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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.

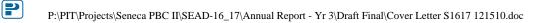
This work was performed in accordance with the Scope of Work (SOW) for Contract No. FA8903-04-D-8674, Task Order No. 0031.

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 K. Hoddinott, USACHPPM R. Battaglia, USACE - NY District T. Battaglia, USACE - NY District AFCEE Contact Data Library (letter only via email)





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December 15, 2010

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Mr. Kuldeep K. Gupta, P.E. New York State Department of Environmental Conservation (NYSDEC) Division of Environmental Remediation Remedial Bureau A, Section C 625 Broadway Albany, NY 12233-7015

Mr. Mark Sergott Bureau of Environmental Exposure Investigation Flanigan Square, Room 300 547 River Street 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

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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,

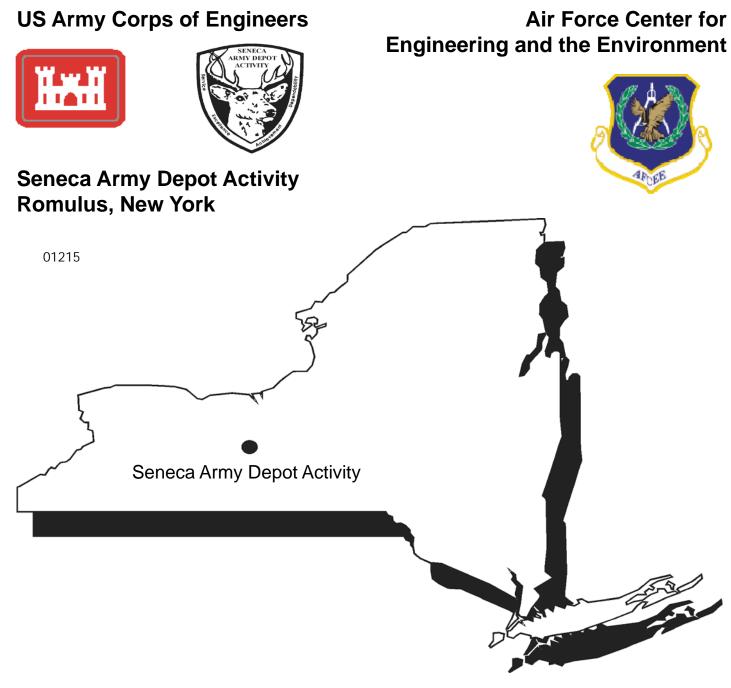
Todd Heino, P.E., VP Project Manager

Enclosures

cc: M. Heaney, TechLaw R. Battaglia, USACE-NY J. Chavez, AFCEE S. Absolom, SEDA T. Battaglia, USACE-NY AFCEE CDL (letter only)

K. Hoddinott, USACHPPM





# 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



#### 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**

**Prepared by:** 

## PARSONS 100 High Street Boston, MA 02110

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  $2.8 \times 10^{-3}$  cm/sec to  $2.5 \times 10^{-2}$  cm/sec and the geometric mean was  $7.3 \times 10^{-3}$  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  $2.9 \times 10^{-3}$  cm/sec to  $1.4 \times 10^{-2}$  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 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  $\mu$ g/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  $\mu$ g/L and 14.6  $\mu$ g/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  $\mu$ g/L), and comparable (i.e., 6.3  $\mu$ g/L, unfiltered; 6  $\mu$ g/L filtered) at MW16-4.

Iron exceeded its Class GA standard (300  $\mu$ g/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  $\mu$ g/L and 800 J  $\mu$ g/L, respectively).

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

Unfiltered "iron+manganese" concentrations found in wells MW16-4 and MW16-6 also exceeded the 500  $\mu$ g/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  $\mu$ g/L).

Sodium was detected at concentrations above its Class GA standard (20,000  $\mu$ g/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  $\mu$ g/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  $\mu$ g/L at MW16-6 and 54,000 J  $\mu$ g/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  $\mu$ g/L) in both the filtered (2690 J  $\mu$ g/L) and unfiltered (827 J  $\mu$ g/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 concentrations 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  $\mu$ g/L) and unfiltered (364,000 J  $\mu$ g/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  $\mu$ g/ in Year 1 to 88.6  $\mu$ g/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  $\mu$ g/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 ( $3.44 \ \mu g/L$ ) exceeded the Class GA groundwater standard of  $3 \ \mu g/L$ , and the concentration of antimony decreased to levels below the Class GA standard each subsequent year to 2.76  $\mu g/L$  in Year 2 and 2.2  $\mu g/L$  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 of 300  $\mu$ g/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  $\mu$ g/L; and in MW17-4 the concentration of iron dropped below the standard to 60  $\mu$ g/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  $\mu$ g/L once in Year 2 at a concentration of 911  $\mu$ g/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  $\mu$ g/L were observed: one during Year 1 at MW17-4 (28,500  $\mu$ g/L), and one during Year 3 at MW17-5 (364,000 J  $\mu$ g/L). From Year 1 to Year 2, the concentration of sodium at MW17-4 decreased below the Class GA standard to 15,500  $\mu$ g/L; in Year 3 the sodium concentration dropped further below the standard to 10,400  $\mu$ g/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**

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#### TABLES

Table 1	Groundwater Table Elevations Summary - SEAD-16
Table 2	Groundwater Table Elevations Summary - SEAD-17
Table 3A	Comparison of Filtered and Unfiltered Groundwater at SEAD-16
Table 3B	Comparison of Filtered and Unfiltered Groundwater at SEAD-17
Table 4A	Post-Remedial Action Groundwater Summary SEAD-16
Table 4B	Post-Remedial Action Groundwater Summary SEAD-17

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

		April 4, 1994		August 27, 1996		December 6, 1996		December 20, 2007		December 9, 2008		November 13, 2009	
Monitoring	Top of PVC	Depth to	Water Table	Depth to	Water Table	Depth to	Water Table	Depth to	Water Table	Depth to	Water Table	Depth to	Water Table
Well	Elevation (1)	Water	Elevation	Water	Elevation	Water	Elevation	Water	Elevation	Water	Elevation	Water	Elevation
	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(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

		April 4, 1994		August 29, 1996		Decemb	December 6, 1996		er 19, 2007	December 9, 2008		November 11, 2009	
Monitoring	Top of PVC	Depth to	Water Table	Depth to	Water Table	Depth to	Water Table	Depth to	Water Table	Depth to	Water Table	Depth to	Water Table
Well	Elevation (1)	Water	Elevation	Water	Elevation	Water	Elevation	Water	Elevation	Water	Elevation	Water	Elevation
	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(feet)	(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

P 111							1		(E+B-1/	05+5-1(	(E + D + /	(E+B-1/	(F+ P-1/
Facility								SEAD-16	SEAD-16	SEAD-16 MW16-2	SEAD-16	SEAD-16	SEAD-16
Location ID								MW16-1	MW16-1		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 3	LTM	LTM
Sampling Round	1							3	3	3	3	3	3
			Frequency	<i>a</i>	Number	Number	Number						
		Maximum	of	Criteria	of	of Times	of Samples						
Parameter	Units	Value	Detection	Level	Exceedances	Detected	Collected	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Aluminum	UG/L	442	71%	2	0	10	14	45 J	24 U	205	24 U	68 J	24 U
Antimony	UG/L	16.3	64%	3 10	8	9	14	1 U	1 U	3.6 3.7 U	3.6	6.3 3.7 U	6
Arsenic	UG/L	0	0%		0	0	14	3.7 U	3.7 U		3.7 U 71.9		3.7 U
Barium	UG/L UG/L	129 0	100% 0%	1000	0	14	14 14	104 0.3 U	105 0.3 U	72.7 0.3 U	/1.9 0.3 U	123 0.3 U	129 0.3 U
Beryllium				4	0	0							
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%	200	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	,	14	19 UJ	19 UJ	197 J	19 UJ	<b>419</b> J	329 J
Iron+Manganese	UG/L UG/L	1323	100% 29%	500 15	4	14	14	21.4 J 2.9 U	20 J 2.9 U	260.7 J	58.5 2.9 U	513.5 J 2.9 U	417.7 J 2.9 U
Lead		12.1		15	0	4	14			2.9 U			
Magnesium	UG/L	18000	100%	200	0	14	14	17900	18000	12300	12600	16000	16800
Manganese	UG/L	173	100%	300	0	14	14 14	2.4 J	1 J	63.7	39.5	94.5	88.7
Mercury Nickel	UG/L	0	0%	0.7 100	0	0	• •	0.1 U 1.2 J	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U
	UG/L	2.6	100%	100	0	14	14 14		1.8 J	2.6 J	2.2 J	1.4 J	1.7 J
Potassium	UG/L	7010	100%	10	0	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 UG/L	0 380000	0%	50 20000	0	0	14 14	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U	1.3 U
Sodium			100%	20000	8	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	/	/	0.4		17.9		0.03	

Notes:

1. Only exceeding metals are included in this sumamry table.

Only exceeding inclusive inclusion in summary lattice.
 The criteria values are NYSDEC Classis 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.

#### Table 3A Comparison of Filtered and Unfiltered Groundwater at SEAD-16 Round 3 - SEAD-16 & 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	1							3	3	3	3
			Frequency		Number	Number	Number				
		Maximum	of	Criteria	of	of Times	of Samples				
Parameter	Units	Value	Detection	Level	Exceedances	Detected	Collected	Value (Q)	Value (Q)	Value (Q)	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	<u>2.5</u> J	1.9 J
Iron	UG/L	1150	64%	300	5	9	14	1150 J	800 J	<b>440</b> J	55 J
Iron+Manganese	UG/L	1323	100%	500	4	14	14	1323 J	<b>970</b> 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	<b>20600</b> 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.

Only exceeding inclusive inclusion in summarily lattice.
 The criteria values are NYSDEC Classis 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.

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

	Facility	,							SEAD-16	SEAD-16	SEAD-16	SEAD-16
	Location ID	)							MW16-7	MW16-7	MW16-7	MW16-7
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Matrix								GW	GW	GW	GW
O       DU       DU       SA       SA       SA         Sampling Round       Sampling Round       III       IIIM       IIIM<	Sample ID	)							16LM20020UNFIL	16LM20020FIL	16LM20019UNFIL	16LM20019FIL
Starpling Round         LTM	Sample Date								11/12/2009	11/12/2009	11/12/2009	11/12/2009
Sampling Round         Frequency         Number of Order         Number of Samples or Samples	QC Code								DU	DU	SA	SA
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	Study ID	)							LTM	LTM	LTM	LTM
Image: brain	Sampling Round	1							3	3	3	3
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$				Frequency		Number	Number	Number				
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $			Maximum	of	Criteria	of	of Times	of Samples				
AntimonyUGL16.364%3891416.313.915.715.2ArsenicUGL00%1000014143.7 U3.7 U3.7 U3.7 U3.7 UBariumUGL129100%10000141480.38.3.98.1.683.6BerylliumUGL00%500140.3 U0.3 U0.3 U0.3 UCadniumUGL130000100%0141482800 J81900 J84600 J85000 JCobaltUGL214%02141.1 U1.1 U1.1 U1.1 U1.1 UCobaltUGL6.286%200012144.1 J3.5 J5 J3.1 JIronUGL16.286%200012144.1 J3.5 J5 J3.1 JIronUGL1323100%500414168 J171244 J155LeadUGL12.12.9%15041416620145001650015900MaganeseUGL12.12.6100%00141416200144107152109136MaganeseUGL12.12.6100%014141670152109136MaganeseUGL13.00.0014141620014400	Parameter	Units	Value	Detection	Level	Exceedances	Detected	Collected	Value (Q)	Value (Q)	Value (Q)	Value (Q)
ArsenicUG/L00%10001414 $3.7 \cup$	Aluminum	UG/L	442	71%		0	10	14	116 J	25 J	182 J	32 J
BariumUG/L129100%10000141480.383.981.683.6BerylliumUG/L00%400140.3 U0.3 U0.3 U0.3 UCadniumUG/L00%500140.3 U0.3 U0.3 U0.3 UCalciumUG/L130000100%0141482800 J81900 J84600 J85000 JChromiumUG/L00%5000140.9 U0.9 U0.9 U0.9 UCobaltUG/L6.286%200012141.1 U1.1 U1.1 U1.1 UCoperUG/L6.286%20001214461 J19 UJ135 J19 UJIron+MaganeseUG/L115064%300591461 J19 UJ135 J19 UJIron+MaganeseUG/L12.129%150414168 J171244 J155LeadUG/L18000100%01414107152109136MarganeseUG/L18000100%01414101 U0.1 U0.1 U0.1 UNickelUG/L00%001414101 U1.1 U0.1 U0.1 UNanzeseUG/L100%00141410.1 U0.1 U0	Antimony	UG/L	16.3	64%	3	8	9	14	16.3	13.9	15.7	15.2
BerylliumUG/L00%400140.3 U0.3 U0.3 U0.3 UCadiumUG/L100000%500140.3 U0.3 U0.3 U0.3 U0.3 UCalciumUG/L13000100%0141482800 J81900 J84600 J85000 JChroniumUG/L00%5000140.9 U0.9 U0.9 U0.9 UCobaltUG/L6.286%200012141.1 U1.1 U1.1 U1.1 UCoperUG/L6.286%200012144.1 J3.5 J5 J3.1 JIronUG/L1.15064%300591461 J19 UJ135 J19 UJIron+ManganeseUG/L12.129%150414168 J171244 J155LeadUG/L12.129%15041416200148001650015900MarganesiumUG/L173100%00141416200148001650015900MercuryUG/L00%0.700141.1 U0.1 U0.1 U0.1 UNickelUG/L2.6100%100141.41.1 J2.J1.7 J1.9 JSolumUG/L00%1000141.1 U1	Arsenic	UG/L	0	0%	10	0	0	14	3.7 U	3.7 U	3.7 U	3.7 U
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	Barium	UG/L	129	100%	1000	0	14	14	80.3	83.9	81.6	83.6
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         15.5         15         14         14         1618 J         171         12.1         4.4 J         155         Lead         UG/L         12.1         4.4 J         1620         144.0	Beryllium	UG/L	0	0%	4	0	0	14	0.3 U	0.3 U	0.3 U	0.3 U
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Cadmium	UG/L	0	0%	5	0	0	14	0.3 U	0.3 U	0.3 U	0.3 U
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Calcium	UG/L	130000	100%		0	14	14	82800 J	81900 J	84600 J	85000 J
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Chromium	UG/L	0	0%	50	0	0	14	0.9 U	0.9 U	0.9 U	0.9 U
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Cobalt	UG/L	2	14%		0	2	14	1.1 U	1.1 U	1.1 U	1.1 U
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Copper	UG/L	6.2	86%	200	0	12	14	4.1 J	3.5 J	5 J	3.1 J
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Iron	UG/L	1150	64%	300	5	9	14	61 J	19 UJ	135 J	19 UJ
MagnesiumUG/L18000100%0141416200148001650015900ManganeseUG/L173100%30001414107152109136MercuryUG/L00%0.7001414107152109136MickelUG/L2.6100%100014141.1 J2 J1.7 J1.9 JPotassiumUG/L7010100%014145630701057806520SeleniumUG/L00%100014145630701057806520SeleniumUG/L00%5000141.3 U1.3 U1.3 U1.3 U1.3 USodiumUG/L380000100%200008141446100 J55900 J47100 J52100 JThallumUG/L00%20014140.2 U0.2 U0.2 U0.2 UVandiumUG/L1.329%04141U1U1 U1 U1 UZincUG/L1.314%02143.6 U3.6 U3.6 U3.6 U	Iron+Manganese	UG/L	1323	100%	500	4	14	14	168 J	171	244 J	155
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Lead	UG/L	12.1	29%	15	0	4	14	9.4	4.9 J	12.1	4.4 J
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	Magnesium	UG/L	18000	100%		0	14	14	16200	14800	16500	15900
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         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         6.1 U         1.3 U         1.	Manganese	UG/L	173	100%	300	0	14	14	107	152	109	136
Potassium         UG/L         7010         100%         0         14         14         5630         7010         5780         6520           Selenium         UG/L         0         0%         10         0         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         6.1 U         1.3 U         1.2 U         1.2 U         0.2 U	Mercury	UG/L	0	0%	0.7	0	0	14	0.1 U	0.1 U	0.1 U	0.1 U
Selenium         UG/L         0         0%         10         0         0         14         6.1 U	Nickel	UG/L	2.6	100%	100	0	14	14	1.1 J	2 J	1.7 J	1.9 J
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]         55900]         47100]         52100]         13 U         1.3 U <td>Potassium</td> <td>UG/L</td> <td>7010</td> <td>100%</td> <td></td> <td>0</td> <td>14</td> <td>14</td> <td>5630</td> <td>7010</td> <td>5780</td> <td>6520</td>	Potassium	UG/L	7010	100%		0	14	14	5630	7010	5780	6520
Sodium         UG/L         38000         100%         2000         8         14         14         46100 J         55900 J         47100 J         52100 J           Thallum         UG/L         0         0%         2         0         0         14         0.2 U	Selenium	UG/L	0	0%	10	0	0	14	6.1 U	6.1 U	6.1 U	6.1 U
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         1 U           Zinc         UG/L         11.3         14%         0         2         14         3.6 U         3.6 U         3.6 U         3.6 U	Silver	UG/L	0	0%	50	0	0	14	1.3 U	1.3 U	1.3 U	1.3 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	Sodium	UG/L	380000	100%	20000	8	14	14	46100 J	55900 J		52100 J
Zinc UG/L 11.3 14% 0 2 14 3.6 U 3.6 U 3.6 U 3.6 U	Thallium	UG/L	0	0%	2	0	0	14	0.2 U	0.2 U	0.2 U	0.2 U
			1.3			0	4	14		1 U		1 U
Turbidity NTU 17.9 100% 0 7 7 0.8 0.8	Zinc	UG/L	11.3	14%		0	2	14		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.

Only exceeding inclusive inclusion in summarily lattice.
 The criteria values are NYSDEC Classis 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.

# 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

Facilit	v							SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17	SEAD-17
Location II								MW17-1	MW17-1	MW17-2	MW17-2	MW17-3	MW17-3
Matri								GW	GW	GW	GW	GW	GW
Sample II								17LM20010UNFIL	17LM20010FIL	17LM20011UNFIL	17LM20011FIL	17LM20012UNFIL	17LM20012FIL
Sample Dat								11/18/2009	11/18/2009	11/17/2009	11/17/2009	11/18/2009	11/18/2009
QC Cod								SA	SA	SA	SA	SA	SA
Study II								LTM	LTM	LTM	LTM	LTM	LTM
Sampling Roun	d							3	3	3	3	3	3
1 0			Frequency		Number	Number	Number						
		Maximum	of	Criteria	of	of Times	of Samples						
Parameter	Units	Value	Detection	Level	Exceedances	Detected	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	<b>2690</b> 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	<b>968</b> 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	<b>20300</b> 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

Facilit	v							SEAD-17	SEAD-17	SEAD-17	SEAD-17
Location II								MW17-4	MW17-4	MW17-5	MW17-5
Matri								GW	GW	GW	GW
Sample II								17LM20013UNFIL	17LM20013FIL	17LM20014UNFIL	17LM20014FIL
Sample Dat								11/17/2009	11/17/2009	11/17/2009	11/17/2009
OC Cod								SA	SA	SA	SA
Study II	)							LTM	LTM	LTM	LTM
Sampling Roun	ł							3	3	3	3
1 0			Frequency		Number	Number	Number				
		Maximum	of	Criteria	of	of Times	of Samples				
Parameter	Units	Value	Detection	Level	Exceedances	Detected	Collected	Value (Q)	Value (Q)	Value (Q)	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
			Frequency		Number	Number	Number						
		Maximum	of	Criteria	of	of Times	of Samples						
Parameter	Units	Value	Detection	Level	Exceedances	Detected	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	<b>419</b> 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:

I. Only exceeding metals are included in this sumamry table
 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
 Shading indicates a concentration above the GA or MCL groundwater standard.

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

Facilit	,							SEAD-16	SEAD-16	SEAD-16	SEAD-16
Location ID								MW16-5	MW16-5	MW16-6	MW16-6
Matrix	1							GW	GW	GW	GW
Sample IE	)							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	1							LTM	LTM	LTM	LTM
Sampling Round	1							3	3	3	3
			Frequency		Number	Number	Number				
		Maximum	of	Criteria	of	of Times	of Samples				
Parameter	Units	Value	Detection	Level	Exceedances	Detected	Collected	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Antimony	UG/L	16.3	64%	3	8	9	14	<u>1</u> U	<u>1</u> U	1 U	0.9 J
Iron	UG/L	1150	64%	300	5	9	14	1150 J	800 J	<b>440</b> J	55 J
Iron+Manganese	UG/L	1323	100%	500	4	14	14	1323 J	<b>970</b> J	515 J	153.4 J
Sodium	UG/L	380000	100%	20000	8	14	14	2800 J	2700 J	20600 J	<b>22000</b> J
Turbidity	NTU	17.9	100%		0	14	14	10	10	7.3	7.3

Notes:

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

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

Facilit	v							SEAD-16	SEAD-16	SEAD-16	SEAD-16
Location II	<b>)</b>							MW16-7	MW16-7	MW16-7	MW16-7
Matri	ĸ							GW	GW	GW	GW
Sample II	)							16LM20020UNFIL	16LM20020FIL	16LM20019UNFIL	16LM20019FIL
Sample Dat	e							11/12/2009	11/12/2009	11/12/2009	11/12/2009
QC Code	e							DU	DU	SA	SA
Study II								LTM	LTM	LTM	LTM
Sampling Roun	d							3	3	3	3
			Frequency		Number	Number	Number				
		Maximum	of	Criteria	of	of Times	of Samples				
Parameter	Units	Value	Detection	Level	Exceedances	Detected	Collected	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Antimony	UG/L	16.3	64%	3	8	9	14	16.3	13.9	15.7	15.2
. mannong			0470	2	0		14				
Iron	UG/L	1150	64%	300	5	9	14	61 J	13.5 19 UJ	135 J	19 UJ
5				300 500	5 4						
Iron	UG/L	1150	64%		5 4 8	9	14	61 J	19 UJ	135 J	19 UJ

Notes:

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

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

													<b>_</b>
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	GQ	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
			Frequency		Number	Number	Number						
		Maximum	of	Criteria	of	of Times	of Samples						
Parameter	Units	Value	Detection	Level	Exceedances	Detected	Collected	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	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	<b>2690</b> 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	<b>968</b> 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	<b>20300</b> 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 IE	)							LTM	LTM	LTM	LTM
Sampling Round	l							3	3	3	3
			Frequency		Number	Number	Number				
		Maximum	of	Criteria	of	of Times	of Samples				
Parameter	Units	Value	Detection	Level	Exceedances	Detected	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

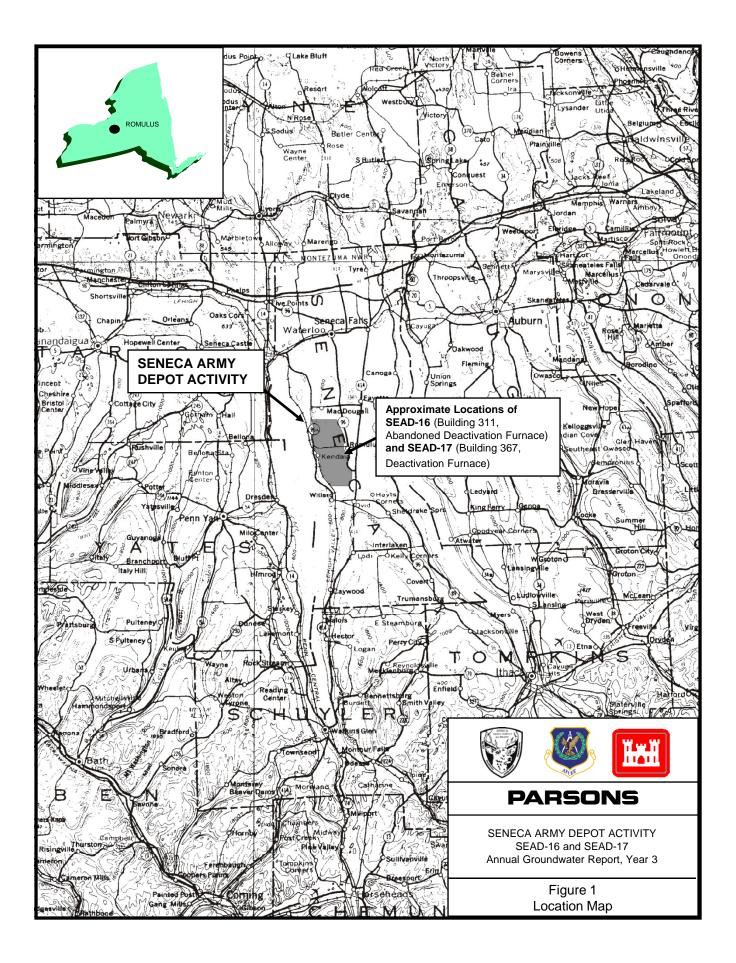
3. Shading indicates a concentration above the GA or MCL groundwater standard.

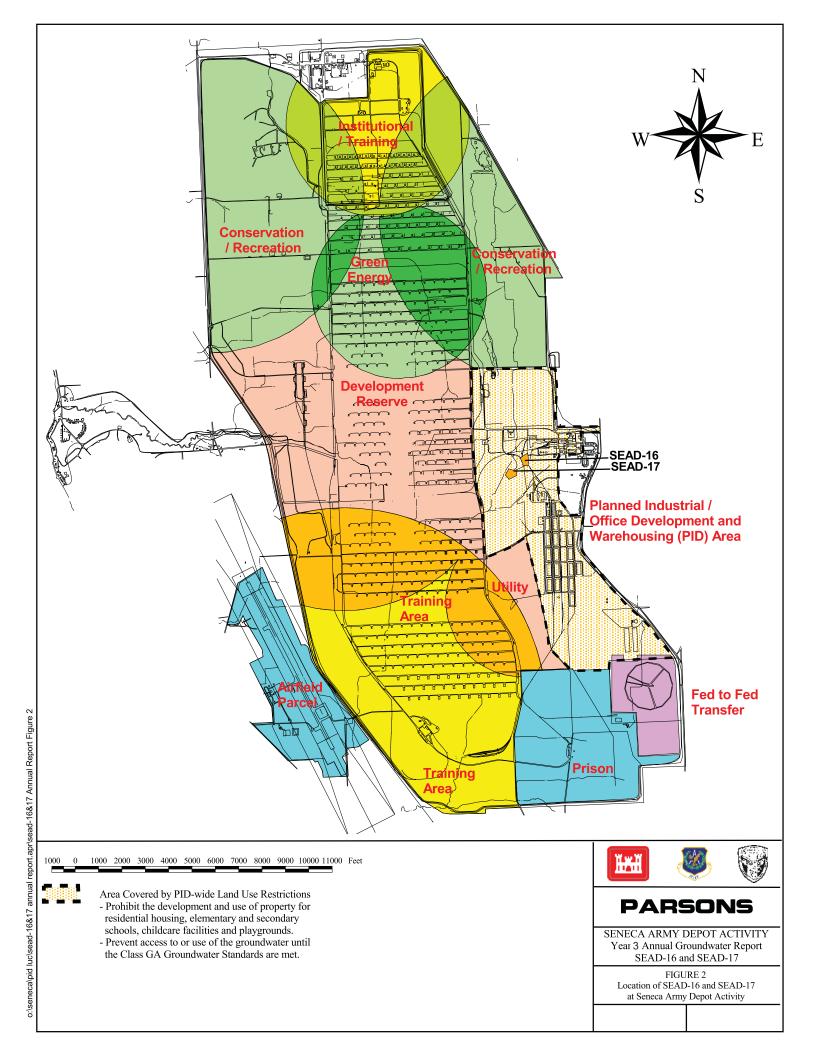
U = compound was not detected

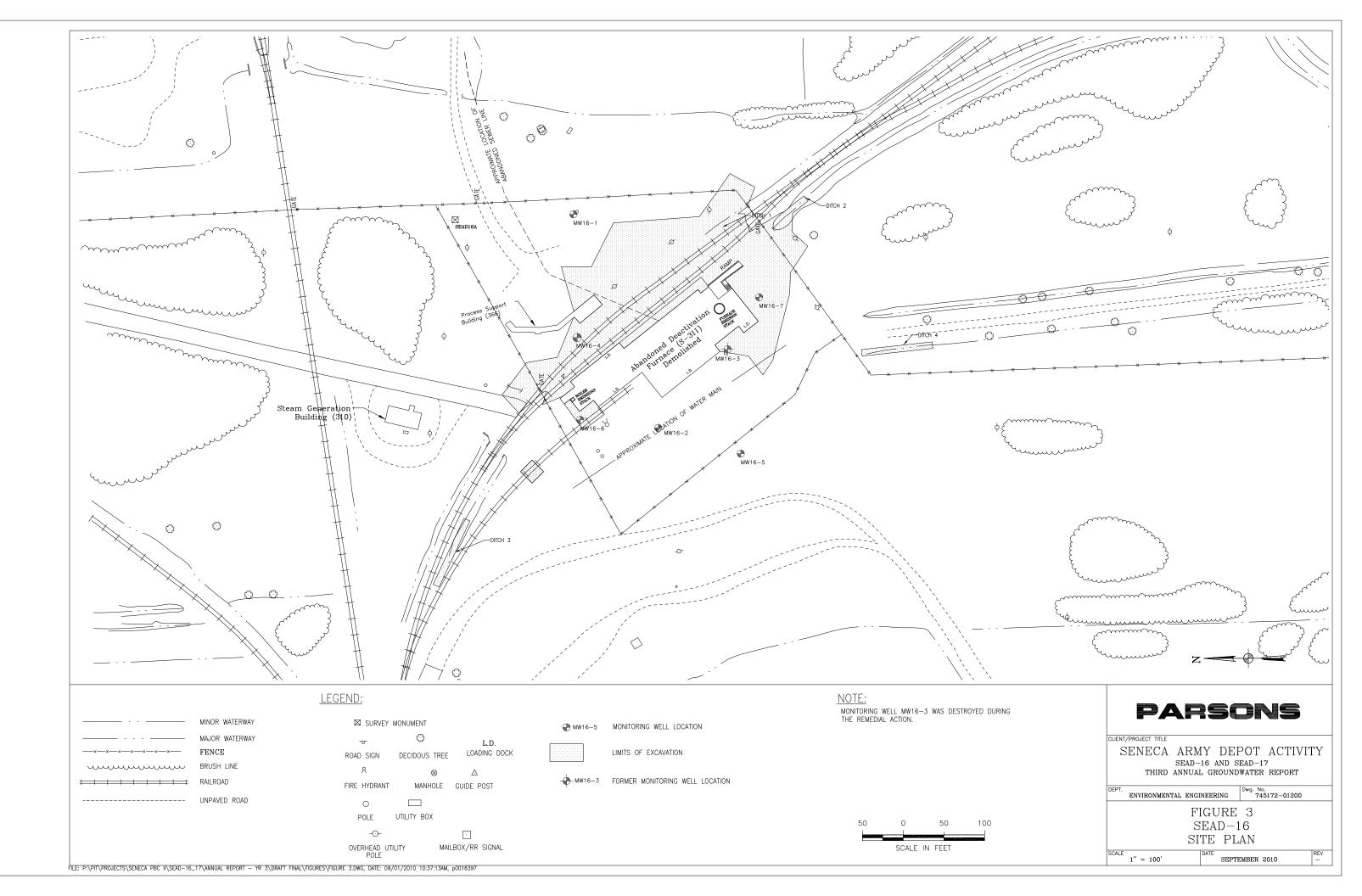
J = the reported value is an estimated cocentration

## FIGURES

- Figure 1 Seneca Army Depot Activity Location Map
- Figure 2 Location of SEAD-16 and SEAD-17 at Seneca Army Depot Activity
- Figure 3 Site Plan SEAD-16
- Figure 4 Site Plan SEAD-17
- Figure 5 Groundwater Flow Trend SEAD-16 and SEAD-17

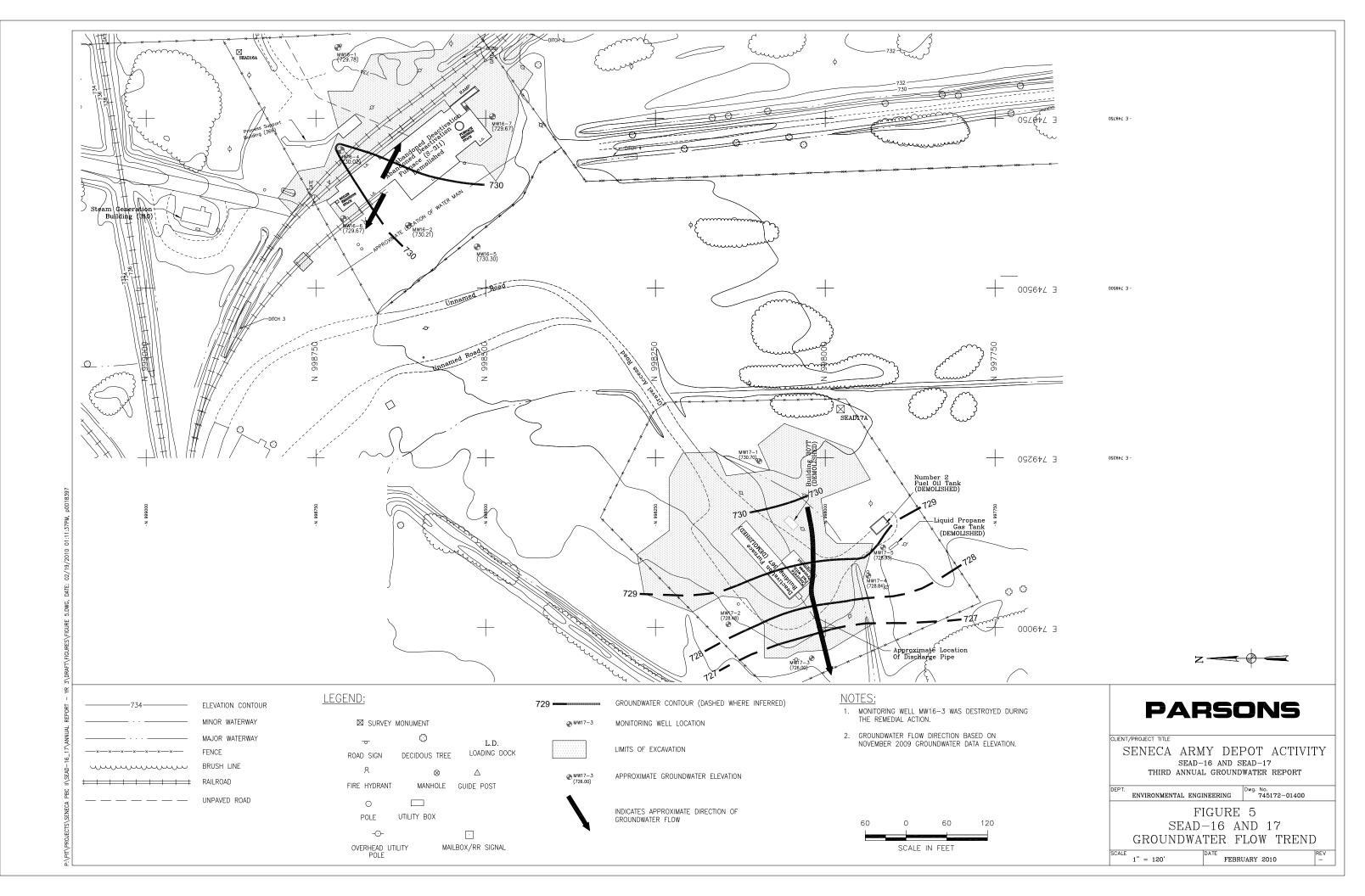








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*	CLIENT/PROJECT TITLE SENECA ARMY DEPOT ACTIVITY SEAD-16 AND SEAD-17 THIRD ANNUAL GROUNDWATER REPORT
	DEPT. ENVIRONMENTAL ENGINEERING DWG. NO. 745172-01200 FIGURE 4 SEAD-17 SITE PLAN SCALE 1" = 100' DATE FEBRUARY 2010 REV -



### 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

		LOC_II SAMP II QC CODI STUDY II MATRE SAMPLE DAT	D: E: D: K:	MW16-1 16101 SA RI ROUND1 WATER 8/27/1996	MW16-1 16152 SA RI ROUND2 WATER 12/7/1996	MW16-2 16102 SA RI ROUND1 WATER 8/27/1996	MW16-2 16150 SA RI ROUND2 WATER 12/6/1996	MW16-3 16110 SA RI ROUND1 WATER 8/30/1996	MW16-3 16165 SA RI ROUND2 WATER 12/10/1996	MW16-4 16105 SA RI ROUND1 WATER 8/28/1996	MW16-4 16156 SA RI ROUND2 WATER 12/7/1996	MW16-5 16162 SA RI ROUND2 WATER 12/9/1996	MW16-6 16111 SA RI ROUND1 WATER 9/3/1996	MW16-6 16155 SA RI ROUND2 WATER 12/8/1996	MW16-7 16104 SA RI ROUND1 WATER 8/28/1996	MW16-7 16158 SA RI ROUND2 WATER 12/8/1996	MW16-7 16159 DU RI ROUND2 WATER 12/8/1996
	ACTION		10.07														
PARAMETER SEMIVOLATILE ORGANICS	LEVEL	SOURCE (1)	UNIT	VALUE Q	VALUE Q	VALUE Q	VALUE Q	VALUE Q	VALUE Q	VALUE Q	VALUE Q	VALUE Q					
3-Nitroaniline	5	GA	UG/L	26 UJ	25 U	26 U	25 U	25 U	25 U	25 U	25 J	25 U	25 U				
4-Chloroaniline		GA	UG/L UG/L	10 UJ	10 U	10 U	25 U 10 U	25 U 10 U	25 U 10 U	20 U 10 U	10 U	10 U	25 U 10 U	25 U 10 U	10 J	25 U 10 U	10 U
Benzo[ghi]perylene	5	0A	UG/L UG/L	10 UJ	10 U 10 U	10 U	10 U	10 C	10 U	10 U	10 U	10 U 10 U	10 U	10 U	10 J 10 U	10 U	10 U
Dibenz[a,h]anthracene			UG/L UG/L	10 UJ	10 U 10 U	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 10 U	10 U
Diethyl phthalate			UG/L 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	10 U	10 U	10 U 10 U	10 U
Indeno[1,2,3-cd]pyrene			UG/L UG/L	10 UJ	10 U 10 U	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	10 U 10 U	10 U
OTHER ANALYSES			UU/L	10 05	10 0	10 0	10 0	0.0 J	10 0	10 0	10 0	10 0	10 0	10 0	10 0	10 0	10 0
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	0.68 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		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		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		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		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		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					
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		UG/L	2.4 U	4.7 UJ		4.7 UJ		4.7 UJ		4.7 UJ		2.4 U	4.7 U.		4.7 UJ	4.7 UJ
Sodium	20,000		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:

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 standard or standard is a secondary value.

U = compound was not detected

J = the reported value is and estimated concentration

		LOC_ID: SAMP ID: QC CODE: STUDY ID: MATRIX: SAMPLE DATE	16108 SA RI ROUND1 Groundwater	MW17-1 16109 DU RI ROUND1 Groundwater 8/29/1996	MW17-1 16171 SA RI ROUND2 Groundwater 12/11/1996	MW17-2 16163 SA RI ROUND2 Groundwater 12/9/1996	MW17-3 16166 SA RI ROUND2 Groundwater 12/10/1996	MW17-4 16169 SA RI ROUND2 Groundwater 12/11/1996	MW17-5 16106 SA RI ROUND1 Groundwater 8/29/1996	MW17-5 16170 SA RI ROUND2 Groundwater 12/11/1996
	ACTION									
PARAMETER	LEVEL SOURCE	<sup>(1)</sup> UNIT	VALUE Q	VALUE Q	VALUE Q	VALUE Q	VALUE Q	VALUE Q	VALUE Q	VALUE Q
SEMIVOLATILE ORGA	NICS									
Benzo[a]pyrene		UG/L	0.7 J	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
Dibenz[a,h]anthracene		UG/L	1 J	0.9 J	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			0.04			0.0 C II	0.0 C II	0.04.11		0 <b>0</b> 4 <b>X</b>
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			00.4	54.6	207	05.2 11	261.11	41.0.11	20.0	60 H
Aluminum	2.04	UG/L	90.4	54.6	386	85.3 U	36.1 U	41.9 U		59 U
Antimony	3 GA	UG/L UG/L	2 U	2 U 2.7 U		3 U	3 U	3 U		3 U
Arsenic	10 MCL		2.7 U 85			4.4 U	4.4 U	4.4 U		4.4 U
Barium	1,000 GA 4 MCL	UG/L UG/L	85 0.26	87 0.21	90.4 U 0.2 U	66.1 U 0.2 U	27.4 U 0.2 U	27.4 U 0.2 U		62.6 U 0.2 U
Beryllium Cadmium	4 MCL 5 GA	UG/L UG/L	0.26 0.3 U	0.21	0.2 U 0.6 U	0.2 U 0.6 U	0.2 U 0.6 U	0.2 U 0.6 U		0.2 U 0.6 U
Calcium	5 GA	UG/L UG/L	108000	110000	104000	118000	108000	92000	108000	81100
Chromium	50 GA	UG/L UG/L	108000 1 U	1.5	104000 1 U	1 U	1 U	92000 1 U		1 U
Cobalt	50 GA	UG/L UG/L	1.2 U	1.5	1 U 2 U	1.3 U	1.3 U	1.3 U	-	1.3 U
Copper	200 GA	UG/L	3.1	4.3	1.1 U	2.6 U	1.5 U 1.1 U	1.5 U 1.1 U		1.3 U
Iron	200 GA 300 GA	UG/L	119	90.6	572 J	2.0 0	53.1 U	96.4 U		134
Lead	15 MCL	UG/L	1.7 U	1.7 U		1.9 U	1.5 U	3 U		1.5 U
Magnesium	10 MCL	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
Nickel	100 GA	UG/L	1.8	2.2	2.5 U	2.5 U	2.5 U	2.5 U		2.5 U
Potassium		UG/L	472	574	843 U	5320	772 U	1330 U		1070 U
Selenium	10 GA	UG/L	2.4 U	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		1.5 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		8.6 U
Vanadium		UG/L	1.2 U	1.4	1.6 U	1.6 U	1.6 U	1.6 U		1.6 U
Zinc		UG/L	2.5 R	3.2 R		63.9	7.7 U	8.3 U		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 standard 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

## **APPENDIX B**

## SEDA BACKGROUND GROUNDWATER DATA SUMMARY

# Table 3SEDA Background Groundwater ConcentrationsSEAD-16 & SEAD-17 Third Annual Groundwater Monitoring ReportSeneca Army Depot Activity

					FREQUENCY		TYPE	NUMBER	NUMBER	NUMBER
			AVERAGE	STANDARD	OF	CRITERIA	OF	OF	OF	OF
PARAMETER	UNIT	MAXIMUM	CONCENTRATION	DEVIATION	DETECTION	VALUE	CRITERIA	EXCEEDENCES	DETECTS	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

## **SAMPLING RECORD - GROUNDWATER**

SENEC	A ARMY D	DEPOT ACTIVITY	, C	ONSULT.	ANT: PAF	RSONS ES	WELL #: (6	-1
PROJECT	:	QUART	" ERLY SAMI	PLING -SEA	D 16/17		DATE:	11/13/09
LOCATION	N:		ROMUL	US, NY			<b>INSPECTORS:</b>	
WEATH	ER/ FIELD	CONDITIONS CHECK	LIST REL.	(RECO) WIND	RD MAJOR ( <b>FROM</b> )	CHANGES) GROUND / SITE	PUMP #: SAMPLE ID #:	16LM 20014
TIME	TEMP	WEATHER	HUMIDITY	VELOCITY	DIRECTION	SURFACE	MONII	TORING
(24 HR)	(APPRX)	(APPRX)	(GEN)	(APPRX)	(0 - 360)	CONDITIONS	INSTRUMENT	DETECTOR
1320	600	Sun	low	0-5	545	D-9	OVM-580	PID
DIAMETER ( GALLONS / LITEKS/F	INCHES): FOOT:	UME CALCULATION FACT           0.25         1         2           0.0026         0.041         0.163           0.010         0.151         0.617	3         4           0.367         0.654           1.389         2.475	<b>6</b> 1.47 5.564	34.16	3 = .4743=	stabilized water le eter factor (Gal/Ft) اعلی ا	1
HISTORIC	154114	DEPTH TO POINT OF WELL (TOC)	DEPT TOP SCREEM	OF LENG	TH D	WELL EVELOPMENT TURBIDITY	WELL DEVELOPMENT	WELL DEVELOPMENT SPEC. COND
mstorie	DAIA	E.EO	3.8	-	)		рН	SFEC. COND
DATA COLLE WELL S		PID READING (OPENING WELL)	WAT	DEPTH TO STATIC ER LEVEL (TOC		DEPTH TO STABILIZED ER LEVEL (TOC)	DEPTH TO PUMP INTAKE (TOC)	PUMPING START TIME
		0.00	4	+95 5.8	0		8.10	13:45
RADIATION SC DATA		PUMP PRIOR TO SAMPLING (cps)	1	14		PUMP AFTER AMPLING (cps)	N4	
	МО	NITORING DATA	COLLEC	TED DU	RING PU	RGING OPE	RATIONS	
TIME WATER (min) LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVE OXYGEN (m			COND hos) pH	ORP (mV)	TURBIDITY (NTU)
14:15 6.0	325	1.5	1.86	12.5			119	274
(4:23 6.0	325	1.5	.58	12.6			•	24.4
	-	4·0 2 A	-				/2/	
19:28 6.0	325	3.0	0.31	12.6			121	9.4
14:32 6.0	325	3.25	0.16	12-0		6 5.70	121	7.0
14:37 6.0	325	3.75	0.00	12.5	58 2.9	5 5.69	120	2.7
19:43 6.0	325	415	0.00	12.5	8 2.9	5 5.68	119	1.2
19:46 6.0	325	5.0	0.00	12.5	8 2.9	9 5.68	118	0.4

Sample

16LM 20014U @ 1446 16LM 20014 F @ 1445

ver. 2 / 11/12/2009

SEE MASTER ACRONYM LIST FOR COMPLETE LISTING OF ABBREVIATIONS

Gwsamprd.xls/TYPE1

Form #\_

9	SENEC	A ARMY D	EPOT ACTIVITY		C	ONSI	ULTAN	NT: PAI	RSONS H	ES	WELL #:	6 M	いて	
27538384222322463945	ROJEC		OUART	TERLY	/ SAMP	LING	-SEAD	16/17	1979-1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 - 1979 -		DATE:	6M1 11/4	109	- and a second
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т		TEME	WEATHER		EL. idity	WIN		FROM) RECTION	SURF		MON	ITORINO	•*************************************	3 <b>19-</b> 102
	'IME 4 HR)	TEMP (APPRX)	(APPRX)		ĺ	(APPI	1	0 - 360)	CONDI	i i	INSTRUMENT		TECTOR	••••
	45	450	Son Diche	lor		10-	5	NW	Du	1	OVM-58	30	PID	<b>W</b> (26.6)
							1999 - 1996 - 1996 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 -	En al angrés de l'Al de l'anne a de l'an Dagagan d'Al		/	0	0	)	-96.00.17.4
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	ALLONS LITERS/	FOOT:	0.0026 0.041 (0.163 0.010 0.151 (0.163	0.367		1.47 5.564	and a factor	1.58.			· ·			
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	HISTORIC	DATA	(10C)		SCREEN		(FI)		TURBIDITY		рН		C. COND	<b></b>
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DA	TA COLLI	CTED AT	PID READING			DEPTH T STATIC	2		DEPTH TO STABILIZED		DEPTH TO PUMP INTAKE		ING START TIME	
	WELL S		(OPENING WELL)	*	WATE	R LEVE	L (TUC)	WA	TER LEVEL (	IOC)	(100) 5.36		10-1	10- <sup>2</sup> -194 -
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TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)		DISSOLVEI (YGEN (mg		TEMP (C)	3	. COND nhos)	рĦ	ORP (mV)		TURBIDITY (NTU)	
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V	FATH	FR / FIELD	CONDITIONS CHECK	LIST	(RECO	ORD MAJO	R CHAN	GES)		16LM 20016
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			0.36 mg/1		1.05		44	and (1970) page our plant 1 Years	6.55	1005
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TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLV OXYGEN (r	1		C. COND amhos)	pH	ORP (mV)	TURBIDITY (NTU)
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1		PUMPING RATE (ml/min)	(GALLONS)	Design State of States and	XYGEN (n		(C)	1	nhos)	pH	anternational status	(mV)	(NTU)	
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SEE MASTER ACRONYM LIST FOR COMPLETE LISTING OF ABBREVIATIONS

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Form #\_\_\_\_\_

Form	#	

	SENE	CA ARMY	DEPOT ACTIVITY	ľ	6	CONS	ULTA	ANT: PA	RSON	5 ES	WELL #: MI	N16-6
general and an and a second	PROJEC	T:	QUA	RTERLY	" Y SAMI	PLING	-SEAI	D 16/17			DATE:	14/17/09
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an	WEATE	IER/ FIEL	D CONDITIONS CHEC		EL.	(K WIN		D MAJOR		GES) ND/SITE	SAMPLE ID #:	16LM/001
1	TIME	TEMI	WEATHER		IDITY	VELOC	TTY I	DIRECTION	-	RFACE	MONI	roring
	24 HR)	(APPR			EN)	(APPI	manafin	(0 - 360)		DITIONS	INSTRUMENT	DETECTO
10	15	450	Sim	<u> </u>	ou	5-1	<u>5</u>	Su	Ĺ	m	OVM-580	PID
an a	interantistiki <del>nati</del> ti	WELL V	OLUME CALCULATION	FEORS	and the second	anti-merile survey as survey.		NE WELL VO	LUME (CA	I) = [(POW - 9	STABILIZED WATER LE	VEL)
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	HISTORIC	) DATA	OF WELL (TOC)		TOP SCREEN	OF	LENG (Ff)	IH L	WELL DEVELOPM TURBIDIT		DEVELOPMENT pH	DEVELOPMENT SPEC. COND
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TIME (min)	WATER LEVEL	PUMPING RATE (ml/mi	CUMULATIVE VOL (GALLONS)		NSSOLVE YGEN (mg		TEMI (C)		COND thos)	pH	ORP (mV)	TURBIDITY (NTU)
103	Ò	Pull	Down & Pro	la.	On	vr12	naytes mit modern	en en den ziel en de ser de	09/7780000.00000.0000000000		002/17/06/2014/07/2014/17/07/97/97/97/97/97/02/2014/17/2014/07/2014/07/92/97/97/97/97/97/97/97/97/97/97/97/97/ 4	906/16/10/00/00/10/00/00/00/00/00/00/00/00/00/
1045	4.5	120 m/			335	Ysi	13.3	0.2	257	722	-47	260
1055	4.55	120m//al		3	5.42	9 - 99 B) an , an e - 1 ag - 1	13.		271	7.32	water a second second second response a second s	65
[]:00	4.70	110 m/ine		2	.90		13.2	. 0:2	15	7.36	51	45.6
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1210	4.85	80 mint	1 -		2.07	vsi		30.2	83	7.39	- 46	26-4
1115	4.90	80 mlint			1.88	45	13~	4 0.2	.84	7.40	-72	19.1
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SEE MASTER ACRONYM LIST FOR COMPLETE LISTING OF ABBREVIATIONS

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Form	#	

nf eer tu vultui ol	SENE	CA ARMY I	DEPOT ACTIVITY		CON	SULT	ANT: PA	ARSON	IS ES	WI	ELL #: M	W 16.7
	ROJEC		QUAR		SAMPLIN		D 16/17				DATE:	11/12/09
LO	OCATIO	)N:		RO	MULUS,	NY			—		PECTORS: MP #:	MCA
un na management and same same United and a same same same same same same same sa	WEATH	IER / FIELD	CONDITIONS CHEC			ene granter en er bestere	D MAJ		an a	SAN	APLE ID #:	16LM20019
Т	TIME	TEMP	WEATHER	REI HUMID	lan an a	/IND LOCITY	(FROM DIRECTIO		UND / SITE JRFACE	2854.01.07.01	MONI	FORING
	4 HR)	(APPRX)		(GEN	alaan ayaada wax	PPRX)	(0 - 360)	CON	DITIONS	INS	STRUMENT	DETECTOR
150	30	<b>54°</b>	Sun	104	, 0-	5	Sw	1	<i>by</i>		OVM-580	PID
	AMETER GALLONS LITERS/	(INCHES): / FOOT:	LUME CALCULATION FAC 0.25 1 2 0.0026 0.041 0.151 0.63 0.010 0.151 0.617	<b>3</b> 0.367 0	<b>4 6</b> 0.654 1.4 0.475 5.56	7	NE WELL V				IZED WATER LE FACTOR (GAL/FT • 905	
	HISTORIC	• 15A.11.4	DEPTH TO POINT OF WELL		DEPTH TO TOP OF SCREEN (TOO	SCREI LENG	rH	WEL DEVELOP TURBIE	MENT	DF	WELL SVELOPMENT	WELL DEVELOPMENT
	BISTORIC	, DATA	(TOC) 6.6		1.6	<sup>(FT</sup>		IUKBIL	ЛП <u>Ү</u>		рН	SPEC. COND
DA	TA COLL WELL	ECTED AT SITE	PID READING (OPENING WELL)		DEPT STA WATER LE		· · · · · · · · · · · · · · · · · · ·	DEPTH STABILI ATER LEV	ZED	DEI	PTH TO PUMP INTAKE (TOC)	PUMPING START TIME
			0.00	1	5.60	\$475	•				errore of the second second reaction	15:20
RAI	DIATION S DAT	CREENING A	PUMP PRIOR TO SAMPLING (cps)	11-11 Martin - 4000 martines	ann an t-air ann a t-thairt	antika katalan sa	a	PUMP AI SAMPLING				
and a state of the state of the	na u ni oferina - 2 cente	МО	NITORING DATA	COL	LÉCTE	d dui	RING 1	PURGI	NG OPE	RAT	IONS	
TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)		SOLVED EN (mg/L)	TEM (C)	1	C. COND umhos)	рН	2000-0491 (20,200) 	ORP (mV)	TURBIDITY (NTU)
15:40	\$5.1	200 m	5	3.	03	12.1	в.	314	5.92	<u> </u>	118	27.2
15:45		180	1.0	1.5	74	/2.0	) .3	529	5.87	Z	128	19.4
15:50	5.2	170	paulije (Murinium v), mijerniho za o namenjuje iz ur obraza na jeko Murinium kompanija	0.8	35	11.97	0.3	536	5.91	į	126	16.4
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1600	5.2	150	1.5	0.0	<u>)</u>	12.0		62	5.91		127	12.1
1665	5.2	150		0.0		12.0			5.92	• • • ••	129	5.7
610	· · · · · · · · · · · · · · · · · · ·	150	·····	0.0			5 03		5.93	and the providence	128	3.6
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1	SENEC	CA ARMY I	DEPOT ACTIVITY		CO	NSULT	ΓAN	IT: PAI	RSONS	ES	WELL #: MI	w17-1
P	ROJEC	<b>T:</b>	QUAR	TERL	Y SAMPLI	ING -SE	AD 1	6/17			DATE:	11/18/09
L	OCATIC	)N:		F	ROMULUS	S, NY	- n:				INSPECTORS: PUMP #:	2 
on and a state of the	WEATH	ER / FIELD	CONDITIONS CHECI	KLIST	, na	(RECC	ORD	MAJOR	CHANG	ES)		TLM 20010
				- and the second se	EL.	WIND	Q	FROM)	GROUN	D / SITE		
	IME	TEMP	WEATHER (APPRX)	1		ELOCITY	1	RECTION	SURF	20	MONII INSTRUMENT	ORING DETECTOR
12.0	4 HR) ビ	(APPRX) 50 •	Sun		~	a second and as a second s		and the second	OVM-580	PID		
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DIA	METER	WELL VOI (INCHES):	UME CALCULATION FAC 0.25 1 2	TORS 3	4	6	ONE	WELL VOI			STABILIZED WATER LEV ETER FACTOR (GAL/FT)	
	ALLONS LITERS/	/ FOOT:	0.0026 0.041 0.163 0.010 0.151 0.61	0.367 1.389		.47 564		4.4ft	-8163	= 0	·717x3-	2.156
~~~Q&		and a second	DEPTH TO POINT OF WELL		DEPTH T TOP OF SCREEN (T	LEN	EEN GTH		WELL EVELOPMEN TURBIDITY		WELL DEVELOPMENT	WELL DEVELOPMENT
	HISTORIC	, DAIA	(10C) [D.50		5.5	, and the second se	FT)			on the second state of the	pH	SPEC. COND
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		an series and and and an internal series and a series of the first ser	4.50		6.	.1 <i>f</i> <b>f</b> .	*****		6.6ff.		9.3H.	1200
RAI	DIATION S DAT	CREENING A	PUMP PRIOR TO SAMPLING (cps)	n an			in an		PUMP AFTEI AMPLING (cj			8.1.3 16876-989-982-99250-952055550-0420-3004-8.188450-0420-
			NITORING DATA	CO	LLECTI	ED DU	<b>RI</b>	Ad Variantine and Didenation and	JRGING	G OPE	RATIONS	
TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	5	DISSOLVED (YGEN (mg/L)	1	MP C)	1	COND thos)	pH	ORP (mV)	TURBIDITY (NTU)
30s	6.5	180 WILM	2 82	6	1.42	14		0.30	8	7.01	61	200
3(0	6.6	180 m min		4	.03	14	٢	0.3		6.85	67	254
315	6.6	180m/mm		3	·41 ¥\$	: 14	2	0.3	21	6.85	66	234
320	6.6	180m unn		3	·20 ys	: 14	٠L	0.31	7	689	<b>5</b> 8	84
325	6.6	180m min	3gal	3	1·40 w	si 14	٠Z	6.31	6	6.90	55	10.2
	6.6	18 mil/mit		3	.50 y	si 14.		0.3/		6.97	48	64
		180ml/m.m	والمراجع وال		.60 y		and the second	0.31	-	6.98	42	4.3
340		(Delimin			-67 w					6.98	en e	[.]
345		180 m (ain			.65 VS	าวรางสุดที่สารที่สาราชตระสะสาว	With the second second	The second se	and the second se	6.98	37	12
		180m/imm	Aga		56 42				en e	6.99	a service and the service of the ser	0.8
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TIME (min)	WATER LEVEL	PUMPING RATE (ml/min)	CUMULATIVE VOL (GALLONS)	DISSOLVED OXYGEN (mg/L)		TEMP (C)		COND ahos)	pH	ORP (mV)	TURBIDITY (NTU)
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## **APPENDIX D**

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

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
SAMILL KOUND			Action	1	1	2	5	5	1	2	5	5
<b>n</b> (1	<b>T</b> T •4	$\alpha \cdot \cdot$		$\mathbf{V} = (0)$			$\mathbf{V} = (0)$	$\mathbf{V} = (0)$				V 1 (O)
Parameter	Units	Criteria <sup>2</sup>	Level	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Aluminum	UG/L		2	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	<u>1</u> U	<u>1</u> U	1.3 U	1.3 U	1.3 U	<u>1</u> U	<u>1.3</u> U	1.3 U	1.3 U
Sodium	UG/L	GA	20,000	25300 J	<b>24200</b> J	182000	8000 J	8000 J	<b>49600</b> 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 standard or standard is a secondary value.

U = compound was not detected

J = the reported value is and estimated concentration

SITE LOCATION LOCATION ID				SEAD-16 MW16-4	SEAD-16 MW16-4	SEAD-16 MW16-4	SEAD-16 MW16-4	SEAD-16 MW16-4	SEAD-16 MW16-5	
MATRIX				GW	GW	GW	GW	GW	GW	
SAMPLE ID				16LM20003	16LM20009	16LM20008	16LM20016UNFIL	16LM20016FIL	16LM20004	1
SAMPLE DATE				12/20/2007	12/9/2008	12/9/2008	11/17/2009	11/17/2009	12/20/2007	
SAMPLE TYPE				SA	DU	SA	SA	SA	SA	
STUDY ID				LTM	LTM	LTM	LTM	LTM	LTM	
SAMPLE ROUND				1	2	2	3	3	1	
			Action	-	_	_	-	-	-	
Parameter <sup>1</sup>	Units	Criteria <sup>2</sup>	Level	Value (Q)						
Aluminum	UG/L	01100110	20101	167 J	101 J	104 J	68 J	24 U	160 J	
Antimony	UG/L	GA	3	5.11	2.94	2.89	6.3	6	1.82	
Arsenic	UG/L	MCL	10	4.2 U	3.7 U	3.7 U	3.7 U	3.7 U	4.2 U	
Barium	UG/L	GA	1,000	44.5	279	290	123	129	38.9	
Beryllium	UG/L	MCL	4	0.27 U	0.33 U	0.33 U	0.3 U	0.3 U	0.27 U	
Cadmium	UG/L	GA	5	0.36 U	0.33 U	0.33 U	0.3 U	0.3 U	0.36 U	
Calcium	UG/L	-		87100 J	267000	275000	125000 J	130000 J	89000 J	
Chromium	UG/L	GA	50	1 J	0.88 U	0.88 U	0.9 U	0.9 U	1.1 J	
Cobalt	UG/L			0.89 U	1.1 U	1.1 U	2 J	1.8 J	0.89 U	
Copper	UG/L	GA	200	5.4 J	4.2 J	4.4 J	6.2 J	2.4 J	3.1 J	
Iron	UG/L	GA	300	95.4	38.4 J	57 J	<b>419</b> J	<b>329</b> J	1200	
Iron+Manganese	UG/L	GA	500	127	46 J	65	513.5 J	417.7 J	1238	
Lead	UG/L	MCL	15	2.9 U						
Magnesium	UG/L			9440 R	34500	35200	16000	16800	9380 R	
Manganese	UG/L	GA	300	31.2	8	7.7	94.5	88.7	37.6	
Mercury	UG/L	GA	0.7	0.12 U	0.12 U	0.12 U	0.1 U	0.1 U	0.12 U	
Nickel	UG/L	GA	100	1.2 U	1.9 J	2.2 J	1.4 J	1.7 J	1.2 U	
Potassium	UG/L			1300 R	3690 J	3830 J	3270	3270	4420 R	
Selenium	UG/L	GA	10	6.1 U						
Silver	UG/L	GA	50	1 U	1.3 U	1.3 U	1.3 U	1.3 U	1 U	
Sodium	UG/L	GA	20,000	<b>40800</b> J	419000	434000	<b>363000</b> J	<b>380000</b> J	8410 R	
Thallium	UG/L	MCL	2	0.03 U	0.09 U	0.09 U	0.2 U	0.2 U	0.03 U	
Vanadium	UG/L			0.78 U	0.98 U	0.98 U	1.1 J	1.1 J	1.2 J	
Zinc	UG/L			5.3 J	9.8 J	14.6 J	3.6 U	3.6 U	34.4	

#### 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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SEAD-16	SEAD-16	SEAD-16
MW16-5	MW16-5	MW16-5
GW	GW	GW
16LM20010	16LM20017UNFIL	16LM20017FIL
12/10/2008	11/16/2009	11/16/2009
SA	SA	SA
LTM	LTM	LTM
2	3	3
Value (Q)	Value (Q)	Value (Q)
563	164 J	24 U
4.23	1 U	1 U
3.7 U	3.7 U	3.7 U
22	42	42.8
0.33 U	0.3 U	0.3 U
0.33 U	0.3 U	0.3 U
53100	110000 J	115000 J
1.2 J	0.9 U	0.9 U
1.1 U	1.1 U	1.1 U
10.6	1.3 U	1.3 U
699	<b>1150</b> J	<b>800</b> J
731	<b>1323</b> J	<b>970</b> J
10.1	2.9 U	2.9 U
6050	11800	12200
32.4	173	170
0.12 U	0.1 U	0.1 U
2.6 J	2 J	1.8 J
2610 J	2380	2370
6.1 U	6.1 U	6.1 U
1.3 U	1.3 U	1.3 U
2180	2800 J	2700 J
0.09 U	0.2 U	0.2 U
2.3 J	1.1 J	1 U
10.3	3.6 U	3.6 U

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
			Action									
Parameter <sup>1</sup>	Units	Criteria <sup>2</sup>	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	<b>440</b> J	55 J	29.2 J	770	61 J	19 UJ	135 J
Iron+Manganese	UG/L	GA	500	441	158	<b>515</b> 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	<b>20600</b> J	<b>22000</b> J	68400 J	74900	<b>46100</b> J	<b>55900</b> J	<b>47100</b> 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 standard or standard is a secondary value.

U = compound was not detected

J = the reported value is and estimated concentration

SITE LOCATION LOCATION ID MATRIX SAMPLE ID				SEAD-16 MW16-7 GW 16LM20019FIL
SAMPLE DATE				11/12/2009
SAMPLE TYPE				SA
STUDY ID				LTM
SAMPLE ROUND				3
,		2	Action	
Parameter <sup>1</sup>	Units	Criteria <sup>2</sup>	Level	Value (Q)
Aluminum	UG/L			<u>32</u> 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	<b>52100</b> J
Thallium	UG/L	MCL	2	0.2 U
Vanadium	UG/L			1 U
Zinc	UG/L			3.6 U

#### Notes:

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(TOGS 1.1.1, June 1998) and EPA Maximum Contamination Limit

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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
			Action										
Parameter <sup>1</sup>	Units	Criteria <sup>2</sup>	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	<b>25929</b> 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

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1. The criteria values are NYSDEC Class GA Groundwater Standards (TOGS 1.1.1, June 1998) and EPA Maximum Contamination Limit

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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
Shini EE ROOND			Action	5	5	1	-	5	5	1	2	5	5
Parameter <sup>1</sup>	Units	Criteria <sup>2</sup>	Level	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)	Value (Q)
Aluminum	UG/L	Cinterna	Level	1550 J	141 J	50.2 J	125 J	value (Q) 70 J	28 J	98.5 J	125 J	98 J	29 J
Antimony	UG/L UG/L	GA	3	1550 J	141 J 1 U	50.2 J 1 U	0.62 J	70 J 1 U	28 J 1 U	98.3 J 1 U	0.56 J	98 J	29 J
Arsenic	UG/L UG/L	MCL	10	1.5 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 UG/L	GA	1,000	54.5	49.4	4.2 U 32.5	35.9	36.6	36.3	4.2 U 86.7	82.9	168	166
Beryllium	UG/L UG/L	MCL	4	0.3 U	49.4 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 UG/L	GA	5	0.3 U 0.3 U	0.3 U	0.27 U 0.36 U	0.33 U	0.3 U	0.3 U	0.27 U 0.36 U	0.33 U	0.3 U	0.3 U
Calcium	UG/L UG/L	UA	5	95900 J	99400 J	74900 J	74700	97600 J	96600 J	97100 J	97300	185000 J	184000 J
Chromium	UG/L UG/L	GA	50	93900 J 5.2	0.9 U	74900 J 1 J	0.88 U	97000 J 0.9 U	90000 J 0.9 U	0.84 U	0.88 U	0.9 U	0.9 U
Cobalt	UG/L UG/L	UA	50	5.2 1.7 J	0.9 U 1.5 J	0.89 U	2.4 J	0.9 U 1.3 J	0.9 U 1.5 J	0.84 U 0.89 U	0.88 U 1.1 U	0.9 U 1.1 U	0.9 U 1.1 U
Copper	UG/L UG/L	GA	200	1.7 J 7.9 J	2.5 J	1.8 J	2.4 J 1.8 J	1.3 J 1.3 U	1.3 J 1.3 U	1.3 U	1.1 U 1.5 J	1.1 U 1.3 U	1.1 U
Iron	UG/L UG/L	GA	300	2690 J	827 J	45.4 J	1.8 J	1.5 U 142 J	60 J	91.7	76	1.5 U 34 J	1.5 U 19 UJ
Iron+Manganese	UG/L UG/L	GA	500	2050 J 2858 J	968 J	45.4 J 59 J	2671	142 J 355 J	258 J	128	85	61.4 J	43.3
Lead	UG/L UG/L	MCL	15	8.6	2.9 U	2.9 U	2071 2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	43.5 2.9 U
Magnesium	UG/L UG/L	MCL	15	9170	9850	10400 R	10200	13000	12900	15800 J	15600	27300	27100
Manganese	UG/L	GA	300	168	141	13.7	911	213	12900	36.5	8.9	27300	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	0.12 C 1.2 J	0.1 C 1.8 J	1.7 J
Potassium	UG/L	GIT	100	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	20,000	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
	0012					0.1 9	0., 9	2.5 0	510 0			2.5 0	2.0 0

#### 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 standard or standard is a secondary value.

U = compound was not detected

J = the reported value is and estimated concentration