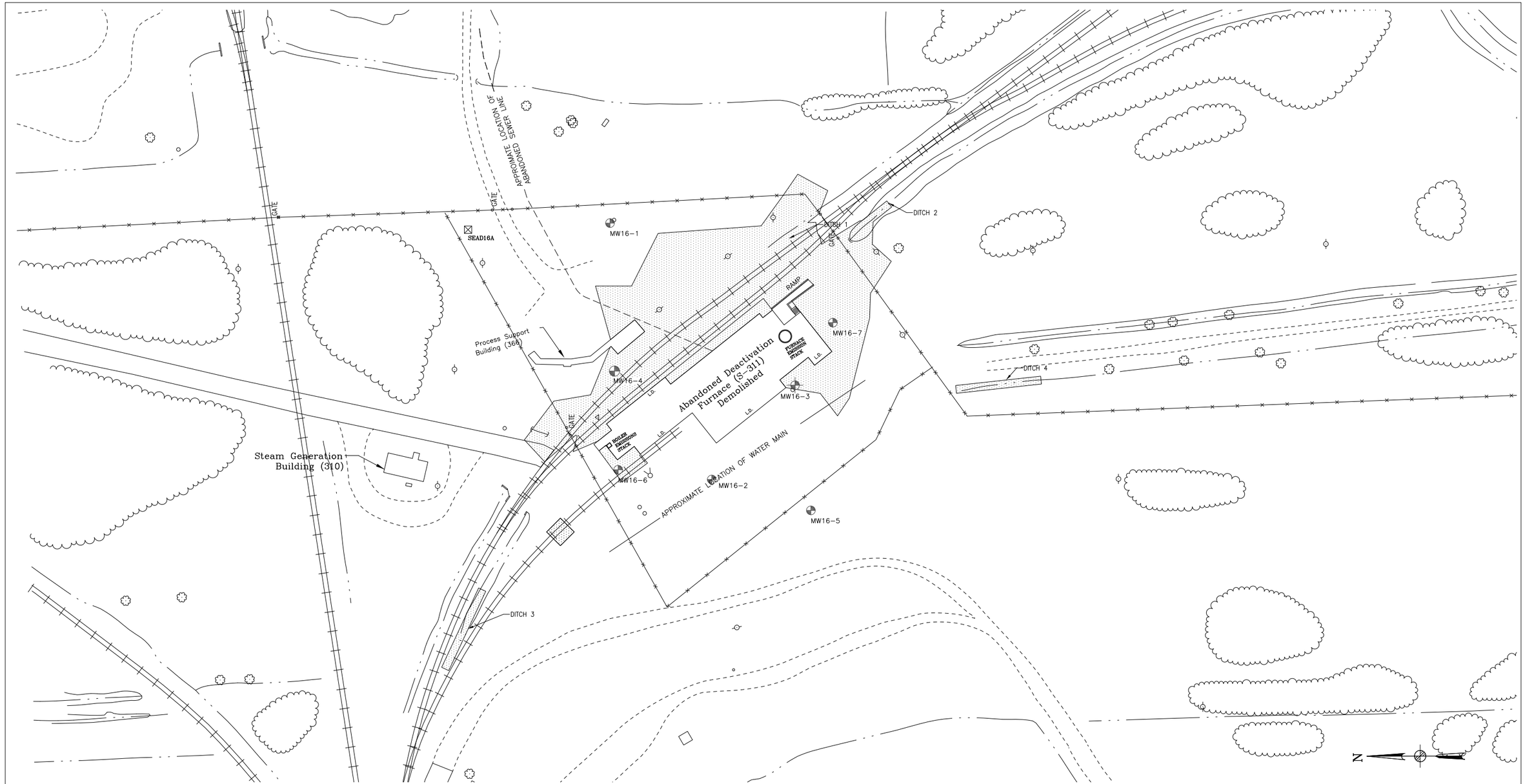
Area Covered by PID-wide Land Use Restrictions
- Prohibit the development and use of property for residential housing, elementary and secondary schools, childcare facilities and playgrounds.
- Prevent access to or use of the groundwater until the Class GA Groundwater Standards are met.

PARSONS

SENECA ARMY DEPOT ACTIVITY
Year 3 Annual Groundwater Report
SEAD-16 and SEAD-17

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

o:\seneca\pid luc\sead-16&17 annual report.apr\sead-16&17 Annual Report Figure 2



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 FORMER 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

SEAD-16 AND SEAD-17

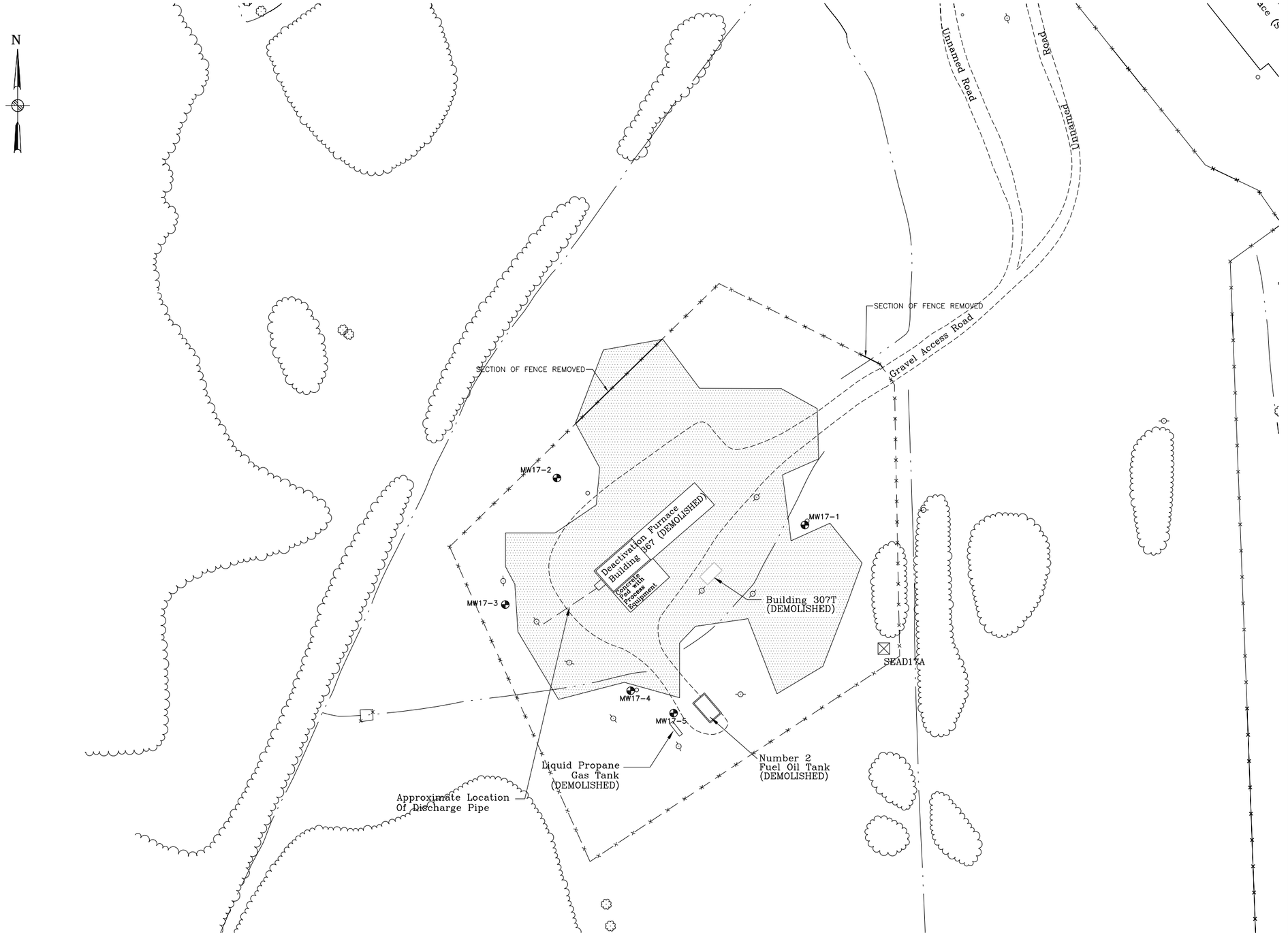
THIRD ANNUAL GROUNDWATER REPORT

DEPT.	Dwg. No.
ENVIRONMENTAL ENGINEERING	745172-01200

FIGURE 3
SEAD-16
SITE PLAN

SCALE	DATE	REV
1" = 100'	SEPTEMBER 2010	-

FILE: P:\PIT\PROJECTS\SENECA PBC II\SEAD-16_17\ANNUAL REPORT - YR 3\DRAFT FINAL\FIGURES\FIGURE 3.DWG, DATE: 09/01/2010 10:37:13AM, p0018397



LEGEND:

- MINOR WATERWAY
- MAJOR WATERWAY
- FENCE
- UNPAVED ROAD
- BRUSH LINE
- RAILROAD
- SURVEY MONUMENT
- ROAD SIGN
- DECIDOUS TREE
- GUIDE POST
- FIRE HYDRANT
- MANHOLE
- MAILBOX/RR SIGNAL
- POLE
- UTILITY BOX
- OVERHEAD UTILITY POLE
- MW17-5 MONITORING WELL LOCATION
- LIMITS OF EXCAVATION

PARSONS

CLIENT/PROJECT TITLE

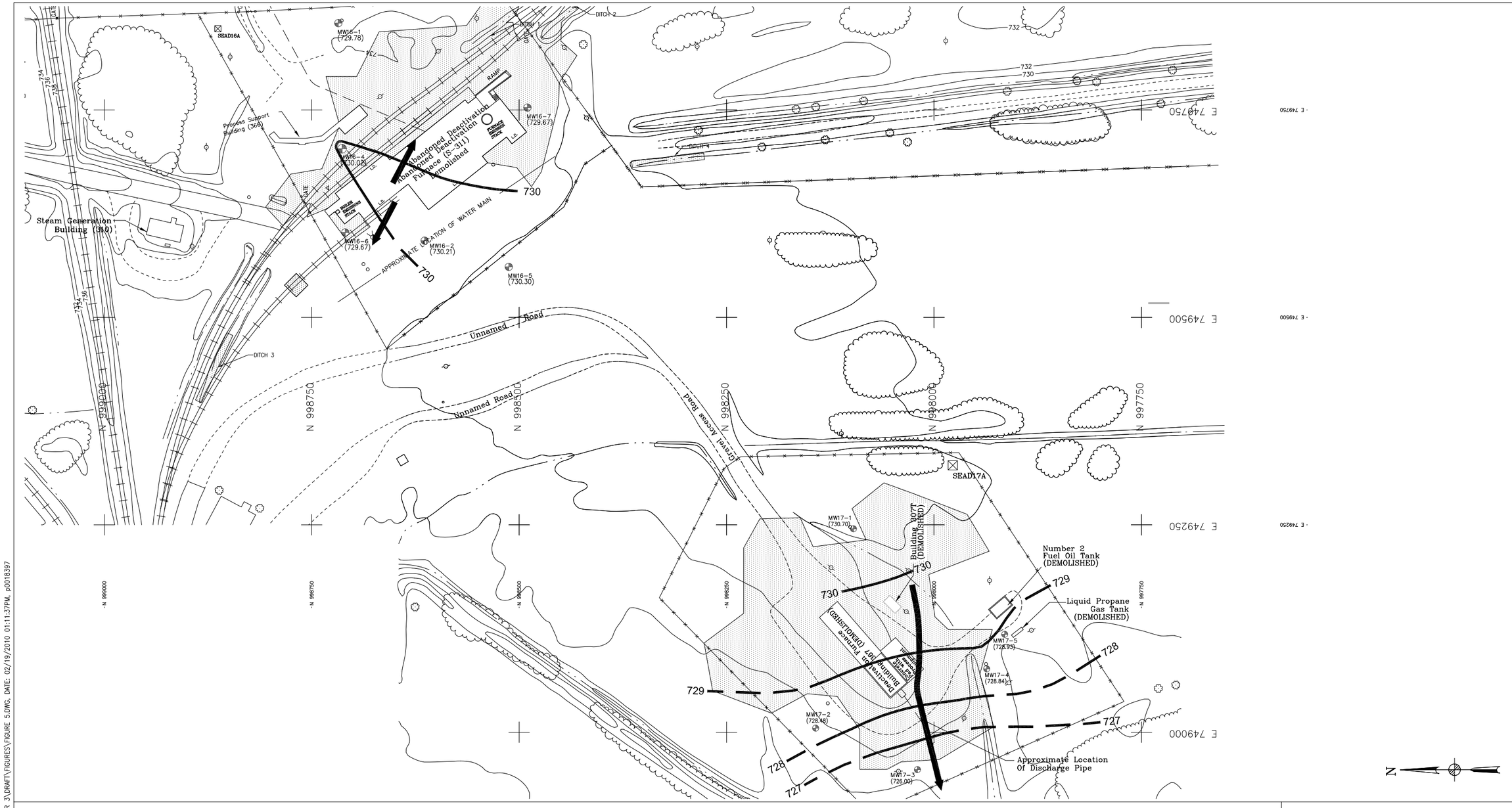
SENECA ARMY DEPOT ACTIVITY
SEAD-16 AND SEAD-17
THIRD ANNUAL GROUNDWATER REPORT

DEPT.	Dwg. No.
ENVIRONMENTAL ENGINEERING	745172-01200

FIGURE 4
SEAD-17
SITE PLAN

SCALE	DATE	REV
1" = 100'	FEBRUARY 2010	-

FILE: P:\PIT\PROJECTS\SENECA PBC II\SEAD-16_17\ANNUAL REPORT - YR 3\DRAFT\FIGURES\FIGURE 4.DWG, DATE: 02/09/2010 04:03:32PM, p0018397



LEGEND:

- ELEVATION CONTOUR (734)
- 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
- GROUNDWATER CONTOUR (DASHED WHERE INFERRED) (729)
- MONITORING WELL LOCATION (MW17-3)
- LIMITS OF EXCAVATION
- APPROXIMATE GROUNDWATER ELEVATION (MW17-3 (726.00))
- INDICATES APPROXIMATE DIRECTION OF GROUNDWATER FLOW

NOTES:

1. MONITORING WELL MW16-3 WAS DESTROYED DURING THE REMEDIAL ACTION.
2. GROUNDWATER FLOW DIRECTION BASED ON NOVEMBER 2009 GROUNDWATER DATA ELEVATION.

60 0 60 120
SCALE IN FEET

N

PARSONS

CLIENT/PROJECT TITLE
SENECA ARMY DEPOT ACTIVITY
SEAD-16 AND SEAD-17
THIRD ANNUAL GROUNDWATER REPORT

DEPT. ENVIRONMENTAL ENGINEERING
Dwg. No. 745172-01400

FIGURE 5
SEAD-16 AND 17
GROUNDWATER FLOW TREND

SCALE 1" = 120'
DATE FEBRUARY 2010
REV -

P:\PIT\PROJECTS\SENECA PBC II\SEAD-16_17\ANNUAL REPORT - YR 3\DRAFT\FIGURES\FIGURE 5.DWG, DATE: 02/19/2010 01:11:37PM, p0018397

APPENDICES

Appendix A Historic Groundwater Data

Appendix B SEDA Background Groundwater Data Summary

Appendix C Field Forms for Year 3 Sampling Activities

Appendix D Complete Groundwater Data Results for Year 1, Year 2, and Year 3

APPENDIX A

HISTORIC GROUNDWATER DATA

Appendix A Table
SEAD-16 Pre Remedial Groundwater Monitoring Results
SEAD-16 & SEAD-17 Third Annual Groundwater Monitoring Report
Seneca Army Depot Activity

			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:	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
			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
PARAMETER	ACTION LEVEL	SOURCE [1]	UNIT	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.

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

Appendix A Table
SEAD-17 Pre Remedial Groundwater Monitoring Results
SEAD-16 & SEAD-17 Third Annual Groundwater Monitoing Report
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:	Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater		Groundwater	
			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.

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

APPENDIX B

SEDA BACKGROUND GROUNDWATER DATA SUMMARY

Table 3
SEDA Background Groundwater Concentrations
SEAD-16 & SEAD-17 Third Annual Groundwater Monitoring Report
Seneca Army Depot Activity

PARAMETER	UNIT	MAXIMUM	AVERAGE CONCENTRATION	STANDARD DEVIATION	FREQUENCY OF DETECTION	CRITERIA VALUE	TYPE OF CRITERIA	NUMBER OF EXCEEDENCES	NUMBER OF DETECTS	NUMBER OF ANALYSES
Aluminum	UG/L	42,400	2,732	8,207	87%	50	MCL	25	27	31
Antimony	UG/L	52.7	8.2	13.9	13%	3	GA	3	4	31
Arsenic	UG/L	10	1.7	2.2	13%	5	MCL	2	4	31
Barium	UG/L	337	78.2	62.6	94%	1000	GA	0	29	31
Beryllium	UG/L	2.2	0.2	0.4	13%	4	MCL	0	4	31
Cadmium	UG/L	0	0.5	0.5	0%	5	GA	0	0	31
Calcium	UG/L	181,000	115,619	25,274	100%			0	31	31
Chromium	UG/L	69.4	4.7	13.4	48%	50	GA	1	15	31
Cobalt	UG/L	34.6	3.7	7.4	45%			0	14	31
Copper	UG/L	32.5	3.3	6.9	48%	200	GA	0	15	31
Cyanide	UG/L	2.8	NA	NA	3%	200	GA	0	1	31
Iron	UG/L	69,400	4,476	13,429	100%	300	GA	22	31	31
Lead	UG/L	34.8	2.5	6.3	32%	15	MCL	1	10	31
Magnesium	UG/L	58,200	28,568	13,848	100%			0	31	31
Manganese	UG/L	1120	224	254	97%	50	SEC	22	30	31
Mercury	UG/L	0.06	0.04	0.02	23%	0.7	GA	0	7	31
Nickel	UG/L	99.8	7.3	18.7	61%	100	GA	0	19	31
Potassium	UG/L	10,200	3,833	3,010	94%			0	29	31
Selenium	UG/L	3.6	1.5	0.7	19%	10	GA	0	6	31
Silver	UG/L	0.98	1.0	1.0	6%	50	GA	0	2	31
Sodium	UG/L	59,400	14,601	13,877	97%	20000	GA	7	30	31
Thallium	UG/L	4.7	1.5	1.2	13%	2	MCL	4	4	31
Vanadium	UG/L	70.8	5.2	13.5	52%			0	16	31
Zinc	UG/L	143	23.1	34.5	84%	5000	MCL	0	26	31

APPENDIX C

FIELD FORMS FOR YEAR 3 SAMPLING ACTIVITIES

Form # _____

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY **CONSULTANT: PARSONS ES** **WELL #:** 16-1

PROJECT: QUARTERLY SAMPLING -SEAD 16/17 **DATE:** 11/13/09

LOCATION: ROMULUS, NY **INSPECTORS:** _____

PUMP #: _____

WEATHER / FIELD CONDITIONS CHECKLIST (RECORD MAJOR CHANGES) **SAMPLE ID #:** 16LM200149

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
1330	60°	Sun	low	0-5	SW	Dry	OVM-580	PID

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)]

34.163 = .4743 = 1.388 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
	8.80	3.8	5			

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
	0.00	~~4.95~~ 5.80		8.20	13:45
RADIATION SCREENING DATA	**PUMP PRIOR TO SAMPLING (cps)**		**PUMP AFTER SAMPLING (cps)**		
	NA			NA	

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)
14:15	6.0	325	1.5	1.86	12.7	3.02	5.73	119	27.4
14:23	6.0	325	2.5	.58	12.6	2.98	5.70	121	24.9
14:28	6.0	325	3.0	0.31	12.6	2.97	5.76	121	9.9
14:32	6.0	325	3.25	0.16	12.6	2.96	5.76	121	7.0
14:37	6.0	325	3.75	0.00	12.58	2.95	5.69	120	2.7
14:43	6.0	325	4.25	0.00	12.58	2.95	5.68	119	1.2
14:46	6.0	325	5.0	0.00	12.58	2.94	5.68	118	0.4

Sample 16LM200149U @ 1446
16LM200149F @ 1445

Form # _____

SAMPLING RECORD - GROUNDWATER

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

PROJECT: QUARTERLY SAMPLING -SEAD 16/17
LOCATION: ROMULUS, NY

DATE: 11/18/09
INSPECTORS: _____
PUMP #: _____
SAMPLE ID #: _____

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
1145	45°	Sun Pt clds	low	10-15	NW	Dry	OVM-580	PID
							0	0

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)]
1.5 x .163 =

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

DATA COLLECTED AT WELL SITE	PID READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
		4.35		5.36	11:45

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)	
1145	-	200ml/min		4.24	10.75	0.292	7.08	88	0.1	
1150	-	200ml/min		4.29	10.41	0.293	7.13	89	0.7	
1155	-	200ml/min		4.24	10.76	0.290	7.13	84	4.5	
1200	-	200ml/min		4.50	10.8	0.290	7.14	83	2.5	
1205	-	200ml/min		4.66	10.81	0.290	7.15	82	1.4	
			Lower pump intake to .5Ft wait for turbidity to clear							
1230	4.45	60ml/min	.25gal	5.21	11.4	0.296	7.21	68	130	
1235	4.45	60ml/min		1.23 Ysi		0.323	7.20	63	53.2	
1240	4.45	60ml/min		1.53 Ysi	10.2	0.347	7.18	58	31.3	2026
1245	4.45	60ml/min		1.34 Ysi	10.2	0.349	7.19	54	30.8	2026
1250	4.45	60ml/min	.5gal	1.22 Ysi	10.2	0.346	7.20	53	28.2	2026
1255	4.45	60ml/min		1.19 Ysi	10.2	0.346	7.21	55	23.2	2026
1300	4.45	60ml/min		1.18 Ysi	10.2	0.346	7.21	57	19.1	2026
1305	4.45	60ml/min		1.15 Ysi	10.2	0.345	7.22	59	21.3	2026
1310	4.45	60ml/min	1 gallon	1.16 Ysi	10.2	0.344	7.21	58	20.2	2026
1315	4.45	60ml/min		1.14 Ysi	10.2	0.346	7.22	60	18.6	2026
1320	4.45	60ml/min		1.13 Ysi	10.2	0.347	7.22	59	18.7	2026
1325	4.45	60ml/min		1.12 Ysi	10.2	0.348	7.22	58	17.9	2026
1330		Sample Collected		16LM200						

Form # _____

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	CONSULTANT: PARSONS ES	WELL #: MW16-4

PROJECT: QUARTERLY SAMPLING -SEAD 16/17
LOCATION: ROMULUS, NY

DATE: 11/17/09
INSPECTORS:
PUMP #:
SAMPLE ID #: 16LM20016

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
1000	45°	Sun	low	5-15	sw	Dry.	OVM-580 Ø	PID Ø

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)]
3X.163= 0.489X3= 1.4gal

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
	7.05		5			

DATA COLLECTED AT WELL SITE	YSI DO ~~(HH) READING~~ (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
	0.36 mg/l	4.05	4.4	6.55	1005

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)	
1010	4.20	80ml/min	—	0.31	10.6	2.69	7.22	-115	52.5	
1020	4.15	100ml/min	—	0.29	10.6	2.49	7.22	-148	13.5	
1040	4.30	100ml/min	—	0.80	10.6	2.29	7.30	-111	0.00	
1045	4.30	100ml/min	1gal	1.11	10.6	2.30	7.43	-93	0.00	
1050	4.4	100ml/min		1.45 Ysi	10.5	2.34	7.43	-88	0.00	
1100	4.4	100ml/min		1.19 Ysi	10.5	2.38	7.44	-86	0.00	
1110	4.4	100ml/min		1.13 Ysi	10.5	2.40	7.43	-83	0.00	
1115	4.4	100ml/min		1.12 Ysi	10.5	2.50	7.43	-78	0.18	20%
1120	4.4	110ml/min	1.5gal	1.16 Ysi	10.5	2.54	7.43	-74	0.09	10%
1125	4.4	110ml/min		1.17 Ysi	10.5	2.58	7.43	-72	0.03	10%
1130		Sample	Collected	16LM20016U & 16LM20016F @ 1130						
			water stabilized at 4.4ft	80ml/min						

Form # _____

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	CONSULTANT: PARSONS ES	WELL #: MW16-5

PROJECT: QUARTERLY SAMPLING -SEAD 16/17
LOCATION: ROMULUS, NY

DATE: 11/16/06
INSPECTORS:
PUMP #:
SAMPLE ID #:

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
11:00	50°	P. Cloudy	low	10-15	NW	Dry	OVM-580	PID
							Ø	Ø

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)]
2.0 X .163 = 0.326 X 3 = .978 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
	5.10		5			

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
		3.10			1136

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)
1200	—	60 ml/min	25	0.00	10.4	0.288	5.88	~~0.288~~	62.1
1205	-	60 ml/min		4.77	10.4	0.289	5.86	-156	70.1
1210		60 ml/min	~~.75~~	4.27	10.2	0.329	5.88	-156	44.5
1215		60 ml/m		2.57 ysi	10.2	.341	5.90	-149	28.4
1220	-	40 ml/min	.5	2.03 YSi	10.3	0.356	5.90	-145	21.4
1225	—	40 ml/min		2.03 YSi	10.3	0.354	5.90	-143	20.1
12:30	—	40 ml/min		1.67 YSi	10.2	0.343	5.90	-136	14 ntu
12:35	—	40 ml		1.23 YSi	10.2	0.339	5.90	-140	13 ntu
12:40	—	40 ml		1.20	10.2	0.340	5.90	-141	12 ntu
12:45	—	40 ml	1 gallon	1.19	10.2	0.339	5.90	-142	10 ntu

Sample 16LM20017 collected at 1245

16LM20017U & 16LM20017F

Form # _____

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	CONSULTANT: PARSONS ES	WELL #: MW16-6

PROJECT: QUARTERLY SAMPLING -SEAD 16/17
LOCATION: ROMULUS, NY

DATE: 10/7/09
INSPECTORS: _____
PUMP #: _____
SAMPLE ID #: 16LM20018

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
1015	450	Sun	Low	5-15	SW	Dry	OVM-580 Ø	PID Ø

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)]
3 X .163 = .486 X 3 = 1.4 gallons

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
	6.95		5			

DATA COLLECTED AT WELL SITE	YSI ~~PID~~ READING (OPENING WELL)	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
		3.95	5.15 ft		1020

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)
1030		Pull	Pump & Replace	0 mgs					
1045	4.5	120 ml/m	–	3.35 ysi	13.3	0.257	7.22	-47	260
1055	4.55	120 ml/m	–	3.42	13.2	0.271	7.32	-75	65
1100	4.70	110 ml/min	–	2.90	13.2	0.275	7.36	51	45.6
1105	4.75	100 ml/min		2.36 ysi	13.3	0.281	7.40	-6	34.2
1110	4.85	80 ml/min	–	2.07 ysi	13.3	0.283	7.39	-46	26.4
1115	4.90	80 ml/min		1.88 ysi	13.4	0.284	7.40	-72	19.1
1120	5.0	80 ml/min	1 gallon	1.76 ysi	13.4	0.286	7.39	-74	16.2
1125	5.1	80 ml/min		1.54 ysi	13.4	0.288	7.38	-84	13.1
1130	5.1	80 ml/min		1.53 ysi	13.4	0.289	7.37	-88	12.0
1135	5.1	80 ml/min		1.50 ysi	13.4	0.288	7.37	-86	10.0
1140	5.1	80 ml/min		1.45 ysi	13.4	0.289	7.37	-80	9.3
1145	5.1	80 ml/min	1.5 gal	1.40 ysi	13.4	0.290	7.37	-75	8.4
1150	5.1	80 ml/min		1.42 ysi	13.5	0.291	7.37	-73	7.3
1155									
1200			Sample Collected 16LM20018						

16LM20018U @ 1200 16LM20018F @ 1200
Water Stabilized at 5.1 Ft @ 80 ml/min.

Lower flow →

Form # _____

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	CONSULTANT: PARSONS ES	WELL #: MW 16-7

PROJECT: QUARTERLY SAMPLING -SEAD 16/17
LOCATION: ROMULUS, NY
DATE: 10/12/09
INSPECTORS: MCM
PUMP #:
SAMPLE ID #: 16LM20019

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
1500	54°	Sun	low	0-5	SW	Dry	OVM-580	PID

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)]
18.74 - 16.3 = 2.30 X 3 = .905

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
	6.6	1.6	5			

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
	0.00	5.68 475			15:20

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)
15:40	5.1	200 ml	.5	3.03	12.1	0.314	5.92	118	27.2
15:45	5.2	180	1.0	1.74	12.0	.329	5.87	128	19.4
15:50	5.2	170		0.85	11.97	0.336	5.91	126	16.4
15:55	5.2	150		0.24	12.1	0.352	5.96	125	10.0
1600	5.2	150	1.5	0.01	12.0	0.362	5.91	127	12.1
1605	5.2	150		0.00	12.0	0.364	5.92	129	5.7
1610	5.2	150		0.00	11.98	0.366	5.93	128	3.6
1615	5.2	150	2.1	0.00	11.98	0.368	5.93	128	3.0
1620	5.2	150		0.00	11.97	0.369	5.94	127	2.0
1625	5.2	150	2.5	0.00	11.97	0.370	5.96	127	1.8
1630	5.2	150		0.00	11.97	0.371	5.95	127	0.8

Sample Time 1635

SA = 16LM20019 U&F BA = 16LM20020 U&F MS = 16LM20019MS U&F MSD = 16LM20019MSD U&F

Dup

Form # _____

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	CONSULTANT: PARSONS ES	WELL #: MW17-1

PROJECT: QUARTERLY SAMPLING -SEAD 16/17
LOCATION: ROMULUS, NY

DATE: 11/18/09
INSPECTORS:
PUMP #:
SAMPLE ID #: 17LM20010

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
1200	50°	Sun	low	0-10	SW	Dry	OVM-580	PID
							0	0

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)]

4.4ft x .163 = 0.717 x 3 = 2.156

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
	10.50	5.5	5	—	—	—

DATA COLLECTED AT WELL SITE	PID READING ~~(OPENING WELL)~~ DO	DEPTH TO STATIC WATER LEVEL (TOC)	DEPTH TO STABILIZED WATER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
	4.50	6.1 ft.	6.6 ft.	9.3 ft.	1200

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)	
1305	6.5	180 ml/min	2 gal	4.42	14.2	0.308	7.01	61	200	
1310	6.6	180 ml/min		4.03	14.2	0.320	6.85	67	25.4	
1315	6.6	180 ml/min		3.41 ysi	14.2	0.321	6.85	66	23.4	
1320	6.6	180 ml/min		3.20 ysi	14.2	0.317	6.89	58	8.4	
1325	6.6	180 ml/min	3 gal	3.40 ysi	14.2	0.316	6.90	55	10.2	
1330	6.6	180 ml/min		3.50 ysi	14.2	0.316	6.97	48	6.4	
1335	6.6	180 ml/min		3.60 ysi	14.2	0.317	6.98	42	4.3	
1340	6.6	180 ml/min		3.67 ysi	14.2	0.316	6.98	39	1.1	
1345	6.6	180 ml/min		3.65 ysi	14.2	0.315	6.98	37	1.2	
1350	6.6	180 ml/min	4 gal	3.56 ysi	14.2	0.315	6.99	35	0.8	202c
1355	6.6	180 ml/min		3.56 ysi	14.2	0.315	6.99	34	0.4	202c
1400		Sample Collected 17LM20010								

17LM 20010 U @ 1400 & 17LM20010F @ 1400

Form # _____

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	CONSULTANT: PARSONS ES	WELL #: MW17-2

PROJECT: QUARTERLY SAMPLING -SEAD 16/17
LOCATION: ROMULUS, NY

DATE: 11/17
INSPECTORS:
PUMP #:
SAMPLE ID #:

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
1600	50°	Sun	Low	05	SW	Dry	OVM-580	PID
							0	0

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	0.611	1.389	2.475	5.564

ONE WELL VOLUME (GAL) = [(POW - STABILIZED WATER LEVEL) X WELL DIAMETER FACTOR (GAL/FT)]
290 x .163 =

HISTORIC DATA	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND
	8.80		2			

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	5.70			1645

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)
			Roots in Well Pump cannot reach bottom of well the peristaltic pump will need to be used tomorrow.						
			Peristaltic pump is not able to get past the obstruction in the well there is .5 foot of water in this well enough to collect one Sample.						

Form # _____

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	CONSULTANT: PARSONS ES	WELL #: MW17-3

PROJECT: QUARTERLY SAMPLING -SEAD 16/17
LOCATION: ROMULUS, NY

DATE: 11/17/09
INSPECTORS: _____
PUMP #: _____
SAMPLE ID #: 17LM20012

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
1530	50°	Sun	Low	5-10	SW	Dry	OVM-580	PID
							Ø	Ø

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)]
1.17 x .163 =

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
	7.58	5.58	2			

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
	Ø	6.41			1515

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)
1530		Black	organic	water	removed	with	roots &	dirt	pumped well dry
		at	1545	wait	to	recharge	to	start	purge WL= 7.40
1615			Purged	1500 ml	total	well	well	be	sampled tomorrow.
			Well	dry	at	1654			
11/18/09	the well has .8 ft of water after beg purged 11/17 and let to recharge overnight. Sample well be collected directly from the well for both Filtered and Unfiltered samples.								
	17LM20012U @ 1245 on 11/18/09								
	17LM20012F @ 1245 on 11/18/09								

Form # _____

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	CONSULTANT: PARSONS ES	WELL #: MW-17-4
PROJECT: QUARTERLY SAMPLING -SEAD 16/17		DATE: 11/17/09
LOCATION: ROMULUS, NY		INSPECTORS:
		PUMP #:
		SAMPLE ID #: 17LM20013

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
1300	50°	Sun	low	0-5	SW	Dry	OVM-580	PID
							ø	ø

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)]

3.02ft x .163

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
	8.7					

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
		5.68		7.6	1315

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)	
1325	6.5	100ml/min		2.10	13.2	0.260	7.13	15	13.9	
1335	6.6	100ml/min		2.05	13.2	0.262	7.23	20	7.7	
1345	6.70	100ml/min		2.12	13.2	0.264	7.43	12	8.1	
1355	6.75	100ml/min	1.5gal	Well Dry	water level	below	7.0			
1400	7.0	100ml/min		7.84	13.1	0.267	7.10	-45	15.1	
				~~Reduce to 70ml/min~~		Stop purge.				
1500	7.0	75ml/min	1.75	0.87		.273	7.30	-33	9.3	
1505	7.0	75ml/min		0.79		.264	7.31	-26	10.3	
1510	7.0	75ml/min		0.78		.263	7.31	-24	9.4	202
1515	7.0	75ml/min		0.76		.263	7.31	-20	8.4	20.
1520	7.0	75ml/min		0.75		.262	7.31	-18	7.3	202
1525				0.74		.261	7.31	-17	6.2	202
1530				Sample Collected.						
			17LM20013U @ 1530		and	17LM20013F @ 1530				

Form # _____

SAMPLING RECORD - GROUNDWATER

SENECA ARMY DEPOT ACTIVITY	CONSULTANT: PARSONS ES	WELL #: MW17-5

PROJECT: QUARTERLY SAMPLING -SEAD 16/17
LOCATION: ROMULUS, NY

DATE: 11/17/09
INSPECTORS:
PUMP #:
SAMPLE ID #: 17LM20014

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
1320	50°	Sun	low	0-5	SW	Dry	OVM-580	PID
							Ø	Ø

WELL VOLUME CALCULATION FACTORS

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

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

HISTORIC DATA	DEPTH TO POINT OF WELL (TOC)	DEPTH TO TOP OF SCREEN (TOC)	SCREEN LENGTH (FT)	WELL DEVELOPMENT TURBIDITY	WELL DEVELOPMENT pH	WELL DEVELOPMENT SPEC. COND
	10.5					

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
	Ø				1320

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)	
1330	5.75	120 m/m		2.97	11.8	0.358	7.23	82	62	
1340	5.75	120 m/min		2.91	11.8	0.356	7.42	85	36.4	
1345	5.75	120 m/min		2.94 ysi	11.8	0.356	7.36	72	24.1	
1355	5.75	120 m/min		2.68 ysi	11.8	0.342	7.32	87	18.6	
1405	5.75	120 m/min		2.42 ysi	11.8	0.332	7.24	90	14.2	
1415	5.75	120 m/min	1.0 gal	2.01 ysi	11.8	0.337	7.19	107	006	2020
1420	5.75	120 m/min		1.86 ysi	11.8	0.335	7.18	109	006	2020
1425	5.75	120 m/min		1.86 ysi	11.8	0.336	7.20	105	0.03	2020
1430	5.75	120 m/min		1.86 ysi	11.8	0.336	7.21	106	0.04	2020

Sample Collected 1430
17LM20014U @ 1430 and 17LM20014F @ 1430

APPENDIX D

COMPLETE GROUNDWATER DATA RESULTS FOR YEAR 1, YEAR 2, AND YEAR 3

Appendix D Table D-1
SEAD-16 Post-Remedial Action Groundwater Monitoring Results
SEAD-16 & SEAD-17 Third Annual Groundwater Monitoring Report
Seneca Army Depot Activity

SITE LOCATION				SEAD-16	SEAD-16	SEAD-16	SEAD-16	`	SEAD-16	SEAD-16	SEAD-16	SEAD-16
LOCATION ID				MW16-1	MW16-1	MW16-1	MW16-1	MW16-1	MW16-2	MW16-2	MW16-2	MW16-2
MATRIX				GW	GW	GW	GW	GW	GW	GW	GW	GW
SAMPLE ID				16LM20001	16LM20000	16LM20013	16LM20014UNFIL	16LM20014FIL	16LM20002	16LM20007	16LM20015UNFIL	16LM20015FIL
SAMPLE DATE				12/20/2007	12/20/2007	12/9/2008	11/13/2009	11/13/2009	12/20/2007	12/9/2008	11/11/2009	11/11/2009
SAMPLE TYPE				DU	SA	SA	SA	SA	SA	SA	SA	SA
STUDY ID				LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM
SAMPLE ROUND				1	1	2	3	3	1	2	3	3
Parameter[1]	**Units**	**Criteria**[2]	**Action Level**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Aluminum	UG/L			91.6 J	61.4 J	148 J	45 J	24 U	98.8 J	97.1 J	205	24 U
Antimony	UG/L	GA	3	1.02	1 U	0.95 J	1 U	1 U	**3.36**	**5.53**	**3.6**	**3.6**
Arsenic	UG/L	MCL	10	4.2 U	4.2 U	3.7 U	3.7 U	3.7 U	4.2 U	3.7 U	3.7 U	3.7 U
Barium	UG/L	GA	1,000	59	60.4	125	104	105	64.6	69.7	72.7	71.9
Beryllium	UG/L	MCL	4	0.27 U	0.27 U	0.33 U	0.3 U	0.3 U	0.27 U	0.33 U	0.3 U	0.3 U
Cadmium	UG/L	GA	5	0.36 U	0.36 U	0.33 U	0.3 U	0.3 U	0.36 U	0.33 U	0.3 U	0.3 U
Calcium	UG/L			105000 J	107000 J	176000	110000 J	111000 J	143000 J	138000	117000 J	118000 J
Chromium	UG/L	GA	50	0.84 U	0.84 U	0.88 U	0.9 U	0.9 U	0.84 U	0.88 U	0.9 U	0.9 U
Cobalt	UG/L			0.89 U	0.89 U	1.1 U	1.1 U	1.1 U	0.89 U	1.1 U	1.1 U	1.1 U
Copper	UG/L	GA	200	1.3 U	1.3 U	1.3 U	1.6 J	1.6 J	4.5 J	4 J	5.1 J	3.4 J
Iron	UG/L	GA	300	68.3	35.8 J	93.3	19 UJ	19 UJ	49.5 J	26.1 J	197 J	19 UJ
Iron+Manganese	UG/L	GA	500	73	39 J	105	21.4 J	20 J	53 J	27	260.7 J	58.5
Lead	UG/L	MCL	15	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U
Magnesium	UG/L			15900 J	16100 J	25800	17900	18000	15600 J	15700	12300	12600
Manganese	UG/L	GA	300	5	3.3	11.8	2.4 J	1 J	3.4	0.84 J	63.7	39.5
Mercury	UG/L	GA	0.7	0.12 U	0.12 U	0.12 U	0.1 U	0.1 U	0.12 U	0.148 J	0.1 U	0.1 U
Nickel	UG/L	GA	100	1.2 U	1.2 U	1 U	1.2 J	1.8 J	1.2 U	1.6 J	2.6 J	2.2 J
Potassium	UG/L			907 R	886 R	1340 J	1100	1110	2050 R	2410 J	3140	3170
Selenium	UG/L	GA	10	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U
Silver	UG/L	GA	50	1 U	1 U	1.3 U	1.3 U	1.3 U	1 U	1.3 U	1.3 U	1.3 U
Sodium	UG/L	GA	20,000	**25300** J	**24200** J	**182000**	8000 J	8000 J	**49600** J	**63500**	18800 J	19500 J
Thallium	UG/L	MCL	2	0.03 U	0.03 U	0.09 U	0.2 U	0.2 U	0.03 U	0.09 U	0.2 U	0.2 U
Vanadium	UG/L			0.78 U	0.78 U	0.98 U	1 U	1 U	0.78 U	0.98 U	1 U	1 U
Zinc	UG/L			7.8 J	4.4 J	5.8 J	3.6 U	3.6 U	8.2 J	10.2	11.3	11.1

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.

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

Appendix D Table D-1
SEAD-16 Post-Remedial Action Groundwater Monitoring Results
SEAD-16 & SEAD-17 Third Annual Groundwater Monitoring Report
Seneca Army Depot Activity

SITE LOCATION				SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16
LOCATION ID				MW16-4	MW16-4	MW16-4	MW16-4	MW16-4	MW16-5	MW16-5	MW16-5	MW16-5
MATRIX				GW	GW	GW	GW	GW	GW	GW	GW	GW
SAMPLE ID				16LM20003	16LM20009	16LM20008	16LM20016UNFIL	16LM20016FIL	16LM20004	16LM20010	16LM20017UNFIL	16LM20017FIL
SAMPLE DATE				12/20/2007	12/9/2008	12/9/2008	11/17/2009	11/17/2009	12/20/2007	12/10/2008	11/16/2009	11/16/2009
SAMPLE TYPE				SA	DU	SA	SA	SA	SA	SA	SA	SA
STUDY ID				LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM
SAMPLE ROUND				1	2	2	3	3	1	2	3	3
Parameter[1]	**Units**	**Criteria[2]**	**Action Level**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Aluminum	UG/L			167 J	101 J	104 J	68 J	24 U	160 J	563	164 J	24 U
Antimony	UG/L	GA	3	**5.11**	2.94	2.89	**6.3**	**6**	1.82	**4.23**	1 U	1 U
Arsenic	UG/L	MCL	10	4.2 U	3.7 U	3.7 U	3.7 U	3.7 U	4.2 U	3.7 U	3.7 U	3.7 U
Barium	UG/L	GA	1,000	44.5	279	290	123	129	38.9	22	42	42.8
Beryllium	UG/L	MCL	4	0.27 U	0.33 U	0.33 U	0.3 U	0.3 U	0.27 U	0.33 U	0.3 U	0.3 U
Cadmium	UG/L	GA	5	0.36 U	0.33 U	0.33 U	0.3 U	0.3 U	0.36 U	0.33 U	0.3 U	0.3 U
Calcium	UG/L			87100 J	267000	275000	125000 J	130000 J	89000 J	53100	110000 J	115000 J
Chromium	UG/L	GA	50	1 J	0.88 U	0.88 U	0.9 U	0.9 U	1.1 J	1.2 J	0.9 U	0.9 U
Cobalt	UG/L			0.89 U	1.1 U	1.1 U	2 J	1.8 J	0.89 U	1.1 U	1.1 U	1.1 U
Copper	UG/L	GA	200	5.4 J	4.2 J	4.4 J	6.2 J	2.4 J	3.1 J	10.6	1.3 U	1.3 U
Iron	UG/L	GA	300	95.4	38.4 J	57 J	**419** J	**329** J	**1200**	**699**	**1150** J	**800** J
Iron+Manganese	UG/L	GA	500	127	46 J	65	**513.5** J	417.7 J	**1238**	**731**	**1323** J	**970** J
Lead	UG/L	MCL	15	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	10.1	2.9 U	2.9 U
Magnesium	UG/L			9440 R	34500	35200	16000	16800	9380 R	6050	11800	12200
Manganese	UG/L	GA	300	31.2	8	7.7	94.5	88.7	37.6	32.4	173	170
Mercury	UG/L	GA	0.7	0.12 U	0.12 U	0.12 U	0.1 U	0.1 U	0.12 U	0.12 U	0.1 U	0.1 U
Nickel	UG/L	GA	100	1.2 U	1.9 J	2.2 J	1.4 J	1.7 J	1.2 U	2.6 J	2 J	1.8 J
Potassium	UG/L			1300 R	3690 J	3830 J	3270	3270	4420 R	2610 J	2380	2370
Selenium	UG/L	GA	10	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U
Silver	UG/L	GA	50	1 U	1.3 U	1.3 U	1.3 U	1.3 U	1 U	1.3 U	1.3 U	1.3 U
Sodium	UG/L	GA	20,000	**40800** J	**419000**	**434000**	**363000** J	**380000** J	8410 R	2180	2800 J	2700 J
Thallium	UG/L	MCL	2	0.03 U	0.09 U	0.09 U	0.2 U	0.2 U	0.03 U	0.09 U	0.2 U	0.2 U
Vanadium	UG/L			0.78 U	0.98 U	0.98 U	1.1 J	1.1 J	1.2 J	2.3 J	1.1 J	1 U
Zinc	UG/L			5.3 J	9.8 J	14.6 J	3.6 U	3.6 U	34.4	10.3	3.6 U	3.6 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.

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

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SEAD-16 Post-Remedial Action Groundwater Monitoring Results
SEAD-16 & SEAD-17 Third Annual Groundwater Monitoring Report
Seneca Army Depot Activity

SITE LOCATION				SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16	SEAD-16
LOCATION ID				MW16-6	MW16-6	MW16-6	MW16-6	MW16-7	MW16-7	MW16-7	MW16-7	MW16-7
MATRIX				GW	GW	GW	GW	GW	GW	GW	GW	GW
SAMPLE ID				16LM20005	16LM20011	16LM20018UNFIL	16LM20018FIL	16LM20006	16LM20012	16LM20020UNFIL	16LM20020FIL	16LM20019UNFIL
SAMPLE DATE				12/20/2007	12/9/2008	11/17/2009	11/17/2009	12/20/2007	12/10/2008	11/12/2009	11/12/2009	11/12/2009
SAMPLE TYPE				SA	SA	SA	SA	SA	SA	DU	DU	SA
STUDY ID				LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM
SAMPLE ROUND				1	2	3	3	1	2	3	3	3
Parameter[1]	**Units**	**Criteria[2]**	**Action Level**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Aluminum	UG/L			168 J	189 J	442	107 J	45.9 J	577	116 J	25 J	182 J
Antimony	UG/L	GA	3	1 U	0.92 J	1 U	0.9 J	**9.58**	**13.6**	**16.3**	**13.9**	**15.7**
Arsenic	UG/L	MCL	10	4.2 U	3.7 U	3.7 U	3.7 U	4.2 U	3.7 U	3.7 U	3.7 U	3.7 U
Barium	UG/L	GA	1,000	31.8	39.1	80.2	78.5	170	122	80.3	83.9	81.6
Beryllium	UG/L	MCL	4	0.27 U	0.33 U	0.3 U	0.3 U	0.27 U	0.33 U	0.3 U	0.3 U	0.3 U
Cadmium	UG/L	GA	5	0.36 U	0.33 U	0.3 U	0.3 U	0.46 J	0.33 U	0.3 U	0.3 U	0.3 U
Calcium	UG/L			80400 J	84300	112000 J	112000 J	194000	133000	82800 J	81900 J	84600 J
Chromium	UG/L	GA	50	0.84 U	0.88 U	0.9 U	0.9 U	0.84 U	1.6 J	0.9 U	0.9 U	0.9 U
Cobalt	UG/L			0.89 U	1.1 U	1.1 U	1.1 U	1.6 J	1.1 J	1.1 U	1.1 U	1.1 U
Copper	UG/L	GA	200	3.4 J	2.1 J	2.5 J	1.9 J	34.7	20.2	4.1 J	3.5 J	5 J
Iron	UG/L	GA	300	**418**	153	**440** J	55 J	29.2 J	**770**	61 J	19 UJ	135 J
Iron+Manganese	UG/L	GA	500	441	158	**515** J	153.4 J	**660** J	**990**	168 J	171	244 J
Lead	UG/L	MCL	15	2.9 U	2.9 U	2.9 U	2.9 U	**26.5**	**88.6**	9.4	4.9 J	12.1
Magnesium	UG/L			7100 R	7380	9950	9970	32000 J	25100	16200	14800	16500
Manganese	UG/L	GA	300	23.3	4.8	75	98.4	**631**	220	107	152	109
Mercury	UG/L	GA	0.7	0.12 U	0.12 U	0.1 U	0.1 U	0.507	0.12 U	0.1 U	0.1 U	0.1 U
Nickel	UG/L	GA	100	1.2 U	1 U	2.6 J	1.2 J	5.5 J	2.6 J	1.1 J	2 J	1.7 J
Potassium	UG/L			2690 R	2310 J	2580	2380	5480 J	5670 J	5630	7010	5780
Selenium	UG/L	GA	10	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U
Silver	UG/L	GA	50	1 U	1.3 U	1.3 U	1.3 U	1 U	1.3 U	1.3 U	1.3 U	1.3 U
Sodium	UG/L	GA	20,000	6110 R	9200	**20600** J	**22000** J	**68400** J	**74900**	**46100** J	**55900** J	**47100** J
Thallium	UG/L	MCL	2	0.03 U	0.09 U	0.008 U	0.008 U	0.03 J	0.09 U	0.2 U	0.2 U	0.2 U
Vanadium	UG/L			0.86 J	0.98 U	1.3 J	1 U	0.78 U	0.98 U	1 U	1 U	1 U
Zinc	UG/L			5.5 J	3.7 J	3.6 U	3.6 U	3.6 U	8.6 J	3.6 U	3.6 U	3.6 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.

U = compound was not detected
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R = the compound was rejected

Appendix D Table D-1
SEAD-16 Post-Remedial Action Groundwater Monitoring Results
SEAD-16 & SEAD-17 Third Annual Groundwater Monitoring Report
Seneca Army Depot Activity

SITE LOCATION				SEAD-16
LOCATION ID				MW16-7
MATRIX				GW
SAMPLE ID				16LM20019FIL
SAMPLE DATE				11/12/2009
SAMPLE TYPE				SA
STUDY ID				LTM
SAMPLE ROUND				3
Parameter[1]	**Units**	**Criteria**[2]	**Action Level**	Value (Q)
Aluminum	UG/L			32 J
Antimony	UG/L	GA	3	**15.2**
Arsenic	UG/L	MCL	10	3.7 U
Barium	UG/L	GA	1,000	83.6
Beryllium	UG/L	MCL	4	0.3 U
Cadmium	UG/L	GA	5	0.3 U
Calcium	UG/L			85000 J
Chromium	UG/L	GA	50	0.9 U
Cobalt	UG/L			1.1 U
Copper	UG/L	GA	200	3.1 J
Iron	UG/L	GA	300	19 UJ
Iron+Manganese	UG/L	GA	500	155
Lead	UG/L	MCL	15	4.4 J
Magnesium	UG/L			15900
Manganese	UG/L	GA	300	136
Mercury	UG/L	GA	0.7	0.1 U
Nickel	UG/L	GA	100	1.9 J
Potassium	UG/L			6520
Selenium	UG/L	GA	10	6.1 U
Silver	UG/L	GA	50	1.3 U
Sodium	UG/L	GA	20,000	**52100** J
Thallium	UG/L	MCL	2	0.2 U
Vanadium	UG/L			1 U
Zinc	UG/L			3.6 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.

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

Appendix D Table D-2
SEAD-17 Post-Remedial Action Groundwater Monitoring Results
SEAD-16 & SEAD-17 Third Annual Groundwater Monitoring Report
Seneca Army Depot Activity

SITE LOCATION				SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17
LOCATION ID				MW17-1	MW17-1	MW17-1	MW17-1	MW17-2	MW17-2	MW17-2	MW17-2	MW17-3	MW17-3
MATRIX				GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
SAMPLE ID				17LM20000	17LM20005	17LM20010UNFIL	17LM20010FIL	17LM20001	17LM20006	17LM20011UNFIL	17LM20011FIL	17LM20002	17LM20007
SAMPLE DATE				12/20/2007	12/11/2008	11/18/2009	11/18/2009	12/20/2007	12/10/2008	11/17/2009	11/17/2009	12/20/2007	12/10/2008
SAMPLE TYPE				SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
STUDY ID				LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM
SAMPLE ROUND				1	2	3	3	1	2	3	3	1	2
Parameter[1]	**Units**	**Criteria[2]**	**Action Level**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Aluminum	UG/L			204	219	59 J	37 J	110 J	142 J	19600	88 J	106 J	386
Antimony	UG/L	GA	3	1 U	1 U	1 U	1 U	**3.44**	2.76	**3.7**	2.2	1 U	1 U
Arsenic	UG/L	MCL	10	4.2 U	3.7 U	3.7 U	3.7 U	4.2 U	3.7 U	7.8 J	3.7 U	4.2 U	3.7 U
Barium	UG/L	GA	1,000	70	79	99	99.1	58.8	51.8	251	82.3	39	29.3
Beryllium	UG/L	MCL	4	0.27 U	0.33 U	0.3 U	0.3 U	0.27 U	0.33 U	1.2 J	0.3 U	0.27 U	0.33 U
Cadmium	UG/L	GA	5	0.36 U	0.33 U	0.3 U	0.3 U	0.36 U	0.33 U	1.7	0.3 U	0.36 U	0.33 U
Calcium	UG/L			98300 J	95600	108000 J	109000 J	110000 J	112000	195000 J	154000 J	69000 J	67200
Chromium	UG/L	GA	50	0.84 U	0.88 U	0.9 U	0.9 U	0.84 U	2.9 J	37.2	0.9 U	0.84 U	0.88 U
Cobalt	UG/L			0.89 U	1.1 U	1.1 U	1.1 U	0.89 U	1.1 U	10.5	1.1 U	0.89 U	1.1 U
Copper	UG/L	GA	200	1.3 U	1.3 U	1.3 U	1.3 U	6.2 J	4.4 J	46.7	2.9 J	2.6 J	2.8 J
Iron	UG/L	GA	300	106	126	42 J	19 UJ	140	115	**25500** J	19 UJ	133	**1300**
Iron+Manganese	UG/L	GA	500	119	141	67.6 J	57.9	160	121	**25929** J	20.5 J	170	**1573**
Lead	UG/L	MCL	15	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	**103**	2.9 U	2.9 U	2.9 U
Magnesium	UG/L			21800 J	20600	24000	24300	11000 R	11200	23300	18200	7560 R	7400
Manganese	UG/L	GA	300	13.2	14.9	25.6	38.9	20.5	6.1	**429**	1.5 J	36.7	273
Mercury	UG/L	GA	0.7	0.12 U	0.12 U	0.1 U	0.1 U	0.12 U	0.12 U	0.1 U	0.1 U	0.12 U	0.12 U
Nickel	UG/L	GA	100	1.2 U	1.3 J	1 U	1 U	1.2 U	2.8 J	34	1.2 J	1.2 U	1.8 J
Potassium	UG/L			614 R	462 J	254 J	260 J	1690 R	1260 J	7810	2390	2620 R	1840 J
Selenium	UG/L	GA	10	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U
Silver	UG/L	GA	50	1 U	1.3 U	1.3 U	1.3 U	1 U	1.3 U	1.3 U	1.3 U	1 U	1.3 U
Sodium	UG/L	GA	20,000	7790 R	8380	7400 J	7300 J	6620 R	7860	**20300** J	19800 J	4550 R	5500
Thallium	UG/L	MCL	2	0.03 U	0.09 U	0.008 U	0.008 U	0.03 U	0.09 U	0.2 U	0.008 U	0.03 U	0.09 U
Vanadium	UG/L			0.78 U	0.98 U	1 U	1 U	0.78 U	0.98 U	32.8	1 U	0.78 U	0.98 U
Zinc	UG/L			4.7 J	4 J	3.6 U	3.6 U	72 J	27.6	935	28.6	27 J	14.2

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.

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

Appendix D Table D-2
SEAD-17 Post-Remedial Action Groundwater Monitoring Results
SEAD-16 & SEAD-17 Third Annual Groundwater Monitoring Report
Seneca Army Depot Activity

SITE LOCATION				SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17
LOCATION ID				MW17-3	MW17-3	MW17-4	MW17-4	MW17-4	MW17-4	MW17-5	MW17-5	MW17-5	MW17-5
MATRIX				GW	GW	GW	GW	GW	GW	GW	GW	GW	GW
SAMPLE ID				17LM20012UNFIL	17LM20012FIL	17LM20003	17LM20008	17LM20013UNFIL	17LM20013FIL	17LM20004	17LM20009	17LM20014UNFIL	17LM20014FIL
SAMPLE DATE				11/18/2009	11/18/2009	12/20/2007	12/10/2008	11/17/2009	11/17/2009	12/20/2007	12/11/2008	11/17/2009	11/17/2009
SAMPLE TYPE				SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
STUDY ID				LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM	LTM
SAMPLE ROUND				3	3	1	2	3	3	1	2	3	3
Parameter[1]	**Units**	**Criteria[2]**	**Action Level**	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Aluminum	UG/L			1550 J	141 J	50.2 J	125 J	70 J	28 J	98.5 J	125 J	98 J	29 J
Antimony	UG/L	GA	3	1.5	1 U	1 U	0.62 J	1 U	1 U	1 U	0.56 J	1	1
Arsenic	UG/L	MCL	10	3.7 U	3.7 U	4.2 U	3.7 U	3.7 U	3.7 U	4.2 U	3.7 U	3.7 U	3.7 U
Barium	UG/L	GA	1,000	54.5	49.4	32.5	35.9	36.6	36.3	86.7	82.9	168	166
Beryllium	UG/L	MCL	4	0.3 U	0.3 U	0.27 U	0.33 U	0.3 U	0.3 U	0.27 U	0.33 U	2 U	2 U
Cadmium	UG/L	GA	5	0.3 U	0.3 U	0.36 U	0.33 U	0.3 U	0.3 U	0.36 U	0.33 U	0.3 U	0.3 U
Calcium	UG/L			95900 J	99400 J	74900 J	74700	97600 J	96600 J	97100 J	97300	185000 J	184000 J
Chromium	UG/L	GA	50	5.2	0.9 U	1 J	0.88 U	0.9 U	0.9 U	0.84 U	0.88 U	0.9 U	0.9 U
Cobalt	UG/L			1.7 J	1.5 J	0.89 U	2.4 J	1.3 J	1.5 J	0.89 U	1.1 U	1.1 U	1.1 U
Copper	UG/L	GA	200	7.9 J	2.5 J	1.8 J	1.8 J	1.3 U	1.3 U	1.3 U	1.5 J	1.3 U	1.3 U
Iron	UG/L	GA	300	**2690** J	**827** J	45.4 J	**1760**	142 J	60 J	91.7	76	34 J	19 UJ
Iron+Manganese	UG/L	GA	500	**2858** J	**968** J	59 J	**2671**	355 J	258 J	128	85	61.4 J	43.3
Lead	UG/L	MCL	15	8.6	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U
Magnesium	UG/L			9170	9850	10400 R	10200	13000	12900	15800 J	15600	27300	27100
Manganese	UG/L	GA	300	168	141	13.7	**911**	213	198	36.5	8.9	27.4	24.3
Mercury	UG/L	GA	0.7	0.1 U	0.1 U	0.12 U	0.12 U	0.1 U	0.1 U	0.12 U	0.12 U	0.1 U	0.1 U
Nickel	UG/L	GA	100	4.5 J	3.1 J	1.2 U	2.6 J	2.4 J	2.2 J	1.2 U	1.2 J	1.8 J	1.7 J
Potassium	UG/L			1590	1290	838 R	1190 J	866	844	972 R	824 J	1960	1920
Selenium	UG/L	GA	10	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U	6.1 U
Silver	UG/L	GA	50	1.3 U	1.3 U	1 U	1.3 U	1.3 U	1.3 U	1 U	1.3 U	1.3 U	1.3 U
Sodium	UG/L	GA	20,000	6200 J	7500 J	**28500** J	15500	10500 J	10400 J	7950 R	7360	**366000** J	**364000** J
Thallium	UG/L	MCL	2	0.008 U	0.008 U	0.03 U	0.09 U	0.008 U	0.008 U	0.03 U	0.09 U	0.08 J	0.08 J
Vanadium	UG/L			1.7 J	1 U	0.78 U	0.98 U	1 U	1 U	0.78 U	0.98 U	1 U	1 U
Zinc	UG/L			45.7	21.1	5.1 J	6.7 J	3.6 U	3.6 U	4.7 J	41.6	3.6 U	3.6 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
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